State of Utah

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Lt. Governor

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Division of Facilities Construction and Management
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Addendum No. 1

Date: September 18, 2013

To: CM/GCs

From: Darrell Hunting– Project Manager

Reference: Science and Technology Classroom Building - Tooele Campus
Utah State University – Tooele, Utah
DFCM Project No. 13052770

Subject: **Addendum No. 1**

Pages	Addendum Cover Sheet	1 page
	Draft Program	225 pages
	Total	226 pages

Note: This Addendum shall be included as part of the Contract Documents. Items in this Addendum apply to all drawings and specification sections whether referenced or not involving the portion of the work added, deleted, modified, or otherwise addressed in the Addendum. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to Disqualification.

1.1 SCHEDULE CHANGES: There are no Project Schedule changes.

1.2 GENERAL ITEMS:

1.2.1 See attached Draft Program dated September 16, 2013.

1.2.2 The majority of meetings for the duration this project will be held in Tooele

Tooele Science and Technology Building

PROGRAM DOCUMENT

UtahStateUniversity

September 16th 2013

METHODSTUDIO INC.

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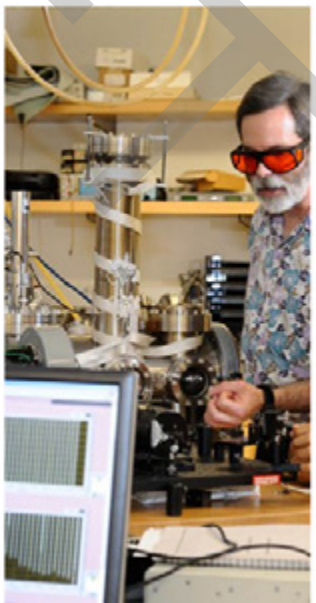

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UTAH STATE UNIVERSITY REVIEW SIGNATURES

We have reviewed the Program for the Utah State University, Tooele Regional Campus, Science and Technology Building and warrant that it adequately represents our request for a program document and it fulfills our mission and program goals. The appropriate parties listed below have reviewed it for approval.

STATE OF UTAH DFCM

_____ _____

Darrell Hunting, Project Manager Date

UTAH STATE UNIVERSITY

_____ _____

Donna Dillingham-Evans, Campus Dean
Utah State University Date

_____ _____

John Fitch, Project Manager Date

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Acknowledgements and Program Design Team

ACKNOWLEDGEMENTS

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Programming Table of Contents

00 **Signature Sheet** *3*
Acknowledgments and Design Team *4*
Table of Contents *6*

01 **Executive Summary**
Project Goals, Mission and Vision *10*
Project Justification *12*
Building Program Summary *14*
Building Cost Summary *16*

02 **Site Analysis**
Overview *24*
Site Location and Planning Principals *26*
Site Circulation and Relationships *28*
Public Transportation *30*
New and Existing Roadways *32*
Zoning *34*
Master Planning *36*
Site Climate/Orientation *38*
Site Views *40*

03 **Building Requirements**
Architectural Narrative and Vision *58*
Codes, Regulations, and Safety *60*
2009 International Building Code Review *62*

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Building Systems Design Criteria- Structural Systems 64
Building Systems Design Criteria- Mechanical, Plumbing and Fire Protection Systems 68
Building Systems Design Criteria- Electrical Systems 74
Civil Design Criteria 82
Landscape Design Criteria 88
Sustainable Design Criteria 90

04 **Space Requirements**
Space Area Summary 94
Adjacency Diagrams 96
Stacking Diagrams 98

05 **IVC Classrooms** 102

06 **Biology** 114

07 **Chemistry** 146

08 **Physics** 162

09 **Misc. Building** 172

10 **Building Support Spaces** 190

11 **Appendices** 202
I. Alternate Adjacency Diagrams
II. Alternate Stacking Diagrams
III. Proposed Fiber/ALTA Survey
IV. Proposed UEN Raceway
V. Laboratory Equipment and Furniture-issued seperately
VI. Research Laboratory Equipment and Furniture-issued seperately
VII. IVC Laboratory Equipment and Furniture-issued seperately

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EXECUTIVE SUMMARY

01 Executive Summary

Project Goals/Mission and Vision

The Utah State University Tooele Campus prepared a master plan in 2011 to help establish a framework for future campus development that will fulfill the vision of the University and fellow stakeholders in the Tooele community. The 50-year plan provides a guide for incremental development that meets programmatic objectives as defined by the University with support and participation from educational partners, local government, local business and industry, and area residents and community members.

From modest beginnings in downtown Tooele in 1986, USU Tooele has grown to serve a head count of nearly 1,000 students. Its current 36,000 SF building in west Tooele City is adjacent to two other educational facilities: the recently completed Tooele Applied Technology college and the Tooele County School District (TCSD) Community Learning Center. The adjacent facilities provide alternative high school and post-secondary technical education and partner with USU in sharing academic and student support space.

USU has acquired 54 acres of undeveloped land directly south of the three existing educational facilities and is working to expand its physical campus on the vacant property. USU, the TATC, the TCSD, and other Tooele community members envision this area of the city as the Tooele Educational Corridor, which will serve the educational, training, and cultural enrichment needs of the entire Tooele County community.

BROAD GOALS FOR DEVELOPMENT OF THE MASTER PLAN INCLUDE:

- Implement the vision of an educational corridor for Tooele County, in which the USU Tooele Campus, the TATC and the TCSD are essential partners. This will be a campus community environment that provides access to high quality adult education, six days a week, 52 weeks a year.

- Develop connections among all educational facilities in the vicinity: the current USU building, the TATC new building, the new USU Science and Technology building, the CLC, and the rest of the newly acquired campus property and future buildings.

- Establish a physical framework for a campus environment that will allow USU Tooele to fulfill its programmatic objectives, as well as the vision and goals of the collective stakeholder group.

- Incorporate sustainable design principles in all aspects of the campus development, including site, building, and utilities.

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- Offer attractive, accessible, and affordable first-rank higher education opportunities to Tooele County and regional residents.

- Become a good community partner for business development and incubation, providing a highly educated workforce to local businesses.

- Fulfill the community expectation of the campus as an economic engine and anchor for local, regional, and statewide development and job growth.

PROJECT GOALS/MISSION AND VISION

The new USU Tooele Science & Technology Building will accommodate a broad future curriculum focusing on an undergraduate comprehensive experience to best support the community. Offerings will focus on Biology and Chemistry with classes also offered in Physics, Math, Geology and Computer Science. The building should be visually and philosophically an extension of Utah State University and offer a smaller class experience in this location. The new building should execute the vision and goals for master planned campus and should bolster technological, philosophical and community connections. Since the Science and Technology building is the first new building of the master plan build out it should be located close to the road to establish a strong presence for the campus. It should have a strong physical and visual connection between all USU buildings along Tooele Boulevard with walk able connections to the Tooele Applied Technology College and the Community Learning Center. The building will strive to be a good neighbor with sensitivity to surrounding neighborhoods and communities. Views from neighboring properties through the site should be preserved as much as possible and construction disturbance minimized.

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SCIENCE AND TECHNOLOGY BUILDING

The new Science & Technology building will provide much needed space to accommodate the current and anticipated growth in enrollment and programs at the USU Tooele Campus. New programs to be implemented within the next eight years and housed in this building include:

- Applied Sciences
- Registered Nursing
- Industrial Hygiene
- Construction Management
- Forensic Anthropology
- Criminal Justice
- Environmental Sustainability

A large portion of the new building will consist of instructional classrooms with state-of-the-art distance learning capabilities that accommodate the broader student base. The existing campus and new building are distance learning facilities that have strong ties to the main campus in Logan but allow for regional course offerings to remote and rural communties across Western Utah. The facility will also house new teaching and research laboratories for Biology, Chemistry and Physics. Additional spaces will also include IV Origination Classrooms, multipurpose rooms, study and lounge space for students, and administrative offices for faculty and staff needed to implement these programs.

From 2006-07 through 2010-11, USU Tooele enrollments had an average 12% yearly increase in the quantity of full-time equivalent students (FTE's). Over the past five years, the campus has experienced greater than a 77% increase in FTE quantity and a 155% increase in the number of degrees awarded.

USU Tooele has historically had a high number of non-traditional students, including concurrent students who are taking college courses while still enrolled in high school, and students above 26 years of age. Tooele County residents who are high school graduates aged 18-26 years old have typically attended full-time college outside of Tooele County.

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As local post-secondary educational offerings have increased, and as the local population has grown, the number of traditional students on the Tooele Campus has increased as well. USU Tooele and other area educators and community members are hoping to increase local post-secondary educational opportunities, so that local youth can gain college education while remaining at home, in their own community. In support of this, USU Tooele is implementing policies and programs to target growth in the traditional-age student demographic, while trimming concurrent enrollment to general education courses only. After studying past patterns and looking at possible future growth scenarios, an FTE growth rate of 23% for future five-year periods has been applied to project long term campus growth (equivalent to a 4.25% yearly growth rate.) This will take the campus from a fall 2011 FTE quantity of 408 to around 3,200 over the next 50 years.

Utah State University, the Tooele Applied Technology College, the Tooele County School District, and other Tooele community members envision the USU Tooele Campus as the Tooele Educational Corridor, which will serve the educational, training, and cultural enrichment needs of the entire Tooele County community. Utah State University Tooele's programs and capacities are being supplemented by shared space in two adjacent facilities: the Tooele County School District's Community Learning Center, completed in 2010, and the new Tooele Applied Technology College completed in June of 2013.

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DESCRIPTION

The USU Tooele Science and Technology Building will consist of the following major program elements: one large multipurpose room with the ability to house 250 occupants, two large IVC origination classrooms, two mid-size IVC origination classrooms, one mid-size pod IVC classroom, five teaching laboratories, one cadaver laboratory, one large shared research laboratory, one computer lab and several miscellaneous support, office and admistrative spaces. Further explanation of the major programmed areas can be found in Section 4 in the Detailed Space Area Summary and in the Individual Space Summary, Sections 5-10. To meet the programmatic needs for the new USU Tooele building it has been sized to 29,600 gross square feet. A .25 grossing factor was applied to the net square footage to get to the final gross square footage amount. The gross factor is for circulation, wall thickness, shafts and ancillary spaces.

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Description	Sq. Feet
IVC CLASSROOMS	4018
BIOLOGY	8123
CHEMISTRY	1950
PHYSICS	1440
MISC BUILDING	4250
BUILDING SUPPORT	3480
NSF Subtotal	23261
Circulation, access, walls (25% NSF)	5815
TOTAL	**29076**

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SITE ANALYSIS

02 Site Analysis

Overview

ANALYSIS

The Site Analysis portion of the program document identifies the impact of the site on the program, project budget and schedule. It identifies the physical characteristics of the direct building site and the surrounding geographical region. The analysis includes diagrams, maps and photographs to illustrate key features including: site topography, site climate, pedestrian and vehicular circulation, view corridors, key physical and visual adjacencies. The site analysis for the programming phase is intended to be a useful tool for the design phase of the project.

LOCATION

USU Tooele is located in Tooele, Utah approximately 30 miles from Salt Lake City. The campus is located near several recreation areas including the Oquirrh Mountains, Stansbury Mountains, and Antelope Island State Park on the Great Salt Lake. Tooele City has hosted the Tooele Arts Festival since 1985. Other notable features of the region include the Miller Motor Sports Park, Tooele Army Depot, and Deseret Peak Complex. Nearby towns include Grantsville, Stansbury, Erda, and Stockton.

The 54 Acre planned USU campus is located along what is envisioned as the Tooele Education Corridor, incorporating Tooele Applied Technology College (TATC), the existing USU facility, and the Community Learning Center (CLC). The new Science and Technology Building will be the first building to be constructed on the USU Tooele master plan. The site lies directly south of the CLC building, and within walking distance from the existing USU facility and TATC, which offers USU distance learning courses and hosts a USU bookstore. To the east of the planned campus is a residential neighborhood, while on the west, there is room for the growth of the Tooele Research and Business Park. Primary access to the site is Tooele Boulevard, while 700 South forms the secondary access point to the south, from the nearby residential neighborhood.

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great salt lake
I-80
I-80
farnsworth peak
stansbury
midvale highway (proposed route)
grantsville
erda
oquirrh mountains
miller motor sports park
deseret peak complex
stansbury mountains
tooele army depot
tooele
usu tooele campus
settlement canyon
deseret peak
stockton
rocky peak

SITE SUMMARY

The new Science and Technology Building site is located in the new Tooele Educational Corridor and is bordered by the CLC and the TATC to the north, the future Tooele Research and Business Park and the Utah Industrial Depot to the west, and residential neighborhoods to the east and south. The site sits on a former airport, bisected by both a drainage ditch as well as the remains of a landing strip. Much of the site has remained undisturbed and consists of native vegetation. The site gently slopes down from the southeast to the northwest. See the Civil Design Criteria section for additional site and topographical information.

OUTDOOR SPACES

The 15 (54 for the entire master plan) acre site affords many opportunities for outdoor space. Most likely only part of the 15 acre phase II site will be developed for the New Science and Technology Building. The exact extent will be determined in the schematic design phase of the project and will be dependant on the budget with building specific requirements. It is the intent of the design team to continue the master plan's strong emphasis on open spaces, pedestrian paths and native vegetation.

LANDSCAPE

The landscape will demonstrate that this is a higher eduction facility while being sensitive to local influences and planting products and techniques. The site will utilize regional and waterwise landscaping. Because the project will be LEED Silver V3.0, there will be opportunities to gain LEED credits for water efficient irrigation and plantings. See the Landscape Design Criteria for additional information.

PARKING

The master plan specifies parking space north of the building site, which will be the first phase of what will become a perimeter parking area the entire length of the campus. This arrangement will be tested in the programming and early design phases, a loading zone with direct building access is required for the new Science and Technology building which will require some changes to the master plan parking layout.

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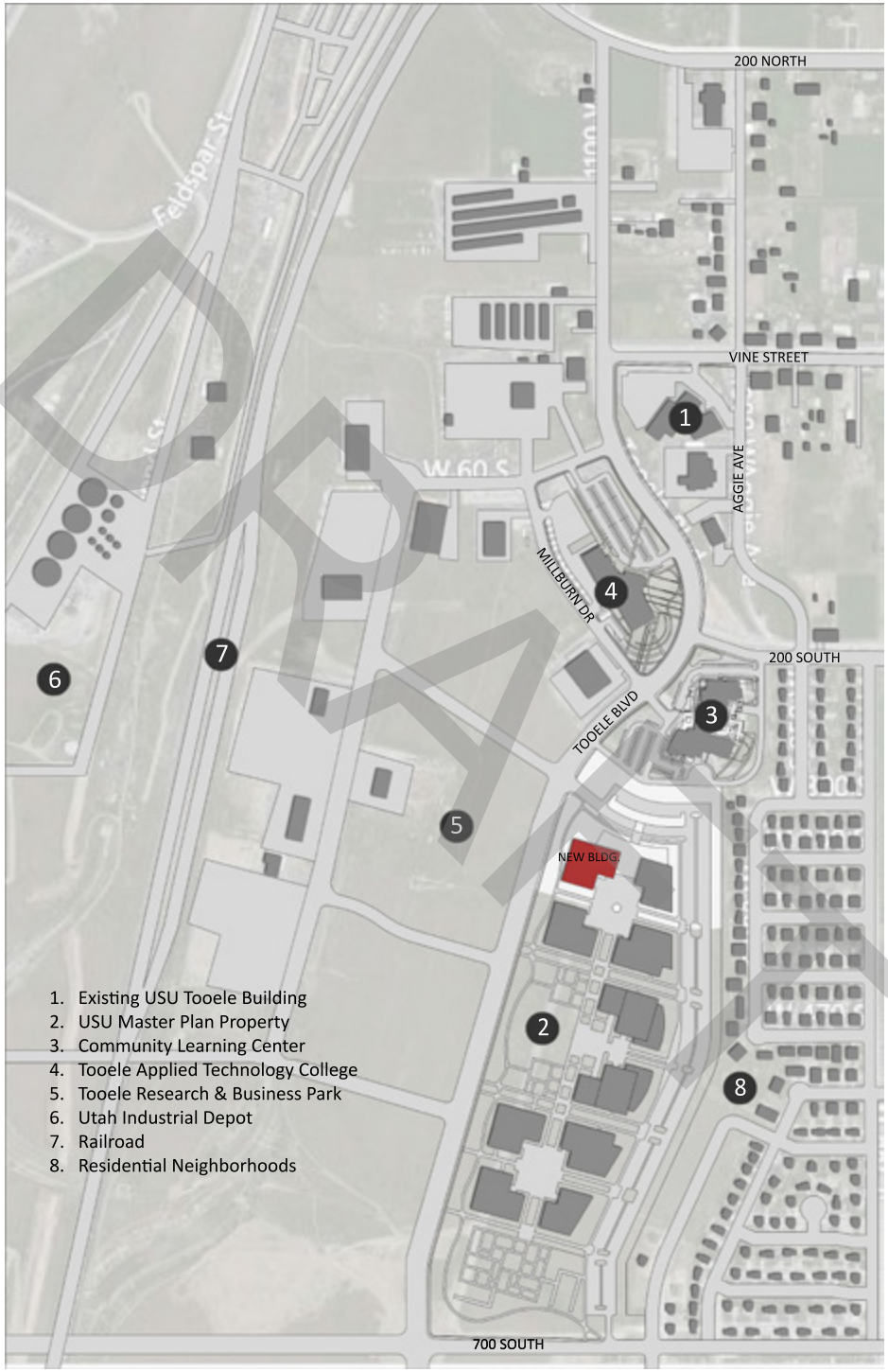
200 NORTH
VINE STREET
AGGIE AVE
MILLBURN DR
200 SOUTH
TOOELE BLVD
NEW BLDG
700 SOUTH
Feldspar St
W 60 S
1. Existing USU Tooele Building
2. USU Master Plan Property
3. Community Learning Center
4. Tooele Applied Technology College
5. Tooele Research & Business Park
6. Utah Industrial Depot
7. Railroad
8. Residential Neighborhoods

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VEHICLE TRAFFIC FLOW

The primary vehicular access for the site is along Tooele Boulevard, most traffic is anticipated to come from the north from Vine Street and 200 North, with drive access to interior parking and secondary vehicular circulation on the north end of the campus. Parking will be concentrated north of the site, between the new building and the existing Community Learning Center, which will eventually form perimeter parking along the entire east length of the master plan. This parking perimeter will also serve as a secondary vehicular path for the site. Secondary vehicular access will be located towards the south end of the campus and will be an extension of 700 South from the residential neighborhood to the east, upon the full build-out of the master plan. Tooele City will be designing and will facilitate the construction of the Tooele Boulevard extension. It is anticipated that the construction of the Tooele Blvd. extension will parallel the design and construction of the new Science and Technology Building.

PEDESTRIAN TRAFFIC FLOW

Pedestrian traffic will be concentrated on Tooele Boulevard between the existing elements of the Tooele Education Corridor, and the new Science and Technology Building until more elements of the USU master plan are completed. At which point the main pedestrian traffic would likely shift to the internal pedestrian walk ways outlined in the master plan. Upon completion of the new Science and Technology Building primary pedestrian traffic will flow along Tooele Blvd. from the north to the south with the need for students to cross 200 South to reach the current administration and extension building or to reach the TATC.

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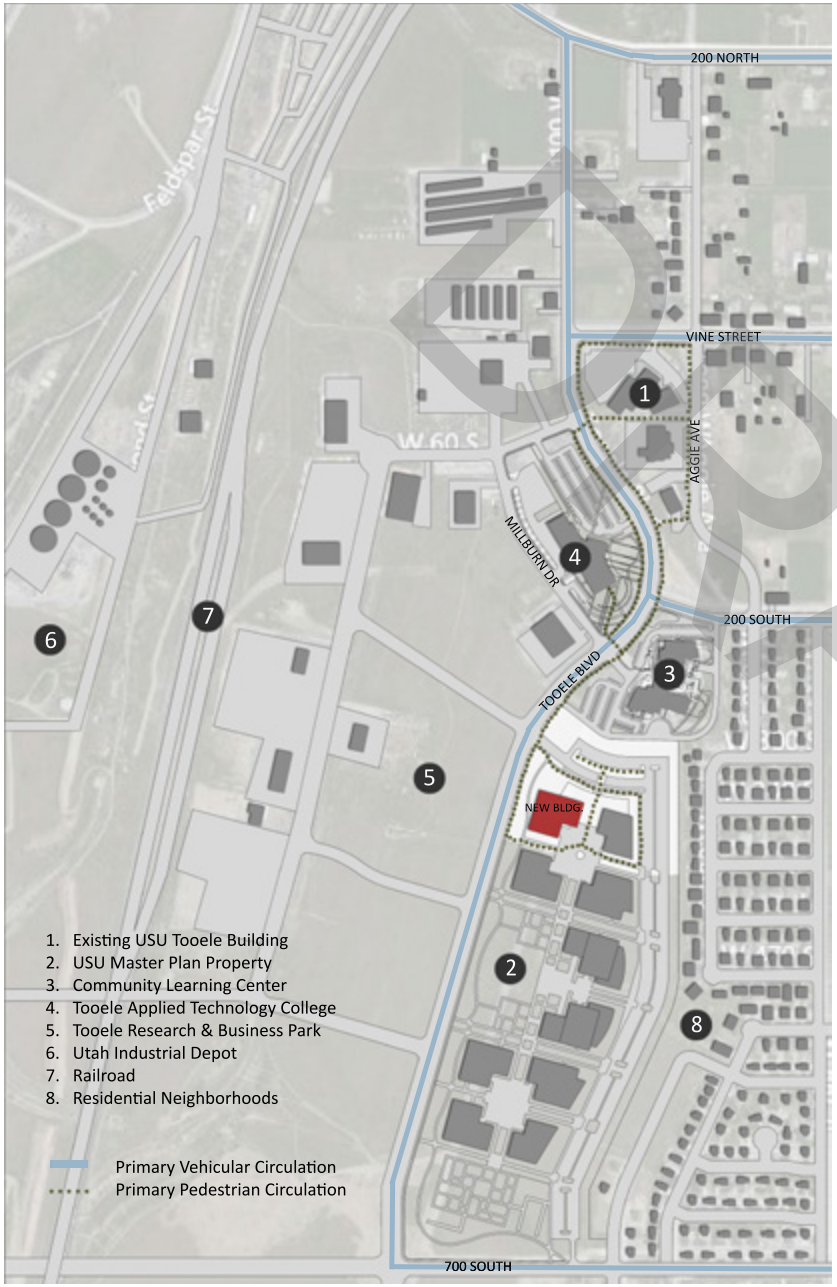
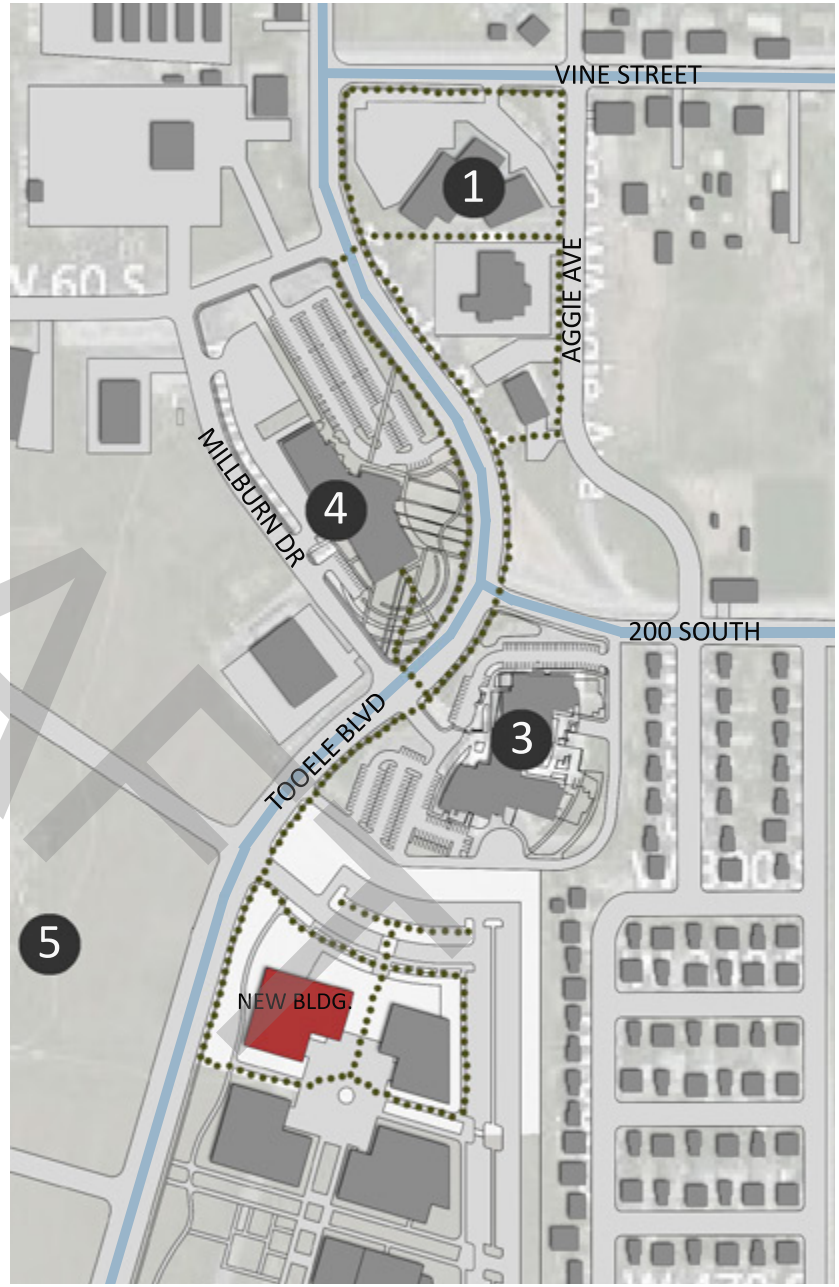

200 NORTH
VINE STREET
AGGIE AVE
MILLBURN DR
200 SOUTH
TOOELE BLVD
NEW BLDG.
700 SOUTH
Feldspar St
1. Existing USU Tooele Building
2. USU Master Plan Property
3. Community Learning Center
4. Tooele Applied Technology College
5. Tooele Research & Business Park
6. Utah Industrial Depot
7. Railroad
8. Residential Neighborhoods
Primary Vehicular Circulation
Primary Pedestrian Circulation


VINE STREET
AGGIE AVE
MILLBURN DR
200 SOUTH
TOOELE BLVD
NEW BLDG.

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BUS ROUTES

Routes F-400 (Figure 2.2) and F-401 (Figure 2.1) run hourly, and connect to Routes 451, 453, and 454 which runs from Tooele County to Salt Lake City. The nearest bus stops are located close to the new TATC building and take approximately 6 minutes to walk to from the new USU Tooele building. (Figure 2.3)

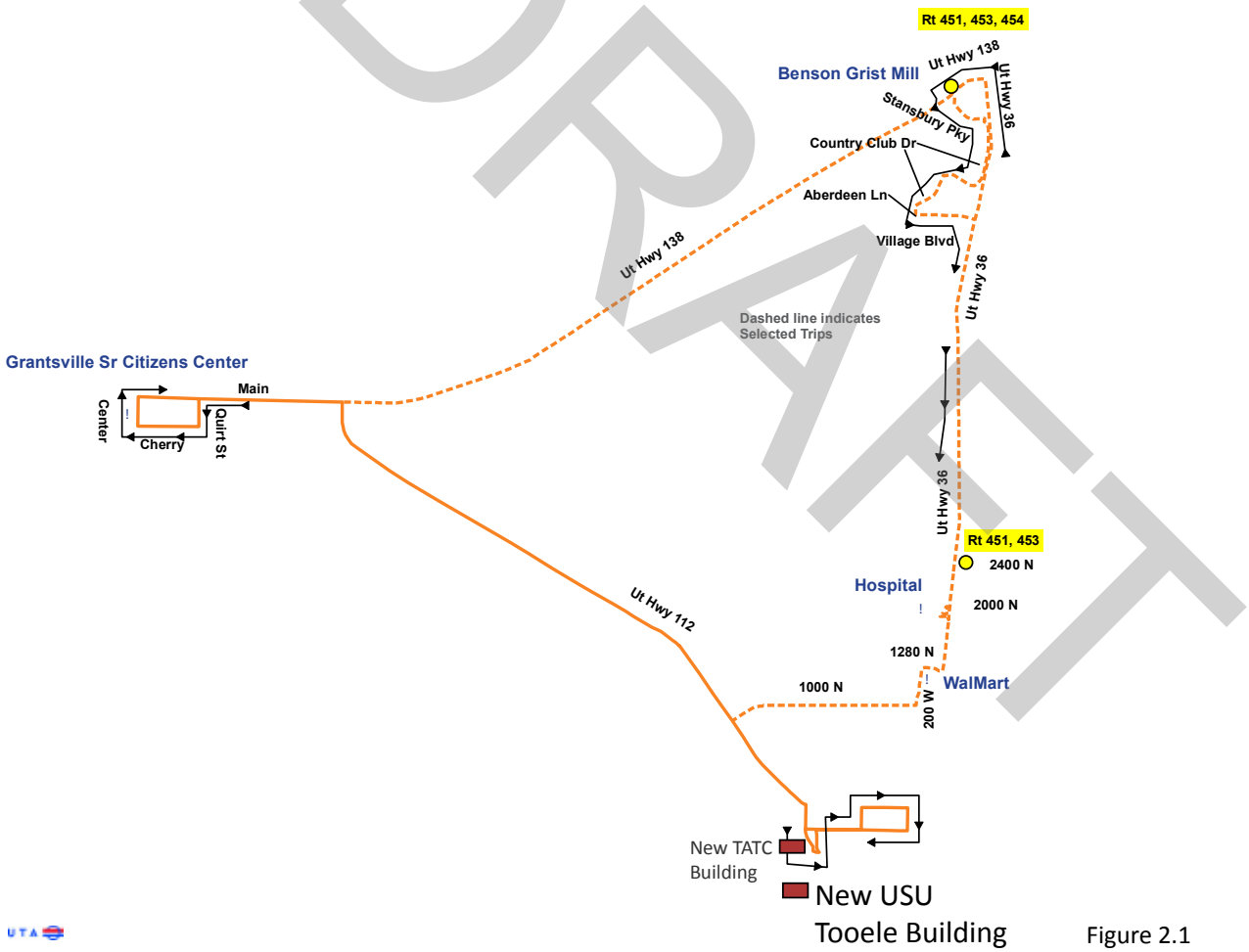

Figure 2.1

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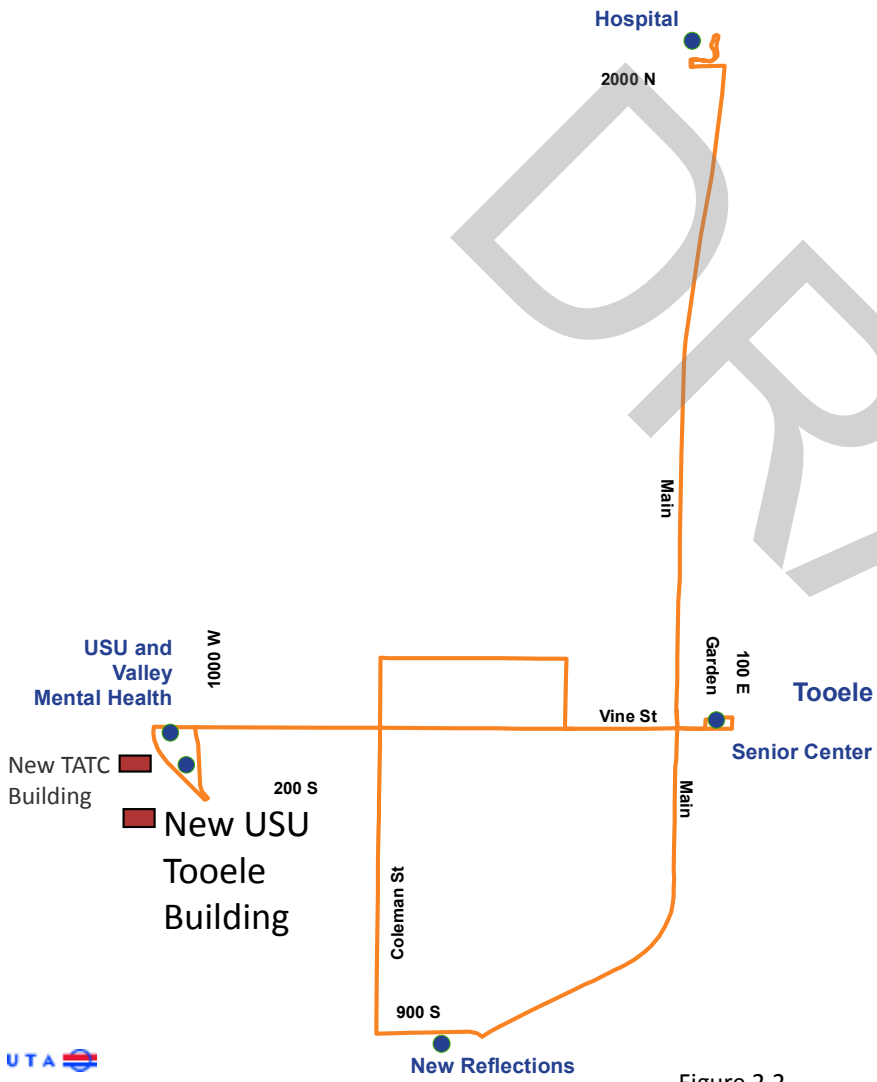

Figure 2.2

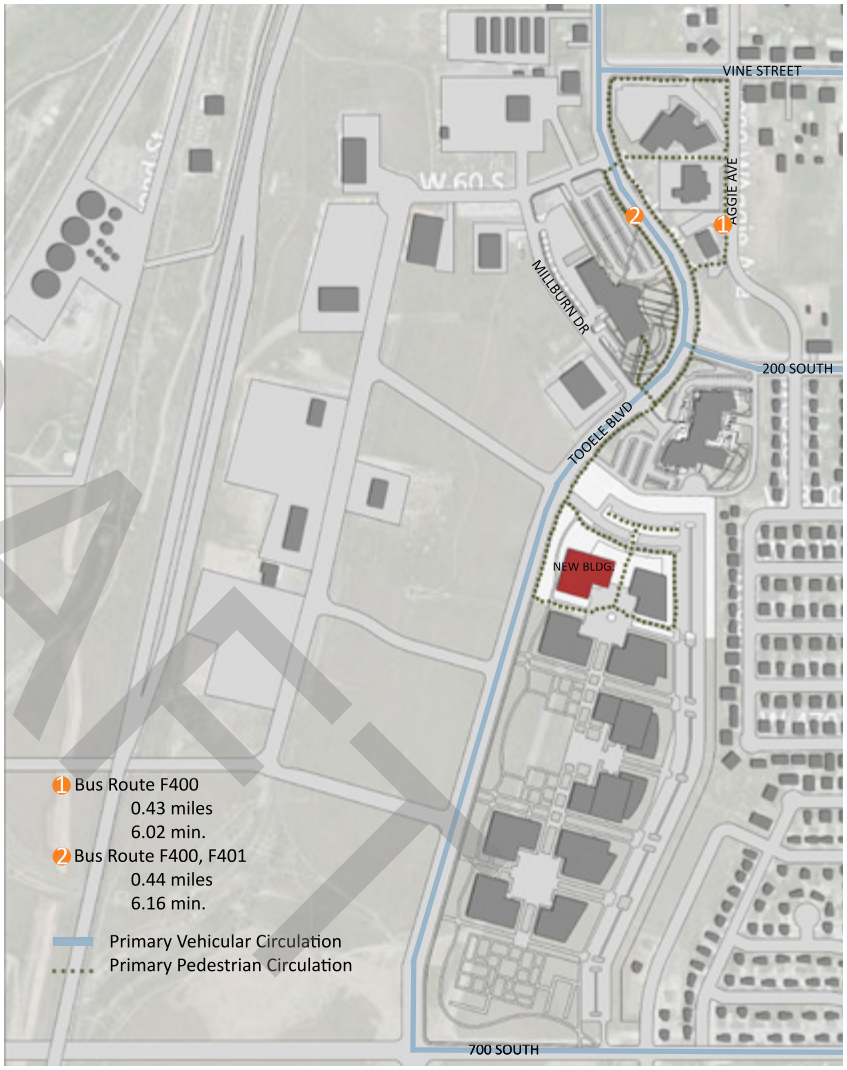

Figure 2.3

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02 Site Analysis

New and Existing Roadways

The city is to build a new 84' limited access collector road to the west of the new USU Tooele Science and Technology building, extending Tooele Boulevard south. This road will be connected to the south by a new 200' wide mid-valley highway.

FUTURE HIGHWAYS & ROADS	EXISTING HIGHWAYS & ROADS	
STATE	NA	**200 FT WIDE MID–VALLEY HIGHWAY** STATE HIGHWAY DESIGNED TO MANAGE HIGH SPEED AND HIGH TRAFFIC VOLUMES BETWEEN THE SOUTH END OF TOOELE VALLEY AND I-80 WITH CONTROLLED ACCESSES WITH THE TOOELE VALLEY ARTERIAL ROAD SYSTEM WITH NO INTERFERENCE AT ACCESS POINTS.
COUNTY	NA	**200 FT BOULEVARD** A 106 FT WIDE COUNTY HIGHWAY DESIGNED TO MANAGE HIGH SPEED AND HIGH TRAFFIC VOLUMES BETWEEN MILLER SPORTS PARK AT SHEEP LANE AND STATE ROAD 36 AND COUNTY DROUBAY ROAD BEFORE AND AFTER SPORTS PARK EVENTS. AN EQUESTRIAN COMPONENT OF THE RIGHT-OF-WAY IS TO BE CONSTRUCTED. ACCESS IS TO BE LIMITED FOR LESS INTERFERENCE.
NA NA	STATE CITY	**106 FT ARTERIAL ROAD** ARTERIAL ROADS DESIGNED TO INTERCONNECT THE MAJOR CENTERS OF ACTIVITY, HAVE LONG TRIP LENGTHS AND MANAGE MODERATE TO HIGH SPEED AND HIGHER TRAFFIC VOLUMES. ARTERIALS ARE RECOMMENDED TO BE ACCESS CONTROLLED BUT MAY HAVE HISTORIC OR INDUSTRIAL SECTIONS WHICH ARE NOT ACCESS CONTROLLED.
		84 FT LIMITED ACCESS COLLECTOR ROAD LIMITED ACCESS COLLECTOR ROADS ARE RECOMMENDED TO HAVE INTERCONNECTIONS WITH AND AUGMENT THE ARTERIAL SYSTEM, MODERATE TRIP LENGTH AND ACCESS CONTROL IN ORDER TO DISTRIBUTE MODERATE SPEED TRAFFIC FROM ARTERIALS AND SUB COLLECTORS WITH AS LITTLE INTERFERENCE AS POSSIBLE.
NA		**99\84\82.5\76 FT HISTORIC COLLECTOR ROAD** HISTORIC COLLECTOR ROAD HAVE RIGHT-OF-WAY WIDTHS FROM 99 FEET TO 76 FEET WITH NO ACCESS CONTROL AND DISTRIBUTE LOW SPEED TRAFFIC THROUGH SECTIONS OF MOSTLY HISTORIC TOOELE CITY. CONNECTION TO THE ARTERIAL SYSTEM IS NOT ALWAYS FOUND WITH HISTORIC COLLECTORS.
		66 FT SUB COLLECTOR ROAD A SUB COLLECTOR ROAD IS RECOMMENDED TO DISTRIBUTE LOW SPEED TRAFFIC FROM LIMITED ACCESS COLLECTOR ROADS, WIDE HISTORIC COLLECTOR ROADS AND LOCAL ROADS WITH LESS INTERFERENCE THAN LOCAL ROADS WOULD PROVIDE WITH STREET SIDE PARKING.
NA		**56 FT OLD INDUSTRIAL COLLECTOR ROAD** HISTORIC INDUSTRIAL COLLECTOR ROADS ARE DESIGNED TO MANAGE THE INDUSTRIAL TRAFFIC IN THE OLD ARMY DEPOT AREA WHERE RIGHT-OF-WAY WIDTHS ARE RESTRICTED BY EXISTING WORLD WAR II FACILITIES.
		60 FT OR LESS LOCAL ROADS LOCAL STREETS ARE NOT CLASSIFIED IN A HIGHER SYSTEM, PRIMARILY PROVIDING DIRECT ACCESS TO ABUTTING LAND AND ACCESS TO SUB COLLECTOR AND COLLECTOR ROADS. LOCAL STREETS HAVE THE LOWEST LEVEL OF SPEED AND MOBILITY AND MAY DELIBERATELY DISCOURAGE THROUGH TRAVEL IN NEIGHBORHOODS.

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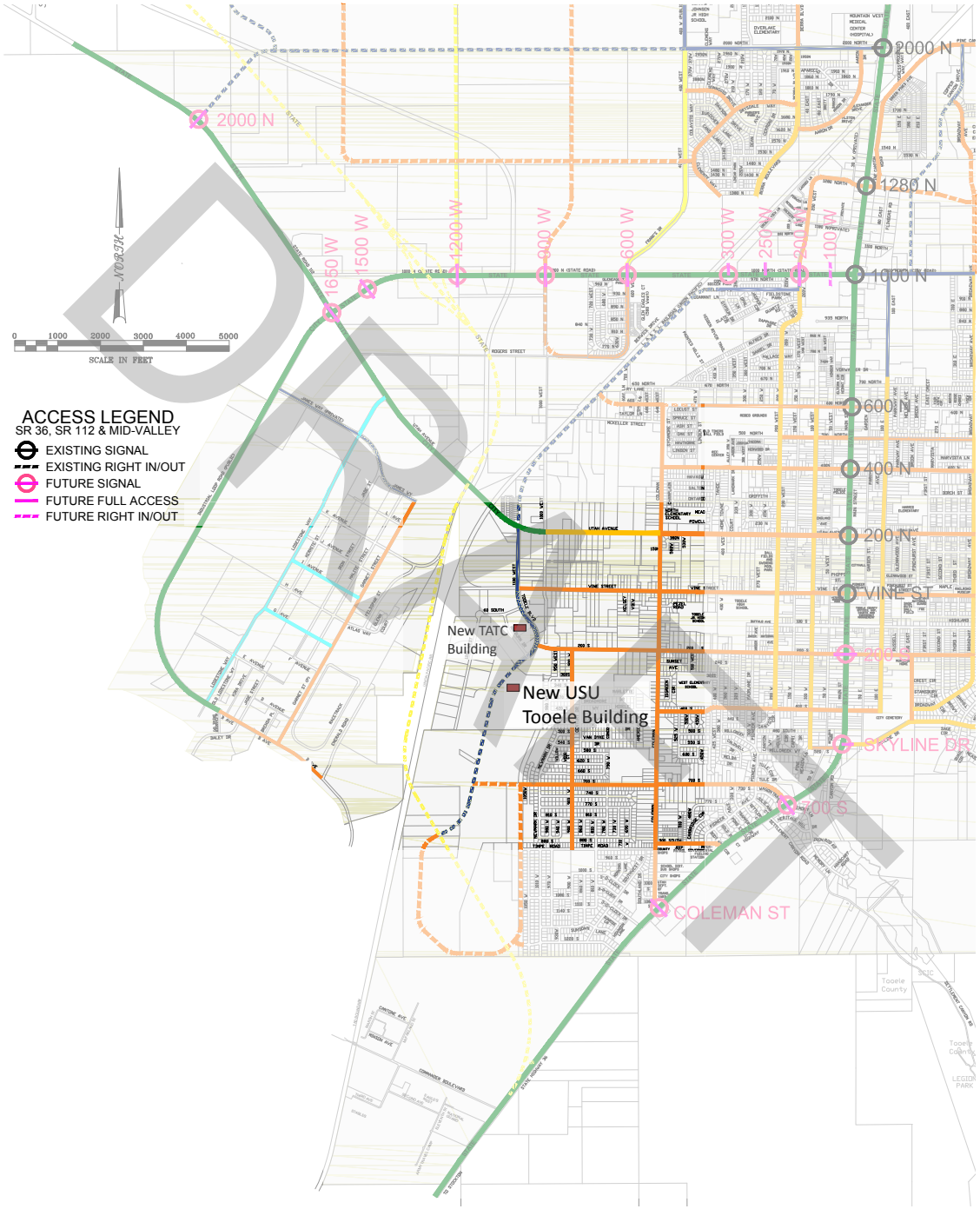
ACCESS LEGEND
SR 36, SR 112 & MID-VALLEY
EXISTING SIGNAL
EXISTING RIGHT IN/OUT
FUTURE SIGNAL
FUTURE FULL ACCESS
FUTURE RIGHT IN/OUT
NORTH
0 1000 2000 3000 4000 5000
SCALE IN FEET
2000 N
1650 W
1500 W
1200 W
900 W
600 W
300 W
250 W
200 W
100 W
1280 N
1000 N
600 N
400 N
200 N
VINE ST
SKYLINE DR
COLEMAN ST
New TATC Building
New USU Tooele Building

02 Site Analysis

Zoning

The New USU Science and Technology Building will be located in the new educational corridor and is designated currently as a Light Industrial Zone. The new building is adjacent to a Rural Residential and Medium Density Residential Zones. This proximity to residential areas allows for multiple routes for students living in nearby neighborhoods. A higher education facility located in an light industrial zone normally requires a conditional use permit however because this is state owned property and a state owned facility the project is not required to go through the city's conditional use application. Due to the recent education projects in this zone the TATC and CLC, the majority of the community already knows about the implications and long term plans for the area however the design team and project owner may electively choose to participate in the city's conditional use process.

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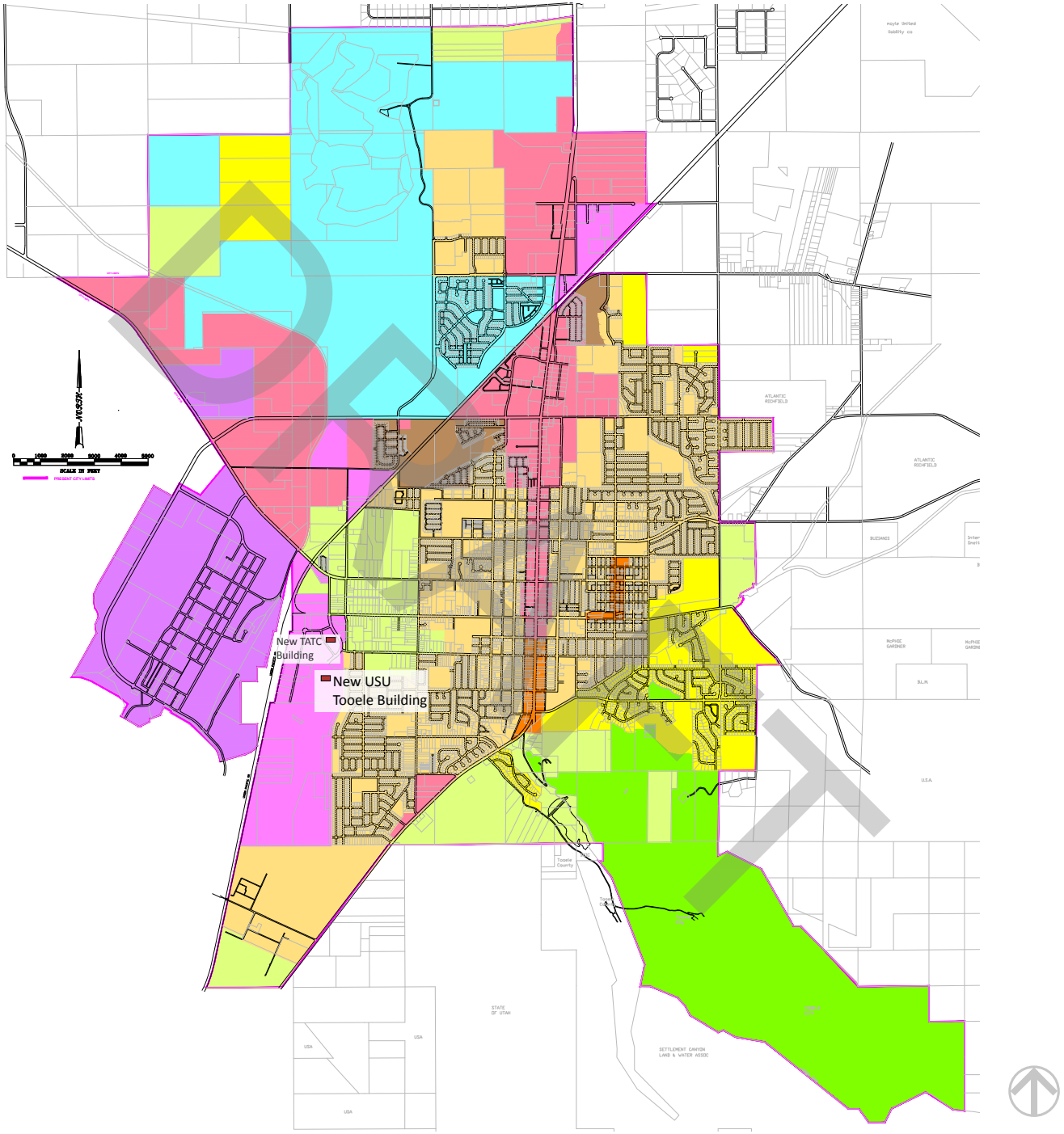
LAND USE ELEMENT LEGEND

- Open Space
- Rural Residential
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Overtake Planned District
- Mixed Use
- Commercial
- Regional Commercial
- Light Industrial
- Industrial


New TATC Building
New USU Tooele Building
NORTH
SCALE IN FEET
0 1000 2000 3000 4000 5000
PRESENT CITY LIMITS
ATLANTIC RICHFIELD
BUZIANES
McPHEE GARDNER
BLM
USA
Tooele County
STATE OF UTAH
SETTLEMENT CANYON LAND & WATER ASSOC

The Master plan for the new USU Tooele Science and Technology Building consists of 10 new buildings, extensive landscaping, pedestrian pathways, bicycle lanes, open space, and utilities to support 700,000 gross square feet. The construction of the new Science and Technology building will occur in 4 phases from North to South. The order of construction to be specified as needed.

PHASE 1: CONSTRUCTION OF THE NEW TATC BUILDING

The building faces Tooele Boulevard, connecting it to the USU Tooele Science and Technology building. Landscaping, pedestrian pathways, and bike lanes to act as a connecting piece as well.

PHASE 2: 4 BUILDINGS IN NORTHERN CAMPUS

This phase will include construction of the east parking lot and the northern part of the campus utility tunnel. The first building in this phase will be the New Science and Technology Building

PHASE 3: 2 BUILDING IN CENTRAL CAMPUS

Campus-wide support functions to move from main USU building to the 2 buildings in this phase. Roadways, pathways, parking and utilities will be extended.

PHASE 4: 4 BUILDINGS IN SOUTHERN CAMPUS

Final phase consisting of construction of 4 new buildings in south corridor and extension of roadways, pathways, parking, and utilities.

The campus will have its main entrance located in the central corridor facing Tooele Boulevard. This area will have extensive landscaping and pedestrian pathways connecting the north and south portions of campus. Along the eastern edge of campus, a 45’ wide landscaped zone will be put in place as a buffer between campus and residential neighborhoods. Parking lots will be placed along the north and east sides of campus to accommodate approximately 1,150 vehicles. Along the west side of campus, a 120’ intermodal zone contains landscaping, pedestrian and bike pathways, and dop-off/pick-up locations. This intermodal zone acts as a visual connection to TATC to the north, and Tooele Boulevard which runs along the west edge of campus. Within campus spaces are compact for a pedestrian-only zone, with a walkable utility corridor below-grade.

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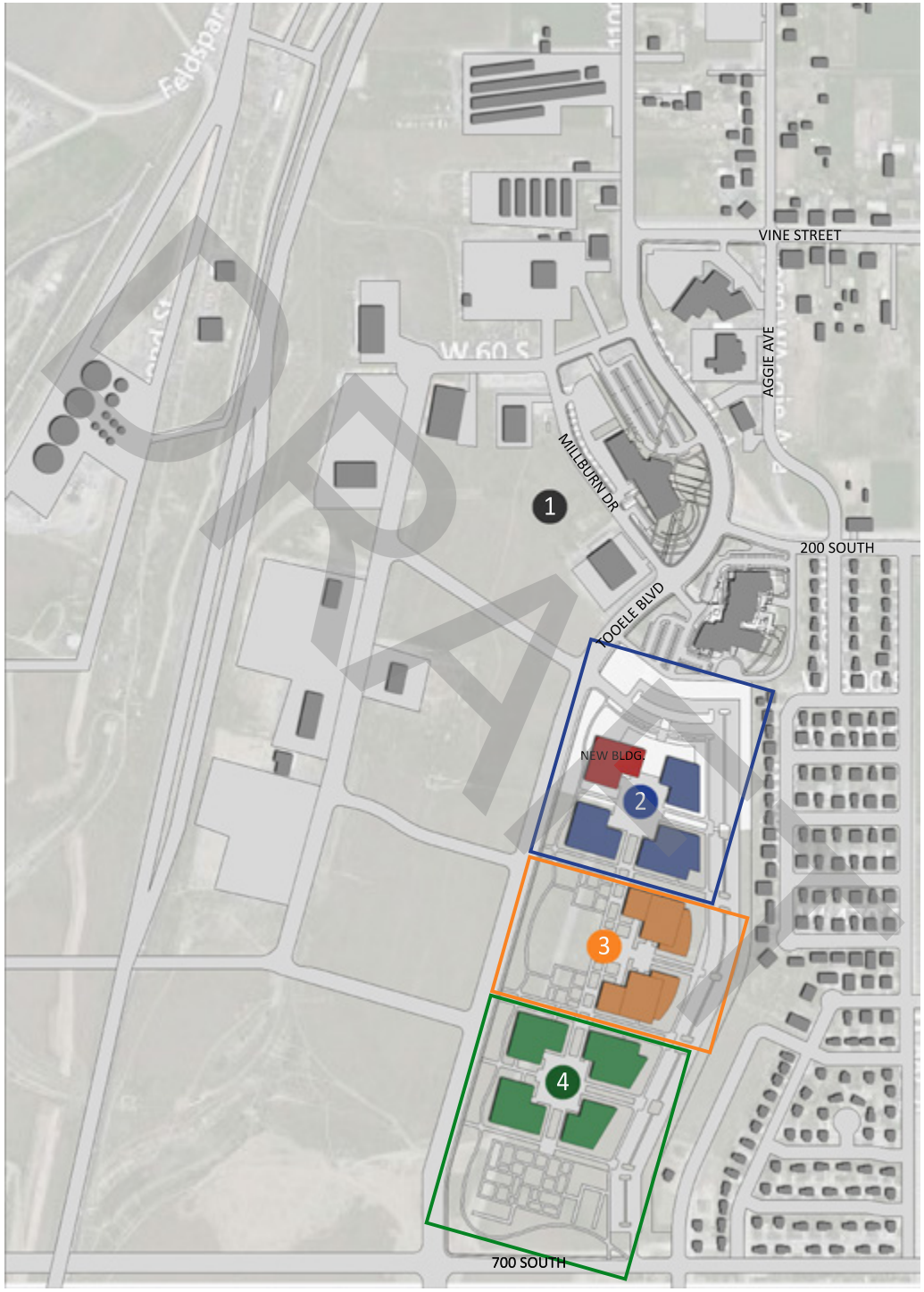
VINE STREET
AGGIE AVE
W 60 S
MILLBURN DR
1
200 SOUTH
TOOELE BLVD
NEW BLDG.
2
3
4
700 SOUTH

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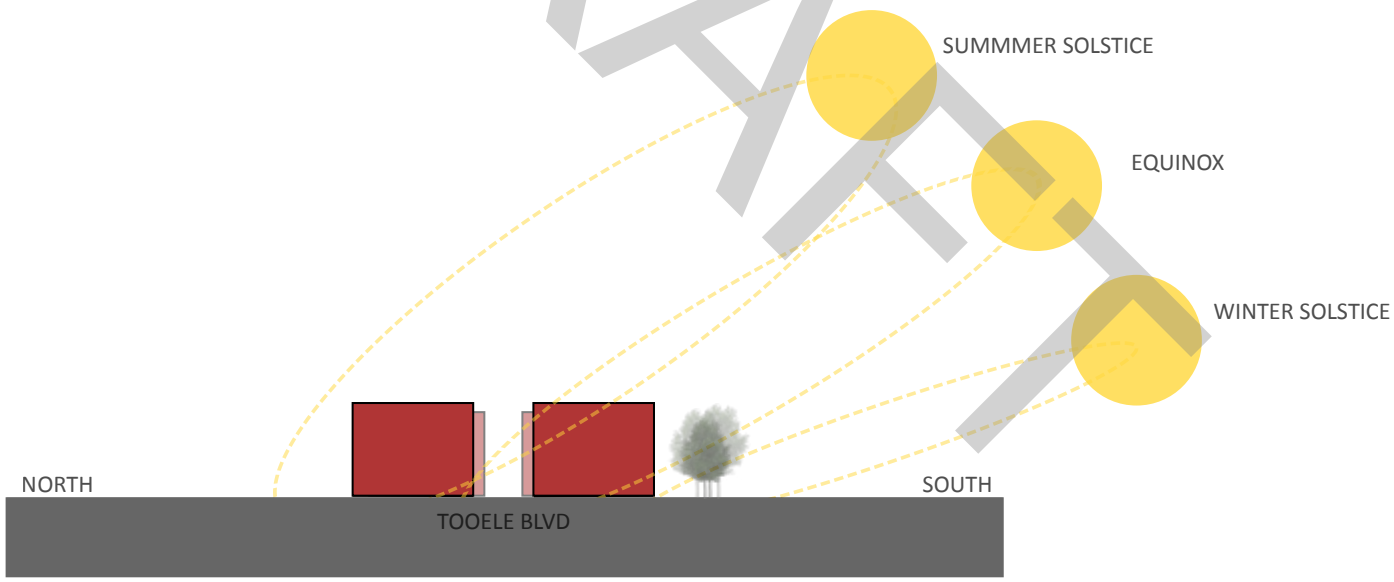
SOLAR AZIMUTH

The angle of the sun is at it's highest during the Summer Solstice (June 21st). As the seasons change, the height of the sun gets lower in the sky until it is at it's lowest point during the Winter Solstice (December 21st). Using the proper length of over hangs will help to shade the interior from the summer sun, while allowing the winter sun to enter, adding heat to the interior. Tooele is in a desert and has more cooling days than heating days and with the amount of lighting and electrical loading from equipment in the laboratories and IVC classrooms keeping direct sun out will help to improve building efficiency.

WIND PATTERNS

Strong consistent primary wind comes from the south in Tooele. Wind patterns in this area do shift and can come from different directions however high importance should be place on the southerly winds. Sheltering of pedestrians through the use of berms, vegetation and structures should be highly considered for this site.



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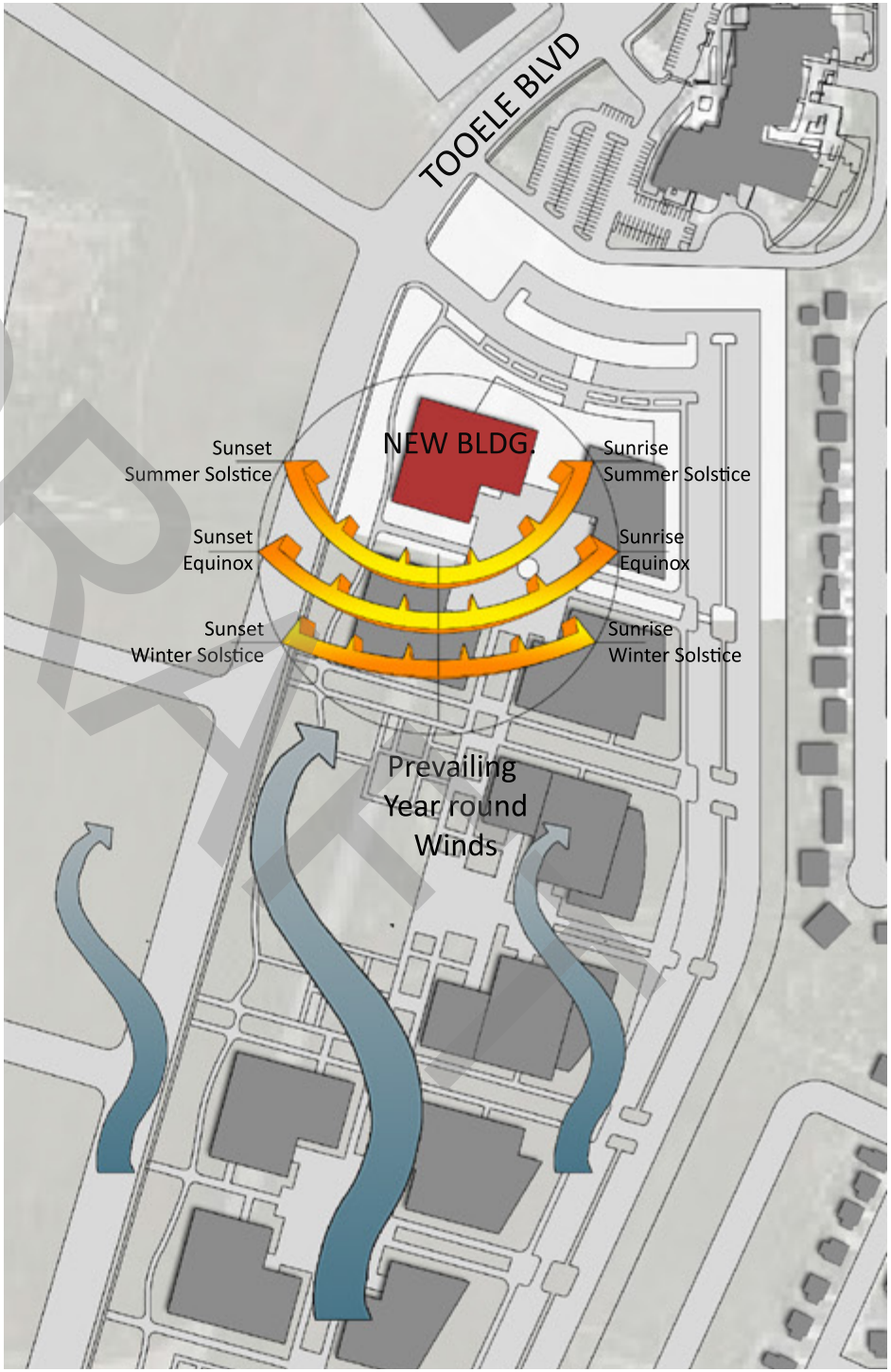

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Average High Summer Temperature: 86.5 F
Average Low Winter Temperature: 43.7 F
Median Yearly Rainfall: 11.5”
Median Yearly Snowfall: 34.1”

02 Site Analysis

Site Views

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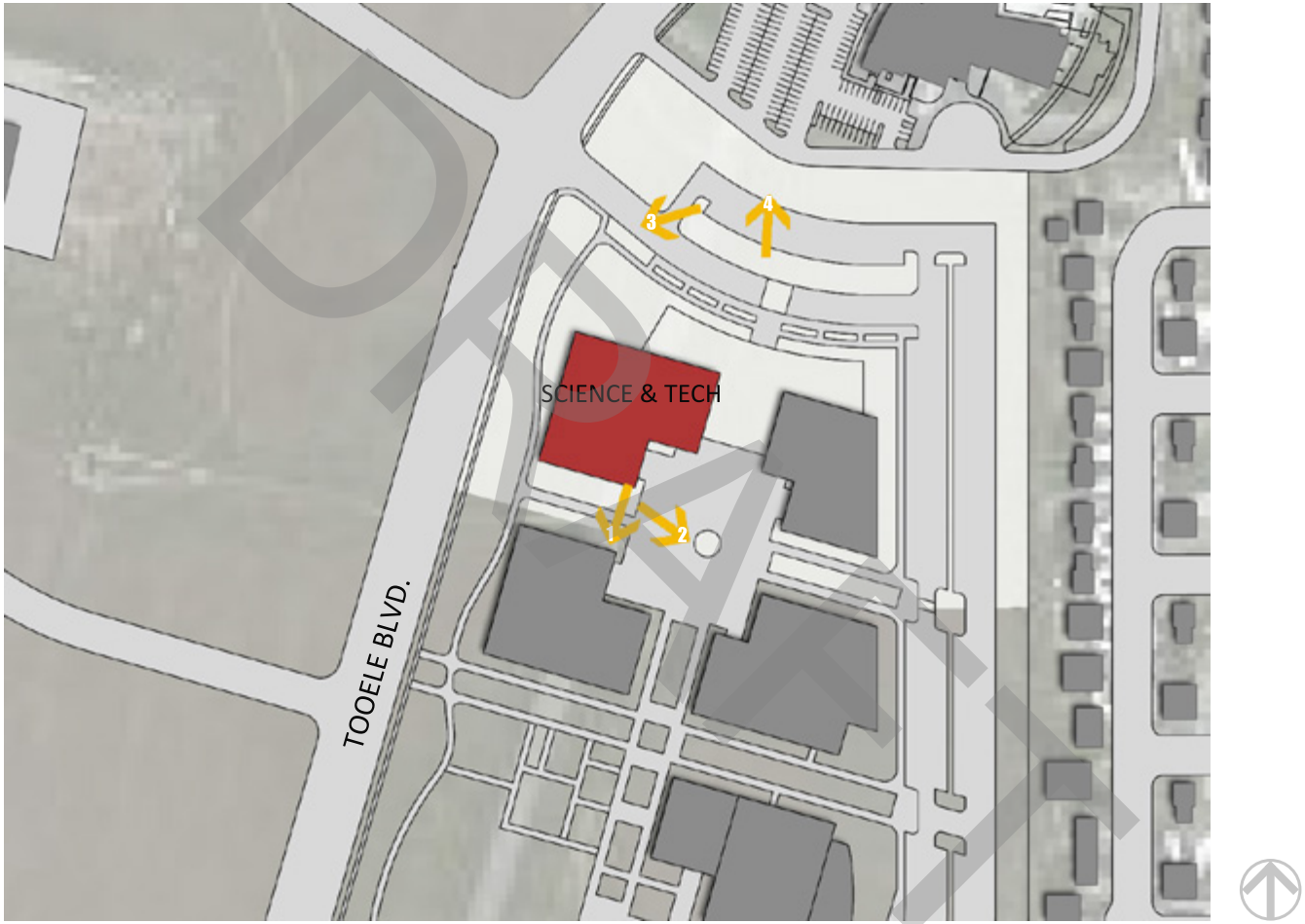

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02 Site Analysis

Site Views

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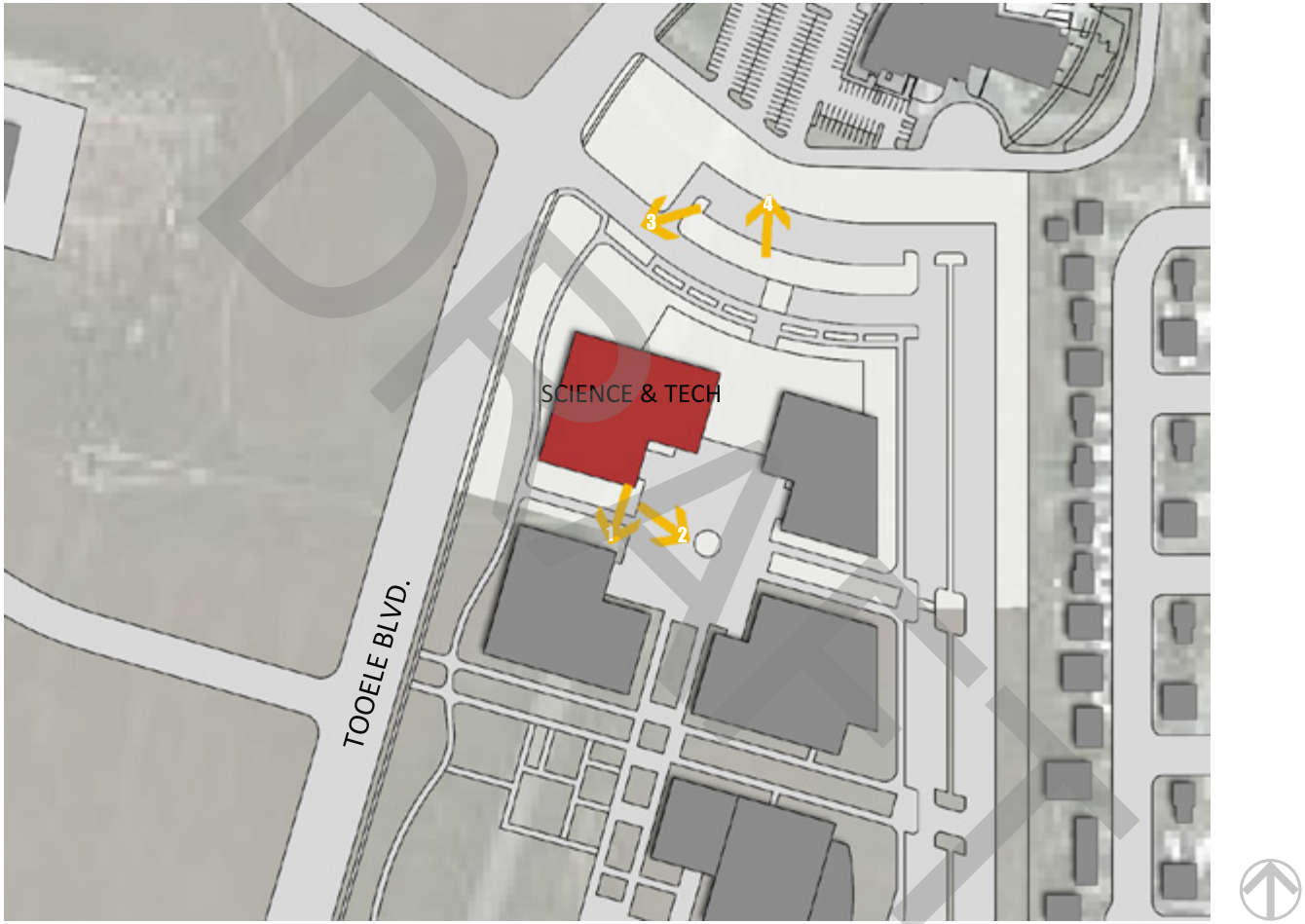

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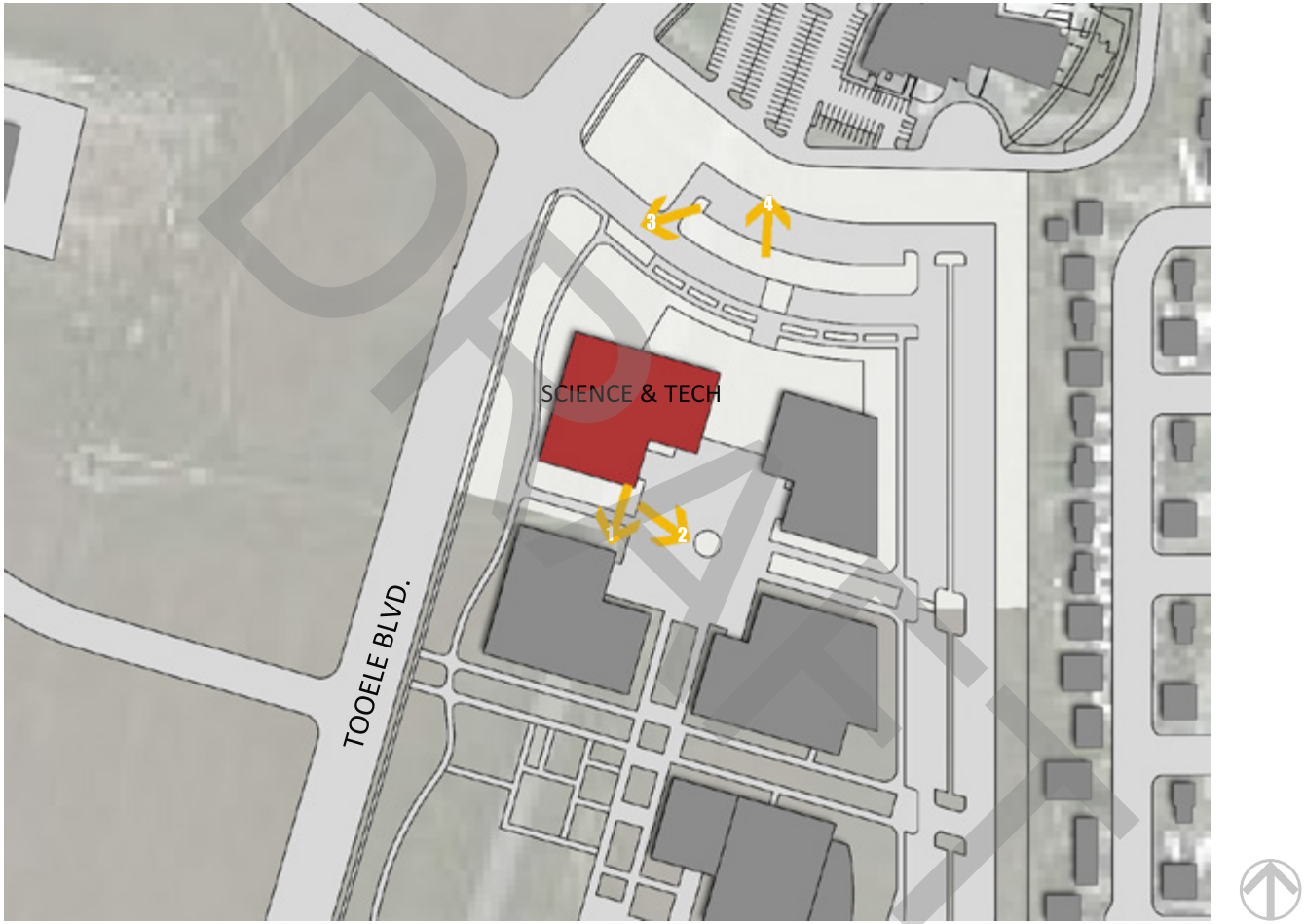
02 Site Analysis

Site Views



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Site Views

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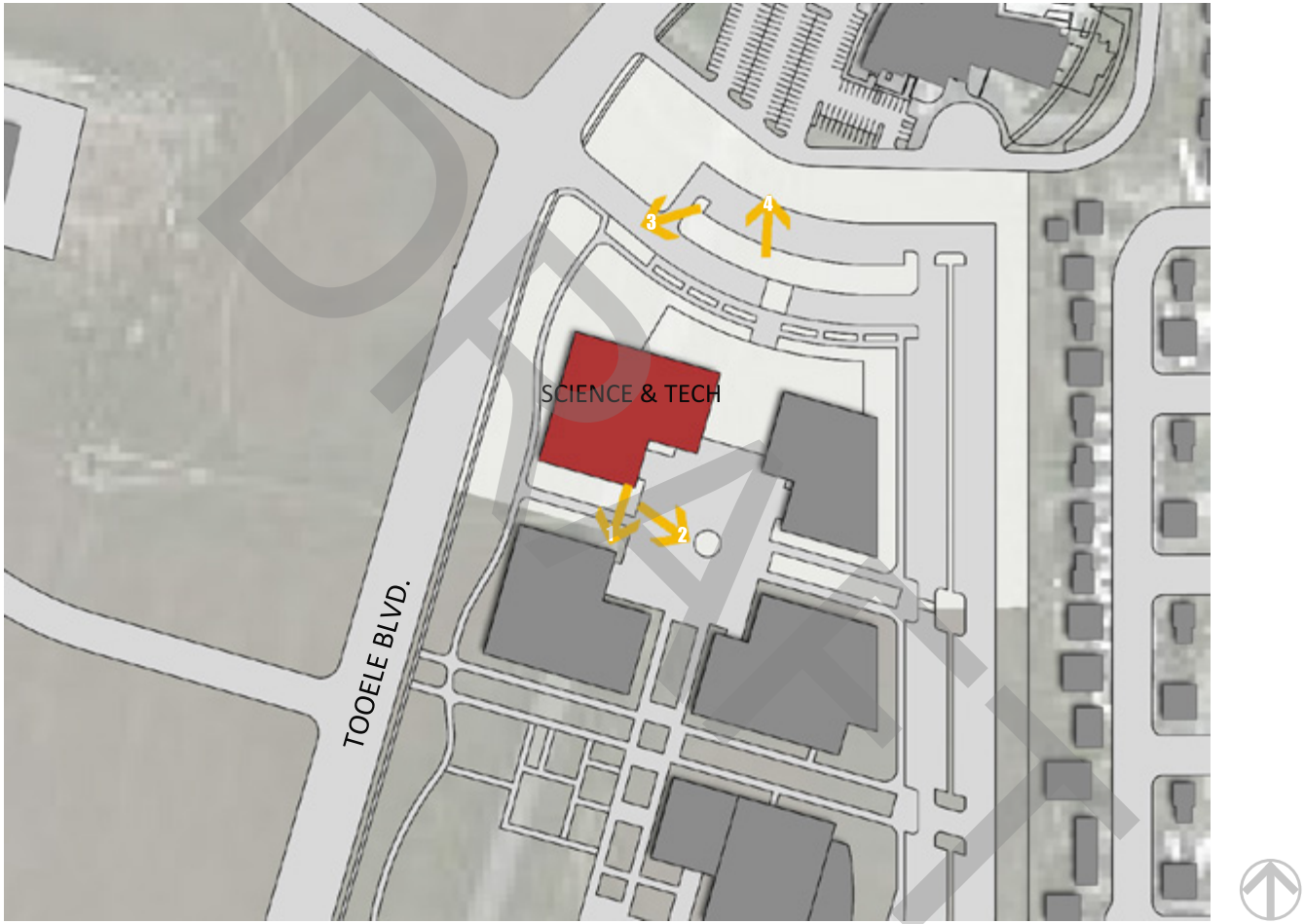

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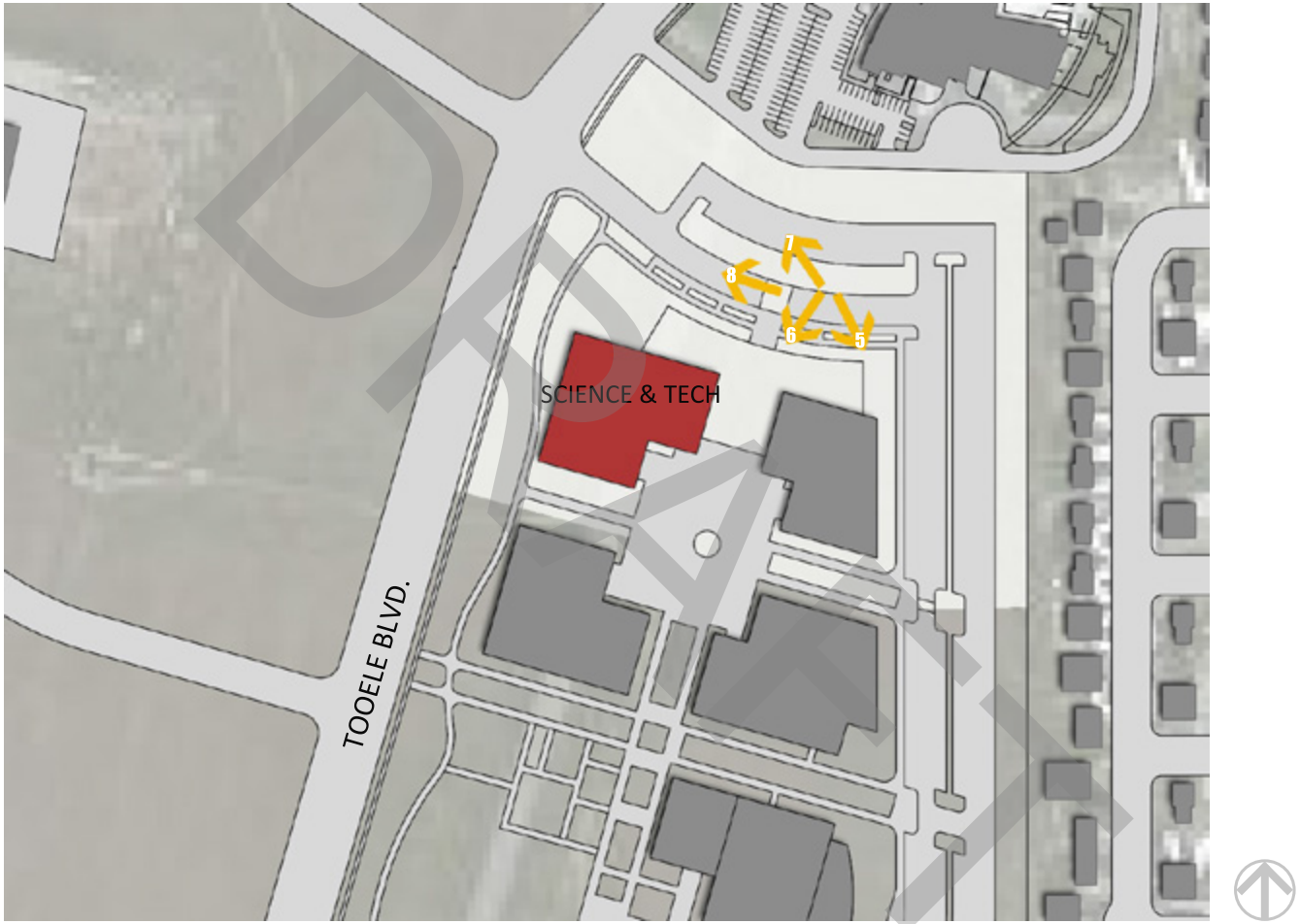

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Site Views

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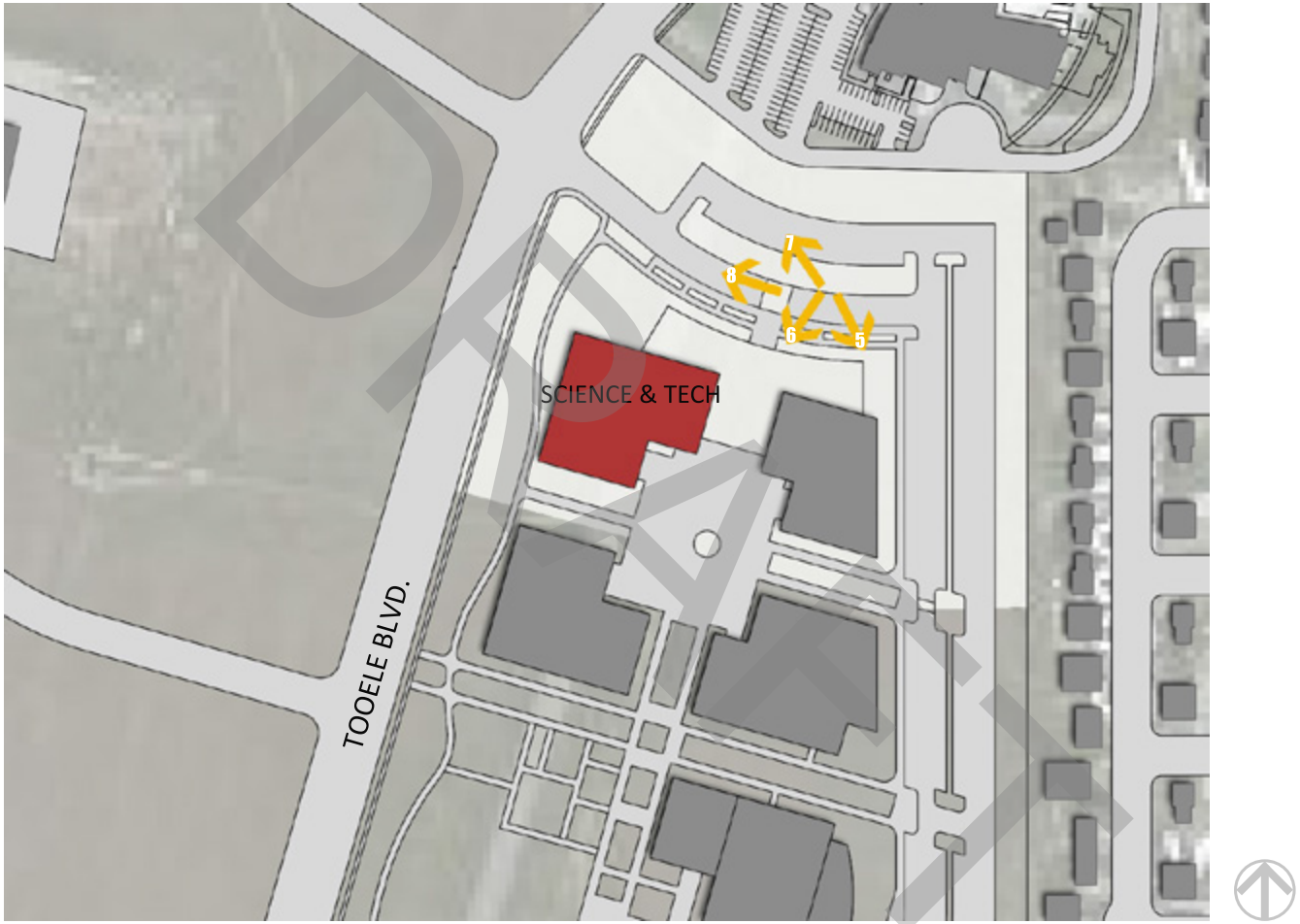

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Site Views

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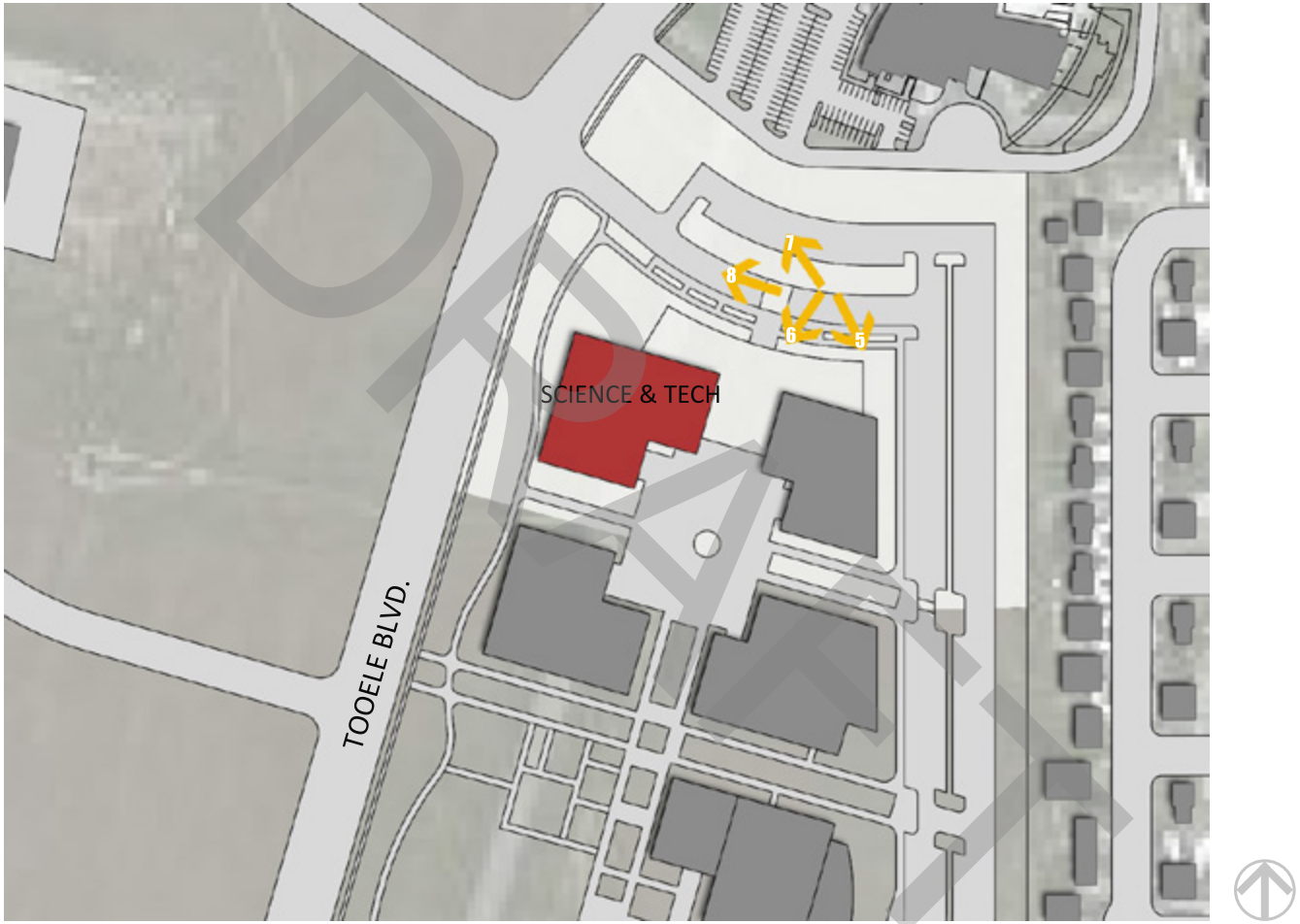

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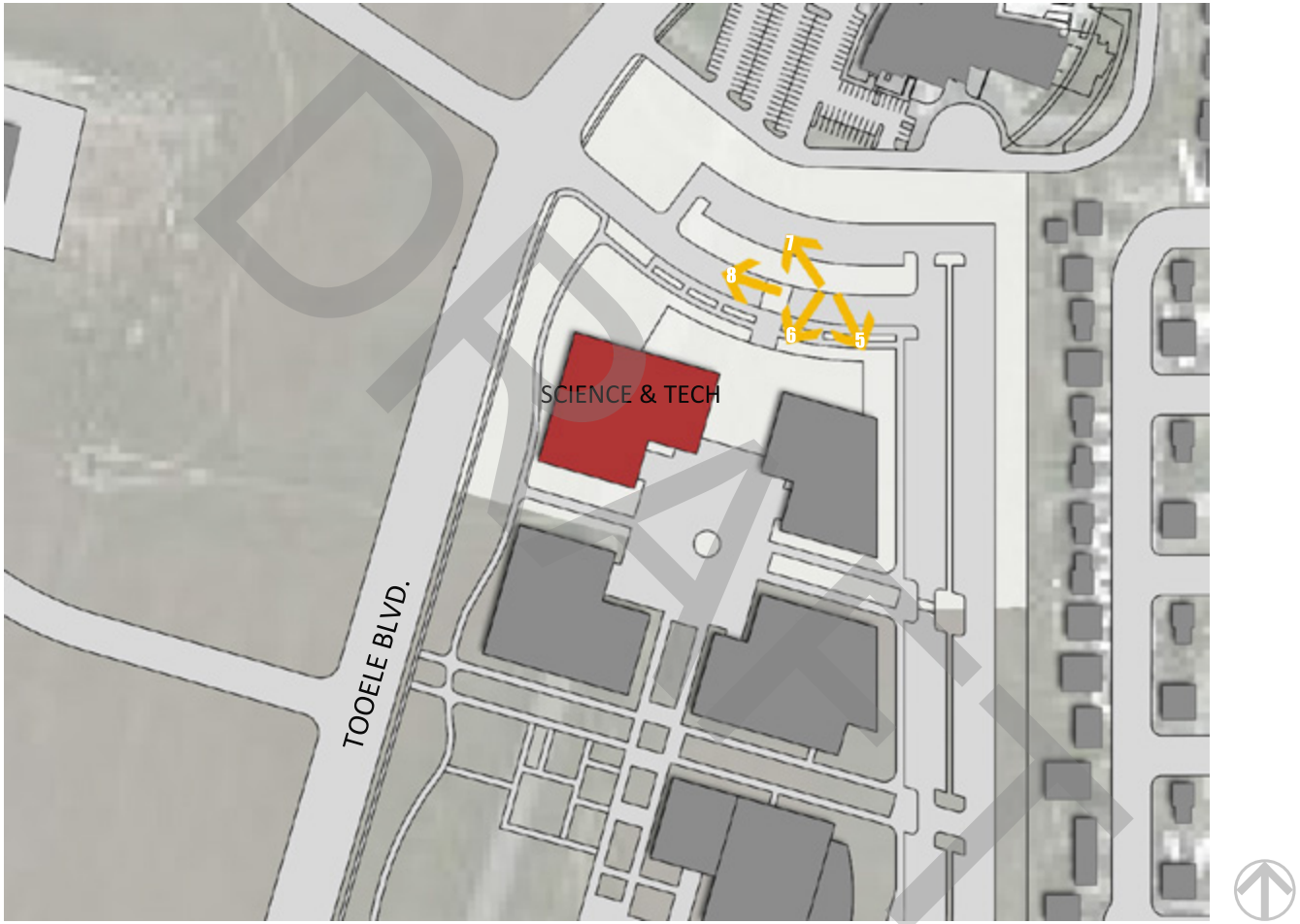

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BUILDING REQUIREMENTS

BUILDING DESIGN

Throughout the programming effort the architectural vision of the project was discussed at length with the USU Tooele Steering Committee. This new building will be a Science and Technology Lab & Classroom building. The new building and in particular the administrative, student services and reception areas should have prominence on the site and act as a visual and physical corridor to the community and future students. The new building is envisioned to be a 2 story structure with a strong architectural presence that reflects and respects the contextual elements of Tooele City and the greater Tooele County while simultaneously establishing a contemporary higher education expression.

BUILDING MASSING

It is strongly encouraged that the design of the facility takes advantage of opportunities to break up the massing of the building and provide articulation to the facades. This can be done both horizontally and vertically with the massing or within the fenestration or architectural detail of the elevations. Consideration should also be given to stepping the building and breaking the massing up into wings to address scale. Also, massing should be considered with respect to the campus master plan and potential future buildings.

BUILDING ORIENTATION

The building should be oriented to not only meet the goal of serving as a gateway building to the community but should also take advantage of sustainable practices in response to solar orientation, wind, and take full advantage of views and natural day lighting. Strong considerations must also be given to existing buildings that surround the site such as the existing USU Tooele headquarters, the CLC and the Tooele Applied Technology College to the North, Tooele City High School to the East, the miscellaneous commercial buildings to the West and the residential homes to the East and South. Existing utility infrastructure, pedestrian & vehicular circulation, grading, and parking should also be carefully studied and considered as design of the facility moves forward. In addition, relationship and adjacency to outdoor amenities is an important element to the student experience on campus and must be considered in the development of the building location and orientation.

NATURAL LIGHT AND VIEWS

Every opportunity to utilize natural light to maintain and enhance view corridors should be considered strongly in the design of the facility. In particular all public spaces, offices, and classrooms must maintain access to natural light and views. This is critical element it affects both the comfort and well being of the occupants as well as the building's energy efficiency.

In an effort to achieve this goal the design could consider the use of large windows, clerestory windows, skylights, and other potential transparent or translucent materials. Window openings should be oriented to take advantage of soft northern sky or controlled southern exposure. Windows on the west and east sides of the building should also be controlled or minimized.

Additionally, considerations for the type of glass will be important to controlling and minimizing the amount of heat gain and harmful UV exposure. Balancing the type of glass with the size and orientation will be critical to meet the minimum quantities prescribed by the code and to achieve the goal of LEED Silver Certification and Utah State mandated high performance

EXTERIOR MATERIALS

The architectural response should consider the context of Tooele City and the surrounding area. Existing buildings utilize materials such as brick, stone, precast concrete elements,

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integral colored honed or split-faced CMU, metal panel, and glass elements. It is the desire of the College to explore a palette of materials that respects the regional context and creates a rich and welcoming expression in the architecture.

Generally, material selection should be easily maintained and durable. The building should be designed to be warm and inviting to students, faculty, the local community and all that interact with the University.

INTERIOR MATERIALS

The design of the interior spaces should create a welcoming learning environment that is warm, bright, inviting, and promotes good health. Selection of interior finishes and materials should be responsive to the use of each of the spaces as outlined in this program document. Consideration must be given to texture, color, acoustics, sustainability, and light reflectance. In regard to durability and maintenance, generally the selection of materials within reason should consider a 50-year building standard and should correspond to the amount of traffic and anticipated use of each space.

SUSTAINABLE DESIGN

The State of Utah & Utah State University have adopted the policy that all future State owned buildings are required to be designed to a minimum of LEED Silver Certification. With this in mind, the design of the facility must incorporate sustainable practices while balancing budget parameters.

LANDSCAPE

The landscape plan will be one of sustainability and durability. The plant materials will be native to the Tooele City area and Utah and once established will require low amounts of water to maintain. The vegetation that surrounds the building will consist of larger trees that will break up the building facade and allow for easy maintenance. All of the main entrances will have an identifying landscape that will help to create a warm welcome environment to the students, faculty, and visitors. These plant materials will also be low maintenance and will be small enough not to provide a security risk. All the vegetation will be positioned in a way to allow various views around the buildings and into the entry plaza to help maintain the overall security of the site. The irrigation system will be a high efficiency system. The planter beds and islands will utilize a drip system and the turf areas will use a combination of larger rotors and small pop-up spray heads. The new building site will use low trajectory nozzles in the sprinkler heads to help combat wind and provide the most efficient use of water. This use of drip and low trajectory nozzles will also assist in keeping the building from being sprayed and developing water stains.

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03 Building Requirements

Codes, Regulations and Safety

For the USU Tooele Science and Technology Building the materials, design and construction will conform to the standards established by the Utah State Division of Facilities Construction and Management (DFCM). Furthermore, it will conform to all building, accessibility codes and requirements and the energy codes adopted by the State of Utah at the time of design and construction, whether or not they are specifically referenced in this document.

It is the Design Team and the Architect of Record's responsibility to verify and use all the latest revisions, editions and adopted version code documents. If there are conflicting standards, code provisions and/or regulations, the most stringent will govern unless such requirements are waived in writing by the Utah State Division of Facilities Construction and Management.

Partial list of applicable codes and standards:

- National Electric Code (NEC) w/ Utah Amendments 2011
- Life Safety Code NFPA 101 w/ Utah Amendments
- International Building Code (IBC) 2012 w/ Utah Amendments
- International Fire Code (IFC) 2009
- International Mechanical Code (IMC) 2012
- International Plumbing Code (IPC) 2012
- Laws, Rules, & Regulations of the Utah State Fire Marshal
- Americans w/ Disabilities Act Title III, 1991/1998 (ADA)
- Planning & Design Criteria to Prevent Architectural Barriers for Aged & Physically Handicapped (4th Revision, w/lever hardware amendment)
- International Energy Conservation Code 2009
- International Fuel Gas Code (IFGC) 2012
- EIA/TIA, Electronics Industries Association / Telecommunications Industry Association
- IEEE 1100-1999, Recommended Practice for Power & Grounding Electronic Equipment
- IESNA, Illuminating Engineering Society of North America
- NFPA, National Fire Protection Association (applicable sections including but not limited to): NFPA 70, National Electrical Code & NFPA 72, National Fire Alarm Code
- ASHRAE Indoor Air Quality 62-2001 & Addendum 62
- Utah Code for Energy Conservation in New Building Construction (ASHRAE Standard 90.1-1989)
- American Society of Heating, Refrigeration & Air Conditioning (ASHRAE)
- Occupational Safety & Health Administration (OSHA)
- Sheet Metal & Air Conditioning Contractor National Association (SMACNA)
- Underwriters Laboratory (UL)
- American Society of Testing Materials (ASTM)
- American Standards Association (ASA)

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- DFCM Design Criteria for Architects & Engineers
- DFCM Indoor Air Quality Criteria

OCCUPANCY CLASSIFICATION

The occupancy presented in this package is for preliminary programming and planning purposes. The occupancy determination must be confirmed by the Architect of Record with the State Building Official and the State Fire Marshall at the time of design.

ADA ACCESSIBILITY

The new USU Tooele Science and Technology Building is required to be in compliance with the American with Disabilities Act, Title III, 1991/1998 (ADA). The Utah State Building Board has adopted the following additional requirements:

- All public entries to the building will be ADA compliant with automatic door operators including required vestibule doors.
- One set of accessible Rest room doors shall be equipped with automatic door operators including vestibule doors if applicable.
- ADA compliant parking shall be provided.

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03 Building Requirements

2009 International Building Code Review

TYPE OF CONSTRUCTION

(Chapter 6)	Type IIB

OCCUPANCY

(Chapter 3) Educational/university function	B	(section 304)
Multipurpose room	A3	(section 304)
Occupancy Separation required	No-accessory	
Occupancy Separation		

FIRE SPRINKLERS Yes

FRONTAGE

(Section 506.2)	Assume .75

STORIES ALLOW

(Table 503)	B -3 stories
	A3-2 stories

ALLOWABLE BUILDING AREA

Occupancy	B	A3	
Program area sf	28,000	2,000	30,000 total
Basic allowable area			
Table (503) per floor	23,000	9,500	
Frontage increase (506.2)	1.75	1.75	
Multi story increase (506.4.1)	x2	x2	
Sprinkler increase (506.3)	x2	x2	
Total allowable	132,250	54,625	
Actual/Allowable (506.41)	21%	17%	

FIRE-RESISTIVE REQUIREMENTS

Structural Frame- including columns, girders, trusses	0 HR
Bearing Walls- Exterior walls	0 HR
Interior walls	0 HR

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Non Bearing walls- interior/exterior	0 HR
Floor Construction-including supporting beams and joists	0 HR
Roof Construction- including supporting beams and joists	0 HR

The occupancy classification is determined by the IBC 2009 definition and confirmed by the Architect of Record and the State Fire Marshall.

The USU Tooele Science and Technology Building is required to be in compliance with the American with Disabilities Act, Title III, 1991/1998 (ADA) and any applicable Utah State Building Board adopted amendments.

The USU Tooele Science and Technology Building will conform to the standards established by the Utah State Division of Facilities Construction and Management (DFCM) and it will conform to all building, accessibility codes and requirements, and the energy codes adopted by the State of Utah at the time of design and construction.

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The structural design for this project should provide a building system which will integrate with the program requirements for space layout, as well as with the architectural and building service needs, while meeting current code standards for vertical and horizontal load carrying capacity. User needs in terms of current flexibility of the spaces and future adaptability of use should be considered. The level of user comfort as determined by the acoustic and vibration sensitivity of the structure also should be addressed.

STRUCTURAL / SERVICE COORDINATION

Layout of the structural grid will need to respect the classroom, office, and public area spaces established for the various building functions. During the design phase, a completely integrated approach to building systems is recommended. Distribution of HVAC, plumbing and electrical services must be carefully coordinated with the structural elements, particularly at framing intersections and major crossover points. This close coordination must be achieved in order to avoid conflicts and limit penetrations of major structural members.

CODES AND STANDARDS

Codes and standards that apply to the design of this building are:

- 2012 International Building Code
- DFCM Design Criteria for Architects and Engineers, May 25, 2005
- American Institute of Steel Construction (AISC) with Commentary
- ACI 318 Building Code Requirements for Reinforced Concrete
- ACI 530 Building Code Requirements for Masonry Structures
- American Iron and Steel Institute (AISI) Specifications for the design of Cold-Formed Steel Structural Members
- American Welding Society (ANSI/AWS) D1.1 Structural Welding Code
- Steel Joist Institute (SJI) for open web Joists and Girders
- Steel Deck Institute (SDI) for Metal floor and roof Decks

GEOTECHNICAL CRITERIA

A site specific geotechnical investigation has not been completed at this time. Geotechnical recommendations for the recently completed USU Tooele Extension were reviewed and should provide a reasonable guideline for what can be expected for the new ATC facility.

The USU extension geotechnical report indicates the typical soil profile to consists of 2-4" of topsoil underlain by dense clayey gravel with sand and occasional cobbles to a depth of 7'. Below this depth silty gravel with sand and cobbles was encountered to the depth of the boring. An allowable bearing pressure of 2750 psf was recommended on undisturbed silty gravels or on compacted structural fill. The site soils are indicated as not susceptible to liquefaction.

Once the final building size, configuration, structural system, number of levels above and below grade, and column loads have been determined, the project geotechnical consultant shall review the following items to verify the assumptions in the geotechnical report conform with the final proposed design of the facility:

- Soil bearing capacity
- Structural fill requirements
- Potential differential settlements
- Potential for expansion or collapse of soils due to moisture changes
- Liquefaction potential
- Groundwater restrictions
- Seismic considerations, coefficients, fault traces, etc.
- Lateral bearing pressures – active and passive
- Alternate foundation systems
- Pavement sections

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DESIGN CRITERIA

The structural systems in the facility shall be designed to meet the requirements of the 2012 International Building Code (IBC) and the Design Criteria Manual adopted by the Utah State Building Board. The following minimum requirements should be anticipated:

- Risk Category Category III (Buildings and other structures with a capacity greater than 500 for colleges or adult education facilities)

- Wind Loads
  Basic Wind Velocity: 120 mph, (3second Gust)

  Exposure Type:

  "B" or "C", for the building structure, as appropriate to the site. Exposure "C" shall be used for elements and components including the exterior window wall systems

  Wind Importance Factor, Iw 1.00

- Seismic Loads
  Short Period Mapped Acceleration Ss = 0.75 g
  Long Period Mapped Acceleration S1 = 0.28 g
  Site Class D

(Assumed, to be confirmed by geotechnical investigation)

  Seismic Design Category D
  Seismic Importance Factor, Ie 1.25

- Roof Loads
  Ground snow, pg 43 psf

  Calculate roof snow load as specified in the Utah Uniform Building Standard Act Rules R156-56 issued January 1, 2002. Design for snowdrift where appropriate. Roof live loads shall not be less than that specified in IBC 1607.11.

  Snow Importance Factor, Is 1.10

- Floor Live Loads

Floor design live loads shall be in accordance with the latest edition of the DFCM Design Criteria Manual and the 2012 International Building Code and as follows:

1. 80 psf, unreduced, except for column and footing designs
2. 15 psf movable partition load
3. Areas of concentrated standard file storage - 125 psf
4. Floor areas supporting high density rolling files – 225 psf, or actual load
5. Paper storage areas – 250 to 350 psf as appropriate
6. UPS Battery Storage areas – 250 to 450 psf as appropriate
7. Mechanical Equipment Rooms – 125 psf minimum or as required by actual equipment
8. Laundry facilities – 125 psf or as required by actual equipment

Areas where heavy load concentrations exceed the normal loading requirements shall be designed
for the specific load case.

Note: The more stringent requirement between the 2012 IBC, the DFCM Design Criteria Manual, and the loads given above shall govern.

FLOOR VIBRATION CRITERIA

Control of suspended floor and roof structure vibrations due to human and mechanically induced excitation forces shall be considered in the selection of the building structural floor and roof framing systems.

The use of microscopes in a classroom environment will be

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included in the project. Floor vibrations should be limited to 2,000 micro-inches/sec in areas intended to support the use of microscopes up to 400X magnification. The additional cost to provide structure meeting this criteria can be significant and should be well defined and of a limited nature. Alternatively, spaces requiring the use of microscopes can be located in areas of slab on grade or isolation table provided for the microscopes.

ANTICIPATED CONSTRUCTION

It is anticipated that the building will be supported on conventional reinforced concrete spread footings.

Suspended floor areas are anticipated to consist of concrete slabs on metal deck supported by steel wide flange floor framing and steel columns. The floor framing will incorporate welded studs to make the floor slab composite with the beams. The roof framing is anticipated to consist of open web steel joist and wide flange beams supporting steel roof deck.

The lateral force resisting system is anticipated to incorporate steel braced frames or moment frames. Shear wall systems will be considered where deemed appropriate with architectural expression and space planning needs and flexibility.

FUTURE BUILDING EXPANSION

The A/E designers of the building shall not consider potential future horizontal and/or vertical expansions because:

- Future vertical expansion is not anticipated.
- Future horizontal expansion of the structure is not anticipated.

TESTING AND INSPECTIONS

The Architect/Engineer, and the selected testing lab, shall perform periodic construction observations, testing, and special inspections, as outlined in the DFCM Design Criteria for Architects and Engineers. The design engineer shall list all required special inspections on the contract drawings, and perform periodic construction observations as required by the A/E agreement. Costs for special inspections and testing services will be paid for directly by the owner.

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Building Systems Design Criteria- Mechanical, Plumbing and Fire Protection Systems

GENERAL

The mechanical system will provide heating, ventilation and air conditioning required for the new building functions.

The mechanical system will be designed to provide a safe, economical, energy efficient, low maintenance type system that is balanced with the projects sustainability goals. All mechanical systems will have a proven track record of high quality, energy efficiency and environmental control.

HVAC DESIGN CRITERIA

- Comply with the 2012 edition of the International Codes.
- International Building Code (IBC) – 2012
- International Mechanical Code (IMC) – 2012
- International Plumbing Code (IPC) – 2012
- International Fuel Gas Code (IFGC) – 2012
- International Energy Conservation Code (IECC) – 2009
- International Fire Code (IFC) – 2012
- National Electric Code (NEC) – 2011
- All state amendments.

- Comply with all applicable local, state, and federal codes of regulations.

- HVAC system to comply with the following standards, most current edition:
- ANSI/ASHRAE 90.1-2010: Energy Standard for Buildings
- ANSI/ASHRAE Std 62-2010: Ventilation for Acceptable Indoor Air Quality
- ANSI/ASHRAE Std 55-2010: Thermal Environmental Conditions for Human Occupancy
- SMACNA Sheet Metal and Air Conditioning Contractor's National Association standards.
- Industrial Ventilation: A Manual of Recommended Practice
- ANSI Z9.5: Laboratory Ventilation Standard
- Heating and Cooling Load Calculations: Size the building heating and cooling systems based on undiversified calculated loads for space and process equipment. Include 10% safety factor for the heating load calculations and no safety factor for the cooling load calculations.

- Infiltration: Design for 30 MHP wind when calculated infiltration loads and building pressurization methods. Infiltration rate to be determined by DFCM's envelope commissioning agent.

- Design for Energy Conservation and Sustainability: Project requirement is LEED silver. Project goal is LEED Silver. Refer to the Project Team Sustainable Design Guidelines.

- Design for Environmental Awareness: The built environment has a profound impact on our natural environment, economy, health, and productivity. Incorporate environmentally friendly solutions in the building design.

DFCM DESIGN CRITERIA

Utah State University Design Requirements

- Div 21: Fire Suppression
- Div 22: Plumbing
- Div 23: HVAC

DFCM High Performance Building Rating System

- ASHRAE Std 55: Thermal Environmental Conditions for Human Occupancy
- ASHRAE Std 62: Ventilation for Acceptable Indoor Air Quality
- ASHRAE Std 90.1: Energy Standard for Buildings
- USGBC LEED 3.0 New Construction Criteria, Silver
    - WE Credit 1.1: Water Efficient Landscaping: Reduce by 50%
    - EA Credit 3 Enhanced Commissioning

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- EQ Credit 3.1 Construction IAQ Management Plan: During Construction
- EQ Credit 4.1: Low-Emitting Materials: Adhesives and Sealants
- EQ Credit 4.2: Low-Emitting Materials; Paints and Coatings

ASHRAE Guidelines and Standards

HVAC DESIGN CONDITIONS

Outside Design Conditions: Use the following climate data from ASHRAE Fundamentals 2009:

- Elevation 4,226 FT
- Summer Design Dry Bulb Temp. (ASHRAE 0.4%) 97.4°F
- Summer Mean Coincident Wet Bulb (ASHRAE 0.4%) 63.5°F
- Cooling Tower Wet Bulb Temp. (ASHRAE 0.4%) 67.0°F
- Winter Design Dry Bulb Temp. (ASHRAE 99%) 9.3°F
- Winter Design Dry Bulb Temp. (USU Standard) 3.0°F

Indoor Design Conditions: ASHRAE Std 55

Interior Occupied Spaces:
- Summer: 72°F, 50% RH Max
- Winter: 68°F, No Minimum

Mechanical Rooms:
- Summer: 95°F, No Humidity Control
- Winter: 60°F, No Humidity Control

Telephone/Data/Communication:
- Year Round: 75°F Max, No Humidity Control

Unoccupied Spaces
- Year Round: 95°F Max, No Humidity Control

Noise Criteria: Design the heating, ventilating and air-conditioning system to meet the USU Design Guidelines:

- Open Offices NC 40 – 45
- Private Offices NC 30 – 35
- Conference Rooms: NC 25 – 30
- Circulation Spaces, Lobbies: NC 35 – 40

Pressure Relationships: Design the heating, ventilation and air conditioning systems to meet the following:

- Building: Positive to outside, +0.05 – 0.08” W.G.
- Toilet Rooms: Negative to adjacent spaces

VENTILATION REQUIREMENTS

Ventilation will comply with the IMC and ASHRAE Standard 62.

Provide a building relief air system to maintain the building to be +0.03—0.05” W.G. building static pressure.

Lab spaces shall be negatively pressurized in relation to the surrounding building areas (-0.03-0.05” W.G.)

HEAT SOURCE

High efficiency condensing type gas fired boilers. Two boilers (sized at 60% capacity for redundancy) will be provided. In the event of failure of one boiler the remaining boiler shall prevent freezing in the building. Each boiler is sized at 60% of full heating load capacity. The system is designed as a low temperature hot water system (150°F supply water, 120°F return water) in order to take advantage of the high efficiency condensing boilers. The boilers will be located in the mechanical room. The boiler stacks will be constructed of 304 stainless steel and will extend thru the roof.

COOLING SOURCE

Two Stage Cooling System:

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First Stage: The main building air handler will have direct evaporation cooling. This will take advantage of Logan Utah's low wet bulb temperatures. The energy savings are substantial. The direct evaporative cooling will be accomplished with air washers located in the air-handler supply stream. Humidity control is achieved via a 50% bypass damper.

Second Stage: Air-cooled condensing unit with modulating hermetic scroll compressor (no hot gas bypass.) Complete with two independent refrigerant circuits. The condensing unit will be located on the roof over a concrete pad, and shall be equipped with seismic vibration isolators.

SUPPLY AIR DISTRIBUTION

The office portion of the building will be equipped with overhead supply air and overhead return air. The laboratory spaces including wet labs, biology, and necropsy labs will be overhead laminar flow supply with low return.

AIR HANDLERS

The building will be equipped with a central rooftop air handler. The air handler will be factory custom built type for better sound performance. Multiple fan arrays (fan walls) will be used for supply air fans and return/relief air fans in order to improve turn-down ration and noise reduction. Multiple fan arras will reduce the low frequency fan noise, compared to larger fans. Multiple fan arrays also provide better redundancy. The smaller fans in the multiple fan arrays are also easier to replace. The air handler is located on a rooftop concrete pad for sound and vibration isolation.

The air handler will have outside air intake and dampers, return air dampers, filters, relief or return air fans, supply air fans, glycol preheat coil, DX cooling coil, and a direct evaporative cooling section. All pre-filters shall be MERV-8 and all final filters shall be MERV 13.

The air handler will be sized for a coil face velocity of 400 feet per minute, in lieu of the standard 500 feet per minute in order to save fan energy.

All fans will have variable frequency drives (VFD's). VFD's are required for multiple zone variable air volume (VAV) systems, in order to reduce the airflow (and fan energy) when these spaces are not occupied or only partially occupied.

HVAC SYSTEMS (OFFICES)

The air handler serves multiple zones and will be variable air volume (VAV) with hot water reheat. This system will accommodate the required number of thermal zones. A VAV box will be provided for each thermal zone. Corner rooms and exterior spaces with different exposures will be provided with VAV boxes. Exterior rooms with similar exposures will be combined on one VAV box, up to three rooms. Baseboard radiation will be provided in each exterior office.

HVAC SYSTEMS (LABORATORIES)

Laboratories will be served by the main building air-handler. Exhaust will designed and installed in accordance with ANSI Z9.5 Laboratory Ventilation Standard. Each laboratory will be provided with a Phoenix, TSI, or equivalent VAV laboratory pressure control system. 6-10 air-changes per hour of ventilation air will be supplied to the space (depending on EH&S requirements.) Unoccupied ventilation will be reduced to 4 air-changes per hour to save energy. Air handling units serving laboratory spaces will be provided with emergency power and will continue to run during a fire alarm condition at a reduced speed. All chemical fume hoods will be provided with dual ventilated base cabinets with storage for acids and flammables.

VENTILATION

Ventilation will comply with the International Mechanical Code

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and ASHRAE Std. 62.1. Outside air flow sensors will be provided on the air handler. Demand controlled ventilation will be provided. Ventilation air will be controlled from space carbon dioxide sensors or occupancy sensors also linked with the lighting control system. As the space occupant load decreases, the ventilation air will decrease to a pre-determined minimum flow. The minimum flow will be determined from makeup air required for exhaust and building pressurization.

RETURN AIR

A ceiling return air plenum will be used. No laboratory air will be return (100% exhaust.)

SNOW MELT HEATING

Snow melt will be provided at the main entrances for a distance of 10-feet to reduce the amount of snow that is tracked into the building.

HEATING HOT WATER DISTRIBUTION

The heating hot water distribution system will be a primary piping system. A set of pumps (primary and standby) will serve the heating loop and will also supply water thru the boilers (a secondary pumping system WILL NOT BE USED.) The hot water supply temperature will be 140°F. The return water temperature will be 110°F.

Water-to-glycol heat exchangers will be provided for the preheat coils in the air handler. This will preclude the pre-heat coils from freezing. The system will be 30% propylene glycol.

Chemical water treatment will be provided by WEST Chemical in accordance with USU's design requirements.

AUTOMATIC TEMPERATURE CONTROL SYSTEM

The ATC system will comply with the USU Design Guidelines. It will have BACnet DDC controls with electric damper valve actuators. The USU approved controls manufacturers are: Johnson Controls, Utah Yamas Controls.

Controls will have the capability of trend login specific parameters in order to commission the system and track energy costs.

SUMMARY OF ENERGY SAVING MECHANICAL FEATURES

- Direct evaporative cooling on the main building air handler.
- Outside air economizer cooling on air handler.
- Perimeter hot water radiation with finned tube radiation at large glass areas.
- High efficiency condensing boiler with low temperature hot water system.
- Lowe pressure drop on air handler.
- Variable speed drives on air handler.
- Variable flow hot water systems.
- Variable flow condensing unit.
- Low return air in large spaces with overhead supply air.
- Demand control ventilation.
- Over-sized reheat coils to reduce pressure drop.
- Low air velocities in ducts to reduce pressure drop.
- Occupancy sensors to shut off ventilation air and reduce space heating and cooling in spaces that are occupied during normal occupied hours.

DOMESTIC WATER SERVICE

A new domestic cold water service will be provided for the building.

DOMESTIC WATER HEATERS

One instantaneous high efficiency condensing gas fired

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domestic water heater will be located in the boiler room. It will vent through the roof.

PURE WATER SYSTEM

A distilled water system will be provided for the building and piped to each laboratory.

LABORATORY GAS & UTILITY SYSTEM

Provide laboratory gas piping to all laboratory and support spaces. Gas piping to stub into each room with isolation valve and capped piping for those areas without specific gas needs at the time of the design. Laboratory gases to include compressed air, vacuum, natural gas, and pure water.

ROOF DRAINAGE SYSTEM

A primary and overflow roof drainage system will be provided. The overflow roof drains will daylight at grade level (12" above finished grade) to catch basins.

NATURAL GAS SERVICES

A new natural gas meter will be provided near the boiler room.

PLUMBING FIXTURES

The following low flow fixtures will be sued for water savings:

- Manual flush valve water closets at 1.28 gal/flush
- Sensor actuator urinals at 1 pt/flush
- Sensor actuator lavatories at 0.5 gpm
- Showers at 1.5 gpm

The lavatories and urinals shall have hard wired sensors.

Laboratories utilizing acid will require a fully automated acid neutralization system.

FIRE SUPRESSION SYSTEMS

The building requires wet-pipe fire sprinkler system coverage throughout, installed to meet the requirements of NFPA 13 and FM Global Requirements.

Class I Standpipes with 2-½" hose vales will be provided on the intermediate landings of all required stairs.

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CODES AND STANDARDS WHICH ARE DIRECTLY APPLICABLE TO DESIGN OF THE ELECTRICAL SYSTEMS ARE LISTED BELOW:

ADA, Americans with Disabilities Act
ASHRAE 90.1 Energy Code
IECC, International Energy Conservation Code
DFCM, Division of Facilities Construction and Management, Design Requirements
DFCM, State Buildings Energy Standard
USU, Utah State University, Design Standards
EIA/TIA, Electronics Industries Association/Telecommunications Industry Association
IBC, International Building Code
IESNA, Illuminating Engineering Society of North America
NFPA, National Fire Protection Association (applicable sections including but not limited to):
- NFPA 70, National Electrical Code
- NFPA 72, National Fire Alarm Code

UL, Underwriter's Laboratories
Utah State Fire Marshal Laws, Rules and Regulations

SITE ELECTRICAL

Electrical service for this project will be fed from the Rocky Mountain Power system. Conduit shall be provided from the existing 12.5KV RMP equipment located just north of the USU property and extended to this project. A concrete transformer pad/vault will be required for the new transformer. 12.5KVcabling and distribution transformer will be provided and sized by Rocky Mountain Power. A utility meter and CT section shall be provided complying with RMP standards within 50 feet of the transformer location. All cabling from the meter to the building distribution equipment shall be provided by the Contractor.

SITE TELECOMMUNICATIONS RACEWAYS

Provide a minimum of (2) 4" conduits from Beehive for fiber and (2) 4" conduits from the existing TATC building for UEN connections to a communications handhole near the new building. (2) 4" conduits shall then be routed from the communications handhole into the building main IT room. Final design will be coordinated with the USU IT department. All telecommunications cabling will be provided by USU IT. It is anticipated that fiber will be brought into the building, but no copper service cabling is anticipated.

BUILDING SERVICE AND DISTRIBUTION

Main Service

Service voltage is anticipated to be between 800-1200A at 277/480V, 3-phase, 4-wire for mechanical and lighting loads, with a dry type step down transformer system for 120/208V which will feed plug loads, lab and other small equipment. NOT: THE DRY TYPE STEP DOWN TRANSFORMERS DOES NOT COMPLY WITH USU STANDARDS; HOWEVER, ROCKY MOUNTAIN POWER WILL NOT PROVIDE TWO SERVICE VOLTAGES FOR A BUILDING LOAD OF THIS SIZE; THEREFORE, A DRY TYPE TRANSFORMER WILL BE REQUIRED IF THE BUILDIGN IS SERVED AT 277/480V FROM RMP. There is a possibility of 120/208V service from RMP; however, with the anticipated large mechanical loads typically associated with lab buildings this is not recommended or anticipated at this point. The main switchboards will provided with digital metering with network connections back to the IT room for central metering as desired by USU.

MOTOR CONTROL CENTERS

Motor control centers will be provided for areas where 6 or more motors (larger than 5 HP) are grouped and controlled by standard starters. All 3-phase motors will be provided with phase-loss protection. Provide disconnect switches within sight of all motors. Provide variable frequency drives (VFD's) where required for mechanical equipment in compliance with

DRAFT

DFCM and Campus requirements, and sized at least 10% over the connected motor load. The design electrical engineer may evaluate the variety of harmonic filtering and mitigation techniques and choose the best method to achieve this performance.

PANELBOARDS

Distribution panelboards will be provided in vertically stacked electrical rooms. The electrical rooms are to be centrally located as much as possible, while taking into account other building and architectural considerations. Ease and accessibility of running new and future conduits out of each room is an important consideration in defining the location of the rooms. Panelboards serving normal lighting and outlet circuits will be located on the same floor as the circuits they serve. All branch panelboards will have hinged front covers, as opposed to screw-on or latching covers.

SPARE CAPACITY

Switchboards, panelboards, transformers and other distribution equipment will be provided with 25% spare capacity and spaces/spares for future growth and flexibility. Electrical equipment rooms will have 25% additional space for future equipment.

BRANCH CIRCUITS

Branch circuits will be loaded to no more than 80% of what is allowed by NFPA 70. Where outlets are intended for a specific piece of equipment, the load of the outlet will be based on the equipment nameplate. Otherwise, no more than 6 convenience outlets per circuit or 4 outlets per circuit serving workstation computer terminals, on average, will be used. Sufficient capacity for plug-in task lights and other peripherals typical of desk items will be provided. Outlets with dedicated branch circuits (one outlet per circuit) are provided for lab equipment, vending machines, copy machines, break room counters, refrigerators, dishwashers, A/V cabinets and other locations likely to have equipment requiring dedicated circuits. Each branch circuit homerun will have no more than 3 circuits per raceway. Dedicated neutrals for each phase conductor will be provided.

CONDUCTORS

All conductors will be copper. Conductors for branch circuits will be sized to prevent voltage drop exceeding 3% at the farthest load. The total voltage drop on both feeders and branch circuits will not exceed 5%. For measurement purposes, a load of 180 VA (1.5A) per outlet, with a 50% diversify factor will be assumed.

RACEWAYS

All raceways are minimum ¾”C. MC Cable is not allowed. Conduit is not allowed to be embedded in elevated concrete slabs. Cable tray system will be such that raceways do not extend more than 50’ (approx.) to cable tray. Conduits will be stubbed to the cable tray and contain pull strings. Raceway is included for all security, audio/visual, and technology systems whether furnished as part of the construction contract or furnished by the Owner.

EQUIPMENT AND FURNITURE

Furniture and equipment that is identified in the program will be provided with electrical connections.

FAULT CURRENT AND COORDINATION STUDY

A fault current and coordination study will be performed to indicate available fault current at all points in the distribution system. New equipment will be rated for the amount of available fault current. Fuses or breakers will be selected

DRAFT

to ensure minimum system outage due to overloads or fault currents. Set breakers with adjustable long time, short time, instantaneous and/or ground fault settings for optimum system coordination. Per the 2011 NEC, emergency systems will be selectively coordinated to the extent possible.

SURGE PROTECTIVE DEVICES

Surge Protective Devices (SPD's) and "noise" protection is provided at service equipment (each main) and on main 120/208V distribution panelboards in the facility which serve computer terminals. SPD units will be integral to the panelboard or switchboard.

It is recommended that additional surge strips be provided under the furnishings and equipment budget on an as-needed basis. The surge strip should be commercial-grade quality and have at least 26 kA per phase maximum surge rating.

OUTLETS

Outlets will be 20A, minimum. The program and space data sheets will be used as a guideline, but user input will be welcomed during the design. Unless noted otherwise, the following will be used as a general guideline where more specific requirements are not elsewhere identified. Each outlet location will be coordinated with the design team and end user during design. Where the term "outlet" is used, this refers to a 20A duplex receptacle outlet (unless otherwise noted).

Classrooms, Lecture Halls and other Instructional Spaces: Provide outlets for instructor's station, audio/visual equipment and each student. Ensure that there is at least one duplex outlet for each 10' of wall space. Provide floor outlets where stations or equipment cannot be served directly from the wall without crossing aisle space. Where tables are fixed in place, coordinate power outlets mounted directly into the millwork.

Student Commons, Lounges and Study Areas: Provide power outlets for laptop computers, at least one duplex for 20% of user seats, but no less than one outlet per each 12' of wall space. Provide floor outlets where stations or equipment cannot be served directly from the wall without crossing aisle space. For ultimate flexibility, a raised floor is being provided in selected areas (refer to Architectural description). In other areas, floor boxes, conduit stubs or poke-through type devices will be used to provide the required connectivity.

Offices: For each workstation, provide one outlet dedicated to computer terminals and one normal outlet, and one additional normal outlet for every 10' of wall space. Provide sufficient outlets to accommodate task lighting for all staff workstations.

Conference and Board Rooms: One outlet for every 10' of wall space, plus one outlet dedicate to computer terminals on two walls. Provide floor outlets underneath conference room tables. Coordinate installation of outlets in conference table tops with furniture/millwork.

Lounges/Breakrooms/Kitchenettes: GFI Outlets on dedicated circuits every 4' on counter top plus dedicated outlets for refrigerator, microwave, dish washer, ice machine and disposal (switched at counter top), plus one outlet for every 10' of other wall space in room.
Counter tops (in general): One outlet every 4'; GFI where within 8' of a sink.

Labs: Provide outlets for instructor's station, audio/visual equipment and each student. Ensure that there is at least one duplex outlet for each 10' of wall space. Provide floor outlets where stations or equipment cannot be served directly from the wall without crossing aisle space. Where tables are fixed in place, coordinate hard wired power connections as required. Provide power to lab equipment. Emergency power to fume hoods and other equipment as determined during design.

Main Telecom MDF: Several outlets on emergency power around perimeter or room with circuit density to allow for at

DRAFT

least 100 watts per square foot. Coordinate exact quantity required with the User groups and the anticipated equipment, including future provisions as well. UPS power is assumed to be rack-mounted, plug-in style and provided by the Owner. Racks and cable tray within these rooms shall be provided by USU IT.

Telephone/Data Closets (IDF): At least 6 quad outlets on emergency power with circuit density to allow for at least 50 watts per square foot. Provide a minimum 6-outlet surge/power strip in every equipment rack. UPS power is assumed to be rack-mounted, plug-in style and provided by the Owner. Racks and cable tray within these rooms shall be provided by USU IT.

Electrical Rooms: At least one outlet on emergency power.

Restrooms: One GFI outlet on wall adjacent to sink at counter height, plus one remote from sink at standard height for breast pumps, vacuum cleaner or power scrubber. Confirm final location with UVU.

Corridors, Lobbies: Provide at least one outlet every 15', on alternating sides of the corridor or lobby.

Stairs: One outlet at each landing and intermediate landing.

Storage Rooms (small), Janitors Closets: One outlet, near light switch.

Building Exterior: One WP/GFI convenience outlet near each entrance, or a minimum of every 120 feet; additional outlets as needed for special events. Coordinate with users during design.

Other Areas: Refer to individual space plan data sheets, and where not defined coordinate requirements with user during design.

GROUNDING

All feeder and branch circuit raceways will include an insulated equipment grounding conductor. Provide a grounding riser system throughout the telecommunications closets, with grounding bus bars mounted accessibly in each closet. In computer or server rooms with raised access flooring, provide a signal reference grounding grid in accordance with IEEE standard 1100-1999. All grounding systems will be bonded together per NEC requirements.

LIGHTING PROTECTION

Perform lightning protection system analysis in accordance with NFPA and provide a lightning protection system for the new Building if recommended by analysis. Engage an LPI-certified installer, designer and inspector for the system. Provide a UL Master Label System and comply with NFPA 780.

EMERGENCY SERVICE AND DISTRIBUTION:

An emergency diesel generator shall be provided for the new building. Generator location will be carefully selected to minimize noise to occupants and neighbors (it shall not be located on the east side of the building). Generator exhaust shall be coordinated with HVAC intake to avoid intake of generator exhaust and fumes into the building. A sound-attenuating housing and skid-mounted, 48 hour double-walled fuel tank shall be included. Design at least two transfer switches: one for emergency and one for non-emergency ("stand-by") loads. Annunciate alarms adjacent to fire alarm panel. Design generator distribution panel with digital metering. The following will be provided with emergency power:

- Emergency egress and exit lighting
- Fire Alarm
- Fume Hoods
- -80 Freezers

DRAFT

- Walk in coolers
- HVAC system as required
- Communications and Server rooms (including main computer room) – outlets, lights and air conditioning
- Electrical rooms – lights and outlets
- Security systems

LIGHTING

General

The basis for design shall be the IES and its Recommended Practices, such as RP1-93 "Office Lighting", RP3-00 "Lighting for Educational Facilities", and RP-33-99 "Lighting for Exterior Environments". For exterior lighting, indirect lighting, and other specialized task lighting, a point-by-point plot of illuminance establishing conformance with the Recommended Practices shall be furnished. Ballasts shall be 10% THD to minimize system harmonics. The amount of different lamp types shall be minimized, making replacement and maintenance easier. Comply with USU design standards for technology preferences. Lamps shall comply with EPA TCLP requirements.

ASHRAE 90.1 requirements shall be met and exceeded to meet the overall project requirement to beat this energy code by at least 20%. This will ensure compliance with the State High Performance Rating System, and contribute to the LEED credits sought for this building. Energy savings design techniques such as daylighting control, occupancy sensors, centralized and de-centralized control systems, energy efficient lamps/ballasts shall be used where practical to maximize energy efficiency.

EXTERIOR LIGHTING

Exterior lighting will use campus standard lighting fixtures and poles for walkways, parking and roadways, unless a new campus standard fixture is desired at the Tooele Campus; this shall be coordinated with USU during design. All exterior lighting fixtures shall be full cut-off to avoid sky glow and light trespass conditions. Control exterior lighting utilizing combination photocell and time schedule control.

INTERIOR LIGHTING

Interior lighting will use fluorescent lamps to the greatest extent possible, with the 4' T8 lamp being the campus preference based on maintenance and cost. HID sources may be considered where needed to provide the required illuminance levels in large volume spaces, but the issues of restrike time and the desirability of instant on need to be addressed. Incandescent sources should be avoided altogether. LED sources will also be evaluated and given strong consideration.

For offices and meeting rooms, pendant indirect lighting should be strongly considered, but must be carefully coordinated in rooms with projectors so that the fixtures will not interfere with the projected image. Select luminaires for areas where VDTs are planned which are designed to minimize veiling reflections, and provide multilevel lighting control and task lighting to reduce the illuminance on the VDT. In addition, in rooms with audio visual, design lighting with variable or switched levels as indicated with a separate controlled zone to reduce glare and illuminance on the audio visual display. In rooms with projectors, provide a separate bank of lighting control switches or station near the instructor position for ease of controlling lighting during presentations.

For IVC labs and classrooms, provide directional lighting with high vertical illumination to provide lighting for broadcasting and good camera images. Lighting shall be provided with dimming to allow light levels to be adjusted and to balance between good vertical illumination glare.

For spaces where glare control is not required, fluorescent, lay-in fixtures may be used. This includes corridors, workrooms, restrooms, common areas, equipment rooms and storage rooms. Recessed fluorescent downlights shall be used in areas

DRAFT

where aesthetics call for an upgraded appearance, such as in main lobbies.

All interior lighting shall be controlled by some automatic means. This shall include vacancy sensors for smaller enclosed areas and relay control with clock and/or timer supervision for larger areas. The corridors and common areas shall be controlled through a lighting control system or occupancy sensors with local wall switch override. Wherever natural daylight is provided, incorporate day lighting controls to promote energy savings by using artificial lighting only as needed. This can be accomplished with automatic dimming, stepped switching or simple on/off control depending on the functional needs of the space. All lighting shall be "instant on" to facilitate quick response to demand and power interruptions.

Exit and emergency lighting shall comply with the IBC. Emergency lighting for means of egress to 1 fc average, 0.3 fc minimum, shall be provided. Emergency lighting shall be included in restrooms, electrical rooms, and communication rooms.

The following table summarizes lighting levels and control methods for important spaces.

Lighting Summary Table:

TYPICAL AREA	ILLUMINANCE IN FOOTCANDLES	COMMENTS
Classrooms	30/50	Bi-level Switched
Labs	50+	Lighted from above, higher light levels may be required at task locations
Conference Rooms	40/50	Multi-zoned or dimmed
Custodial Rooms	10	
Lobby areas	15/30	Daylight Responsive if possible
Offices	20 ambient / 50 task	Daylight Responsive if possible
Restrooms	30	UT Health Dept. Code
Storage Rooms	10	
Toilet / Changing Rooms	30	UT Health Dept. Code
Corridors	10/20	

FIRE ALARM

Campus Fire Alarm and Life Safety

Comply with Utah State Fire Marshal's "Rules and Regulations" and USU requirements. Design an addressable system capable of reporting back to central campus security. Design strobes visible from all locations except private offices and coordinate with furniture and equipment plans, keeping in mind standard stack height is 90" and depth of wall shelving may hinder visibility from below. Locate smoke detectors through corridors and spaces open to corridors as required by Utah State Amendments. Provide duct detectors and fan shutdown where required by NFPA and the IMC, including detection of smoke at all return air shafts serving multiple floors. Coordinate location of the building annunciator with the Campus fire marshal. All other detectors and functions will comply with the referenced codes and standards. All fire alarm wiring will be in conduit. Final programming of system will be coordinated with the Campus Fire Marshal to ensure that the program will be compatible with existing campus fire alarm programming.

TELECOMMUNICATION RACEWAYS

Riser Distribution

Stacked telecommunications closets are provided to serve each floor of the building. Equipment layout and wall space will be coordinated with the USU IT. Closets are located such that when cabling is routed through the raceway system provided, no cable length will exceed 290' regardless of the

DRAFT

path. Consideration was given to the ease and accessibility of running new and future raceways and cables out of each room. Four 4" conduits from the MDF to the stacked IDF locations are provided and four 4" sleeves between floors. Both normal and emergency circuits are provided to each IDF, 3 each, with one fourplex per circuit. The air conditioning for these rooms will be on the generator.

HORIZONTAL RACEWAY DISTRIBUTION

A wire basket type cable tray distribution network is provided throughout each floor and into the IDF closets. Cable tray will be routed above corridors, common and similar areas. Where ceilings are inaccessible, provide an equivalent conduit system bridging cable trays in accessible ceilings. It will be the designer's responsibility to size the cable tray and raceway system for the intended cabling installation. Specify that cable runs take routes that will limit the total cable distance, between termination end points, to 290' or less.

VOICE/DATA DROPS

Each voice/data outlet location will consist of a 4" square box with two gang mud ring and one 1" conduit connected to the nearest cable tray. Refer to program space plans for quantities and coordinate exact locations with the users during design. As a minimum, provide one voice/data drop for each workstation, fax machine, copy machine, vending machine, desk, computer terminal and teaching station. Allow one voice/data box per 80 square feet for areas that are not specifically defined. Provide wireless access point locations as directed by USU IT.

AUDIO/VISUAL SYSTEMS

Provide empty raceways for all A/V systems in the building as coordinated with USU A/V. All cabling and equipment will be provided by USU.

SECURITY SYSTEMS

All security systems will be designed, furnished and installed by USU. Provide raceway systems only.

CLOCK SYSTEMS

Provide self-correcting GPS based clock system complete with headend receiver/transmitter and battery powered clocks. Clocks shall be located as directed by USU.

DISTRIBUTED ANTENNA SYSTEM

A specification shall be included to perform field testing of emergency radio frequencies to ensure compliance with Utah State Law Requirements. If testing results in inadequate signal strength for the emergency radio frequencies, a DAS design shall be completed and system installed as a change order to meet required signal strength.

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SITE LOCATION:

The site is located in Tooele along what will be a future extension of Tooele Boulevard at approximately 340 South. This will be the site for this first building of Phase II of the USU Tooele Campus Master Plan followed by a building to the East and then buildings to the South within Phase II.

ACCESS:

Primary Vehicular access to the site will come off of Tooele Boulevard exclusively until Tooele Boulevard is extended to 700 South at some point in the future. All accesses will be 24' minimum face of curb to face of curb in width with and possibly become larger to accommodate both a right and left turn lanes based on recommendations from a traffic study. This traffic study should include the full build out of campus to provide for adequate sizing of the access roads during the construction of building one Phase II.

With the initial primary access being developed from Tooele Boulevard and the first building sitting in what will likely be an area of fill, the access could potentially be moderate to steep, depending on what finished floor elevation is required. Grading scenarios in the 4% to 6% range based on an average slope of approximately 2.90% across the site from East to West would also be likely.

This may require special attention be paid when setting the elevation of the building such that this drive does not become hazardously steep and difficult to maintain in the winter, especially since it is northwest facing. These slopes will likely necessitate that ADA access to the site be handled separately from the drive aisles as they will likely exceed the maximum running slope for an ADA compliant sidewalk of 5%. An early strategy for pedestrian access, possibly one which separated the two should be discussed to ensure ADA compliance. Pedestrian access to the site will come off of sidewalks which will be constructed along all frontages of the Tooele Boulevard and ultimately 700 South Street.

OPEN SPACES:

Nearly all open spaces will have slope due to the naturally sloping nature of the site and the need to make appropriate transitions from one building to another. Currently planned open space on the northwest side of the building may work to gently take up grade transition between the building finished floor and the proposed vehicular and pedestrian entrances to the site. All areas requiring level spaces, including outbuildings and possible future buildings should be carefully coordinated in the initial stages of the design of Phase II to maximize the comfort of the site and allow advanced planning for grading and drainage for those areas. A large open space on the northwest most corner of the site would be an ideal location for a detention/retention basin and would allow overflow for the drainage swale basins that will ultimately line the East side of Tooele Boulevard. This area could be landscaped and utilized as an outdoor learning area but would not be suitable for any activity requiring flat ground.

BUILDING ELEVATION:

The building elevation will be based on the final site and building plan as previously mentioned should be carefully coordinated with the drive accesses and in particular. Early assessment of whether or not a dock will be required is critical to properly setting the finished floor of the building. The most critical element driving the elevation of the building however, will be sewer. See the sewer section under site utilities.

FIRE ACCESS:

Fire access will be possible during the initial stages of Phase II only from Tooele Boulevard. Fire access routes must be provided through the parking lots to the North and East so that in the event of a fire, facility will have adequate fire protection.

DRAFT

Based on building siting and the currently proposed location for Tooele Boulevard fire protection of for the South and West sides of the building may be possible from the state. Care should be taken in the initial stage of site layout to keep all points of the building within 150 feet of a fire apparatus access. Streets, entryways and drive aisles shall all be capable of handling a fire apparatus. The currently proposed layout in the northwest corner of the site should provide a good balance of fire protection, setback from the streets and grade transition space.

CONSTRUCTION ACCESS AND STAGING:

The construction access and staging could take place to the South or East side of the proposed building site. One of the positive aspects of the site is the ability to stage without encumbering the project area itself. This could potentially be a boon for construction schedule but will undoubtedly be a challenge from a dust control aspect. Care should be taken during construction and implementation of a SWPPP to manage fugitive dust and reduce construction debris from getting onto Tooele Boulevard.

SOILS REPORT:

No geotechnical study for this site is available at the time of this report. However, the findings of any future report shall be coordinated and become part of the design documents. The report should make paving requirements for asphalt as well as concrete, depths to water if found, indications of bearing capacities, maximum cut and fill recommendations and potential for any soil related building settlement problems, etc. Base on buildings previously constructed in the area the soil will be composed of sandy gravels and cobble. Early percolation testing must be performed during the same period as the geotechnical report if sumps are to be utilized to assist in LEED strategies.

TOPOGRAPHICAL SURVEY:

A detailed topographical survey for the site must be completed prior the design of the project. The site appears to be in Zone X according to FEMA FIRM maps.

SITE UTILITIES:

Sanitary Sewer

There are two potential sanitary sewer connection points for the first building in Phase II. The first is a 12-inch diameter PVC sewer line, approximately 10 feet deep that cross the USU property near the east property line and continues north where it has been rerouted through the Tooele School District's Community Learning Center (CLC). The sewer flows from South to North with an approximate slope of 1.3 %, giving the pipe a full flowing capacity of about 2160 gpm. However, because this line is on the east or high side of the property the first two building shown along Tooele Boulevard at the north end of the USU Tooele Campus will have a difficult time gravity flowing into this existing 12-inch sewer line.

The other possible sewer connection is a to an existing 10-inch sewer line in 1200 West Street currently serving a portion of the existing Tooele City Commercial Park, which is approximately 1000 feet west of Tooele Boulevard. Tooele City indicates this existing sewer line could be extended east and enter the USU-Tooele Campus just north of the middle of the Campus's north-south length. The surface elevation at 1200 West at this potential connection point is approximately 28 feet lower than Tooele Boulevard at the mid-point of the USU-Tooele Campus. This would provide approximately 2.5% slope in the proposed sewer line.

Currently there are only 3 same buildings connect sewer line in 1200 West. As growth in the area occurs, Tooele City will evaluate whether the need to upsize the sewer outfall system exists. Tooele City has participated with developments to upsize offsite improvements in similar type projects, if it

DRAFT

benefits the service area.

An early collaborative effort with Tooele City to determine the available downstream capacity will be highly beneficial to the construction of the first buildings in Phase II. It is virtually certain that this secondary outfall line will have to be used serve the westerly side of the campus at some point during the construction of the USU Tooele Campus. This system would run parallel to Tooele Boulevard, running from the North to the middle and the south to the middle of campus and then westerly to the outfall line connecting into 1200 West Street.

The time to construct this system must be determined before the Tooele Science and Technology Building is constructed so it can be appropriately planned for and funded and so that the first building will not require at force main or an artificially high finished floor elevation to function. If this system is not built, the finished floor elevation of these westerly buildings would need to be as much as 5-feet above existing grade to gravity flow into the existing sewer main or a sewage lift station may be necessary. This may appear to be an attractive option at this point but the lift station would ultimately be abandoned in favor of gravity flow sewer to serve the West side of campus. Crossing of a utility tunnel running north-south through the center corridor will also prove to be challenging without some advanced decision making and planning.

CULINARY WATER

There are two Tooele City water wells and pump stations approximately 600 feet west of the west boundary of the USU Tooele Campus and two additional Tooele City water wells and pump stations nearby. These pump stations push the well water east over 1.5 miles to water storage tanks on the east side of State Road 36. The water gravity flows westward through the City and eventually to the proposed USU-Tooele Campus. There are several pressure regulators installed in-line to control the water pressure.

The USU-Tooele Campus can tie onto a 12-inch water line near the southwest corner of CLC in Tooele Boulevard, and into existing 8-inch waterlines from the nearby subdivision to the east at 540 South Street and at 700 South Street. These water lines will be in the same pressure zone and need to connect through the proposed USU-Tooele Campus to create a loop for water system. Creation of a loop from the 12” line currently available in Tooele Boulevard and the 8” line from the neighborhood to the East would be preferable but would expand the scope of the civil design far beyond the proposed the Tooele Science and Technology Building project limits. It may be possible to construct a “lollipop” loop with future expansion in mind, leaving stub outs for future connections to the South in both Tooele Boulevard and the access drives along the East side of campus.

The water line in Tooele Boulevard is approximately 48-inches deep to the top of the pipe, which is Tooele City’s Standard. The static water pressures will vary across the site from 85 psi at the southeast corner of the campus to 105 psi at the northwest corner of campus.

Water line sizes for the construction of the Tooele Science and Technology Building must be based on the culinary water and fire flow demands for the full campus. As part of the construction of Tooele Boulevard, Tooele City will require the extension of the 12-inch water line within the street right-of-way. The water lines will consist of 8-inch, 10-inch and possibly some 12-inch lines constructed using pressure class 200 C-900 PVC Pipe. The campus master plan should be consulted as Phase II is planned to ensure future build out does not require upsizing of pipes that have been previously constructed

The Water Source Protection Plans from the Utah State Division of Drinking Water for these four wells show that the entire USU Tooele Campus falls within the 3-year and 15-year groundwater travel zones of these wells. The Source Protection Plan guidelines indicate new developments need to identify the Potential Contamination Sources (PCSs) individually as they

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move into protection zones, include them on the inventory of PCSs, identify and assess current controls, and plan land management strategies if they are not adequately controlled. This information will be particularly relevant to storm drainage strategies and controls and the ability to utilize sumps to achieve LEED points.

STORM DRAINAGE

The building and site will be graded such that positive drainage is sloped away from the building in all areas. This will begin with the finish grade being set adjacent to the building 6-inches below finish floor and then sloping away from the building. Routes for the 100-year storm will be reviewed so that the building is protected from the 100-year storm. The 100-year storm will also be routed though the parking lot to make sure that the depth in any portion of the parking lots is not more than 12-inches. Swales will be sized for the 100-year storm. Pipes and catch basins will be sized for the 10-year storm.

The storm drainage system will consist of a series of inlet boxes and piping designed to collect roof-drains and runoff from parking lots and landscaped areas. Piping will need to be sized to accommodate the area of drainage and any potential areas of collection above the project area for the Tooele Science and Technology Building. On site storm drain will be composed of PVC, CP and RCP pipes and precast or cast in place catch basins to minimize sheet flows on site. This water will then be routed to the detention pond, detained and release to the historical discharge point.

This system will then direct the flows to an open, landscaped drainage system along the East side of Tooele Boulevard which will serve as both a detention basin and a conveyance mechanism that flow to the northwest along the roadway. Subsequent basins will be tied together through piping and overflow structures with restrictions to control the amount of detention and discharge rates. The landscaped basins will also remove sediment and oils acting as a bio-swale. Style and configuration of the landscaped swales will be determined at the time of design. Tooele City requires designing storm water detention facilities and pipe sizing calculations using a 10-year rainfall intensity frequency with an allowable discharge rate of 0.1 cubic feet per second per acre of property.

It is highly recommended that the detention pond at the northwest corner of the site be developed to handle the anticipated future development for the campus to minimize future permitting efforts and make expansion economical and hassle free.

GAS

The gas line location map from Questar that shows the nearest gas line service to the campus. On Millburn Drive, which is just northwest of the site, there is a 4-inch high pressure gas main. On Tooele Boulevard, north of the CLC Building, there are two lines; a 2-inch and a 4-inch high pressure gas lines. Extension of the 4-inch high pressure main to serve campus is anticipated and will be a part of the Tooele Science and Technology Building. The line that serves the building will be sized by the mechanical engineer and extended by Questar.

IRRIGATION

Currently, Tooele City does not have a secondary water system in the area. The irrigation water used comes directly from Tooele City's culinary water system. Backflow prevention valves are required any time an irrigation main is connected onto the culinary water system. Water rights for both culinary and secondary water are required to connect onto the Tooele City Water System.

The site utilities will be coordinated with the rest of the project team after the topographical survey is completed and utility connection points to the building are known. Future connection to the tunnel running North and South along the project spine must also be anticipated. Utilities that will likely

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be run in the tunnel include steam, chilled water and various communications.

LEED POINTS AND SUSTAINABLE DESIGN:

There are several LEED points that are typically assigned to the civil engineer. These include the storm water quality point and the storm water quantity point as well as some pre-requisites.

The site is now less than 50% imperviousness. As such, the quality point requires that the amount of storm water leaving the site be not more than the amount of water that currently leaves the site. To do this, a certain amount of the storm water must be percolated into the ground. The percolation will be enhanced with the use of swales to clean the storm water and reduce the flow prior to the percolation/detention pond. This must be coordinated with the geotechnical report, the well water protection zones and with the owner.

The other LEED point, storm water quality, requires that the design be set so that 80% removal of total suspended solids takes place for 80% of the storm water leaving the site. This goal can be accomplished with the use bioswales, hydrodynamic separators, and filtration. The methods to clean the storm water will be coordinated with the design team early in the design process so that an economical solution that still works can be provided.

GRADING AND DRAINAGE

The grading concept is to provide good vehicular access to parking areas. Pedestrian access to a University Campus is critical and all access routes will be evaluated to ensure the best alignment and function of the route. Each route will also be designed to meet ADA standards with 2-percent or less cross slopes perpendicular to the direction of travel and less than 5-percent slope in the direction of travel, where ever possible to minimize or eliminate ADA Ramps and handrails. The building placement, finish floor elevations and site grading will be prepared to minimize exporting or importing soils and provide good drainage away from buildings. Parking lots will be design with grades across asphalts between 1.5 and 4.0 percent. The natural slope across the property is roughly 3% from East to West and about 1% from South to North.

SITE PAVING:

The site will have several types of asphalt paving. The personal vehicle parking areas will have asphalt paving. The section will be coordinated with the geotechnical report but is expected to be about 3-inches of asphalt over 6-inches of road base over properly prepared subgrade. Another paving section will be the heavy duty asphalt paving utilized in heavy duty drive aisles. This will be where the large trucks enter the site, major deliveries, trash pickup and areas of high traffic. This paving section will also be coordinated with the geotechnical report but is expected to be about 4-inches of asphalt in two layers over 8-inches of road base, over properly prepared subgrade.

In addition to asphalt paving, sidewalks and concrete paving will be provided. The sidewalks will be 5-inches thick over 4” of base to prepare the area to grade and comply with USU standards. The dumpster site will have a heavy duty concrete pad and will be about 180 square feet and will be a minimum of 6” thick. Other concrete slabs for mechanical units will be prepared. These will be coordinated with the mechanical and electrical engineer during the design process.

SITE PARKING:

The site will have a number of parking stalls yet to be determined. There will be an appropriate number of ADA stalls dispersed throughout the site and based on the total number of stalls. Standard stalls will be 9’ by 20’ when not adjacent to landscaped areas and 9’ by 18’ when adjacent to a 6’ or greater walk or landscaped area. The parking area for the proposed building will be primarily North of the dive access in its current

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configuration. The extent to which the dive access and parking will be constructed to the East is unknown at this time and will likely be determined by the number of stalls required to serve the building.

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OUTDOOR SPACE DESIGN OF AMENITIES AND FEATURES:

Primary objectives for outdoor space will be to:

- Design Landscape and Irrigation such that it complies to LEED Silver V3.0 standards
- Enhance the surrounding mountain views and scenery
- Screen negative views surrounding the site
- Represent the design of the Sciences and Technology building as a symbol of the technological
- knowledge and skills needed to gain or keep well-paying employment by all of its past, present, and future students

Lines and other important physical elements represented by the architectural material palette will be extruded out into the landscape to strengthen and enhance the lines and design of the architecture and to connect the surrounding landscape with the building and other site elements.

Curves may be used to soften the interface between the existing area surroundings with the hard lines of the architecture.

Native vegetation will play an important role as it fingers its way through the various outdoor spaces and creates interesting edges that juxtapose against the more refined elements of crushed rock and layered plant material.

Pedestrian links from among all educational facilities in the vicinity: the current USU building, the TATC /USU building, the CLC, and future building planned on the 54 acre USU campus property will be important to enhance and maintain.

The vehicular experience with respect to views and circulation patterns will be designed to promote efficiency of travel along designated pathways and also to focus attention of the great surrounding mountain vistas to the south and east and provided by the building and surrounding landscape. Safety of travel along these pathways will be addressed through sound design guidelines and queues from landscape and hardscape treatments in paving, walls, and plantings.

PLANT MATERIALS AND SOIL ENHANCEMENTS:

Effective soil testing and analysis are vitally important and suggested so as to assess soil conditions. Effective soil amendments and mitigation, if necessary, allow for plant material to have the nutrients they need to not only survive the harsh conditions of this area but to thrive in them.

Use of indigenous plant materials is encouraged and will be a majority of the plant palette and should be able to withstand drought tolerant conditions during the high heat of the summer months as well as constant high winds.

Deciduous trees are encouraged along pedestrian corridors and walkways and also in plaza areas to provide shade and relief from the hot sun and to reduce the “heat island effect” in parking lot areas.

Evergreen trees are encouraged to act as a wind break wherever appropriate and also to add winter interest and year round green.

Shrub plant massing’s will avoid creating a security hazard by obstructing views through the site, especially along pedestrian corridors, walkways, entries, etc.

Natural earth and turf berming with plant massing’s between roads and parking lots may be used to screen negative views of parking lot and focus attention onto the Architectural features of the USU Sciences Building.

Trees will be planted to provide shade and to enhance views of surrounding landscape features so as not to take away from the beautiful surrounding mountain vistas that one will enjoy from inside the building looking out.

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IRRIGATION DESIGN:

Irrigation System will be designed to deliver maximum watering efficiency inherent in a LEED Silver V3.0 scenario. Water efficient irrigation heads, smart controllers, smart flow sensors, and other water efficient irrigation parts will ensure minimum water use while increasing plant survival in harsh desert conditions.

Native vegetation and more drought tolerant material will be designed and implemented on a majority of site. Colorful flora and textures of plant material will be intensified and massed at important pedestrian and vehicular pathways and at entryways and around signage to enhance, delight, and direct users and travelers of the various outdoor spaces.

Use of native seed mixes and wildflower blends will be encouraged and options explored and will be incorporated where appropriate and where they can visually connect the beauty of the surrounding landscape flora into one cohesive arrangement.

Drought tolerant turf areas will be incorporated to give useable recreational spaces and visual contrast
from native planting areas to more functional outdoor spaces.

Water wise and xeriscape irrigation design will be incorporated and coordinated between installing contractors and landscape maintenance providers.

SITE ACCESSIBILITY:

Paths to building entrances shall meet ADA criteria for slope and landings. Wherever possible, all other site paths shall meet ADA criteria. If that is unfeasible in a particular location, provide elevator access within the USU Sciences Building that will allow wheelchair users to transition the non-compliant grade condition. All usable outdoor spaces shall be fully accessible.

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03 Building Requirements

Sustainable Design Criteria

The new USU Tooele building and site design should incorporate industry and regional sustainable design practices. The building materials should use thermally broken windows, roof and general building shell materials to optimize energy performance and thermal transfer. The mechanical and electrical systems should utilize the latest energy efficient fixtures and equipment. The site should use regional plants and be graded to minimize storm water runoff and maximize on site water detention.

In addition to industry standard sustainable design principles the new building has specific design requirements including the State of Utah adopted policy that all future State owned buildings are required to be designed to a minimum of LEED Silver Certification. There are many paths available to meet LEED Silver certification the design team and client will navigate through the United States Green Building LEED points system to take advantage of the most desired and cost effective sustainable design options. All new Utah State owned and funded buildings also must meet the DFCM established high performance building criteria. There are several LEED requirements that need to be achieved to meet the high performance criteria including: WE credit 1.1 Water Efficient Landscape Reduction by 50%, EA Credit 3- Enhanced commissioning, EQ Credit 3.1- Construction IAQ Management Plan, EQ Credit 4.1-Low Emitting Materials, adhesives and sealants, EQ Credit 4.2 Low Emitting Materials, paints and solvents. An energy model is required to demonstrate that the building design will meet code energy requirements.

In addition a life cycle cost analysis will be provided by the design team. Enhanced building commission with envelope commissioning is typically contracted on large scale state projects to help insure many of the sustainable requirements are achieved. With this in mind, the design of the facility must incorporate sustainable practices while balancing budget parameters.

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LEED 2009 for New Construction and Major Renovations

Project Checklist

USU Tooele Science and Technology Building

September 13th 2013

Y	?	N			
11	6	9	**Sustainable Sites**	Possible Points:	26
Y			Prereq 1	Construction Activity Pollution Prevention	
1			Credit 1	Site Selection	1
		5	Credit 2	Development Density and Community Connectivity	5
		1	Credit 3	Brownfield Redevelopment	1
	6		Credit 4.1	Alternative Transportation—Public Transportation Access	6
1			Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1
3			Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3
2			Credit 4.4	Alternative Transportation—Parking Capacity	2
		1	Credit 5.1	Site Development—Protect or Restore Habitat	1
1			Credit 5.2	Site Development—Maximize Open Space	1
1			Credit 6.1	Stormwater Design—Quantity Control	1
1			Credit 6.2	Stormwater Design—Quality Control	1
		1	Credit 7.1	Heat Island Effect—Non-roof	1
1			Credit 7.2	Heat Island Effect—Roof	1
		1	Credit 8	Light Pollution Reduction	1
4		6	**Water Efficiency**	Possible Points:	10
Y			Prereq 1	Water Use Reduction—20% Reduction	
2		2	Credit 1	Water Efficient Landscaping	2 to 4
		2	Credit 2	Innovative Wastewater Technologies	2
2		2	Credit 3	Water Use Reduction	2 to 4
13	3	19	**Energy and Atmosphere**	Possible Points:	35
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
9		10	Credit 1	Optimize Energy Performance	1 to 19
	1	6	Credit 2	On-Site Renewable Energy	1 to 7
2			Credit 3	Enhanced Commissioning	2
2			Credit 4	Enhanced Refrigerant Management	2
		3	Credit 5	Measurement and Verification	3
	2		Credit 6	Green Power	2
7		7	**Materials and Resources**	Possible Points:	14
Y			Prereq 1	Storage and Collection of Recyclables	
		3	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3
		1	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
2			Credit 2	Construction Waste Management	1 to 2
		2	Credit 3	Materials Reuse	1 to 2

Y	?	N			
			Materials and Resources, Continued		
2			Credit 4	Recycled Content	1 to 2
2			Credit 5	Regional Materials	1 to 2
		1	Credit 6	Rapidly Renewable Materials	1
1			Credit 7	Certified Wood	1
13	2		**Indoor Environmental Quality**	Possible Points:	15
Y			Prereq 1	Minimum Indoor Air Quality Performance	
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
1			Credit 1	Outdoor Air Delivery Monitoring	1
1			Credit 2	Increased Ventilation	1
1			Credit 3.1	Construction IAQ Management Plan—During Construction	1
1			Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
1			Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
1			Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
1			Credit 4.3	Low-Emitting Materials—Flooring Systems	1
1			Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
1			Credit 5	Indoor Chemical and Pollutant Source Control	1
1			Credit 6.1	Controllability of Systems—Lighting	1
1			Credit 6.2	Controllability of Systems—Thermal Comfort	1
1			Credit 7.1	Thermal Comfort—Design	1
1			Credit 7.2	Thermal Comfort—Verification	1
	1		Credit 8.1	Daylight and Views—Daylight	1
	1		Credit 8.2	Daylight and Views—Views	1
6			**Innovation and Design Process**	Possible Points:	6
1			Credit 1.1	Innovation in Design: Specific Title	1
1			Credit 1.2	Innovation in Design: Specific Title	1
1			Credit 1.3	Innovation in Design: Specific Title	1
1			Credit 1.4	Innovation in Design: Specific Title	1
1			Credit 1.5	Innovation in Design: Specific Title	1
1			Credit 2	LEED Accredited Professional	1
1	1	2	**Regional Priority Credits**	Possible Points:	4
	1		Credit 1.1	Regional Priority: SSc4.1	1
1			Credit 1.2	Regional Priority: EAc1	1
		1	Credit 1.3	Regional Priority: Specific Credit	1
		1	Credit 1.4	Regional Priority: Specific Credit	1
55	12	43	**Total**	Possible Points:	110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

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SPACE REQUIREMENTS

04 Space Requirements

Space Area Summary

Description	Sq. Feet
IVC CLASSROOMS	4018
BIOLOGY	8123
CHEMISTRY	1950
PHYSICS	1440
MISC BUILDING	4250
BUILDING SUPPORT	3480
NSF Subtotal	23261
Circulation, access, walls (25% NSF)	5815
TOTAL	**29076**

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DEPARTMENT	AREA	DESCRIPTION	QYT	NET SF	TOTAL NET SF
IVC CLASSROOMS					
	I101	IVC Large Origination Classrooms (32-36 students)	1	800	800
	I102	IVC Large Origination Classrooms (32-36 students) with computers	1	800	800
	I103-I104	IVC Mid Size Origination Classrooms (22-24 students)	2	600	1200
	I105	IVC Pod Origination Classroom (24 students) flexible for origination	1	800	800
	I106	IVC Smal Size Origination Computer Classroom	1	418	418
		Subtotal			4018
BIOLOGY					
	B101-B102	Biology Laboratory (24 stations)	2	1200	2400
	B103	Biology Lab Support (shared)	1	294	294
	B104	Zoology/Anatomy/Physiology Lab	1	1200	1200
	B104a	Zoology Prep Room	1	270	270
	B105	Cadaver Lab	1	459	459
	B106-C103	Research Biology and Chemistry Laboratory - shared	1	1556	1556
	B108-111	Research Biology Individual Labs	4	120	480
	B112-B112a	Mud Room / locker room / Shower	1	630	630
	B113-B115	Biology Office	3	120	360
	B116	Adjunct office bullpen	1	474	474
		Subtotal			8123
CHEMISTRY					
	C101	Chemistry Laboratory (24 stations)	1	1200	1200
	C102	Chemistry Lab Support/storage	1	240	240
	C104	Flex Physical Science Lab Support	1	270	270
	C105, C106	Chemistry Office	2	120	240
		Subtotal			1950
PHYSICS					
	P101	Physics Laboratory	1	1200	1200
	P102	Physics Lab Support	1	120	120
	P103	Physics Office	1	120	120
		Subtotal			1440
MISC BUILIDNG					
	M101-M101a	Multi-purpose room	1	2000	2000
	M101b	Table and Chair Storage	1	200	200
	M103	Tutoring rooms	1	450	450
	M104	Study and lounge space	1	600	600
	M105	Faculty break room	1	300	300
	M105a	Work Room	1	280	280
	M106	Facilitator office /reception area (adjacent to work rm)	1	120	120
	M109	General Conference Room	1	300	300
		Subtotal			4250
BUILDING SUPPORT SPACES					
	S101-S104	restrooms	4	300	1200
	S105-S106-S107	support-electrical/comm	1	460	460
	S108-S109	support-mechanical	1	1500	1500
	S110-S111	janitor	2	80	160
	S112-S113	elevator	1	160	160
		Subtotal			3480

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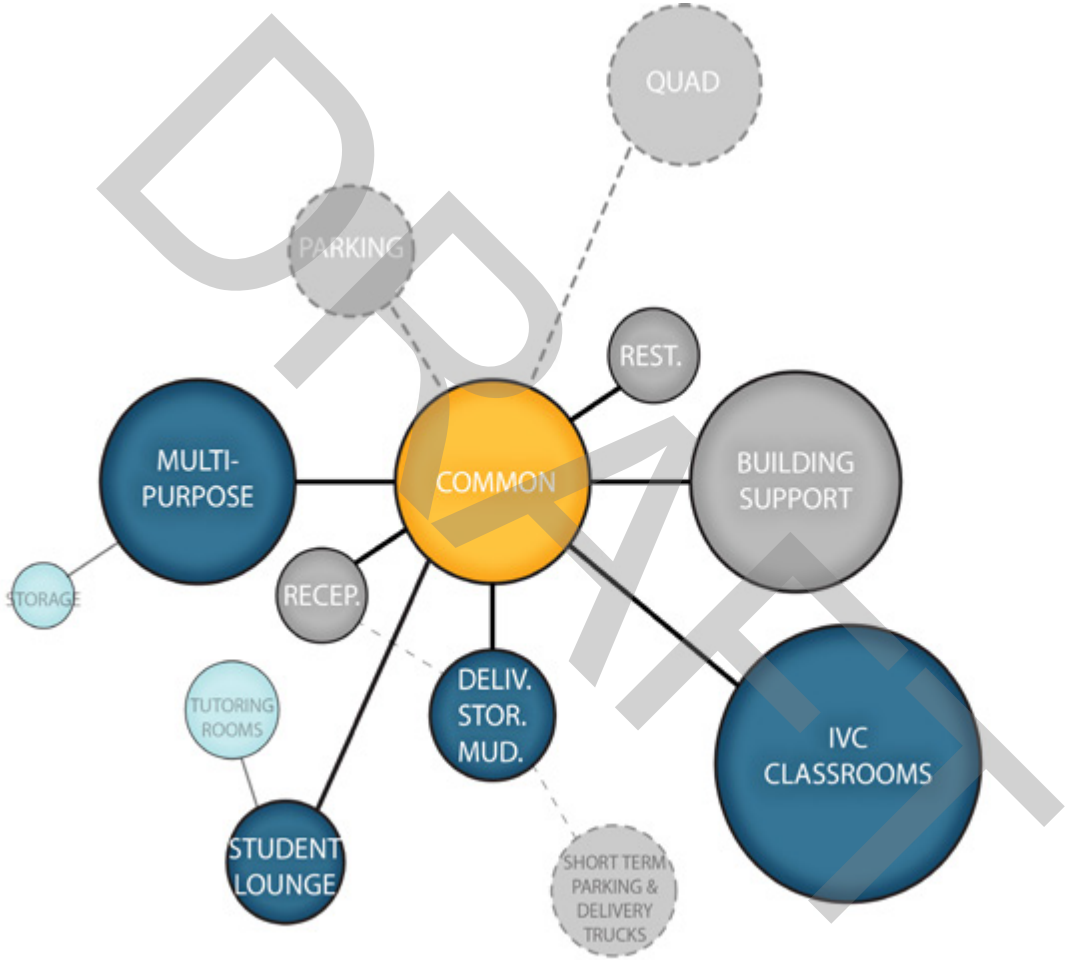
04 Space Requirements

Adjacency Diagram



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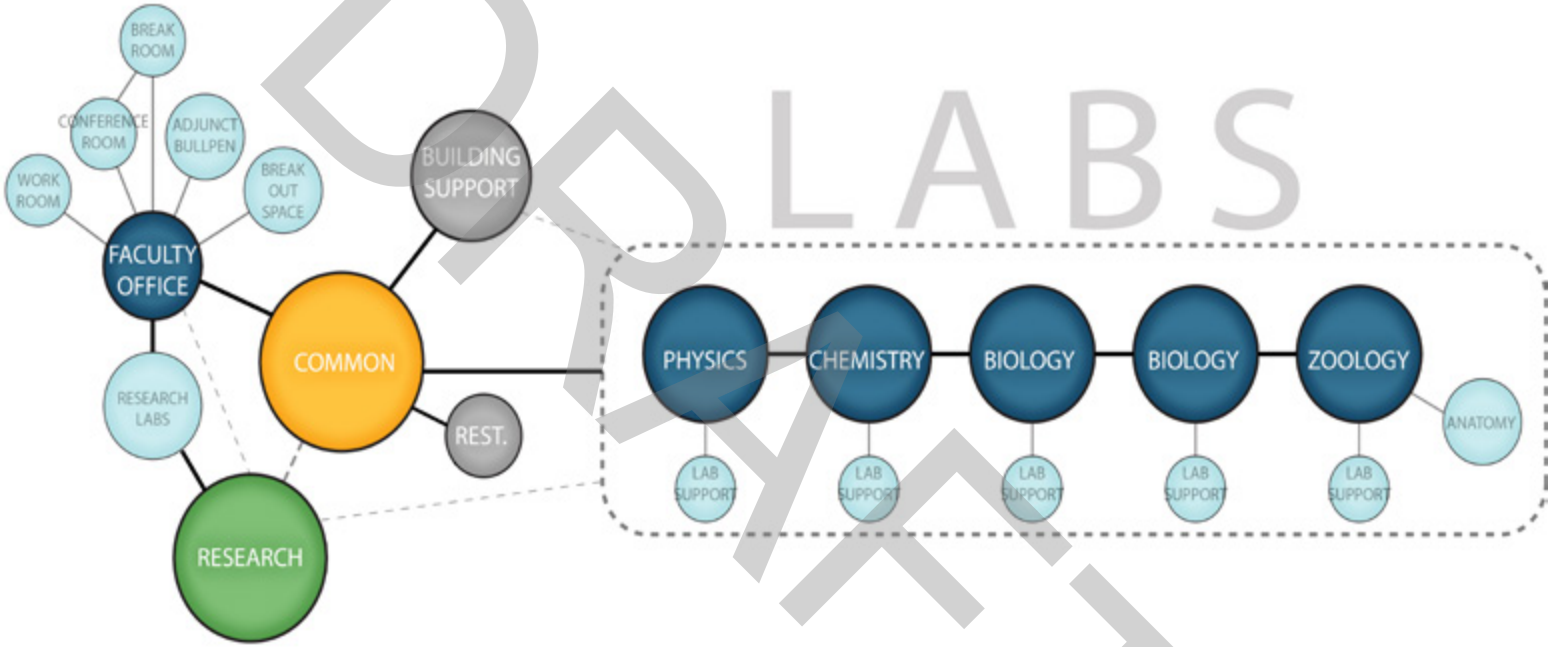
LABS


BREAK ROOM
CONFERENCE ROOM
ADJUNCT BULLPEN
WORK ROOM
BREAK OUT SPACE
FACULTY OFFICE
RESEARCH LABS
RESEARCH
COMMON
BUILDING SUPPORT
REST.
PHYSICS
CHEMISTRY
BIOLOGY
BIOLOGY
ZOOLOGY
ANATOMY
LAB SUPPORT
LAB SUPPORT
LAB SUPPORT
LAB SUPPORT
LAB SUPPORT

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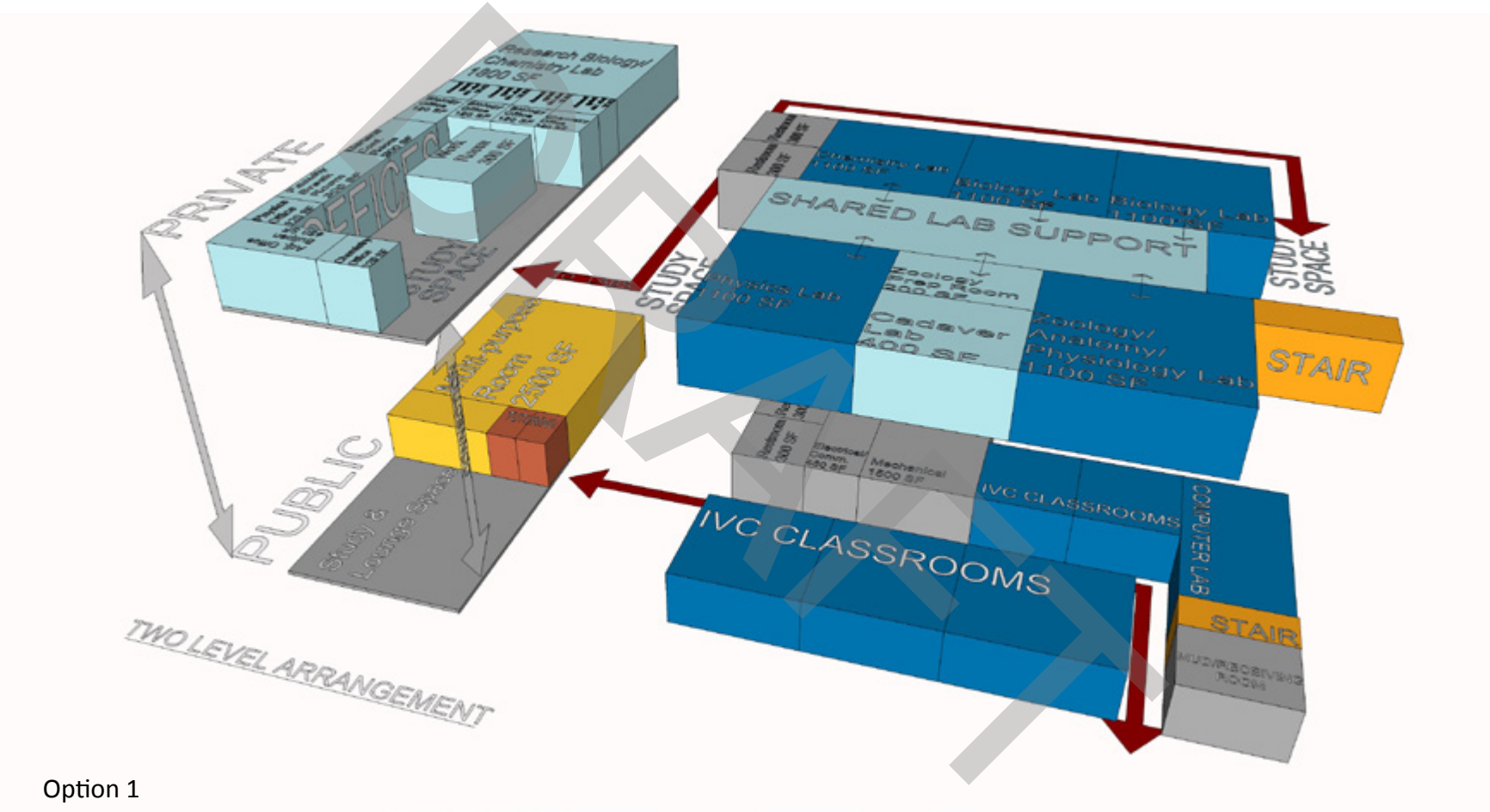
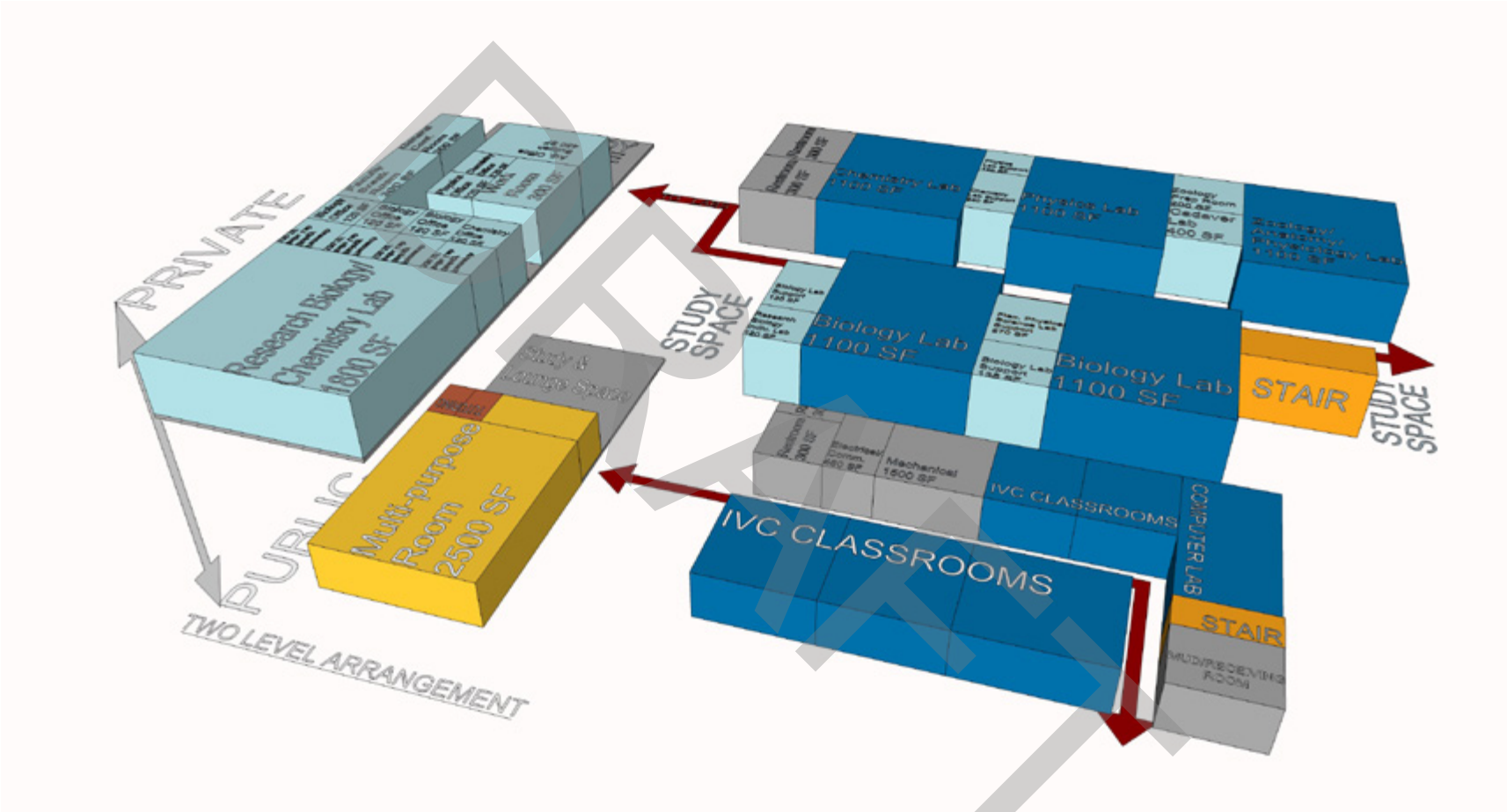
04 Space Requirements

Stacking Diagrams



Option 1


PRIVATE
Research Biology/ Chemistry Lab 1800 SF
Multi-purpose Room 2500 SF
TWO LEVEL ARRANGEMENT
STUDY SPACE
Biology Lab 1100 SF
Biology Lab 1100 SF
STAIR
STUDY SPACE
IVC CLASSROOMS
IVC CLASSROOMS
COMPUTER LAB
STAIR

Option 2

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IVC CLASSROOMS

I101 Large Origination Classroom

Space Requirements

Space Summary:

Type of Space:	Classroom
Number Required:	1
Total Number:	1
Occupants:	32-36 students, 1 instructor, 1 facilitator
Area:	800 SF
Primary Function:	Distance learning classroom for Science and Technology programs

Relationships:

Location:	First Level
Adjacencies:	None required
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Calm, Attractive, Professional

Finishes:

Floor:	Carpet
Walls:	Painted gypsum board
Ceiling:	Acoustical Lay-in, durable panels. Removed frequently for A/V access
Specialty Finishes:	Sound absorption wall panels
Sound:	Sound and vibration isolation required

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	9’-0”

Privacy/Security:

Provide motorized roller shades and blackout panels if any windows are present. Card access and/or keypad control.

Doors:

Type:	Solid core wood with clear finish
Frame:	Painted hollow metal with glazed sidelite
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-Instructor console with A/V racks

Moveable Furnishings:

-Tables (with A/V and power ports), 36 student chairs, 1 instructor chair

Equipment:

-80” LCD screen, 60” LCD screen, touch panel
-Ceiling mounted document camera, digital clock, (2) wall cameras, surround sound ceiling mounted speakers, ceiling microphones
-Whiteboard
-Computer at instructor console
-Sympodium 24” screen
-Flat screen monitor and phone at console

Technical Requirements

Mechanical:

Ventilation:	10CFM/person + 0.12 CFM/sq.ft.
Summer Design Temp:	72 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	15-20 NC required for recording room quality
Special Systems:	Adequate venting for instructor console A/V equipment
Plumbing:	Sink

Electrical:

Power:	1 fourplex at console; 1 fourplex at each student row; 1 fourplex at each monitor; duplex outlets 12’ oc along walls
Phone/Data:	1 drop at console; 1 drop per each student row; 1 drop at each monitor; 1-2 additional drops along wall.
Video:	A/V system with internet connection
Audio:	Ceiling speakers with volume control

Lighting:

Fixture Type:	T-5 Fluorescent or LED lay-in indirect, dimmable
Accent Lighting:	None required
Foot Candles:	40-45
Controls:	Occupancy sensor; zoned lighting for distance learning origination rooms

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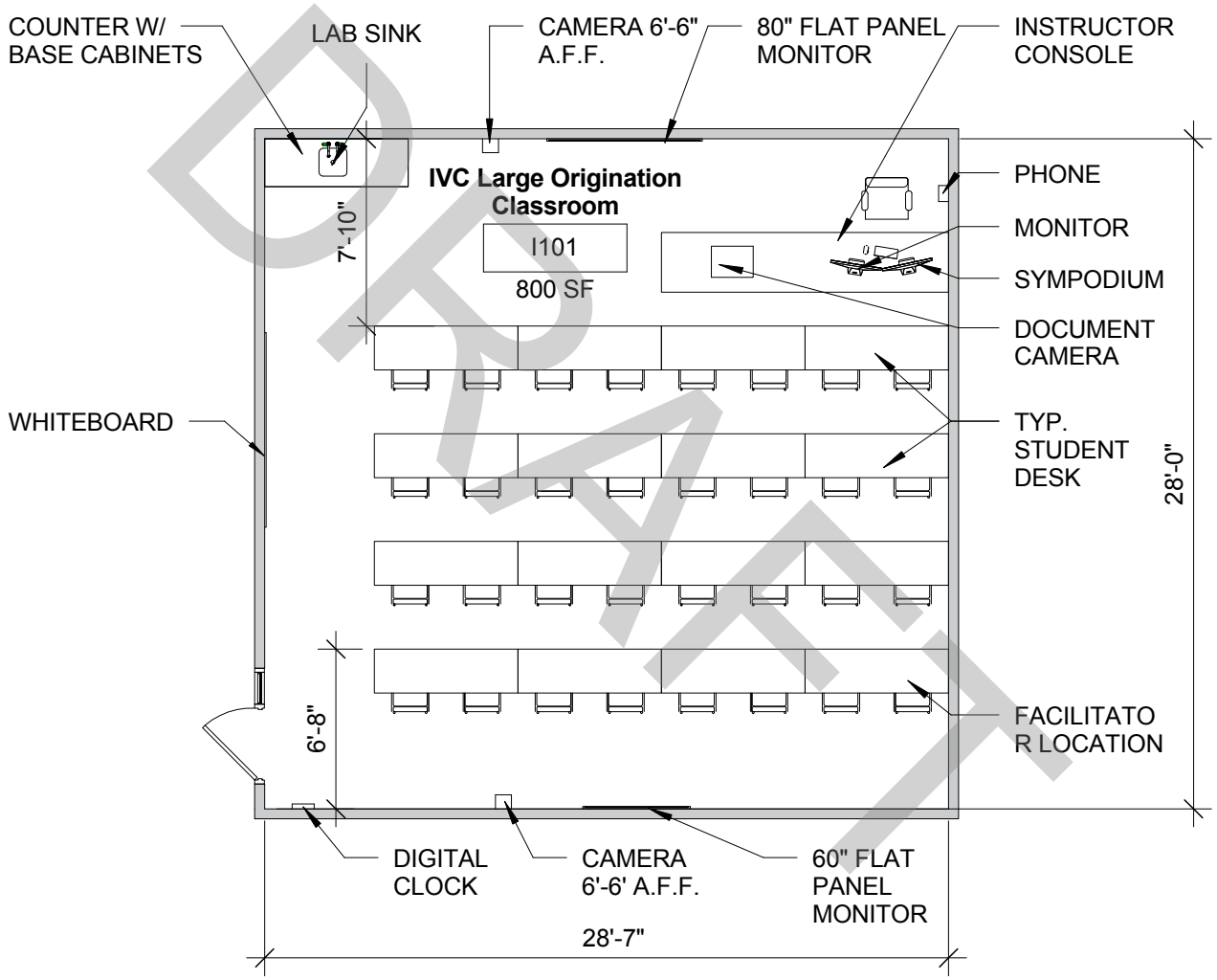
COUNTER W/
BASE CABINETS
LAB SINK
CAMERA 6'-6"
A.F.F.
80" FLAT PANEL
MONITOR
INSTRUCTOR
CONSOLE
IVC Large Origination
Classroom
I101
800 SF
7'-10"
PHONE
MONITOR
SYMPODIUM
DOCUMENT
CAMERA
WHITEBOARD
TYP.
STUDENT
DESK
28'-0"
6'-8"
FACILITATO
R LOCATION
DIGITAL
CLOCK
CAMERA
6'-6' A.F.F.
60" FLAT
PANEL
MONITOR
28'-7"

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I102 Large Origination Computer Classroom

Space Requirements

Space Summary:

Type of Space:	Classroom
Number Required:	1
Total Number:	1
Occupants:	32-36 students, 1 instructor, 1 facilitator
Area:	800 SF
Primary Function:	Distance learning classroom for Science and Technology programs

Relationships:

Location:	First Level
Adjacencies:	None required
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Calm, Attractive, Professional

Finishes:

Floor:	Carpet
Walls:	Painted gypsum board
Ceiling:	Acoustical Lay-in, durable panels. Removed frequently for A/V access
Specialty Finishes:	Sound absorption wall panels
Sound:	Sound and vibration isolation required

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	9’-0”

Privacy/Security:

Provide motorized roller shades and blackout panels if any windows are present. Card access and/or keypad control.

Doors:

Type:	Solid core wood with clear finish
Frame:	Painted hollow metal with glazed sidelite
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-Instructor console with A/V racks

Moveable Furnishings:

-Tables (with A/V and power ports), 36 student chairs, 1 instructor chair

Equipment:

-80” LCD screen, 60” LCD screen, touch panel
-Ceiling mounted document camera, digital clock, (2) wall cameras, surround sound ceiling mounted speakers, ceiling microphones
-Whiteboard
-36 student computers, 1 at instructor console
-Sympodium 24” screen
-Flat screen monitor and phone at console

Technical Requirements

Mechanical:

Ventilation:	10CFM/person + 0.12 CFM/sq.ft.
Summer Design Temp:	72 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	None required
Special Systems:	Adequate venting for instructor console A/V equipment
Plumbing:	Sink

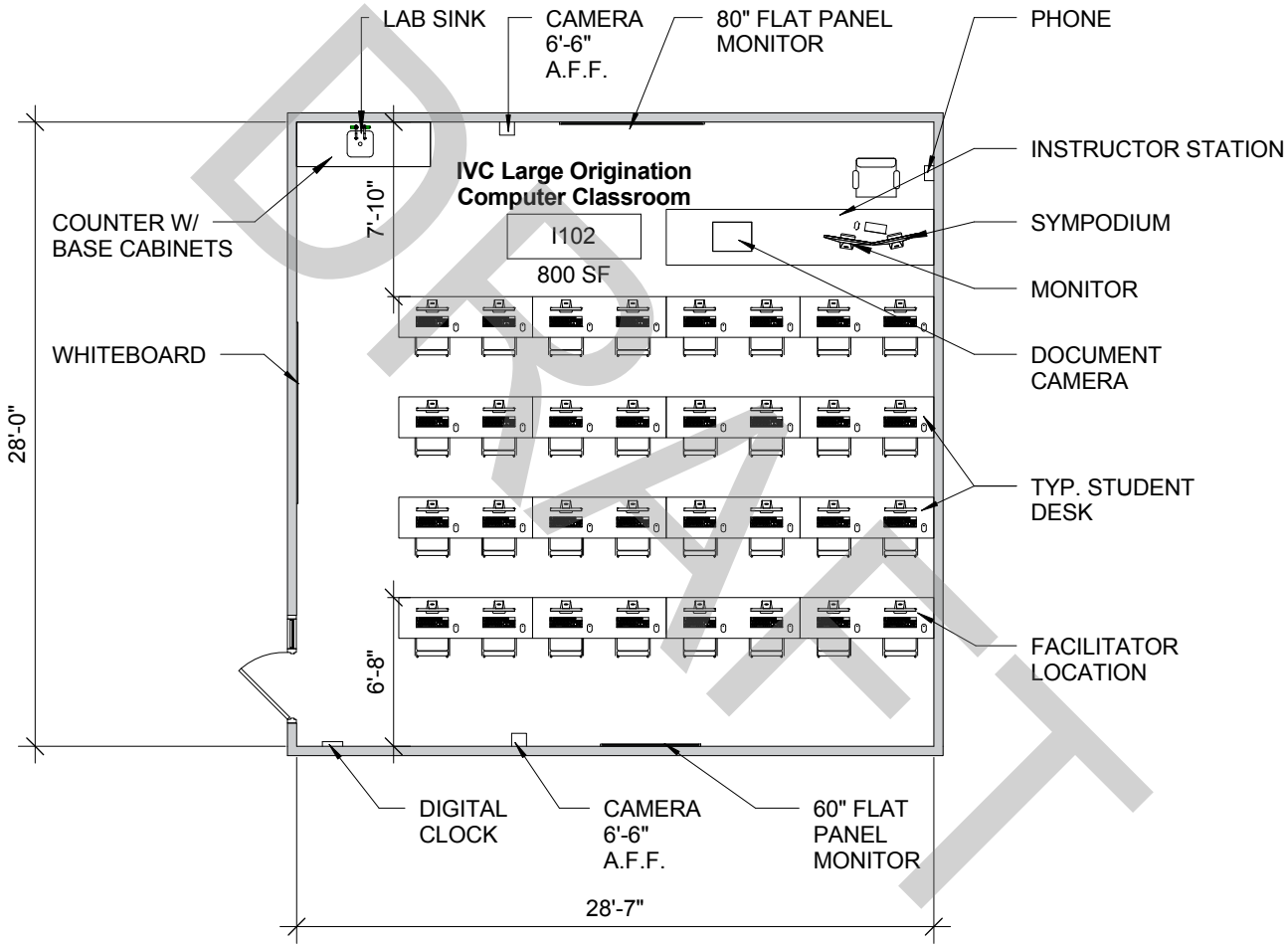
Electrical:

Power:	1 fourplex at console; 1 fourplex at each student row; 1 fourplex at each monitor; duplex outlets 12’ oc along walls
Phone/Data:	1 drop at console; 1 drop per each student row; 1 drop at each monitor; 1-2 additional drops along wall. 2 devices on opposing walls and at instructor console
Video:	A/V system with internet connection
Audio:	Ceiling speakers with volume control

Lighting:

Fixture Type:	T-5 Fluorescent or LED lay-in indirect, dimmable
Accent Lighting:	None required
Foot Candles:	40-45
Controls:	Occupancy sensor; zoned lighting for distance learning origination rooms

DRAFT


LAB SINK
CAMERA 6'-6" A.F.F.
80" FLAT PANEL MONITOR
PHONE
INSTRUCTOR STATION
SYMPODIUM
MONITOR
DOCUMENT CAMERA
TYP. STUDENT DESK
FACILITATOR LOCATION
COUNTER W/ BASE CABINETS
WHITEBOARD
IVC Large Origination Computer Classroom
I102
800 SF
7'-10"
6'-8"
28'-0"
28'-7"
DIGITAL CLOCK
CAMERA 6'-6" A.F.F.
60" FLAT PANEL MONITOR

DRAFT

I103-104 Mid-Size Origination Classroom

Space Requirements

Space Summary:

Type of Space:	Classroom
Number Required:	2
Total Number:	2
Occupants:	22-24 students; 1 instructor; 1 facilitator
Area:	600 SF
Primary Function:	Distance learning classroom with full broadcast and receive capabilities. Available for Science and Technology programs

Relationships:

Location:	First Level
Adjacencies:	None required
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Calm, Attractive, Professional

Finishes:

Floor:	Carpet
Walls:	Painted gypsum board
Ceiling:	Acoustical lay-in, durable panels, removed frequently for A/V access
Specialty Finishes:	Sound absorption wall panels
Sound:	Sound and vibration isolation required

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	9’-0”

Privacy/Security:

Provide motorized roller shades and blackout panels if any windows are present. Card access and/or keypad control.

Doors:

Type:	Solid core wood with clear finish
Frame:	Painted hollow metal with glazed sidelite
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-Instructor console with A/V racks

Moveable Furnishings:

-Tables (with A/V and power ports), 24 student chairs, 1 instructor chair

Equipment:

-80” LCD screen, 60” LCD screen, touch panel
-Ceiling mounted document camera, digital clock, (2) wall cameras, surround sound ceiling mounted speakers, ceiling microphones
-Whiteboard, phone at instructor console

Technical Requirements

Mechanical:

Ventilation:	10CFM/person + 0.12 CFM/sq.ft.
Summer Design Temp:	72 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	25 (NC/RC)
Special Systems:	Adequate venting for instructor console A/V equipment
Plumbing:	Lab Sink

Electrical:

Power:	1 fourplex at console; 1 fourplex at each student row; 1 fourplex at each monitor; duplex outlets 12’ oc along walls
Phone/Data:	1 drop at console; 1 drop per each student row; 1 drop at each monitor; 1-2 additional drops along wall. 2 devices on opposing walls and at instructor station
Video:	A/V system with internet connection
Audio:	Ceiling speakers with volume control

Lighting:

Fixture Type:	T-5 Fluorescent or LED lay-in indirect, dimmable
Accent Lighting:	None required
Foot Candles:	40-45
Controls:	Occupancy sensor; zoned lighting for distance origination rooms

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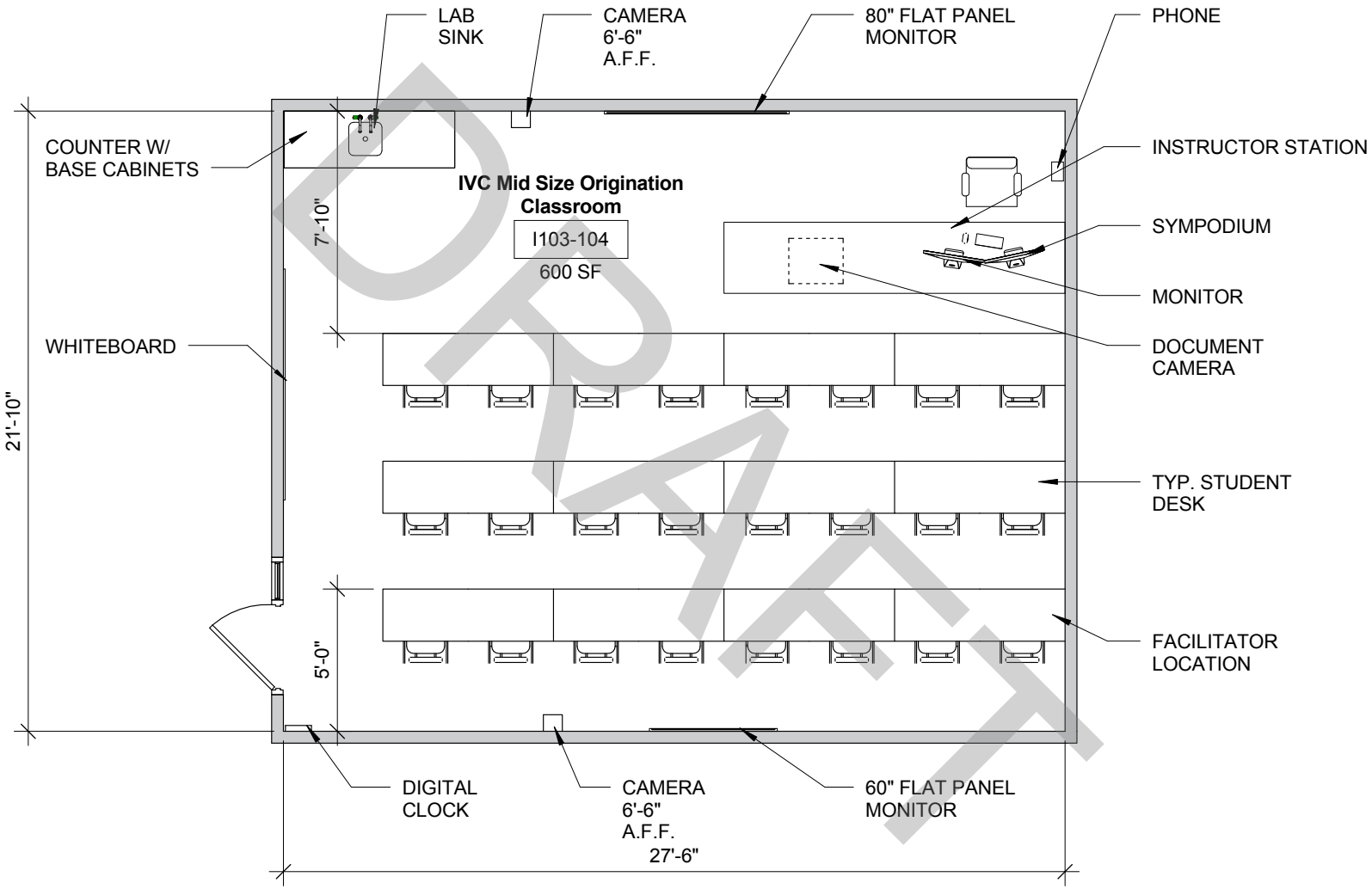
LAB SINK
CAMERA 6'-6" A.F.F.
80" FLAT PANEL MONITOR
PHONE
COUNTER W/ BASE CABINETS
INSTRUCTOR STATION
IVC Mid Size Origination Classroom
I103-104
600 SF
7'-10"
SYMPODIUM
MONITOR
WHITEBOARD
DOCUMENT CAMERA
21'-10"
TYP. STUDENT DESK
5'-0"
FACILITATOR LOCATION
DIGITAL CLOCK
CAMERA 6'-6" A.F.F.
60" FLAT PANEL MONITOR
27'-6"

DRAFT

I105 Pod Origination Classroom

Space Requirements

Space Summary:

Type of Space:	Classroom
Number Required:	1
Total Number:	1
Occupants:	24 students; 1 instructor; 1 facilitator
Area:	800 SF
Primary Function:	Distance learning classroom with full broadcast and receive capabilities. Available for Science and Technology programs

Relationships:

Location:	First Level
Adjacencies:	None required
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Calm, Attractive, Professional

Finishes:

Floor:	Carpet
Walls:	Painted gypsum board
Ceiling:	Acoustical lay-in, durable panels, removed frequently for A/V access
Specialty Finishes:	Sound absorption wall panels
Sound:	Sound and vibration isolation required

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	9’-0”

Privacy/Security:

Provide motorized roller shades and blackout panels if any windows are present. Card access and/or keypad control.

Doors:

Type:	Solid core wood with clear finish
Frame:	Painted hollow metal with glazed sidelite
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-Instructor console with A/V racks

Moveable Furnishings:

-Mediascope tables w/ dual moniotrs and cameras (with A/V and power ports), 24 student chairs, 1 instructor chair

Equipment:

-80” LCD screen, 60” LCD screen, touch panel
-Ceiling mounted document camera, digital clock, (2) wall cameras, surround sound ceiling mounted speakers, microphones in ceiling and in tables
-Whiteboard, phone

Technical Requirements

Mechanical:

Ventilation:	10CFM/person + 0.12 CFM/sq.ft.
Summer Design Temp:	72 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	15-20 NC
Special Systems:	Adequate venting for instructor console A/V equipment
Plumbing:	None required

Electrical:

Power:	1 floorbox w/ fourplex at console; 1 floorboxw/ fouplex at each student pod; 1 fouplex at each monitor; duplex outlets 12’ oc along walls.
Phone/Data:	1 drop at console; 1 drop per each student pod; 1 drop at each monitor 1-2 additional drops along wall.
Video:	A/V system with internet connection, microphone in tables
Audio:	Ceiling speakers with volume control

Lighting:

Fixture Type:	T-5 Fluorescent or LED lay-in indirect, dimmable
Accent Lighting:	None required
Foot Candles:	40-45
Controls:	Occupancy sensor; zoned lighting for distance origination rooms

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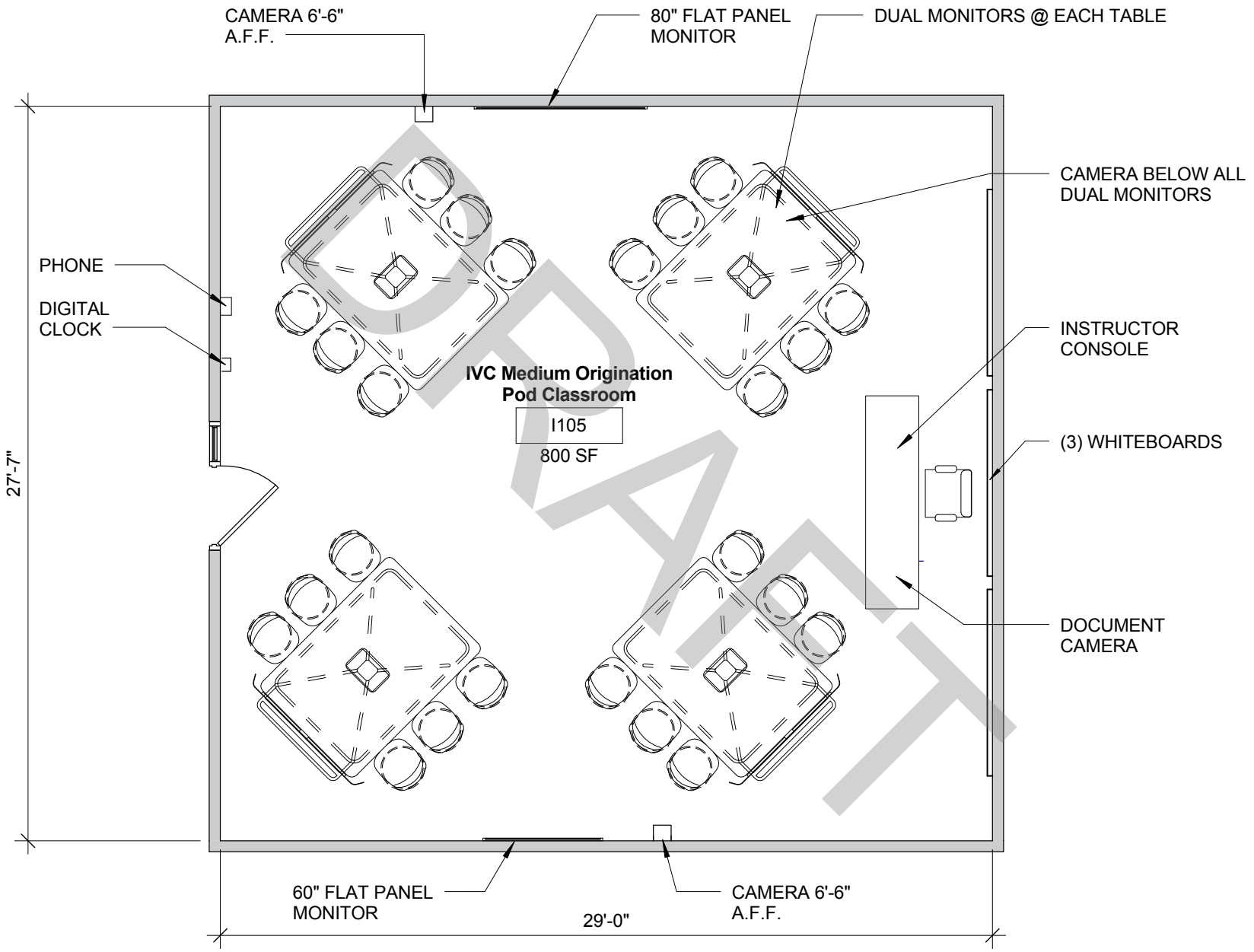
CAMERA 6'-6" A.F.F.
80" FLAT PANEL MONITOR
DUAL MONITORS @ EACH TABLE
CAMERA BELOW ALL DUAL MONITORS
PHONE
DIGITAL CLOCK
INSTRUCTOR CONSOLE
IVC Medium Origination Pod Classroom
I105
800 SF
(3) WHITEBOARDS
27'-7"
DOCUMENT CAMERA
60" FLAT PANEL MONITOR
29'-0"
CAMERA 6'-6" A.F.F.
DRAFT

I106 Small Origination Room

Space Requirements

Space Summary:

Type of Space:	Computer Lab
Number Required:	1
Total Number:	1
Occupants:	20
Area:	400 SF
Primary Function:	Provide a computer based learning space. Origination/receiving room for distance education

Relationships:

Location:	First Level
Adjacencies:	None required
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Provide a quality learning environment with emphasis on computer based collaboration

Finishes:

Floor:	Carpet (low/free static)
Walls:	Painted gypsum board
Ceiling:	Acoustical lay-in. Durable for easy access to A/V equipment
Specialty Finishes:	None required
Sound:	Sound and vibration isolation from adjacencies

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	9'-0"

Privacy/Security:

UV coating and shading device for windows. Key code or classroom schedule management for security.

Doors:

Type:	Solid core wood with clear finish.
Frame:	Painted hollow metal with glazed sidelite
Special:	Sound Isolation

Windows:

Type:	Interior
Glazing:	Clear Glass
Natural Light:	None required

Casework/Fixed Equipment:

-Instructor podium w/ A/V racks; student workstations

Moveable Furnishings:

-Faculty/Student chairs

Equipment:

-(1) ceiling mounted projector with digital cables, (1) projector screen (110" min viewing space), surround sound/evenly distributed audio, digital clock, wall cameras, ceiling mounted microphones
-Whiteboards

Technical Requirements

Mechanical:

Ventilation:	10 CFM/person + 0.12 CFM/sq.ft.
Summer Design Temp:	72 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	30 (NC/RC)
Special Systems:	Dedicated computer A/C units
Plumbing:	None required

Electrical:

Power:	2 duplex receptacles per wall. 1 duplex receptacle on floor per computer station and at instructor station. Additional capacity for equipment listed.
Phone/Data:	2 devices per wall, 1 device per computer station, 6 PPOE injection ports available, 1 device at instructor station
Video:	Security Camera
Audio:	Ceiling speaker with volume control, surround sound for distributed audio

Lighting:

Fixture Type:	T-8 Fluorescent or LED electronic ballast; dimmable
Accent Lighting:	None required
Foot Candles:	50
Controls:	Occupancy sensor; zoned lighting for distance origination rooms

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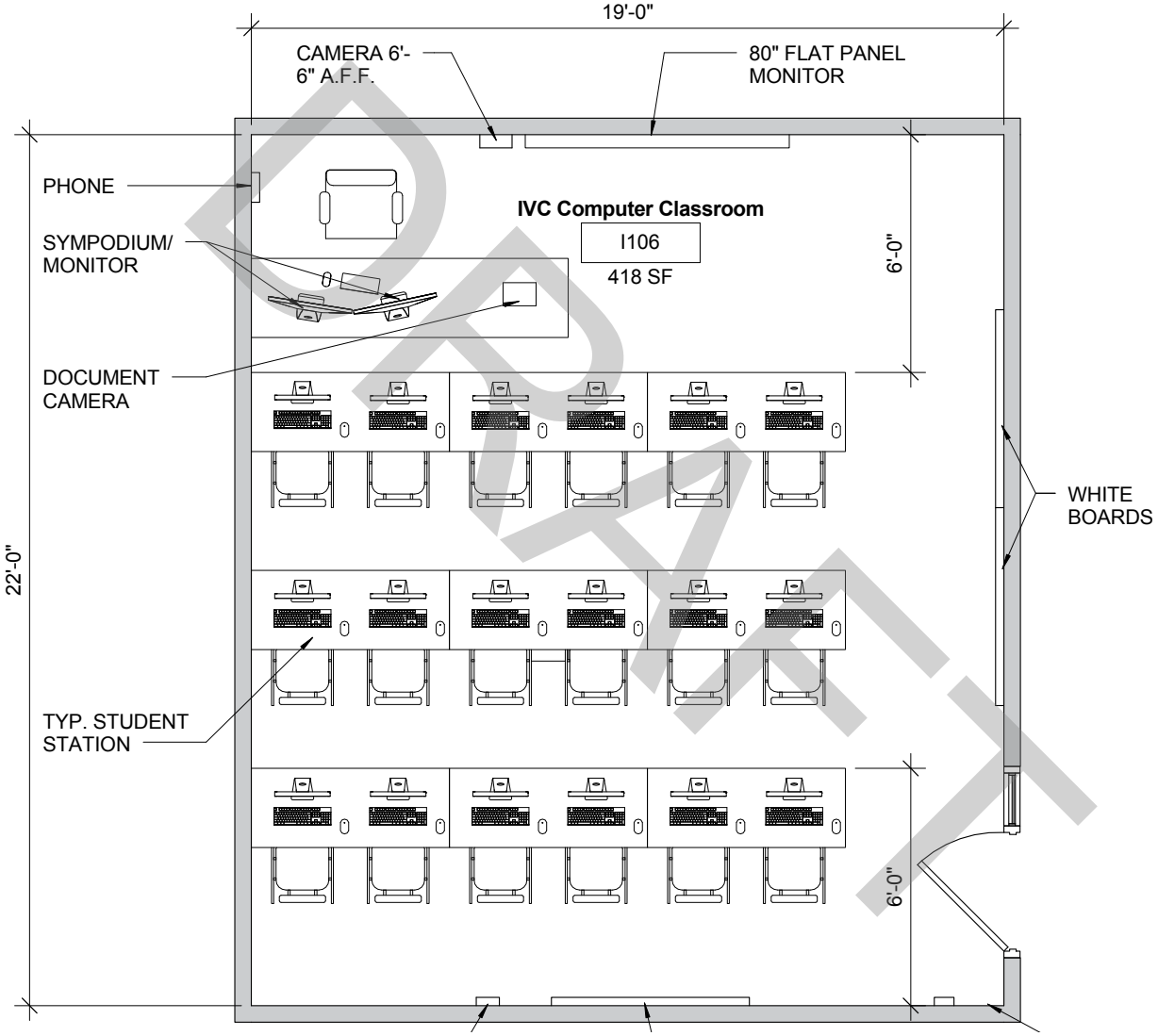
19'-0"
CAMERA 6'-6" A.F.F.
80" FLAT PANEL MONITOR
PHONE
SYMPODIUM/ MONITOR
IVC Computer Classroom
I106
418 SF
6'-0"
DOCUMENT CAMERA
WHITE BOARDS
22'-0"
TYP. STUDENT STATION
6'-0"

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BIOLOGY

B101-102 General Biology Classroom

Space Requirements

Space Summary:

Type of Space:	Teaching laboratory
Number Required:	2
Total Number:	2
Occupants:	24 stations
Area:	1200 SF
Primary Function:	General biology teaching laboratory

Relationships:

Location:	Lab Suite, Second Level
Adjacencies:	Shared lab/prep support room B103, near other labs
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Durable finishes, inviting feel

Finishes:

Floor:	Acid resistant flooring, VCT, vinyl, or epoxy
Walls:	durable; painted gypsum board
Ceiling:	Health grade acoustical lay-in, durable, removed frequently for A/V access
Specialty Finishes:	None required
Sound:	Sound and vibration isolation from adjacencies.

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	10'-0"

Privacy/Security:

Provide motorized roller shades and blackout panels if any windows are present. Card access and/or keypad control.

Doors:

Type:	Solid core wood with clear finish
Frame:	Painted hollow metal with glazed sidelite
Special:	Sound Isolation

Windows:

Type:	Exterior
Glazing:	1" Low-e
Natural Light:	Preferred

Casework/Fixed Equipment:

-Lockable wall and base cabinets with glass door fronts.
-Epoxy resin counters over casework with (3) integrated sink basins (30"W x 12"D) w/ lab faucets, evenly dispersed
-(24) Student cubbies, coat rack, microscope storage (RM 24)

Moveable Furnishings:

-Student and instructor chairs, adjustable student tables, need to be flexible, durable, able to support microscopes w/o excessive vibration, need power/data/management trays

Equipment:

-80" LCD screen, touch panel. Ceiling mounted document camera, digital clock, wall cameras, surround sound ceiling mounted speakers, ceiling microphones, whiteboard, instructor lecturn
(1) Fume hood

Technical Requirements

Mechanical:

Ventilation:	10 Air Changes/HR occupied 4 AC/HR unoccupied (100% exhaust)
Summer Design Temp:	70 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	20-30 NC
Special Systems:	Provide gas and compressed air to each station w/ flexible quick pod disconnect lab sinks. Connect Fume Hood to building exhaust system with 304 SS exhaust duct and lab pressure control.
Plumbing:	Industrial sink, solvent wash and eye wash w/ floor drain, supply, waste and vent. Lab gas and Distilled water dispersed. Emergency drain under.

Electrical:

Power:	1 floorbox w/ fourplex at instructor station; 1 floorbox w/ fourplex at each student pod; 1 fouplex at each monitor; duplex outlets 12' oc along counter; power for lab equipment.
Phone/Data:	1 drop at instructor station; 1 drop per each student pod; 1 drop at each monitor; 1-2 additional drops along wall. Portable
Video:	Rough-in for future capacity
Audio:	

Lighting:

Fixture Type:	T-5 Fluorescent or LED lay-in indirect, dimmable
Accent Lighting:	Surgical light boom at each pod
Foot Candles:	40
Controls:	Occupancy sensor; zoned lighting for distance origination rooms

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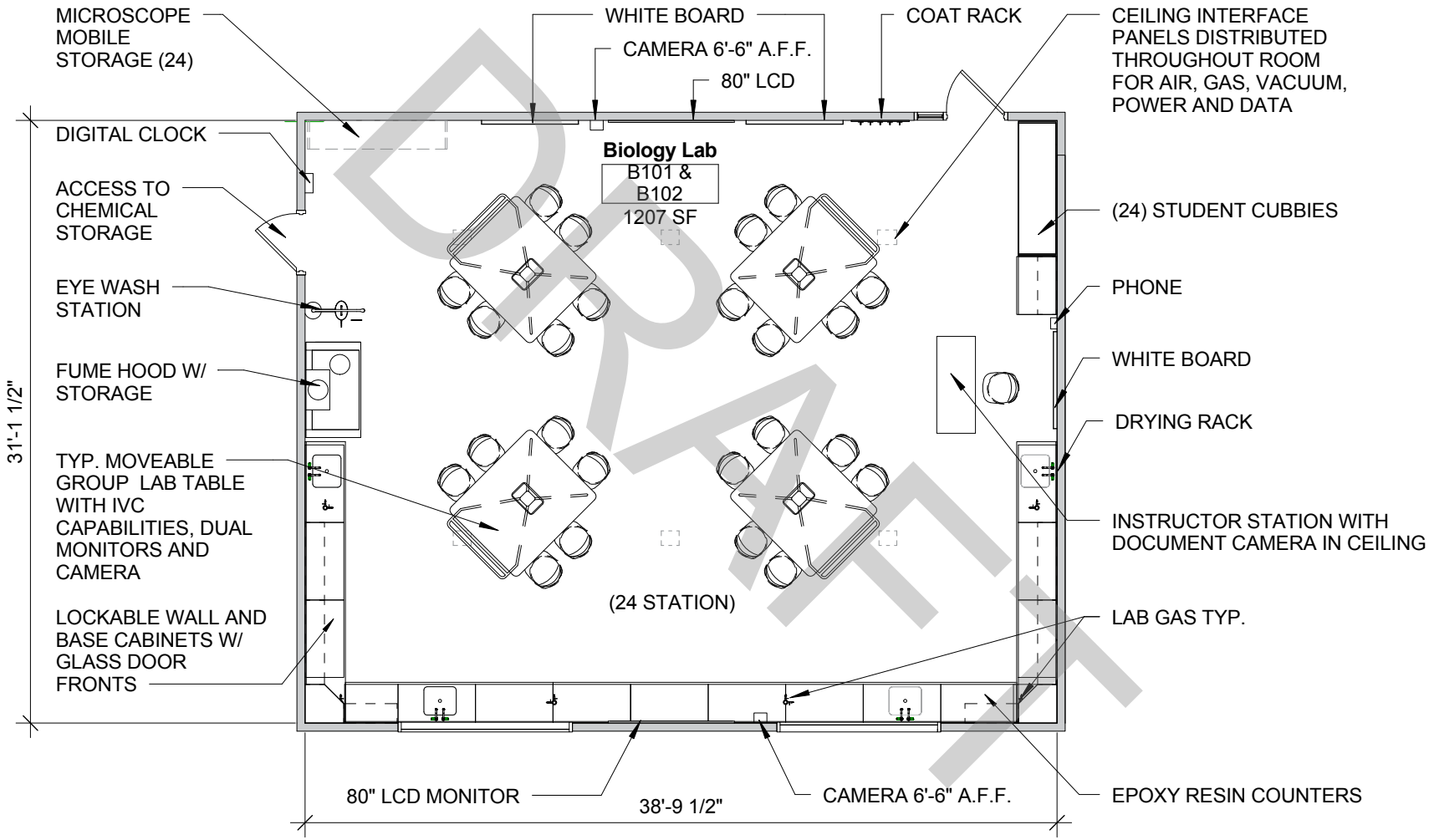
MICROSCOPE MOBILE STORAGE (24)
WHITE BOARD
CAMERA 6'-6" A.F.F.
80" LCD
COAT RACK
CEILING INTERFACE PANELS DISTRIBUTED THROUGHOUT ROOM FOR AIR, GAS, VACUUM, POWER AND DATA
DIGITAL CLOCK
ACCESS TO CHEMICAL STORAGE
EYE WASH STATION
FUME HOOD W/ STORAGE
TYP. MOVEABLE GROUP LAB TABLE WITH IVC CAPABILITIES, DUAL MONITORS AND CAMERA
LOCKABLE WALL AND BASE CABINETS W/ GLASS DOOR FRONTS
Biology Lab
B101 & B102
1207 SF
(24 STATION)
(24) STUDENT CUBBIES
PHONE
WHITE BOARD
DRYING RACK
INSTRUCTOR STATION WITH DOCUMENT CAMERA IN CEILING
LAB GAS TYP.
EPOXY RESIN COUNTERS
CAMERA 6'-6" A.F.F.
80" LCD MONITOR
38'-9 1/2"
31'-1 1/2"

DRAFT

B101-102 General Biology Classroom

ROOM# B101 & B102

EXPANDED TECHNICAL REQUIREMENTS

HOODS	NEED	QYT	COMMENT
Chemical Fume Hood	x	1	5' restricted bypass hood with hard piped utilities (compressed air, vacuum, natural gas, pure water)
Laminar Flow Hood			
Snorkel			
Canopy hood			
Equipment Exhaust			
Miscellaneous			
Miscellaneous			

EQUIPMENT	NEED	QYT	COMMENT
Micro scope	x	24	Provide one per student on moveable storage rack
Autoclave			
Freezer -80degree			
Epoxy resin counter	x		All counters
Drying rack	x	1	Locate above sinks
Fire blanket	x	1	
PCR Instruction Lab Package			
Gradient adapter for MyCyler			
IVC Pod table	x	4	IVC capable w/ epoxy resin surface
White board	x	3	
Instructor console	x	1	IVC capable
Miscellaneous			

CHEMICALS	NEED	QYT	COMMENT
Solvents	x		
Acids	x		Dual chemical storage base cabinet (acid/flammable) below fume hood
Bases	x		
Carcinogens			
Chemical Waste Storage	x	1	Can be in prep room, can be on a cart
Biological Storage	x	1	Biological safety cabinet below fume hood
Chemical Storage	x	1	Acid storage below fume hood
Miscellaneous	x	1	Flamable storage cab.36" min. near fume hoods
Miscellaneous			

PLUMBING	NEED	QYT	COMMENT
Eyewash			
Eyewash/Safety Shower	x		Combo
Floor Drain			
Floor Sink			
Laboratory Sink	x	4	Distributed
Lab Gas	x	4	Distributed
Lab Vacuum	x	4	Distributed
Lab Air	x	4	Distributed
Compressed Air			
Hot Water	x		Locate at sinks
Cold Water	x		Locate at sinks
Distilled/Purified Water	x		Locate at sinks
Chilled Water			
Carbon Dioxide			
Nitrogen			
Cylinder Gases			

ELECTRICAL	NEED	QYT	COMMENT
Emergency Power	x	1	Hoods only
UPS			
110V 20A 1 Phase	x		At tables (1) per student, every 4' at perimeter casework
208V 30A 1 Phase			
208V 30A 3 Phase			
480V 100A 3 Phase			
Data/Power	x		Floor boxes at group tables for IVC components
Zoned Lighting	x		Zoned for IVC and lab configuration
Lighting level	x		75 ft candles at benches
Special Lighting			
Audio Visual	x		IVC capable- (2) 80" LCD monitors with (2) wall cameras

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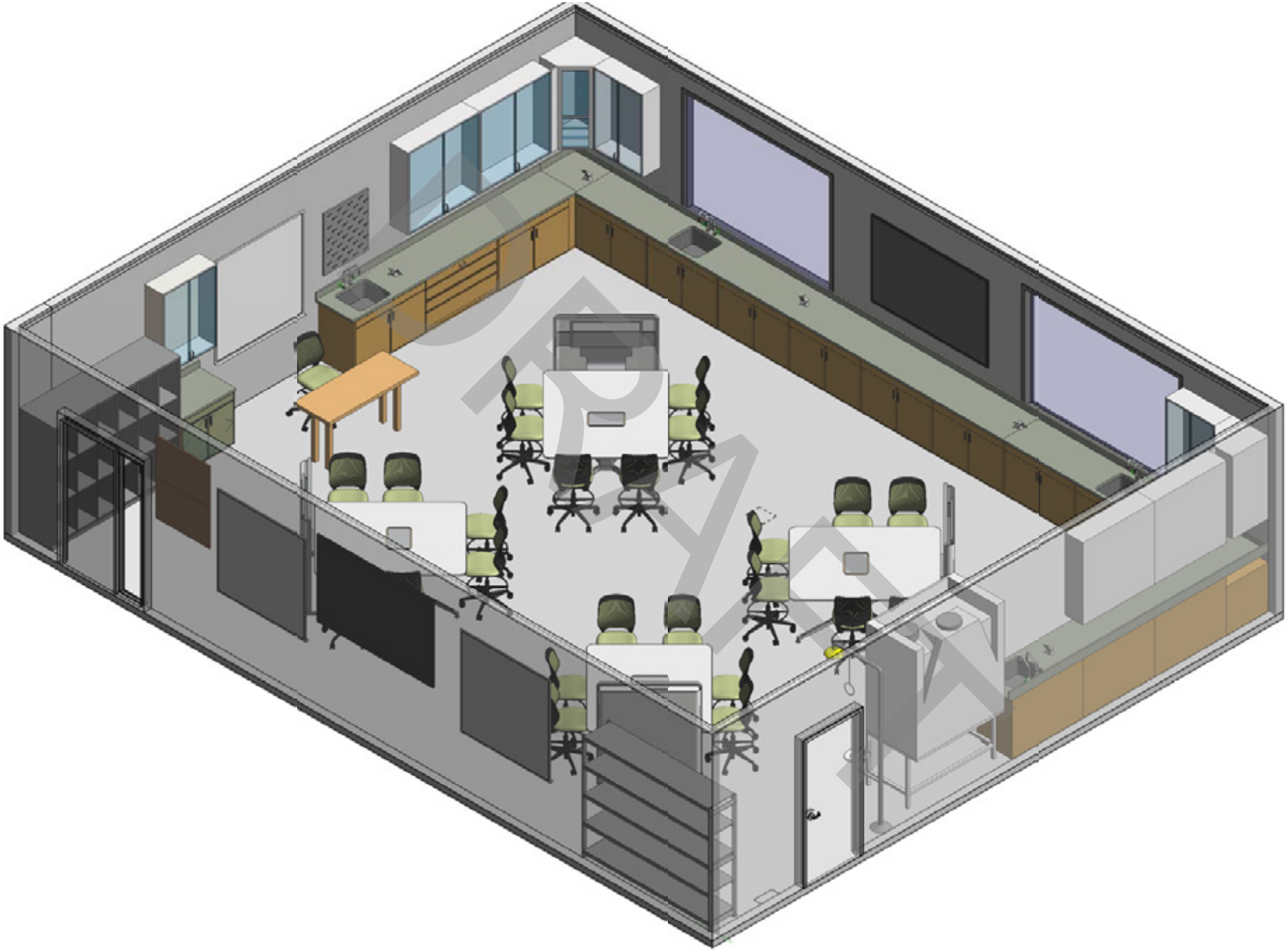

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B103 Biology Lab Support

Space Requirements

Space Summary:

Type of Space:	Support space
Number Required:	2
Total Number:	2
Occupants:	5
Area:	294 SF
Primary Function:	Support the biology teaching labs

Relationships:

Location:	Lab Suite, Second Level
Adjacencies:	Biology teaching labs B101 and B102
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Finishes:

Floor:	Acid resistant. VCT, vinyl, or epoxy
Walls:	Painted gypsum board
Ceiling:	Health grade durable acoustical lay-in
Specialty Finishes:	None required
Sound:	None required

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	10'-0"

Privacy/Security:

Provide card access and/or keypad control

Doors:

Type:	Solid core wood with clear finish
Frame:	Painted hollow metal
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-Lockable wall and base cabinets with glass door fronts around the perimeter.
-Epoxy resin counters over casework with (2) integrated sink basin w/ lab faucet.

Moveable Furnishings:

-(2) Lab stools; (2) moveable tables (2) Lab carts

Equipment:

-(1) autoclave; temp controlled water bath; vortexer; PCR Instruction Lab Package; Under counter flask scrubber; dry rack
-(2) refridgerators
-Whiteboard 2' x 3'

Technical Requirements

Mechanical:

Ventilation:	10 AC/HR occupied 4 AC/HR unoccupied
Summer Design Temp:	70 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	35 (NC/RC)
Special Systems:	Connect fume hood to building exhaust system w/ 304 SS exhaust duct and lab pressure control. Provide canopy hood at face of autoclave to capture moisture.
Plumbing:	Floor drain in center of room; Lab gas and distilled water dispersed; lab sink; Provide compressed air and vacuum; acid waste piping to building neutralization system.

Electrical:

Power:	4 duplex receptacle per wall, every 2-3'. Additional capacity for equipment listed.
Phone/Data:	1 device per wall
Video:	Rough-in for future capacity
Audio:	Rough-in for future capacity

Lighting:

Fixture Type:	T-8 Fluorescent or LED lay-in indirect
Accent Lighting:	None required
Foot Candles:	40
Controls:	Occupancy sensor

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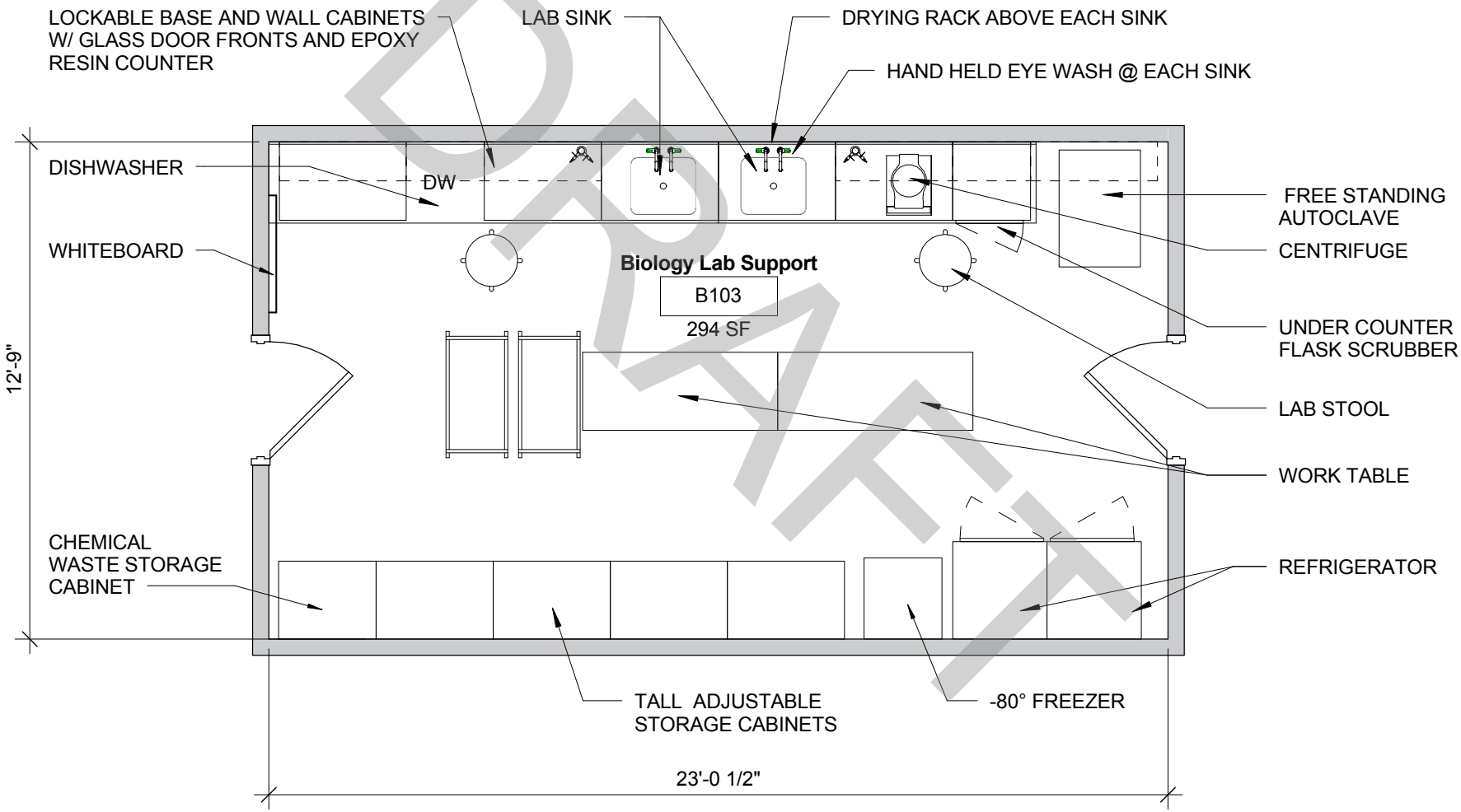
LOCKABLE BASE AND WALL CABINETS W/ GLASS DOOR FRONTS AND EPOXY RESIN COUNTER
LAB SINK
DRYING RACK ABOVE EACH SINK
HAND HELD EYE WASH @ EACH SINK
DISHWASHER
DW
WHITEBOARD
FREE STANDING AUTOCLAVE
CENTRIFUGE
Biology Lab Support
B103
294 SF
UNDER COUNTER FLASK SCRUBBER
LAB STOOL
WORK TABLE
12'-9"
CHEMICAL WASTE STORAGE CABINET
REFRIGERATOR
TALL ADJUSTABLE STORAGE CABINETS
-80° FREEZER
23'-0 1/2"

DRAFT

ROOM# B103

EXPANDED TECHNICAL REQUIREMENTS

HOODS	NEED	QYT	COMMENT
Chemical Fume Hood			
Laminar Flow Hood			
Snorkel			
Canopy hood			
Equipment Exhaust			
Miscellaneous			
Miscellaneous			

EQUIPMENT	NEED	QYT	COMMENT
Autoclave	x	1	Free standing large capacity
Centrifuge	x	1	
Freezer -80degree	x	1	
Epoxy resin counter	x		All counters
Drying rack	x	2	
Vortexer	x	2	Bio-Rad 166-0610EDU
PCR Instruction Lab Package	x	1	Bio-Rad 166-0765EDU
Gradient adapter for MyCyler	x	1	Bio-Rad 170-9707EDU
Refrigerator	x	2	Full height adjustable shelving
Dishwasher	x	1	
Flask scrubber	x	1	
Rolling lab cart	x	2	

EQUIPMENT	NEED	QYT	COMMENT
Solvents	x		
Acids	x		Dual chemical storage in cabinetry
Bases	x		Provide storage in cabinetry
Carcinogens			
Chemical Waste Storage	x	1	
Biological Storage	x	1	
Chemical Storage	x	1	
Miscellaneous			
Miscellaneous			

PLUMBING	NEED	QYT	COMMENT
Eyewash		2	Hand held eyewash at sinks
Eyewash/Safety Shower			
Floor Drain			
Floor Sink	x	1	
Bench Sink	x	2	
Lab Gas	x	2	
Lab Vacuum	x	2	
Lab Air	x	2	
Compressed Air			
Hot Water	x	2	Locate at sink
Cold Water	x	2	Locate at sink
Distilled/Purified Water	x	2	Locate at sink
Chilled Water			
Carbon Dioxide			
Nitrogen			
Cylinder Gases			

ELECTRICAL	NEED	QYT	COMMENT
Emergency Power	x	3	Refrigerators, -80 freezer
UPS			
110V 20A 1 Phase	x		
208V 30A 1 Phase	x		
208V 30A 3 Phase			
480V 100A 3 Phase			
Data/Power	x	2	Distributed above counter
Zoned Lighting			
Lighting level			75 ft candles at benches and work tables
Special Lighting			

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B104 Zoology/Anatomy/ Physiology Lab

Space Requirements

Space Summary:

Type of Space:	Shared Laboratory
Number Required:	1
Total Number:	1
Occupants:	24
Area:	1200 SF
Primary Function:	Shared laboratory for the Zoology, Anatomy, and Physiology programs. Needs to have IVC capacity.

Relationships:

Location:	Lab Suite, Second Level
Adjacencies:	Shared lab prep/support room B103
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Finishes:

Floor:	Acid resistant. VCT, vinyl, or epoxy
Walls:	Painted gypsum board
Ceiling:	Health grade durable acoustical lay-in. Removed frequently for A/V access
Specialty Finishes:	None required
Sound:	Sound and vibration isolation required

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	10'-0"

Privacy/Security:

Provide motorized roller shades and blackout panels if any windows are present. Card access and/or keypad control.

Doors:

Type:	Solid core wood with clear finish
Frame:	Painted hollow metal with glazed sidelite
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-Lockable wall and base cabinets with glass door fronts.
-Epoxy resin counters over casework with (3) integrated sink basins (30"W x 12" D) w/ lab faucets. Dispersed evenly.
-(24) Student cubbies, coat rack
-Microscope storage (RM 48); overhead snorkel exhaust at each pod

Moveable Furnishings:

-Student and instructor chairs, adjustable student tables, need to be flexible, durable, able to support microscopes w/o excessive vibration, need power/data management trays; (4) downdraft vet tables

Equipment:

-80" LCD screen, touch panel
-Ceiling mounted document camera, digital clock, wall cameras, surround sound ceiling mounted speakers, ceiling microphones
-Whiteboard; instructor station; eye wash station

Technical Requirements

Mechanical:

Ventilation:	6-10 AC/HR occupied 4 AC/HR unoccupied (100% exhaust)
Summer Design Temp:	72 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	30 NC
Special Systems:	(1) fume hood; Snorkel exhaust arm at each pod. Eye wash system; downdraft grills and ducting at each student station. Connect fume hoods to the building exhaust systems (100% room exhaust - negative air pressurization). Provide gas and compressed air to each station w/ quick disconnect at each arm. 304 SS exhaust duct with lab pressure control.
Plumbing:	Floor drain near eye wash station; Lab gas and distilled water dispersed

Electrical:

Power:	1 floorbox w/ fourplex at instructor station; 1 floorbox w/ fourplex at each student pod; 1 fouplex at each monitor; duplex outlets 12' oc along counter; power for lab equipment.
Phone/Data:	1 drop at instructor station; 1 drop per each student pod; 1 drop at each monitor; 1-2 additional drops along wall.
Video:	Portable
Audio:	Rough-in for future capacity

Lighting:

Fixture Type:	T-5 Fluorescent lay-in indirect, dimmable
Accent Lighting:	Overheard surgical light at each pod
Foot Candles:	40-45
Controls:	Occupancy sensor; zoned lighting for distance origination rooms

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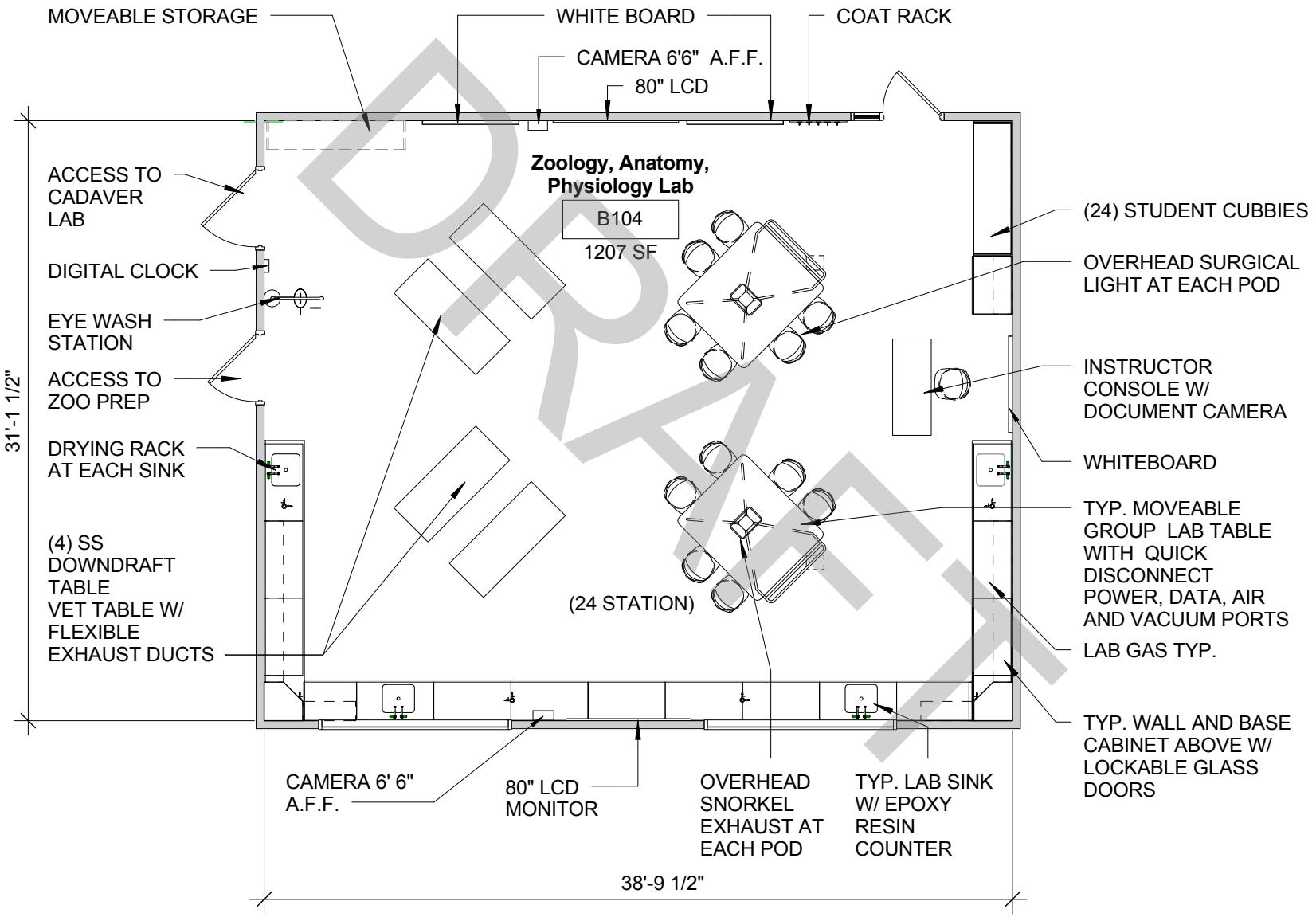
MOVEABLE STORAGE
WHITE BOARD
COAT RACK
CAMERA 6'6" A.F.F.
80" LCD
Zoology, Anatomy, Physiology Lab
B104
1207 SF
ACCESS TO CADAVER LAB
DIGITAL CLOCK
EYE WASH STATION
ACCESS TO ZOO PREP
DRYING RACK AT EACH SINK
(4) SS DOWNDRAFT TABLE VET TABLE W/ FLEXIBLE EXHAUST DUCTS
31'-1 1/2"
(24) STUDENT CUBBIES
OVERHEAD SURGICAL LIGHT AT EACH POD
INSTRUCTOR CONSOLE W/ DOCUMENT CAMERA
WHITEBOARD
TYP. MOVEABLE GROUP LAB TABLE WITH QUICK DISCONNECT POWER, DATA, AIR AND VACUUM PORTS
LAB GAS TYP.
TYP. WALL AND BASE CABINET ABOVE W/ LOCKABLE GLASS DOORS
(24 STATION)
CAMERA 6' 6" A.F.F.
80" LCD MONITOR
OVERHEAD SNORKEL EXHAUST AT EACH POD
TYP. LAB SINK W/ EPOXY RESIN COUNTER
38'-9 1/2"

DRAFT

ZOOLOGY/ANATOMY/PHYSIOLOGY TEACHING LABORATORY

ROOM# B104

EXPANDED TECHNICAL REQUIREMENTS

HOODS	NEED	QYT	COMMENT
Chemical Fume Hood			
Laminar Flow Hood			
Snorkel			
Canopy hood			
Equipment Exhaust	x	4	Exhaust fan and hoses for cadaver tables
Miscellaneous			
Miscellaneous			

EQUIPMENT	NEED	QYT	COMMENT
Micro scope			
Autoclave			
Freezer -80degree			
Epoxy resin counter	x		All counters
Drying rack	x	2	Locate above sinks
Fire blanket	x	1	
PCR Instruction Lab Package			
Gradient adapter for MyCyler			
IVC Pod table	x	4	IVC capable
White board	x	3	
Instructor console	x	1	IVC capable
SS Animal Cadaver table	x	4	With exhaust port

CHEMICALS	NEED	QYT	COMMENT
Solvents			
Acids	x		
Bases	x		
Carcinogens			
Chemical Waste Storage	x	1	Can be in prep room, can be on a cart
Biological Storage	x	1	Biological safety cabinet
Chemical Storage	x	1	Acid storage cabinet
Miscellaneous	x	1	Flamable storage cab.36" min.
Miscellaneous			

PLUMBING	NEED	QYT	COMMENT
Eyewash			
Eyewash/Safety Shower	x		Combo
Floor Drain			
Floor Sink			
Laboratory Sink	x	4	Distributed
Lab Gas	x	4	Distributed
Lab Vacuum	x	4	Distributed
Lab Air	x	4	Distributed
Compressed Air			
Hot Water	x		Locate at sinks
Cold Water	x		Locate at sinks
Distilled/Purified Water	x		Locate at sinks
Chilled Water			
Carbon Dioxide			
Nitrogen			
Cylinder Gases			

ELECTRICAL	NEED	QYT	COMMENT
Emergency Power	x	4	For cadaver tables
UPS			
110V 20A 1 Phase	x		
208V 30A 1 Phase	x		
208V 30A 3 Phase			
480V 100A 3 Phase			
Data/Power	x		Floor boxes at group tables for IVC components
Zoned Lighting	x		Zoned for IVC and lab configuration
Lighting level	x		75 ft candles at benches
Special Lighting			
Audio Visual	x		IVC capable- (2) 80" LCD monitors with (2) wall cameras

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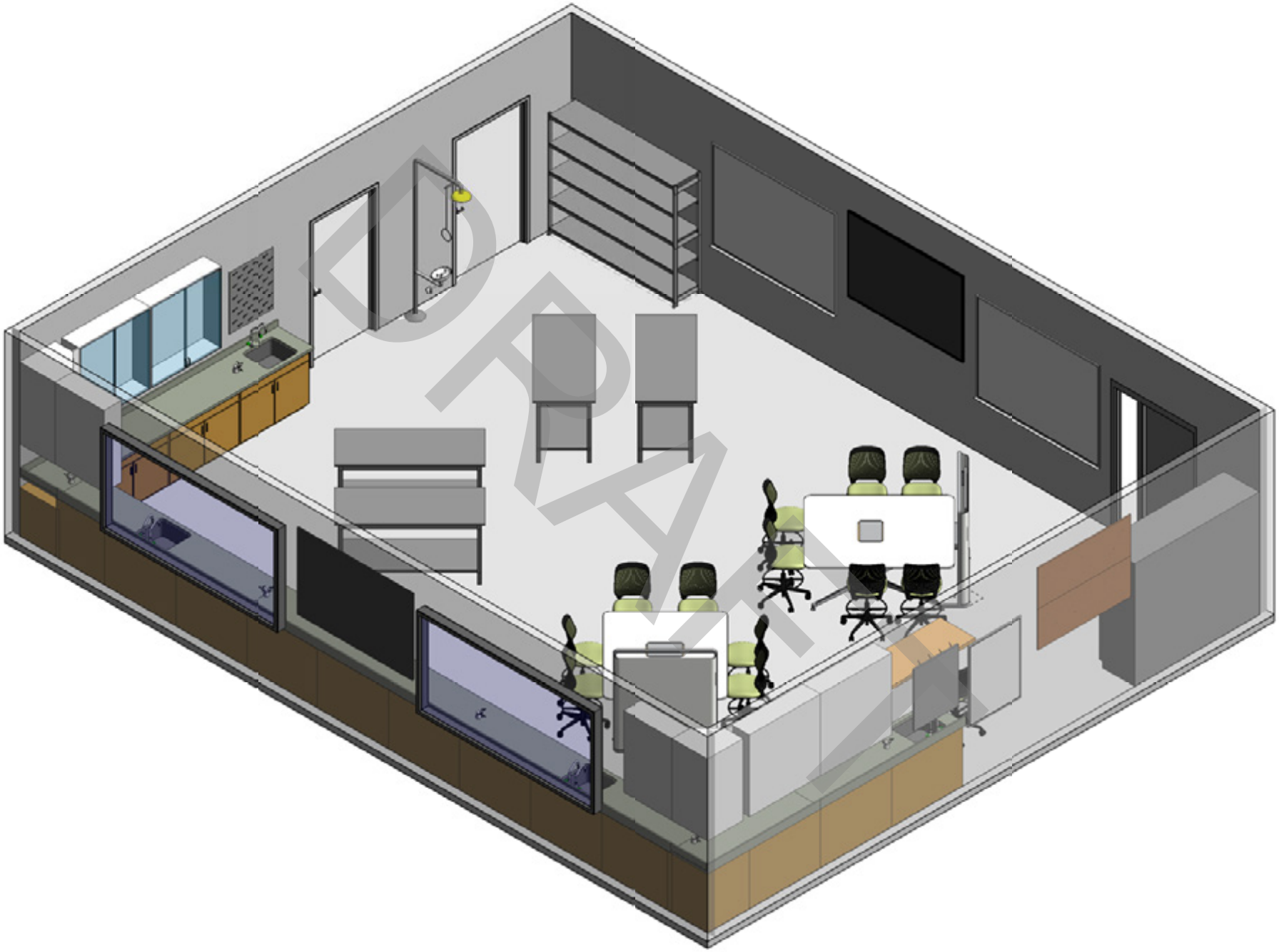
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B104a Zoology Prep Room

Space Requirements

Space Summary:

Type of Space:	Shared Laboratory
Number Required:	1
Total Number:	1
Occupants:	5
Area:	271 SF
Primary Function:	Shared lab support for the Zoology, Anatomy, and Physiology programs.

Relationships:

Location:	Lab Suite, Second Level
Adjacencies:	B104
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Functional

Finishes:

Floor:	Acid resistant. VCT, vinyl, or epoxy
Walls:	Painted gypsum board
Ceiling:	Health grade durable acoustical lay-in.
Specialty Finishes:	None required
Sound:	None required

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	10'-0"

Privacy/Security:

None required

Doors:

Type:	Solid core wood with clear finish
Frame:	Painted hollow metal with
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-Lockable wall and base cabinets with glass door fronts.
-Epoxy resin counters over casework with (3) compartment sink basin w/ lab faucet.
-Chemical cases

Moveable Furnishings:

-Rolling chair, moveable table

Equipment:

-Walk-in cooler (5.5' x 17'-0")
-Whiteboard 2' x 3'

Technical Requirements

Mechanical:

Ventilation:	10 AC/HR occupied 4 AC/HR unoccupied
Summer Design Temp:	72 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	30 (NC/RC)
Special Systems:	100% exhaust high laminar flow supply low return. Room pressure control
Plumbing:	Floor drain in center of room; 3 compartment sink; hot and cold hose bibs; Acid waste piping to building neutralization system

Electrical:

Power:	4 duplex receptacle per wall, every 2-3'. Additional capacity for equipment listed.
Phone/Data:	1 device per wall
Video:	Rough-in for future capacity
Audio:	Rough-in for future capacity

Lighting:

Fixture Type:	T-8 Fluorescent or LED lay-in indirect
Accent Lighting:	None required
Foot Candles:	40
Controls:	Occupancy sensor

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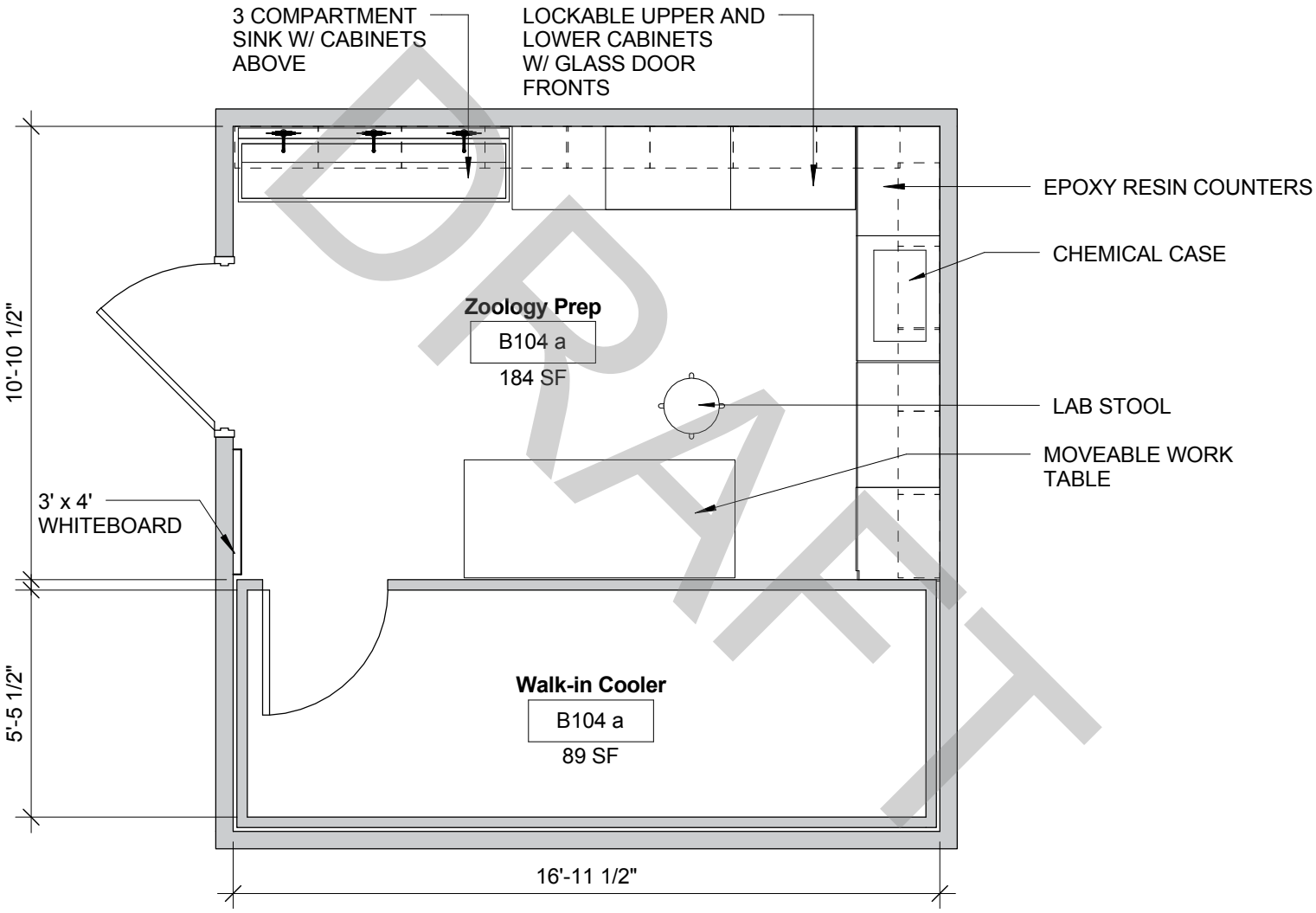
3 COMPARTMENT SINK W/ CABINETS ABOVE
LOCKABLE UPPER AND LOWER CABINETS W/ GLASS DOOR FRONTS
EPOXY RESIN COUNTERS
CHEMICAL CASE
Zoology Prep
B104 a
184 SF
LAB STOOL
MOVEABLE WORK TABLE
3' x 4' WHITEBOARD
10'-10 1/2"
5'-5 1/2"
Walk-in Cooler
B104 a
89 SF
16'-11 1/2"

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B105 Cadaver Laboratory

Space Requirements

Space Summary:

Type of Space:	Laboratory
Number Required:	1
Total Number:	1
Occupants:	16 at (4) stations; 3 fixed, 1 moveable
Area:	459 SF
Primary Function:	Cadaver teaching laboratory to support human anatomy and biology

Relationships:

Location:	Lab Suite, Second Level
Adjacencies:	B104
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Finishes:

Floor:	Acid resistant. VCT, vinyl, or epoxy
Walls:	Painted gypsum board
Ceiling:	Health grade durable acoustical lay-in. Removed frequently for A/V access.
Specialty Finishes:	None required
Sound:	Sound and vibration isolation required

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	10'-0"

Privacy/Security:

Provide motorized roller shades and blackout panels if any windows are present. Card access and/or keypad control.

Doors:

Type:	Solid core wood with clear finish
Frame:	Painted hollow metal
Special:	Sound Isolation

Windows:

Type:	Vision Panel
Glazing:	1/4" Tempered
Natural Light:	None required

Casework/Fixed Equipment:

-Lockable full height casework with glass door fronts and adjustable shelving.
-Provide built-in cubbies and coat hooks. Provide custom built adjustable stainless steel cadaver tables with integrated down draft exhaust rails.

Moveable Furnishings:

None required

Equipment:

-60" LCD screen, touch panel
-Ceiling mounted document camera, digital clock, wall cameras, surround sound ceiling mounted speakers, ceiling microphones
-Whiteboard at the head of each Cadaver table
-(4) overhead surgical lights

Technical Requirements

Mechanical:

Ventilation:	10 CFM/person - 0.18 CFM/sq.ft. (100% Exhaust at tables)
Summer Design Temp:	65 ° F
Winter Design Temp:	65 ° F
Controls:	Individual direct digital controls
Sound Criteria:	30 NC
Special Systems:	Ventilated exhaust cadaver tables. High laminar flow supply low exhaust (100% exhaust - negative air pressurization). Pressure control.
Plumbing:	Floor drain near 3 compartment sink. Hot and cold water hose bibs below the 3 compartment sink, needs to be able to be washed down. Formalyn waste containment.

Electrical:

Power:	1 fouplex at each table; 1 fouplex at each monitor; duplex outlets 12' oc along counter; power for lab equipment
Phone/Data:	1 drop at each table; 1 drop at each monitor; 1-2 drops along walls
Video:	Portable
Audio:	Ceiling Speakers with volume control

Lighting:

Fixture Type:	T-5 Fluorescent or LED lay-in indirect, dimmable
Accent Lighting:	Surgical light at each cadaver table
Foot Candles:	40-45
Controls:	Occupancy sensor; zoned lighting for distance origination rooms

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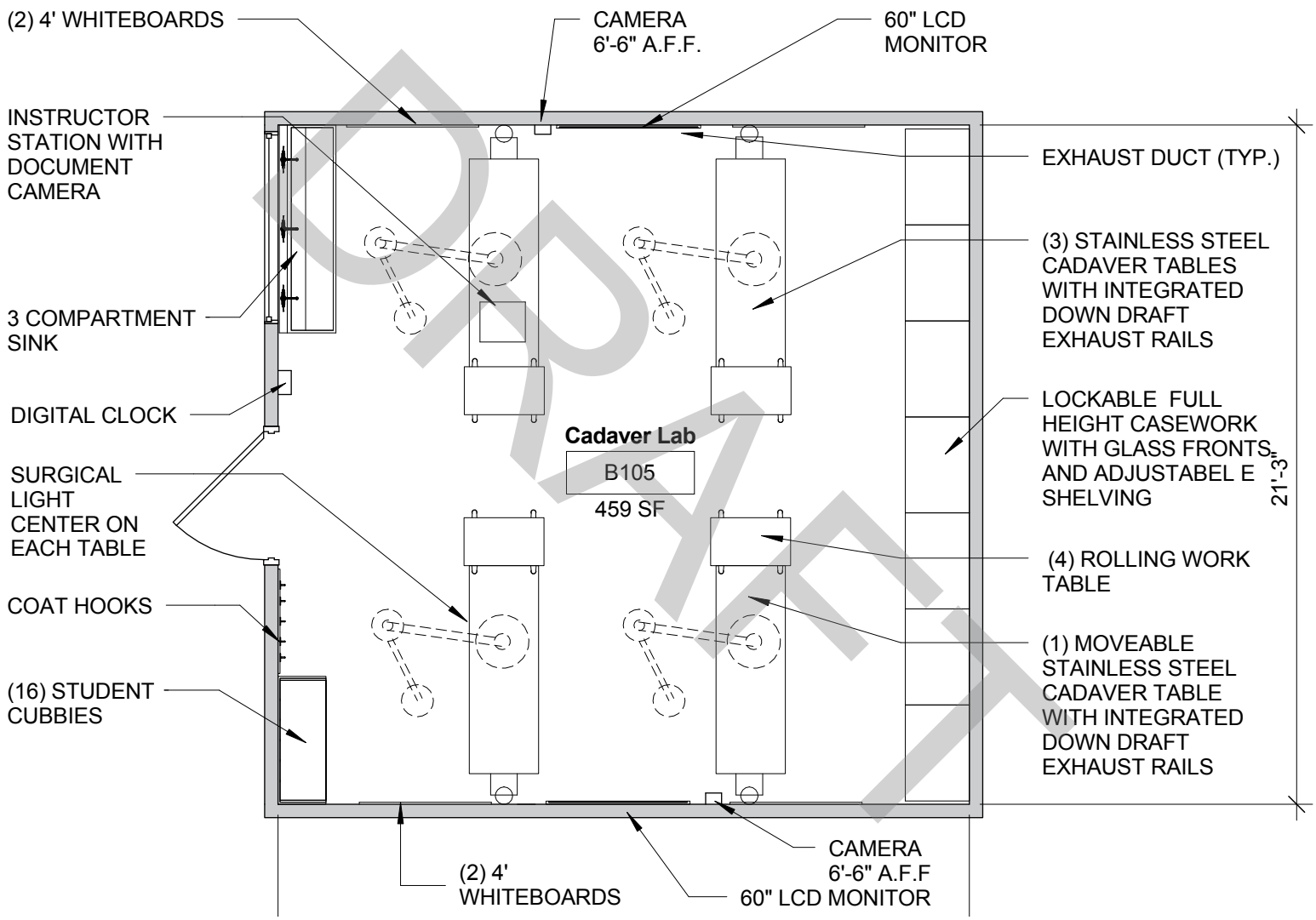
(2) 4' WHITEBOARDS
CAMERA
6'-6" A.F.F.
60" LCD
MONITOR
INSTRUCTOR
STATION WITH
DOCUMENT
CAMERA
EXHAUST DUCT (TYP.)
(3) STAINLESS STEEL
CADAVER TABLES
WITH INTEGRATED
DOWN DRAFT
EXHAUST RAILS
3 COMPARTMENT
SINK
DIGITAL CLOCK
LOCKABLE FULL
HEIGHT CASEWORK
WITH GLASS FRONTS
AND ADJUSTABEL E
SHELVING
21'-3"
Cadaver Lab
B105
459 SF
SURGICAL
LIGHT
CENTER ON
EACH TABLE
(4) ROLLING WORK
TABLE
COAT HOOKS
(1) MOVEABLE
STAINLESS STEEL
CADAVER TABLE
WITH INTEGRATED
DOWN DRAFT
EXHAUST RAILS
(16) STUDENT
CUBBIES
CAMERA
6'-6" A.F.F
(2) 4'
WHITEBOARDS
60" LCD MONITOR

DRAFT

ROOM# B105

HOODS	NEED	QYT	COMMENT
Chemical Fume Hood			
Laminar Flow Hood			
Snorkel			
Canopy hood			
Equipment Exhaust	x	4	Local exhaust at SS downdraft cadaver tables
Miscellaneous			
Miscellaneous			

EQUIPMENT	NEED	QYT	COMMENT
Micro scope			
Autoclave			
Freezer -80degree			
Epoxy resin counter	x		All counters
Drying rack			
Vortexer			
PCR Instruction Lab Package			
Gradient adapter for MyCyler			
IVC Pod table			
White board	x	4	4'x3' above each cadaver table
Instructor console			
Rolling student work tables	x	4	

CHEMICALS	NEED	QYT	COMMENT
Solvents			
Acids			
Bases			
Radioisotopes			
Carcinogens			
Chemical Waste Storage			
Biological Storage			
Chemical Storage			
Miscellaneous			

EXPANDED TECHNICAL REQUIREMENTS

PLUMBING	NEED	QYT	COMMENT
Eyewash			
Eyewash/Safety Shower			
Floor Drain	x		With hose bibs
Floor Sink			
Laboratory Sink	x	1	3-compartment sink with foot pedals
Lab Gas			
Lab Vacuum			
Lab Air			
Compressed Air			
Hot Water	x		Locate at sink
Cold Water	x		Locate at sink
Distilled/Purified Water			
Chilled Water			
Carbon Dioxide			
Nitrogen			
Cylinder Gases			

ELECTRICAL	NEED	QYT	COMMENT
Emergency Power	x	4	All cadaver tables
UPS			
110V 20A 1 Phase	x		
208V 30A 1 Phase			
208V 30A 3 Phase			
480V 100A 3 Phase			
Data/Power	x		IVC capable
Zoned Lighting	x		Zoned for IVC and lab configuration
Lighting level	x		75 ft candles at tables
Special Lighting	x	4	Surgical lights
Audio Visual	x		IVC capable- (2) 80" LCD monitors with (2) wall cameras
			(1) of the surgical lights equipped with document camera

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B106-C103 Research Biology Laboratory - Shared

Space Requirements

Space Summary:

Type of Space:	Research Laboratory
Number Required:	1
Total Number:	1
Occupants:	16
Area:	1567 SF
Primary Function:	Shared research laboratory

Relationships:

Location:	Second Level
Adjacencies:	B108-B111
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Durable finishes, inviting feel

Finishes:

Floor:	Acid resistant flooring, VCT, vinyl, or epoxy
Walls:	durable; painted gypsum board
Ceiling:	Health grade acoustical lay-in, durable, removed frequently for A/V access
Specialty Finishes:	None required
Sound:	Sound and vibration isolation from adjacencies.

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	10'-0"

Privacy/Security:

Provide motorized roller shades. Card access and/or keypad control.

Doors:

Type:	Solid core wood with clear finish
Frame:	Painted hollow metal with glazed sidelite
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-Lockable wall and base cabinets with glass door fronts around the perimeter.
-Epoxy resin counters over casework with (7) integrated sink basins w/ lab faucets, evenly dispersed

Moveable Furnishings:

-None required

Equipment:

-Flake ice machine; Undercounter FlaskScrubber; Upper standard rack; Bulk tube insert; (2) Utensil brackets; Autoclave w/ >3 cu' capacity; GelDoc imagining system; White-light conversion screen; Thermoprinter; Laptop; (1) Revco -80° freezer; Nanodrop model ND-2000c; Microwave oven; Micrcentrifuge; strip tube rotor; pro gradient w/ control panel; PCR Instruction Lab Package; Gradient adapter for MyCycler Thermal Cycler; (2)Temp-Controlled water bath; (2)Vortexer; (2)Extra set of micropipetters (same as PCR package); Classroom digital micropipetter (2) 20-200ul and (2) 100-1000ul.

Technical Requirements

Mechanical:

Ventilation:	10 AC occupied 4 AC unoccupied 100% exhaust
Summer Design Temp:	70 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	50 NC
Special Systems:	Snorkel exhaust arms between rows, connect fume hoods to building exhaust system. Provide gas and compressed air to each station. Acid Neutralization. Provide canopy hood at face of autoclave to capture moisture.
Plumbing:	Source for deionized water and distilled water. Distributed lab gas, air, vacuum, water. Connect to ceiling interface panel. Room pressure control. Acid waste piping to building neutralization system.

Electrical:

Power:	2 duplex receptacles per wall. Distributed power through integrated workstation raceways. Additional capacity for equipment listed.
Phone/Data:	2 drops on opposing walls. Distributed power through integrated workstation raceways
Video:	Rough-in for future capacity
Audio:	Rough-in for future capacity

Lighting:

Fixture Type:	T8 Fluorescent or LED lay-in indirect, dimmable
Accent Lighting:	None required
Foot Candles:	40
Controls:	Occupancy sensor; zoned lighting for distance origination rooms

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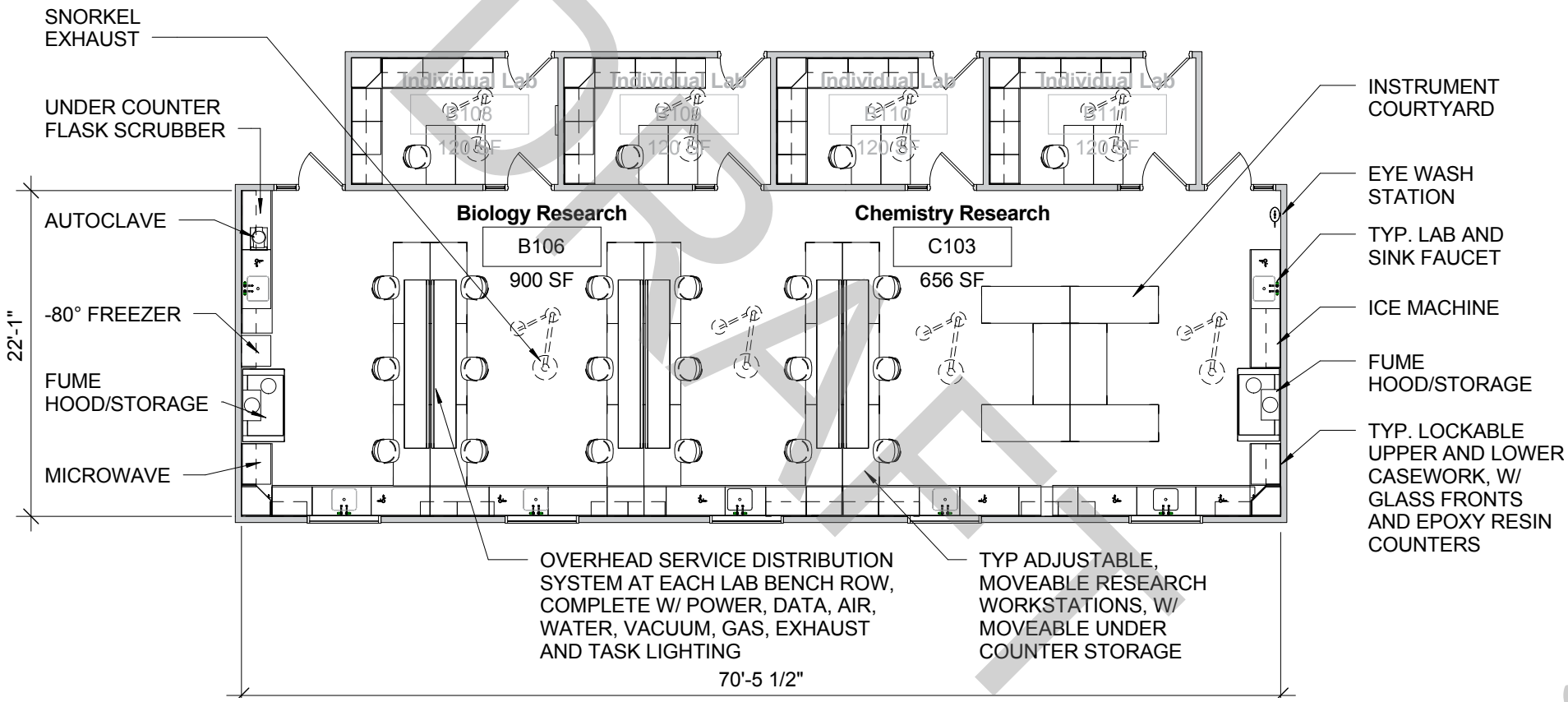
SNORKEL EXHAUST
UNDER COUNTER FLASK SCRUBBER
AUTOCLAVE
-80° FREEZER
FUME HOOD/STORAGE
MICROWAVE
22'-1"
Individual Lab
B108
120 SF
Individual Lab
B109
120 SF
Individual Lab
B110
120 SF
Individual Lab
B111
120 SF
Biology Research
B106
900 SF
Chemistry Research
C103
656 SF
INSTRUMENT COURTYARD
EYE WASH STATION
TYP. LAB AND SINK FAUCET
ICE MACHINE
FUME HOOD/STORAGE
TYP. LOCKABLE UPPER AND LOWER CASEWORK, W/ GLASS FRONTS AND EPOXY RESIN COUNTERS
OVERHEAD SERVICE DISTRIBUTION SYSTEM AT EACH LAB BENCH ROW, COMPLETE W/ POWER, DATA, AIR, WATER, VACUUM, GAS, EXHAUST AND TASK LIGHTING
TYP ADJUSTABLE, MOVEABLE RESEARCH WORKSTATIONS, W/ MOVEABLE UNDER COUNTER STORAGE
70'-5 1/2"

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B106-C103 Research Biology Laboratory - Shared

ROOM# B106

EXPANDED TECHNICAL REQUIREMENTS

HOODS	NEED	QYT	COMMENT
Chemical Fume Hood	x	2	5' restricted bypass fume hood w/ hard piped utilites (compressed air, vacuum, natural gas, pure water)
Laminar Flow Hood			
Snorkel	x	4	Locate in between bays
Canopy hood	x		Type 2 (heat and condensate) hood to capture moisture from autoclave
Equipment Exhaust			
Miscellaneous			
Miscellaneous			

EQUIPMENT	NEED	QYT	COMMENT
Microwave	x	1	Counter top
Autoclave	x	1	Counter top; electric type
Freezer -80degree	x	1	
Epoxy resin counter	x		All counters
Drying rack	x	2	Locate above sinks
Vortexer	x	1	
Flask scrubber	x	1	
Research tables	x	20	Flexible research tables w/ mep/power/data ports
Flammable blanket	x	1	
White board			
Integrated Ceiling Panels	x	8	Distributed mep/power/data panels
Ice machine	x	1	

CHEMICALS	NEED	QYT	COMMENT
Solvents	x		
Acids	x		Dual chemical storage base cabinet (acid/flammable) below fume hood
Bases	x		
Carcinogens			
Chemical Waste Storage	x	2	(1) Chemical, (1) biological waste cabinet
Biological Storage	x	2	Biological safety cabinet below fume hood
Chemical Storage	x	1	Designated corrosive resistant cabinet
Flammable Storage	x	1	Designated cabinet
Miscellaneous			

PLUMBING	NEED	QYT	COMMENT
Eyewash			
Eyewash/Safety Shower	x	1	Combo
Floor Drain			
Floor Sink			
Laboratory Sink	x	7	Distributed
Lab Gas	x	7	Near sinks and in integrated ceiling panels
Lab Vacuum	x	7	Near sinks and in integrated ceiling panels
Lab Air	x	7	Near sinks and in integrated ceiling panels
Compressed Air			Near sinks and in integrated ceiling panels
Hot Water	x		Locate at sinks
Cold Water	x		Locate at sinks
Distilled/Purified Water	x		Locate at sinks
Chilled Water			
Carbon Dioxide			
Nitrogen			
Cylinder Gases			

ELECTRICAL	NEED	QYT	COMMENT
Emergency Power	x	4	Hoods only
UPS			
110V 20A 1 Phase	x		
208V 30A 1 Phase	x		
208V 30A 3 Phase			
480V 100A 3 Phase			
Data/Power	x		Perimeter power and data ports @ casework
Zoned Lighting	x		Zoned for lab configuration
Lighting level	x		75 ft candles at benches
Special Lighting	x		Integrated task lighting into
Audio Visual	x		Building system speakers

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B108-111 Research Biology Individual Labs

Space Requirements

Space Summary:

Type of Space:	Individual Laboratory
Number Required:	4
Total Number:	4
Occupants:	1
Area:	120 SF
Primary Function:	General biology teaching laboratory

Relationships:

Location:	Second Level
Adjacencies:	Research Labs B106 and C103
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Durable finishes, inviting feel

Finishes:

Floor:	Acid resistant flooring, VCT, vinyl, or epoxy
Walls:	durable; painted gypsum board
Ceiling:	Health grade acoustical lay-in, durable, removed frequently for A/V access
Specialty Finishes:	None required
Sound:	Sound and vibration isolation from adjacencies.

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	10'-0"

Privacy/Security:

Provide motorized roller shades and blackout panels if any windows are present. Card access and/or keypad control.

Doors:

Type:	Solid core wood with clear finish
Frame:	Painted hollow metal with glazed sidelite
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-Lockable wall and base cabinets with glass door fronts.
-Epoxy resin counters over casework

Moveable Furnishings:

-None required

Equipment:

-None required

Technical Requirements

Mechanical:

Ventilation:	6-10 AC/HR occupied 4 AC/HR (100% Exhaust)
Summer Design Temp:	70 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	35 (NC/RC)
Special Systems:	Ceiling interface panel for gas, water, air, vacuum, power, snorkel exhaust
Plumbing:	Industrial sink, solvent wash and eye wash w/ floor drain, supply, waste and vent. Room pressure control.

Electrical:

Power:	2 duplex receptacles per wall and at Instructor console. Additional power from "CIP"
Phone/Data:	2 devices on opposing walls
Video:	Rough-in for future capacity
Audio:	Rough-in for future capacity

Lighting:

Fixture Type:	T-8 Fluorescent or LED lay-in indirect, dimmable
Accent Lighting:	None required
Foot Candles:	40
Controls:	Occupancy sensor; zoned lighting for distance origination rooms

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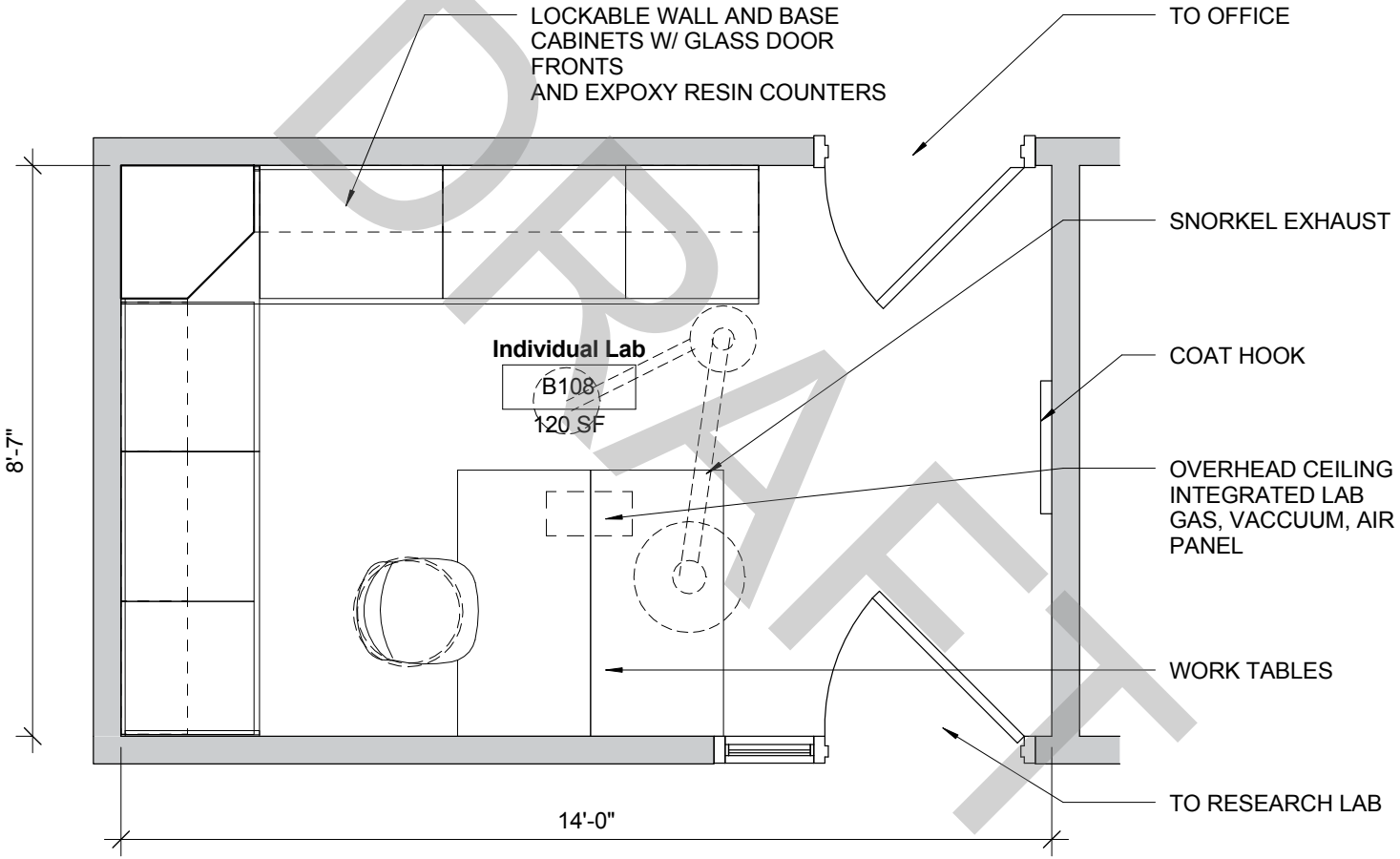
LOCKABLE WALL AND BASE CABINETS W/ GLASS DOOR FRONTS AND EXPOXY RESIN COUNTERS
TO OFFICE
SNORKEL EXHAUST
COAT HOOK
OVERHEAD CEILING INTEGRATED LAB GAS, VACCUUM, AIR PANEL
WORK TABLES
TO RESEARCH LAB
Individual Lab
B108
120 SF
8'-7"
14'-0"

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B112 Mud Room/ Receiving Room/ Shower

Space Requirements

Space Summary:

Type of Space:	Shower/Receiving Room
Number Required:	1
Total Number:	1
Occupants:	2-4
Area:	518 SF
Primary Function:	Unloading and storing large packages.

Relationships:

Location:	First Level
Adjacencies:	Parking lot, Outside door, loading ramp, facilitator/ reception room
Separation:	Quiet spaces

Architectural Requirements

Design/Aesthetic:

Functional, bright, utilitarian

Finishes:

Floor:	Ceramic Tile, polished/ sealed concrete
Walls:	Ceramic Tile, painted GYP
Ceiling:	Painted gypsum board
Specialty Finishes:	None required
Sound:	Secure and sound proof ceiling, insulated for sound control.

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	10'-0"

Privacy/Security:

None required

Doors:

Type:	Solid core wood with clear finish. Loading door.
Frame:	Painted hollow metal
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-(4) 2-tier lockers; floor sink; equipment rack

Moveable Furnishings:

-(2) moveable work benches; tall shelving

Equipment:

-Heavy duty storage racking; loading door and ramp connecting to parking lot

Technical Requirements

Mechanical:

Ventilation:	0.5 CFM/sq.ft. (100% Exhaust) or 6-min A/C
Summer Design Temp:	72 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	35 (NC/RC)
Special Systems:	5 min. air exchange exhaust
Plumbing:	Wall hung flush valve water closet; Wall hung lavatory; Floor drain; Floor sink w/ shower; Shower; Water, waste and venting. Sand interceptor

Electrical:

Power:	1 GFCI duplex outlet per wall. Additional capacity for equipment listed.
Phone/Data:	None required
Video:	None required
Audio:	Speaker with volume control

Lighting:

Fixture Type:	T-8 Fluorescent
Accent Lighting:	None required
Foot Candles:	30
Controls:	Occupancy sensor

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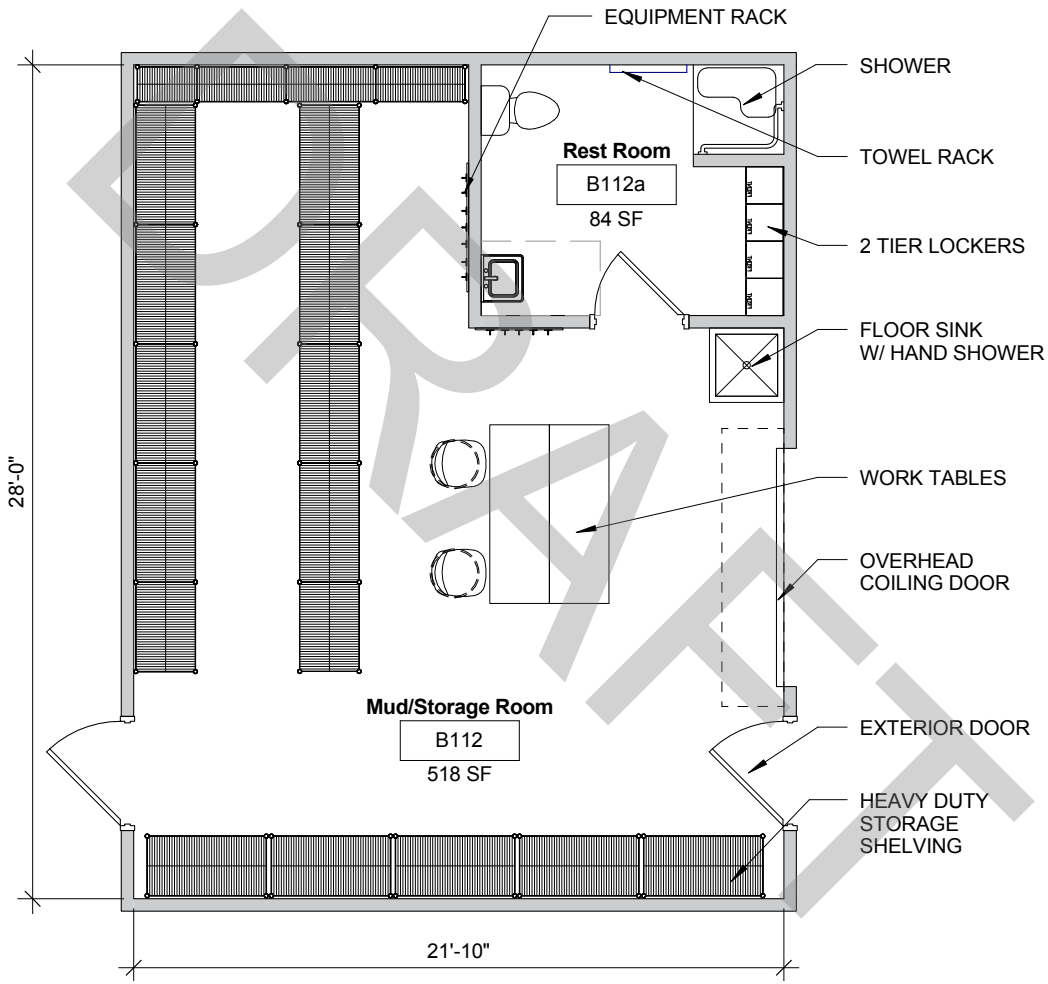
EQUIPMENT RACK
SHOWER
TOWEL RACK
Rest Room
B112a
84 SF
2 TIER LOCKERS
FLOOR SINK
W/ HAND SHOWER
WORK TABLES
OVERHEAD
COILING DOOR
Mud/Storage Room
B112
518 SF
EXTERIOR DOOR
HEAVY DUTY
STORAGE
SHELVING
28'-0"
21'-10"

DRAFT

B113-B115 Biology Office

Space Requirements

Space Summary:

Type of Space:	Office
Number Required:	3
Total Number:	3
Occupants:	1-4
Area:	120 SF
Primary Function:	Day-to-day operations, individual and small group meetings, written and verbal communications, daily document access.

Relationships:

Location:	Second Level
Adjacencies:	Academic Assistant, Curriculum Development, Program Directors
Separation:	Mechanical and elevator rooms, Noisy public areas

Architectural Requirements

Design/Aesthetic:

Visually accessible, comfortable, natural lighting

Finishes:

Floor:	Carpet
Walls:	Painted gypsum board
Ceiling:	Painted gypsum board
Specialty Finishes:	None required
Sound:	Secure and sound proof ceiling, insulated for sound control.

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	9’-0”

Privacy/Security:

None required

Doors:

Type:	Solid core wood with clear finish.
Frame:	Painted hollow metal
Special:	Sound Isolation

Windows:

Type:	Exterior
Glazing:	Low-E
Natural Light:	Desirable

Casework/Fixed Equipment:

-Lockable cabinets; Lateral files; Coat rack; whiteboard

Moveable Furnishings:

-Desk; Filing cabinets; Book Shelves; Guest chairs

Equipment:

-Computer; 2 monitors; printer; conference phone; shredder; flip file and paper management system

Technical Requirements

Mechanical:

Ventilation:	5 CFM/person + 0.06 CFM/sq.ft.
Summer Design Temp:	72 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	35 (NC/RC)
Special Systems:	None required
Plumbing:	None required

Electrical:

Power:	1 duplex receptacle per wall. Additional capacity for equipment listed.
Phone/Data:	2 devices on opposing walls
Video:	Rough-in for future capacity
Audio:	Speaker with volume control

Lighting:

Fixture Type:	T-8 Fluorescent or LED lay-in indirect
Accent Lighting:	Task lighting at work surface
Foot Candles:	40
Controls:	Occupancy sensor

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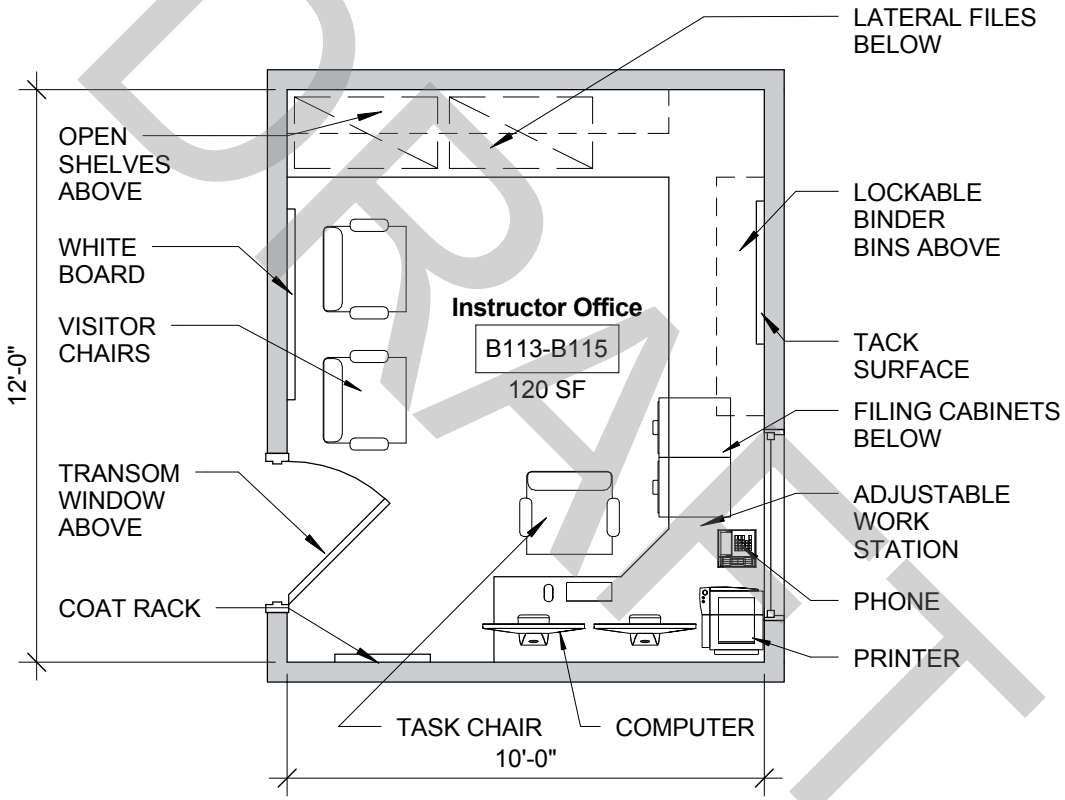

LATERAL FILES BELOW
OPEN SHELVES ABOVE
WHITE BOARD
VISITOR CHAIRS
TRANSOM WINDOW ABOVE
COAT RACK
12'-0"
Instructor Office
B113-B115
120 SF
LOCKABLE BINDER BINS ABOVE
TACK SURFACE
FILING CABINETS BELOW
ADJUSTABLE WORK STATION
PHONE
PRINTER
TASK CHAIR
COMPUTER
10'-0"

DRAFT

B116 Adjunct Bullpen

Space Requirements

Space Summary:

Type of Space:	Office
Number Required:	1
Total Number:	1
Occupants:	10-20
Area:	474 SF
Primary Function:	Provide adjuncts with shared office space in order to maintain files, work on exams, print materials, work on classroom presentations, etc.

Relationships:

Location:	Second Level
Adjacencies:	Work Room, Lounge, Meeting area
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Finishes:

Floor:	Carpet
Walls:	Painted gypsum board
Ceiling:	Painted gypsum board
Specialty Finishes:	None required
Sound:	None required

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	10'-0"

Privacy/Security:

Doors:

Type:	Solid core wood with clear finish.
Frame:	Painted hollow metal
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-None required

Moveable Furnishings:

-(10) Work stations, large work table w/ storage below, 1 filing cabinet per station, 1 lockable hutches per station

Equipment:

-1 computer at each station, network printers, shared phone, internet capabilities
-Whiteboards, small tack board per station, trash cans, mailbox station

Technical Requirements

Mechanical:

Ventilation:	5 CFM/person + 0.06 CFM/sq.ft.
Summer Design Temp:	70 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	35 (NC/RC)
Special Systems:	None required
Plumbing:	None required

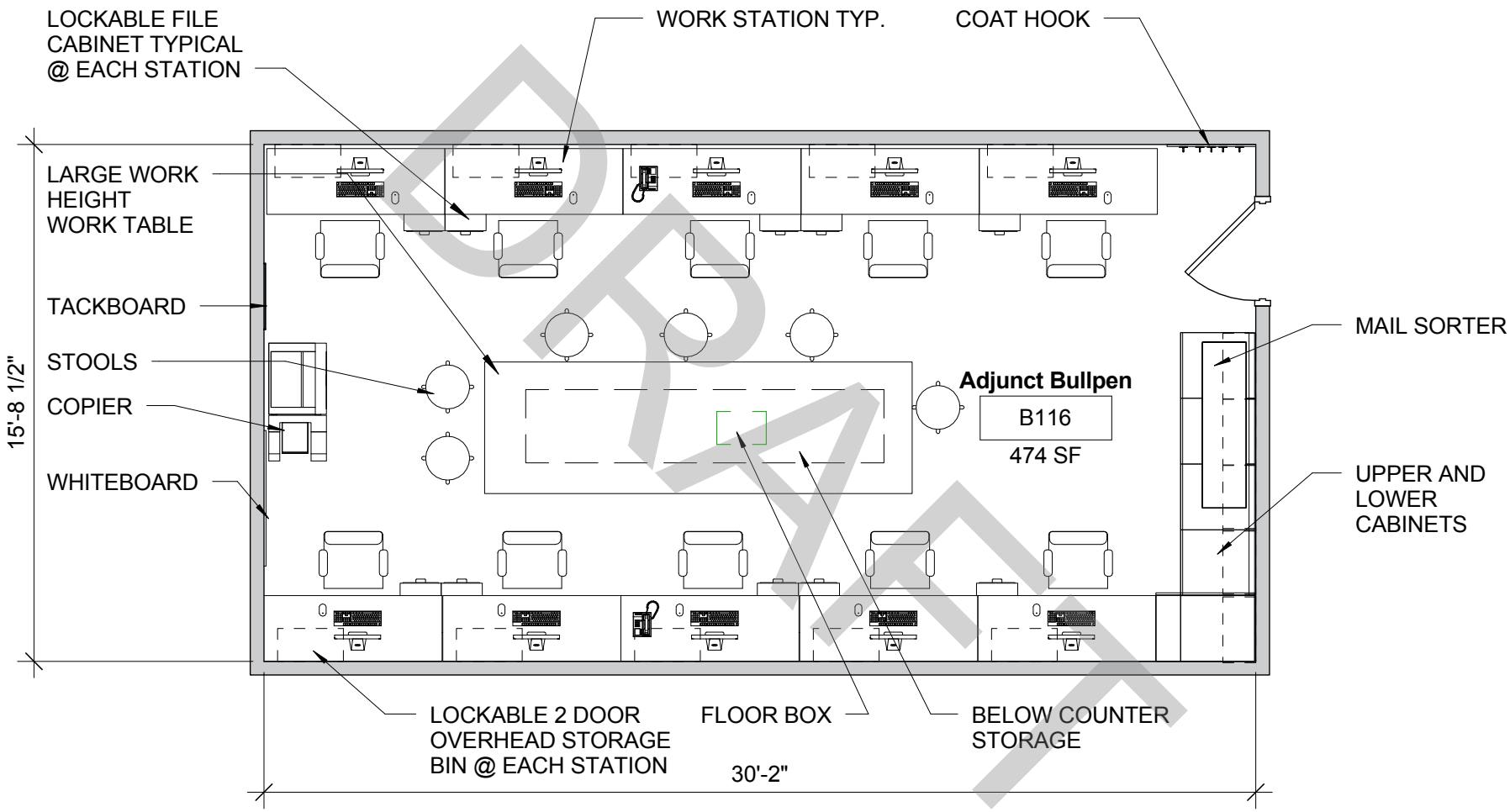
Electrical:

Power:	1 duplex receptacle per wall and at each station. Additional capacity for equipment listed.
Phone/Data:	2 devices total on opposing walls
Video:	Rough-in for future capacity
Audio:	Rough-in for future capacity.

Lighting:

Fixture Type:	T-8 Fluorescent or LED lay-in indirect
Accent Lighting:	Task lighting at each station
Foot Candles:	40
Controls:	Occupancy sensor

DRAFT


LOCKABLE FILE CABINET TYPICAL @ EACH STATION
WORK STATION TYP.
COAT HOOK
LARGE WORK HEIGHT WORK TABLE
TACKBOARD
STOOLS
COPIER
WHITEBOARD
15'-8 1/2"
MAIL SORTER
Adjunct Bullpen
B116
474 SF
UPPER AND LOWER CABINETS
LOCKABLE 2 DOOR OVERHEAD STORAGE BIN @ EACH STATION
FLOOR BOX
BELOW COUNTER STORAGE
30'-2"

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CHEMISTRY

C101 Chemistry Laboratory

Space Requirements

Space Summary:

Type of Space:	Chemistry Laboratory
Number Required:	1
Total Number:	1
Occupants:	24
Area:	1200 SF
Primary Function:	Undergraduate chemistry teaching laboratory to support the biology program

Relationships:

Location:	Second Level
Adjacencies:	C102 Chemical Storage
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Finishes:

Floor:	Acid resistant. VCT, vinyl, or epoxy
Walls:	Painted gypsum board
Ceiling:	Health grade durable acoustical lay-in. Removed frequently for A/V access.
Specialty Finishes:	None required
Sound:	Sound and vibration isolation required

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	10'-0"

Privacy/Security:

Provide motorized roller shades and blackout panels if any windows are present.

Doors:

Type:	Solid core wood with clear finish.
Frame:	Painted hollow metal with glazed sidelite
Special:	Sound Isolation

Windows:

Type:	Exterior; Interior
Glazing:	Insulated Low-E; Clear
Natural Light:	Desirable

Casework/Fixed Equipment:

-Lockable casework, Epoxy resin counters with integrated lab sinks w/ lab faucets. Lockable full height casework with glass doors.

Moveable Furnishings:

-Student and instructor chairs

Equipment:

-(4) large fume hoods (6'/fume hood) to be dispersed as much as possible (preferably 2 per wall), Plexiglas shrouds and downdraft vents at perimeter casework
-Roll away emergency fire blanket
-Red phones w/ emergency contact numbers
-80" LCD touch panel, ceiling mounted document camera, digital clock, wall cameras, surround sound ceiling mounted speakers, ceiling microphones
-(2) 8' Whiteboards

Technical Requirements

Mechanical:

Ventilation:	10 AC/HR occupied 4 AC/HR unoccupied
Summer Design Temp:	72 ° F
Winter Design Temp:	72 ° F
Controls:	Individual direct digital controls; normal/full air flow switch that controls the ventilation system of the entire room
Sound Criteria:	35 (NC/RC)
Special Systems:	Ceiling mounted snorkel exhaust at each pod. Fume hoods to have "emergency" flow setting; downdraft grills and ducting per station. Connect fume hoods to building exhaust systems. Provide gas and compressed air to each pod via ceiling mounted interface parcel. 100% exhaust, room pressure exhaust.
Plumbing:	Double water, gas, and vacuum hookups. Full overhead emergency showers; individual emergency eye wash faucets at each sink. Distilled water tap for each sink. Acid waste piping to building neutralization system.

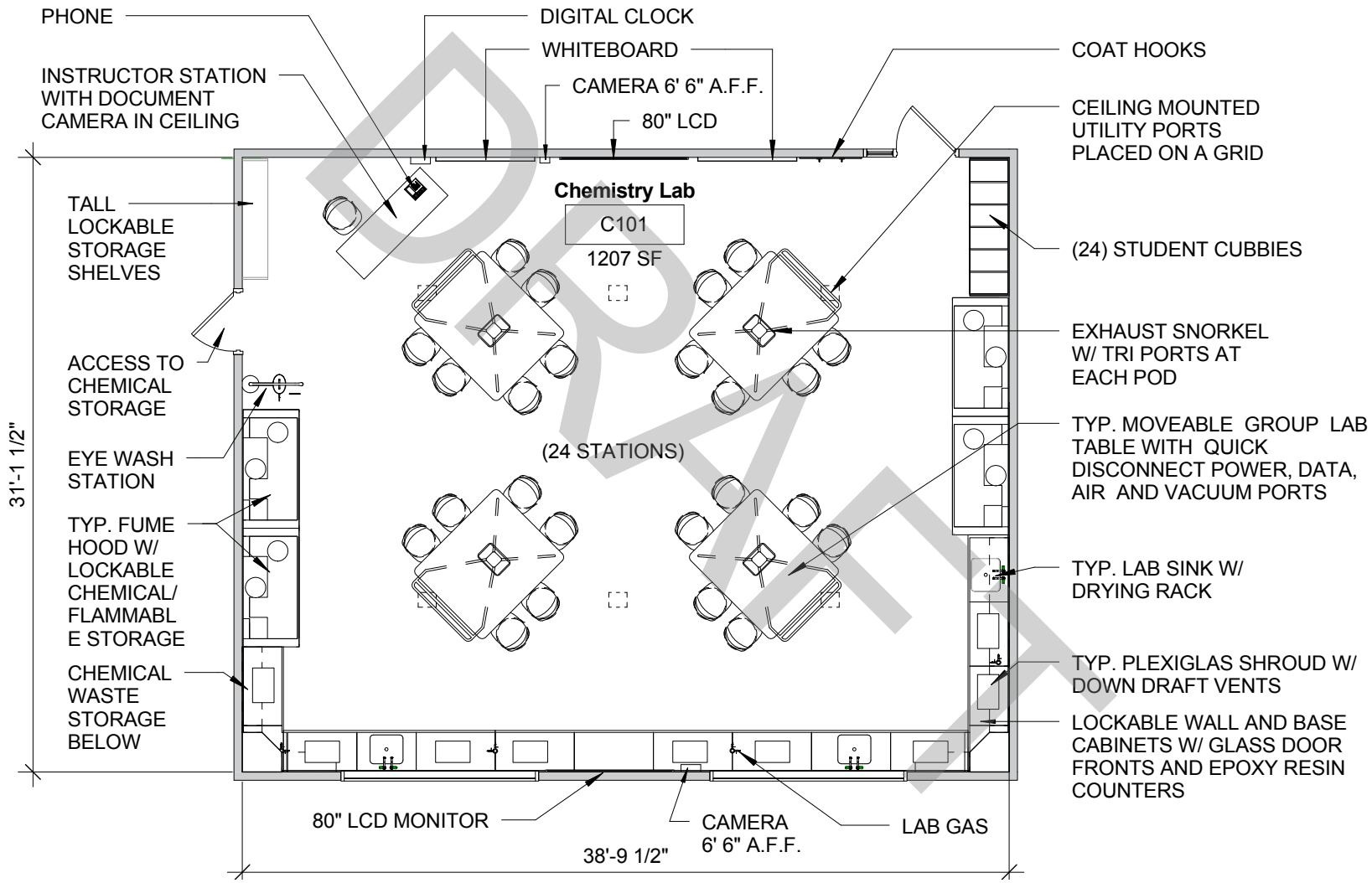
Electrical:

Power:	1 floorbox w/ fourplex at instructor station; 1 floorbox w/ fourplex at each student pod; 1 fouplex at each monitor; duplex outlets 12' oc along counter; power for lab equipment.
Phone/Data:	1 drop at instructor station; 1 drop per each student pod; 1 drop at each monitor; 1-2 additional drops along wall.
Video:	Portable
Audio:	Rough-in for future capacity

Lighting:

Fixture Type:	T-5 Fluorescent or LED lay-in indirect, dimmable
Accent Lighting:	Fume hood lighting
Foot Candles:	40
Controls:	Occupancy sensor; zoned lighting for distance origination rooms

DRAFT


PHONE
DIGITAL CLOCK
WHITEBOARD
COAT HOOKS
INSTRUCTOR STATION WITH DOCUMENT CAMERA IN CEILING
CAMERA 6' 6" A.F.F.
80" LCD
CEILING MOUNTED UTILITY PORTS PLACED ON A GRID
Chemistry Lab
C101
1207 SF
TALL LOCKABLE STORAGE SHELVES
(24) STUDENT CUBBIES
EXHAUST SNORKEL W/ TRI PORTS AT EACH POD
ACCESS TO CHEMICAL STORAGE
(24 STATIONS)
TYP. MOVEABLE GROUP LAB TABLE WITH QUICK DISCONNECT POWER, DATA, AIR AND VACUUM PORTS
31'-1 1/2"
EYE WASH STATION
TYP. FUME HOOD W/ LOCKABLE CHEMICAL/ FLAMMABLE STORAGE
TYP. LAB SINK W/ DRYING RACK
CHEMICAL WASTE STORAGE BELOW
TYP. PLEXIGLAS SHROUD W/ DOWN DRAFT VENTS
LOCKABLE WALL AND BASE CABINETS W/ GLASS DOOR FRONTS AND EPOXY RESIN COUNTERS
80" LCD MONITOR
CAMERA 6' 6" A.F.F.
LAB GAS
38'-9 1/2"

DRAFT

C101 Chemistry Laboratory

ROOM# C101

EXPANDED TECHNICAL REQUIREMENTS

HOODS	NEED	QYT	COMMENT
Chemical Fume Hood	x	4	6' restricted bypass fume hood w/ hard piped utilites (compressed air, vacuum, natural gas, pure water)
Laminar Flow Hood			
Radioisotope Hood			
Snorkel	x	4	Center on tables
Canopy hood			
Equipment Exhaust			
Miscellaneous			

EQUIPMENT	NEED	QYT	COMMENT
Micro scope			
Autoclave			
Freezer -80degree			
Epoxy resin counter	x		All counters
Drying rack	x	2	Locate above sinks
Vortexer			
PCR Instruction Lab Package			
Gradient adapter for MyCyler			
IVC Pod table	x	4	IVC capable
White board	x	3	
Instructor console	x	1	IVC capable
Miscellaneous			

CHEMICALS	NEED	QYT	COMMENT
Solvents	x		
Acids	x		Dual chemical storage base cabinet (acid/flammable) below fume hood
Bases	x		
Carcinogens			
Chemical Waste Storage	x	2	Chemical waste cabinets
Biological Storage	x	4	Biological safety cabinet below fume hood
Radioisotope Storage			
Chemical Storage	x		x
Miscellaneous			

PLUMBING	NEED	QYT	COMMENT
Eyewash			
Eyewash/Safety Shower	x		Combo
Floor Drain			
Floor Sink			
Laboratory Sink	x	3	Distributed
Lab Gas	x	3	Distributed
Lab Vacuum	x	3	Distributed
Lab Air	x	3	Distributed
Compressed Air			
Hot Water	x		Locate at sinks
Cold Water	x		Locate at sinks
Distilled/Purified Water	x		Locate at sinks
Chilled Water			
Carbon Dioxide			
Nitrogen			
Cylinder Gases			

ELECTRICAL	NEED	QYT	COMMENT
Emergency Power	x	4	Hoods only
UPS			
110V 20A 1 Phase	x		
208V 30A 1 Phase	x		
208V 30A 3 Phase			
480V 100A 3 Phase			
Data/Power	x		Floor boxes at group tables for IVC components
Zoned Lighting	x		Zoned for IVC and lab configuration
Lighting level	x		75 ft candles at benches
Special Lighting			
Audio Visual	x		IVC capable- (2) 80" LCD monitors with (2) wall cameras

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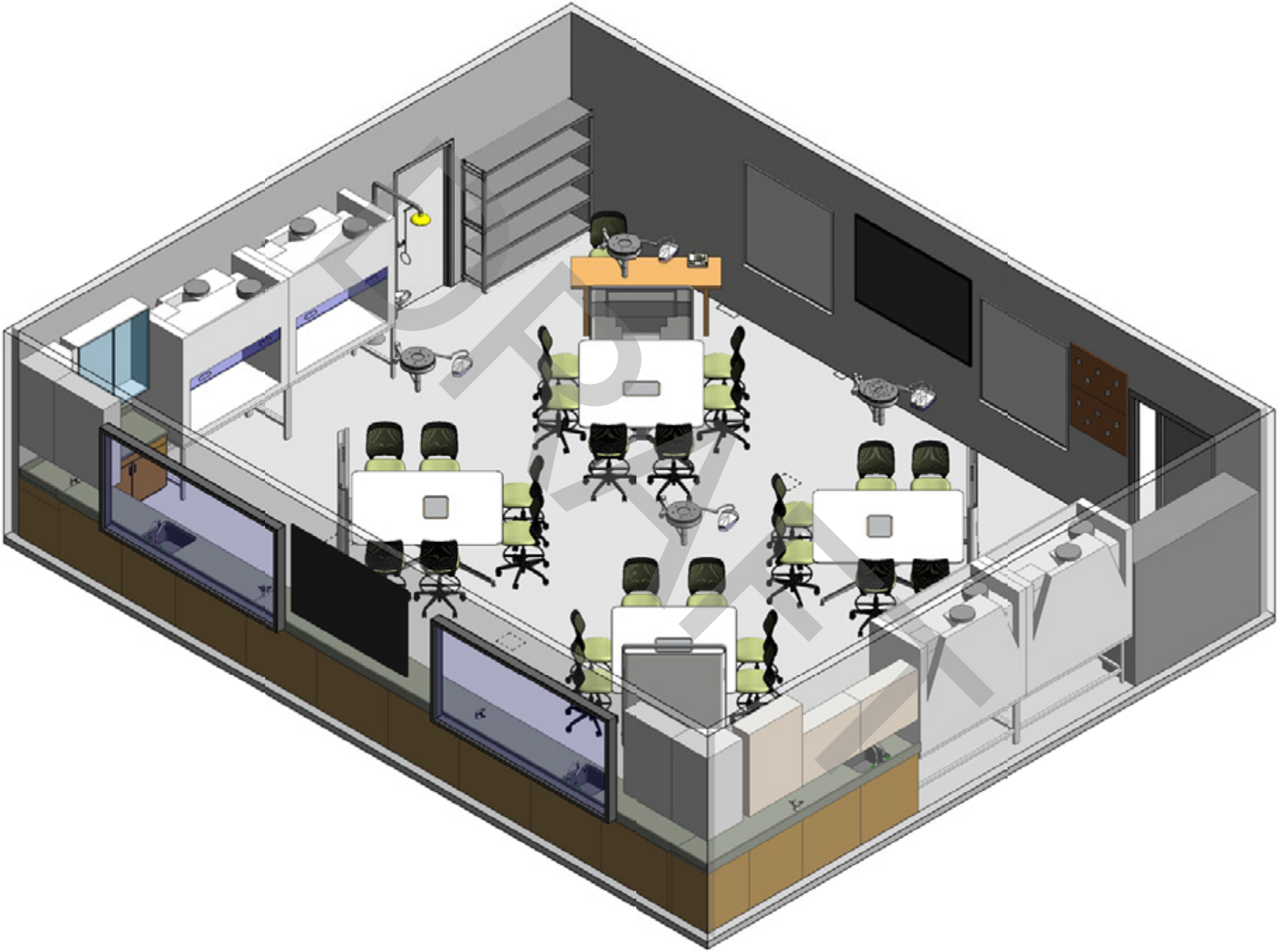


C102 Chemical Storage

Space Requirements

Space Summary:

Type of Space:	Chemical Storage
Number Required:	1
Total Number:	1
Occupants:	1
Area:	240 SF
Primary Function:	To support the Chemistry Laboratory #C101 and provide secure chemical storage for the chemistry program

Relationships:

Location:	Second Level
Adjacencies:	Direct access to C101
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Finishes:

Floor:	Acid resistant. VCT, vinyl, or epoxy
Walls:	Painted gypsum board
Ceiling:	Health grade durable acoustical lay-in. Removed frequently for A/V access.
Specialty Finishes:	None required
Sound:	None required

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	10'-0"

Privacy/Security:

Card access and/or keypad control required to secure equipment and supplies.

Doors:

Type:	Solid core wood with clear finish.
Frame:	Painted hollow metal
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-Moveable prep island with epoxy resin counter. Provide lockable lower casework with glass doors for lab equipment and supplies. Provide full height 36"x18" adjustable open shelving.
-Sink
-Flammable storage cabinet--corrosion proof cabinet

Moveable Furnishings:

-1 lab stool, rolling cart

Equipment:

-Small fume hood, drying rack, eye wash station, storage shelving

Technical Requirements

Mechanical:

Ventilation:	10 AC/HR continuous (100% exhaust) Negative air pressurization
Summer Design Temp:	72 ° F
Winter Design Temp:	72 ° F
Controls:	Individual direct digital controls; normal/full air flow switch that controls the ventilation system of the entire room
Sound Criteria:	50 NC
Special Systems:	Fume hoods to have "emergency" flow setting. Connect fume hoods to building exhaust systems. Provide continual exchange of storage room air space. Negative room pressurization.
Plumbing:	Distilled water tap for sink, lab sink, faucet, emergency eyewash station

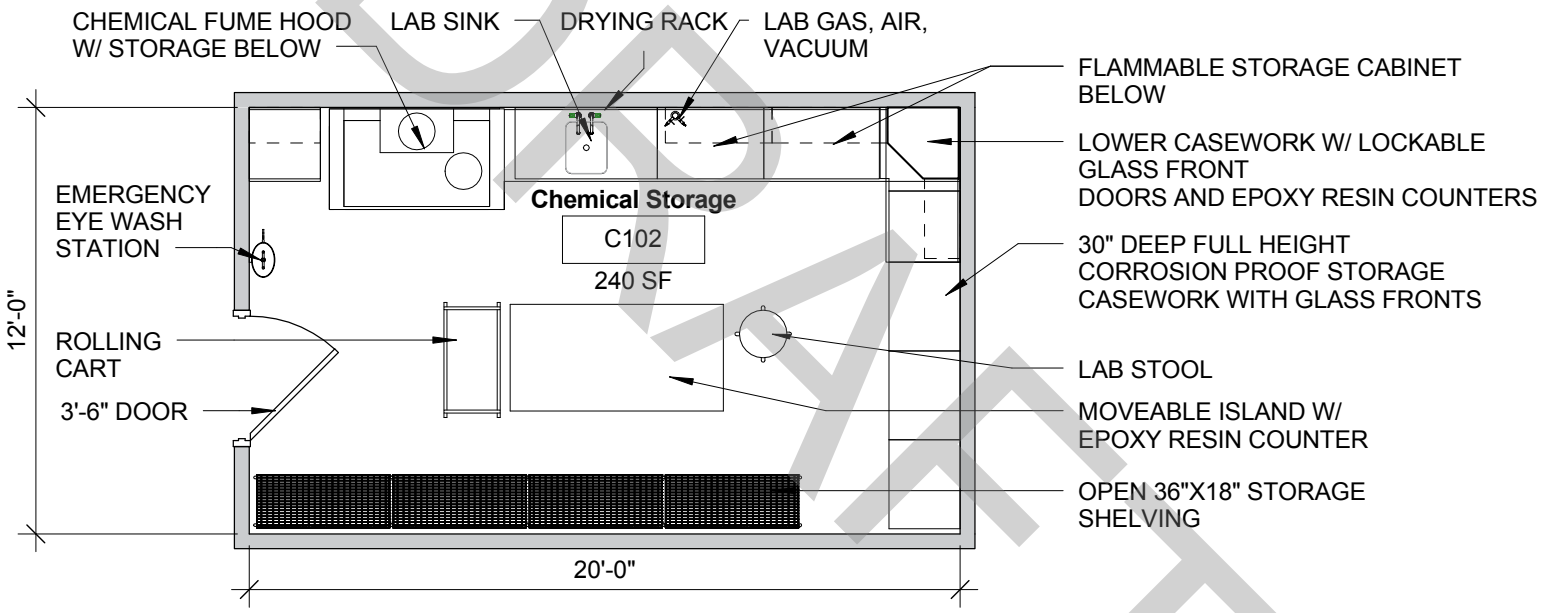
Electrical:

Power:	4 duplex receptacle per wall, every 2-3'. Additional capacity for equipment listed.
Phone/Data:	1 device per wall
Video:	Rough-in for future capacity
Audio:	Rough-in for future capacity

Lighting:

Fixture Type:	T-8 Fluorescent or LED lay-in indirect
Accent Lighting:	None required
Foot Candles:	40
Controls:	Occupancy sensor

DRAFT


CHEMICAL FUME HOOD W/ STORAGE BELOW
LAB SINK
DRYING RACK
LAB GAS, AIR, VACUUM
FLAMMABLE STORAGE CABINET BELOW
LOWER CASEWORK W/ LOCKABLE GLASS FRONT DOORS AND EPOXY RESIN COUNTERS
EMERGENCY EYE WASH STATION
Chemical Storage
C102
240 SF
30" DEEP FULL HEIGHT CORROSION PROOF STORAGE CASEWORK WITH GLASS FRONTS
12'-0"
ROLLING CART
LAB STOOL
3'-6" DOOR
MOVEABLE ISLAND W/ EPOXY RESIN COUNTER
OPEN 36"X18" STORAGE SHELVING
20'-0"

DRAFT

CHEMISTRY STORAGE

ROOM# C102

EXPANDED TECHNICAL REQUIREMENTS

HOODS	NEED	QYT	COMMENT
Chemical Fume Hood	x	1	6' restricted bypass fume hood w/ hard piped utilites (compressed air, vacuum, natural gas, pure water)
Laminar Flow Hood			
Radioisotope Hood			
Snorkel			
Canopy hood			
Equipment Exhaust			
Miscellaneous			

EQUIPMENT	NEED	QYT	COMMENT
Micro scope			
Autoclave			
Freezer -80degree			
Epoxy resin counter	x		All counters
Drying rack	x	1	Locate above sink
Vortexer			
PCR Instruction Lab Package			
Gradient adapter for MyCyler			
IVC Pod table			
White board			
Instructor console			
Miscellaneous			

CHEMICALS	NEED	QYT	COMMENT
Solvents	x		
Acids	x		Dual chemical storage base cabinet (acid/flammable) below fume hood
Bases	x		
Carcinogens			
Chemical Waste Storage	x	1	Chemical waste cabinets
Biological Storage	x	1	Biological safety cabinet below fume hood
Chemical Storage	x	1	4 Full height corrosion proof cabinets
Flammable Storage	x	2	Dedicated cabinters
Miscellaneous			

PLUMBING	NEED	QYT	COMMENT
Eyewash			
Eyewash/Safety Shower	x		Handheld at the sink
Floor Drain			
Floor Sink			
Laboratory Sink	x	1	
Lab Gas	x	2	At fume hood and sink
Lab Vacuum	x	2	At fume hood and sink
Lab Air	x	2	At fume hood and sink
Compressed Air			
Hot Water	x		Locate at sink
Cold Water	x		Locate at sink
Distilled/Purified Water	x		Locate at sink
Chilled Water			
Carbon Dioxide			
Nitrogen			
Cylinder Gases			

ELECTRICAL	NEED	QYT	COMMENT
Emergency Power	x	1	Hood only
UPS			
110V 20A 1 Phase	x		
208V 30A 1 Phase			
208V 30A 3 Phase			
480V 100A 3 Phase			
Data/Power			
Zoned Lighting			
Lighting level	x		75 ft candles at benches and island
Special Lighting			
Audio Visual			

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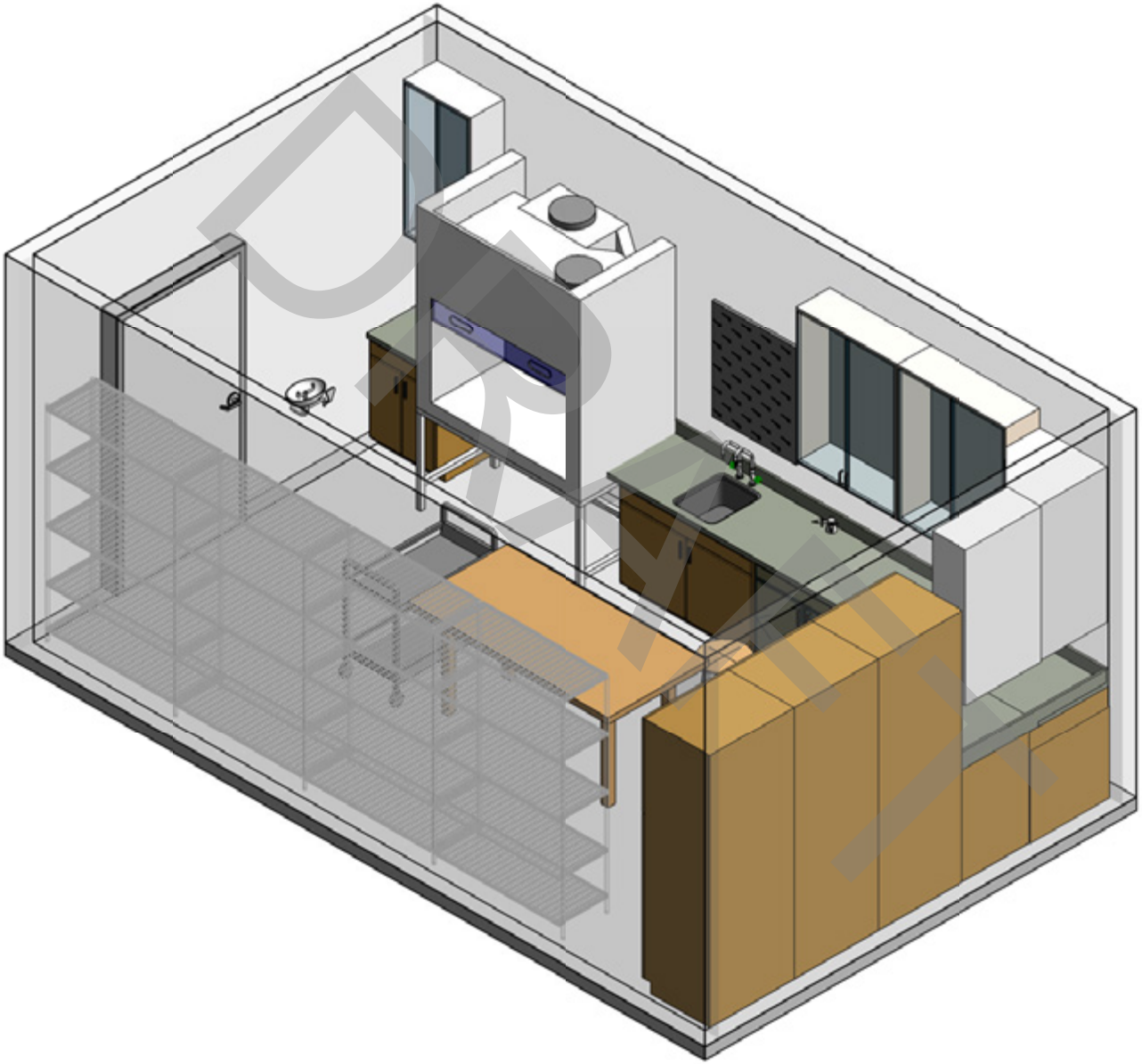

C104 Flex Physical Science Lab Support

Space Requirements

Space Summary:

Type of Space:	Support space
Number Required:	1
Total Number:	1
Occupants:	1
Area:	271 SF
Primary Function:	Support the Chemistry teaching labs

Relationships:

Location:	Second Level
Adjacencies:	Chemistry teaching labs
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Finishes:

Floor:	Acid resistant. VCT, vinyl, or epoxy
Walls:	Painted gypsum board
Ceiling:	Health grade durable acoustical lay-in
Specialty Finishes:	None required
Sound:	Sound and vibration isolation from adjacencies

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	10'-0"

Privacy/Security:

Provide card access and/or keypad control

Doors:

Type:	Solid core wood with clear finish
Frame:	Painted hollow metal
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-Lockable wall and base cabinets with glass door fronts.
-Epoxy resin counters over casework with (2) integrated sink basins w/ lab faucet.

Moveable Furnishings:

-(1) lab stool; (2) moveable table (2) Lab carts

Equipment:

-(1) electric type autoclave; (1) -80 ° freezer; microwave; temp controlled water bath; vortexer; PCR Instruction Lab Package; Ice Machine; Under counter flask scrubber; dry rack; 5' restricted bypass fume hood w/ hard piped utilities (compressed air, vacuum, natural gas, pure water) dual chemical storage base cabinets (acid/flammable) below fume hood; dishwasher; centrifuge; Refrigerator.

Technical Requirements

Mechanical:

Ventilation:	10 AC/HR occupied 4 AC/HR unoccupied
Summer Design Temp:	70 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	35 (NC/RC)
Special Systems:	Connect fume hood to building exhaust system. 100% exhaust. Negative room pressurization. Provide canopy hood at face of autoclave to capture moisture
Plumbing:	Floor drain in center of room; Lab gas and distilled water dispersed; lab sink; Provide compressed air and vacuum

Electrical:

Power:	4 duplex receptacle per wall, every 2-3'. Additional capacity for equipment listed.
Phone/Data:	1 device per wall
Video:	Rough-in for future capacity
Audio:	Rough-in for future capacity

Lighting:

Fixture Type:	T-8 Fluorescent or LED lay-in indirect
Accent Lighting:	None required
Foot Candles:	40
Controls:	Occupancy sensor

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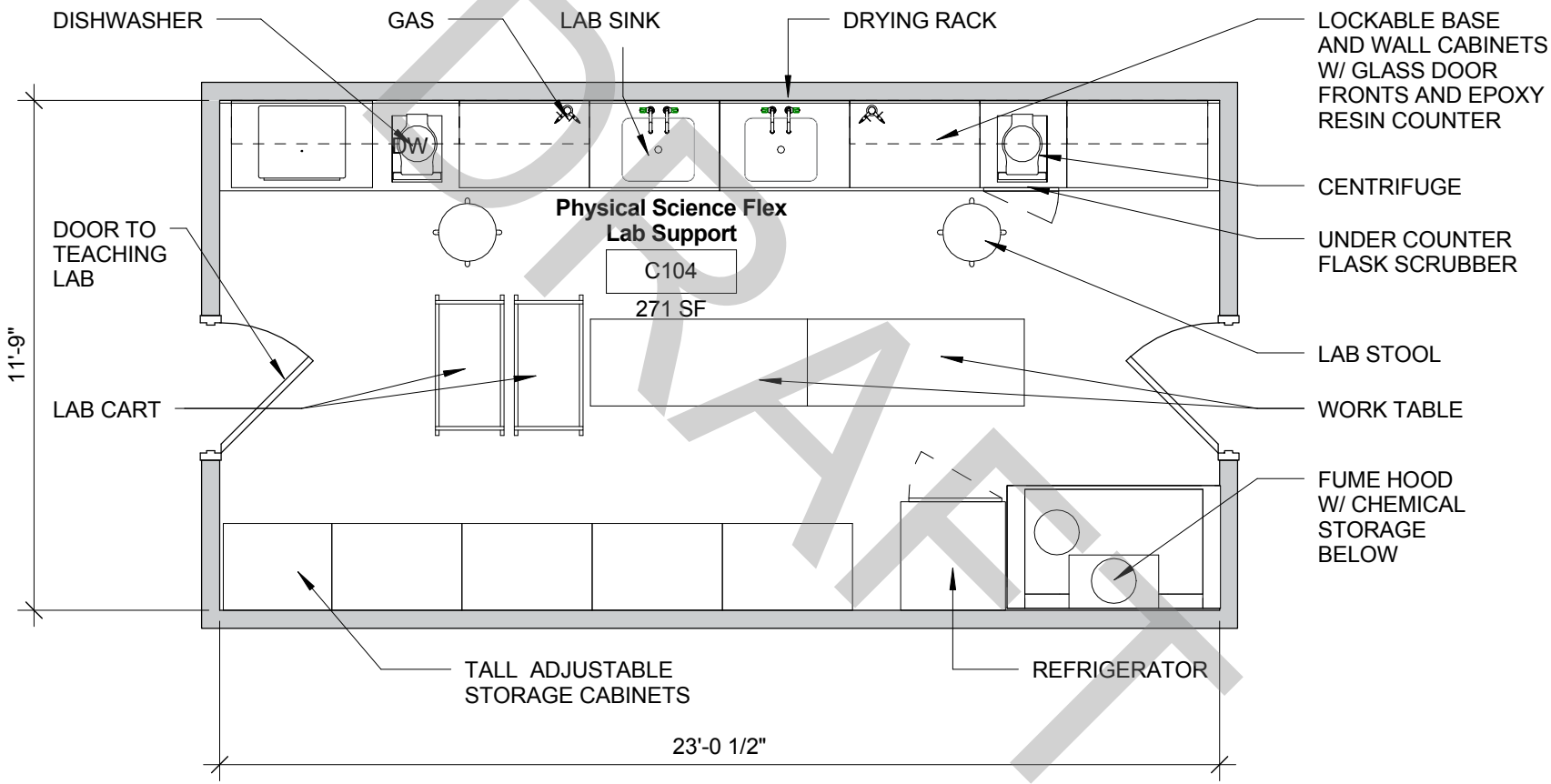
DISHWASHER
GAS
LAB SINK
DRYING RACK
LOCKABLE BASE AND WALL CABINETS W/ GLASS DOOR FRONTS AND EPOXY RESIN COUNTER
CENTRIFUGE
UNDER COUNTER FLASK SCRUBBER
LAB STOOL
WORK TABLE
FUME HOOD W/ CHEMICAL STORAGE BELOW
DOOR TO TEACHING LAB
LAB CART
DW
Physical Science Flex Lab Support
C104
271 SF
11'-9"
TALL ADJUSTABLE STORAGE CABINETS
REFRIGERATOR
23'-0 1/2"

DRAFT

FLEX PHYSICAL SCIENCE LABORATORY SUPPORT

ROOM# C104

EXPANDED TECHNICAL REQUIREMENTS

HOODS	NEED	QYT	COMMENT
Chemical Fume Hood	x	1	5' restricted bypass fume hood w/ hard piped utilites (compressed air, vacuum, natural gas, pure water)
Laminar Flow Hood			
Radioisotope Hood			
Snorkel			
Canopy hood			
Equipment Exhaust			
Miscellaneous			

EQUIPMENT	NEED	QYT	COMMENT
Autoclave			
Centrifuge	x	1	
Freezer -80degree			
Epoxy resin counter	x		All counters
Drying rack	x	2	
Vortexer			
PCR Instruction Lab Package			
Gradient adapter for MyCyler			
Refrigerator	x	1	
Dishwasher	x	1	
Flask scrubber	x	1	
Rolling lab cart	x	2	

EQUIPMENT	NEED	QYT	COMMENT
Solvents			
Acids	x		Dual chemical storage base cabinet (acid/flammable) below fume hood
Bases			
Radioisotopes			
Carcinogens			
Chemical Waste Storage	x	1	
Biological Storage	x	1	
Chemical Storage	x	1	
Miscellaneous			

PLUMBING	NEED	QYT	COMMENT
Eyewash			
Eyewash/Safety Shower			Use Biology Lab eyewash
Floor Drain			
Floor Sink	x	1	
Bench Sink	x	2	
Lab Gas	x	2	
Lab Vacuum	x	2	
Lab Air	x	2	
Compressed Air			
Hot Water	x	2	Locate at sink
Cold Water	x	2	Locate at sink
Distilled/Purified Water	x	2	Locate at sink
Chilled Water			
Carbon Dioxide			
Nitrogen			
Cylinder Gases			

ELECTRICAL	NEED	QYT	COMMENT
Emergency Power	x	1	Hood only
UPS			
110V 20A 1 Phase	x		
208V 30A 1 Phase			
208V 30A 3 Phase			
480V 100A 3 Phase			
Data/Power	x	2	Distributed above counter
Zoned Lighting			
Lighting level			75 ft candles at benches and work tables
Special Lighting			

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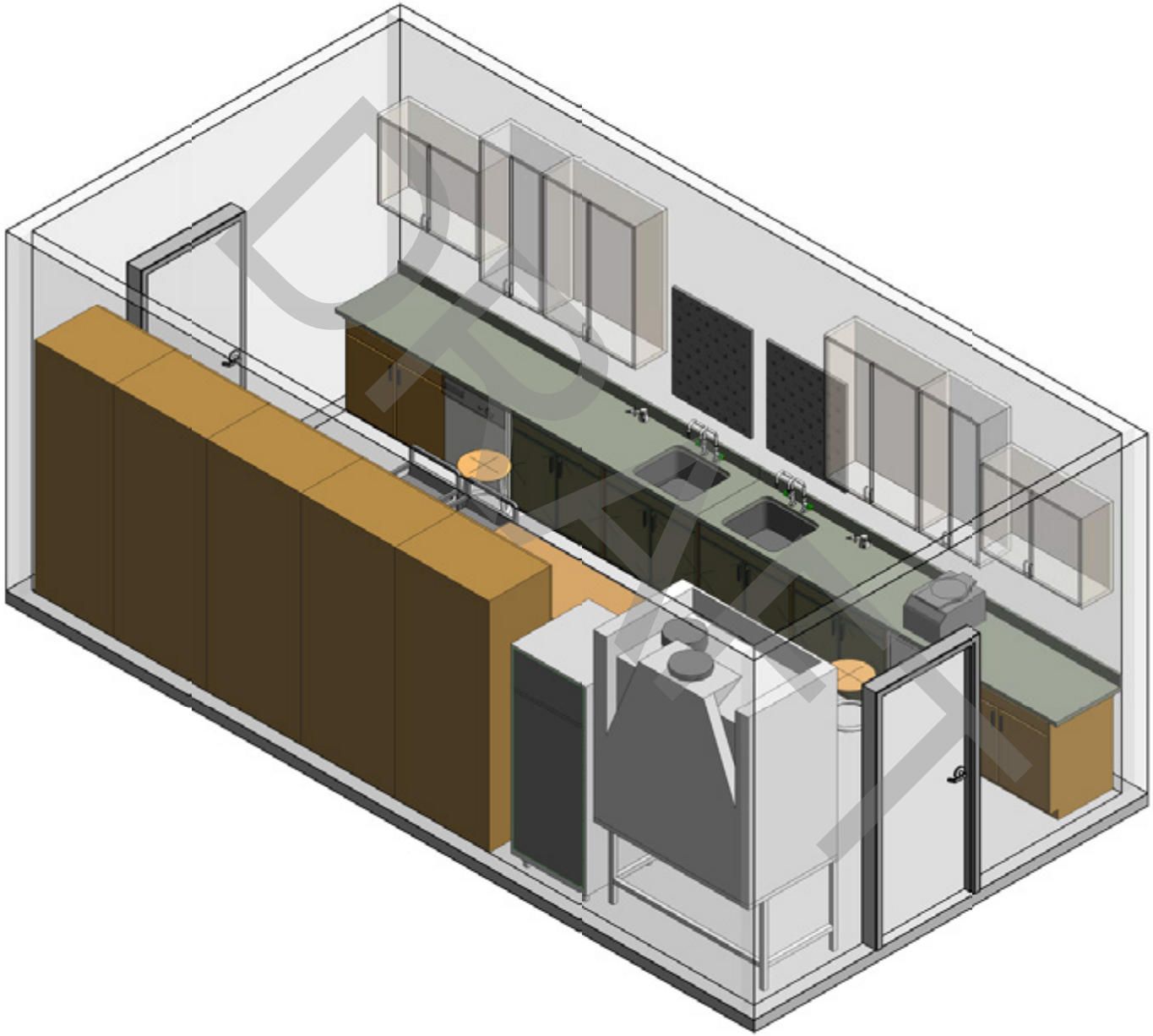

C105-106 Chemistry Office

Space Requirements

Space Summary:

Type of Space:	Office
Number Required:	2
Total Number:	2
Occupants:	1-4
Area:	120 SF
Primary Function:	Day-to-day operations, individual and small group meetings, written and verbal communications, daily document access.

Relationships:

Location:	Second Level
Adjacencies:	None required
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Visually accessible, comfortable, natural lighting

Finishes:

Floor:	Carpet
Walls:	Painted gypsum board
Ceiling:	Painted gypsum board
Specialty Finishes:	None required
Sound:	Secure and sound proof ceiling, insulated for sound control.

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	9'-0"

Privacy/Security:

None required

Doors:

Type:	Solid core wood with clear finish.
Frame:	Painted hollow metal with glazed sidelite
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-Lockable cabinets; Lateral files; Coat rack; whiteboard

Moveable Furnishings:

-Desk; Filing cabinets; Book Shelves; Guest chairs

Equipment:

-Computer; 2 monitors; printer; conference phone; shredder; flip file and paper management system

Technical Requirements

Mechanical:

Ventilation:	5 CFM/person + 0.06 CFM/sq.ft.
Summer Design Temp:	72 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	35 (NC/RC)
Special Systems:	None required
Plumbing:	None required

Electrical:

Power:	1 duplex receptacle per wall. Additional capacity for equipment listed.
Phone/Data:	2 devices on opposing walls
Video:	Rough-in for future capacity
Audio:	Speaker with volume control

Lighting:

Fixture Type:	T-8 Fluorescent or LED lay-in indirect
Accent Lighting:	Task lighting at work surface
Foot Candles:	40
Controls:	Occupancy sensor

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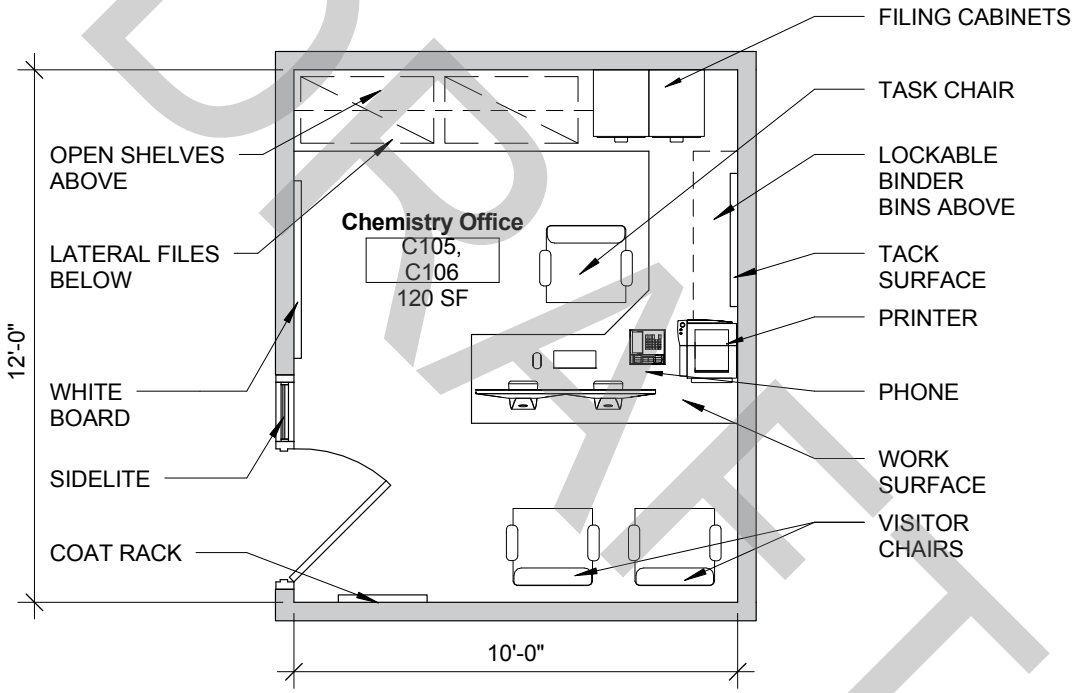
FILING CABINETS
TASK CHAIR
LOCKABLE BINDER BINS ABOVE
TACK SURFACE
PRINTER
PHONE
WORK SURFACE
VISITOR CHAIRS
OPEN SHELVES ABOVE
LATERAL FILES BELOW
WHITE BOARD
SIDELITE
COAT RACK
Chemistry Office
C105, C106
120 SF
12'-0"
10'-0"

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PHYSICS

P101 General Physics Laboratory

Space Requirements

Space Summary:

Type of Space:	Teaching Laboratory
Number Required:	1
Total Number:	1
Occupants:	24 stations
Area:	1200 SF
Primary Function:	General physics teaching laboratory. Needs to have IVC capability and be adaptable to future programmatic and building needs

Relationships:

Location:	Second Level
Adjacencies:	Near other labs
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Durable finishes, inviting feel

Finishes:

Floor:	Acid resistant. VCT, vinyl, or epoxy
Walls:	Painted gypsum board
Ceiling:	Health grade durable acoustical lay-in. Removed frequently for A/V access.
Specialty Finishes:	None required
Sound:	Sound and vibration isolation required

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	10'-0"

Privacy/Security:

Provide motorized roller shades and blackout panels if any windows are present. Card access and/or keypad control.

Doors:

Type:	Solid core wood with clear finish.
Frame:	Painted hollow metal with glazed sidelite
Special:	Sound Isolation

Windows:

Type:	Exterior
Glazing:	1" Low-e
Natural Light:	Preferred

Casework/Fixed Equipment:

-Lockable wall and base cabinets with glass door fronts.
-Epoxy resin counters over casework with (4) integrated sink basins w/ lab faucets, evenly dispersed
-(24) Student cubbies, coat rack

Moveable Furnishings:

-Student and instructor chairs, adjustable student tables, need to be flexible, durable, and able to support microscopes without excessive vibrations, need power/data/ management trays

Equipment:

-80" LCD touch panel, ceiling mounted document camera, digital clock, wall cameras, surround sound ceiling mounted speakers, ceiling microphones, whiteboard, instructor lectern
-fume hoods

Technical Requirements

Mechanical:

Ventilation:	10 AC/HR occupied 4 AC/HR unoccupied
Summer Design Temp:	70 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	35 (NC/RC)
Special Systems:	Snorkel exhaust arm at each pod center, connect fume hoods to building exhaust system. Provide gas and compressed air to each station w/ flexible quick pod disconnect lab sinks. 100% exhaust
Plumbing:	Industrial sink, solvent wash and eye wash w/ floor drain, supply, waste and vent. Lab gas and Distilled water dispersed.

Electrical:

Power:	1 floorbox w/ fourplex at instructor station; 1 floorbox w/ fourplex at each student pod; 1 fouplex at each monitor; duplex outlets 12' oc along counter; power for lab equipment.
Phone/Data:	1 drop at instructor station; 1 drop per each student pod; 1 drop at each monitor; 1-2 additional drops along wall.
Video:	Portable
Audio:	Rough-in for future capacity

Lighting:

Fixture Type:	T-5 Fluorescent or LED lay-in indirect, dimmable
Accent Lighting:	Surgical light boom at ead pod
Foot Candles:	40
Controls:	Occupancy sensor; zoned lighting for distance origination rooms

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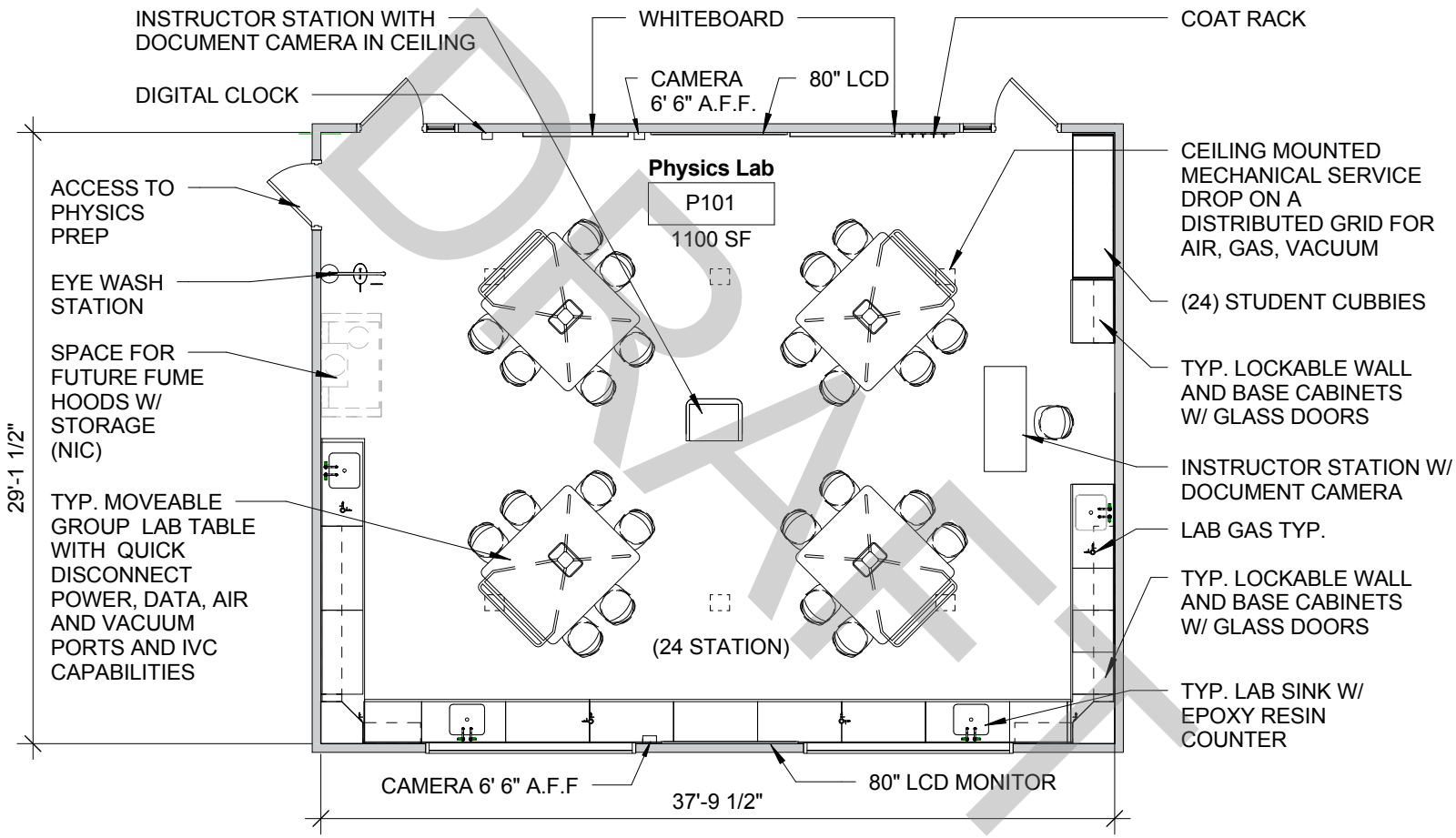
INSTRUCTOR STATION WITH DOCUMENT CAMERA IN CEILING
WHITEBOARD
COAT RACK
DIGITAL CLOCK
CAMERA 6' 6" A.F.F.
80" LCD
Physics Lab
P101
1100 SF
ACCESS TO PHYSICS PREP
EYE WASH STATION
SPACE FOR FUTURE FUME HOODS W/ STORAGE (NIC)
TYP. MOVEABLE GROUP LAB TABLE WITH QUICK DISCONNECT POWER, DATA, AIR AND VACUUM PORTS AND IVC CAPABILITIES
29'-1 1/2"
CEILING MOUNTED MECHANICAL SERVICE DROP ON A DISTRIBUTED GRID FOR AIR, GAS, VACUUM
(24) STUDENT CUBBIES
TYP. LOCKABLE WALL AND BASE CABINETS W/ GLASS DOORS
INSTRUCTOR STATION W/ DOCUMENT CAMERA
LAB GAS TYP.
TYP. LOCKABLE WALL AND BASE CABINETS W/ GLASS DOORS
(24 STATION)
TYP. LAB SINK W/ EPOXY RESIN COUNTER
CAMERA 6' 6" A.F.F
80" LCD MONITOR
37'-9 1/2"

DRAFT

P101 General Physics Laboratory

ROOM# P101

EXPANDED TECHNICAL REQUIREMENTS

HOODS	NEED	QYT	COMMENT
Chemical Fume Hood		1	Space for future 5' long hood (NIC)
Laminar Flow Hood			
Radioisotope Hood			
Snorkel	x		
Canopy hood			
Equipment Exhaust			
Miscellaneous			

EQUIPMENT	NEED	QYT	COMMENT
Micro scope			
Autoclave			
Freezer -80degree			
Epoxy resin counter	x		All counters
Drying rack			
Vortexer			
PCR Instruction Lab Package			
Gradient adapter for MyCyler			
IVC Pod table	x	4	IVC capable
White board	x	3	
Instructor console	x	1	IVC capable
Miscellaneous			

CHEMICALS	NEED	QYT	COMMENT
Solvents			
Acids	x		Dual chemical storage base cabinet (acid/flammable) below fume hood
Bases			
Radioisotopes			
Carcinogens			
Chemical Waste Storage			
Biological Storage		1	Biological safety cabinet below fume hood (NIC)
Chemical Storage			
Miscellaneous			

PLUMBING	NEED	QYT	COMMENT
Eyewash			
Eyewash/Safety Shower	x		Combo
Floor Drain			
Floor Sink			
Laboratory Sink	x	4	Distributed
Lab Gas	x	4	Distributed
Lab Vacuum	x	4	Distributed
Lab Air	x	4	Distributed
Compressed Air			
Hot Water	x		Locate at sinks
Cold Water	x		Locate at sinks
Distilled/Purified Water	x		Locate at sinks
Chilled Water			
Carbon Dioxide			
Nitrogen			
Cylinder Gases			

ELECTRICAL	NEED	QYT	COMMENT
Emergency Power	x	1	Hood only
UPS			
110V 20A 1 Phase	x		
208V 30A 1 Phase	x		
208V 30A 3 Phase			
480V 100A 3 Phase			
Data/Power	x		Floor boxes at group tables for IVC components
Zoned Lighting	x		Zoned for IVC and lab configuration
Lighting level	x		75 ft candles at benches
Special Lighting			
Audio Visual	x		IVC capable- (2) 80" LCD monitors with (2) wall cameras

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P102 General Physics Lab Prep Room

Space Requirements

Space Summary:

Type of Space:	Lab Prep Room
Number Required:	1
Total Number:	1
Occupants:	1 station
Area:	120 SF
Primary Function:	Support physics laboratory and biology program. Used to house equipment and prep experiments and teaching instruments

Relationships:

Location:	Second Level
Adjacencies:	None required
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Finishes:

Floor:	Acid resistant. VCT, vinyl, or epoxy
Walls:	Painted gypsum board
Ceiling:	Health grade durable acoustical lay-in.
Specialty Finishes:	None required
Sound:	Sound and vibration isolation required

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	10'-0"

Privacy/Security:

None required

Doors:

Type:	Solid core wood with clear finish
Frame:	Painted hollow metal with
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-Lockable wall and base cabinets with glass door fronts around the perimeter.
-Epoxy resin counters over casework with (1) integrated sink basin w/ lab faucet.

Moveable Furnishings:

-Lab Stool, moveable table

Equipment:

-None required

Technical Requirements

Mechanical:

Ventilation:	6 AC/HR occupied 4 AC/HR unoccupied
Summer Design Temp:	72 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	30 (NC/RC)
Special Systems:	None required
Plumbing:	Floor drain in center of room; 3 compartment sink; hot and cold hose bibs

Electrical:

Power:	4 duplex receptacle per wall, every 2-3'. Additional capacity for equipment listed.
Phone/Data:	1 device per wall
Video:	Rough-in for future capacity
Audio:	Rough-in for future capacity

Lighting:

Fixture Type:	T-5 Fluorescent or LED lay-in indirect, dimmable
Accent Lighting:	None required
Foot Candles:	40
Controls:	Occupancy sensor; zoned lighting for distance origination rooms

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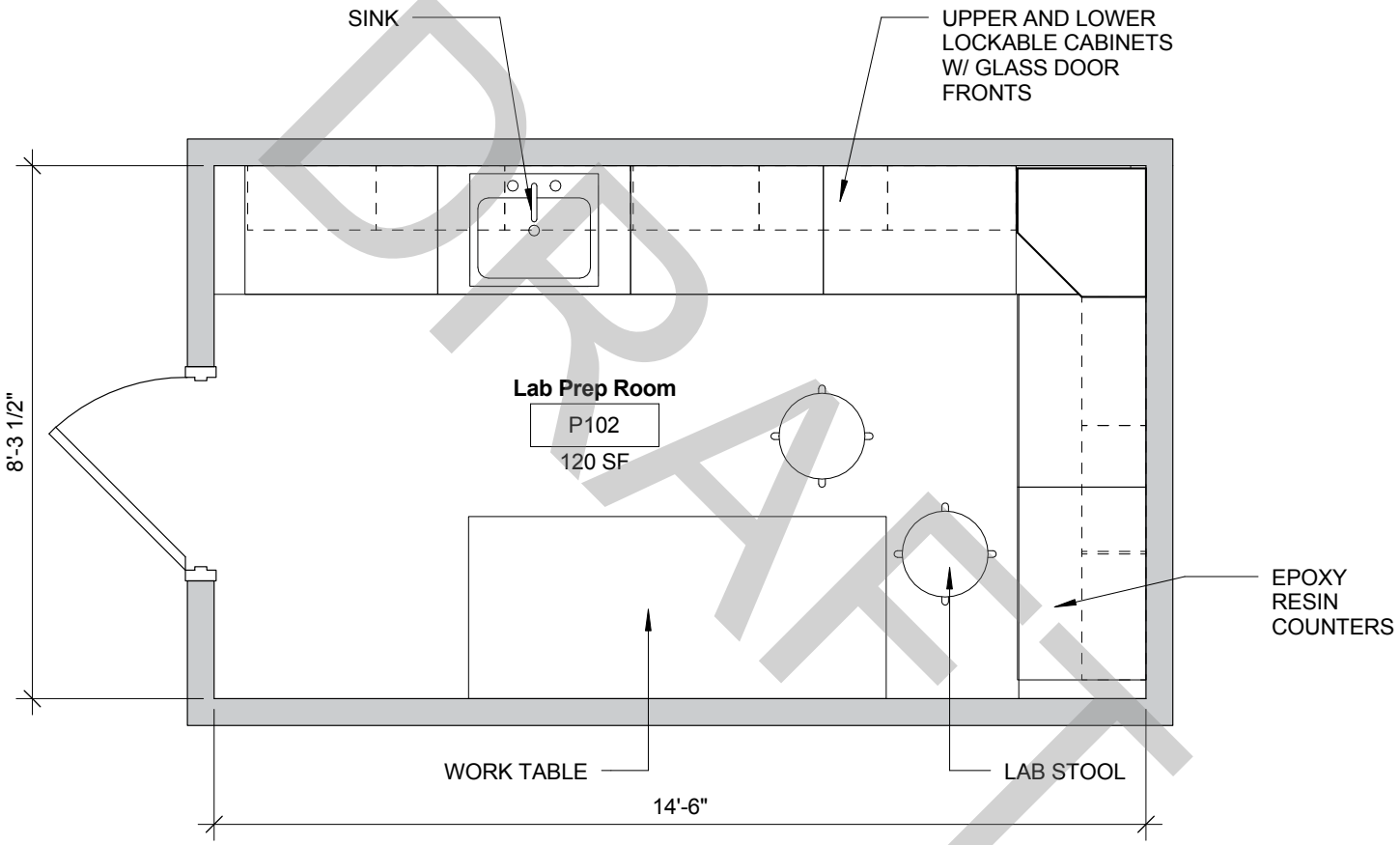
SINK
UPPER AND LOWER LOCKABLE CABINETS W/ GLASS DOOR FRONTS
Lab Prep Room
P102
120 SF
8'-3 1/2"
EPOXY RESIN COUNTERS
WORK TABLE
LAB STOOL
14'-6"

DRAFT

P103 Physics Office

Space Requirements

Space Summary:

Type of Space:	Office
Number Required:	1
Total Number:	1
Occupants:	1-4
Area:	120 SF
Primary Function:	Day-to-day operations, individual and small group meetings, written and verbal communications, daily document access.

Relationships:

Location:	Second Level
Adjacencies:	None required
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Visually accessible, comfortable, natural lighting

Finishes:

Floor:	Carpet
Walls:	Painted gypsum board
Ceiling:	Painted gypsum board
Specialty Finishes:	None required
Sound:	Secure and sound proof ceiling, insulated for sound control.

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	9'-0"

Privacy/Security:

None required

Doors:

Type:	Solid core wood with clear finish.
Frame:	Painted hollow metal with glazed sidelite
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-Lockable cabinets; Lateral files; Coat rack; whiteboard

Moveable Furnishings:

-Desk; Filing cabinets; Book Shelves; Guest chairs

Equipment:

-Computer; 2 monitors; printer; conference phone; shredder; flip file and paper management system

Technical Requirements

Mechanical:

Ventilation:	5 CFM/person + 0.06 CFM/sq.ft.
Summer Design Temp:	72 ° F
Winter Design Temp:	72 ° F
Controls:	Individual direct digital controls
Sound Criteria:	35 (NC/RC)
Special Systems:	None required
Plumbing:	None required

Electrical:

Power:	1 duplex receptacle per wall. Additional capacity for equipment listed.
Phone/Data:	2 devices on opposing walls
Video:	Rough-in for future capacity
Audio:	Speaker with volume control

Lighting:

Fixture Type:	T-8 Fluorescent or LED lay-in indirect
Accent Lighting:	Task lighting at work surface
Foot Candles:	40
Controls:	Occupancy sensor

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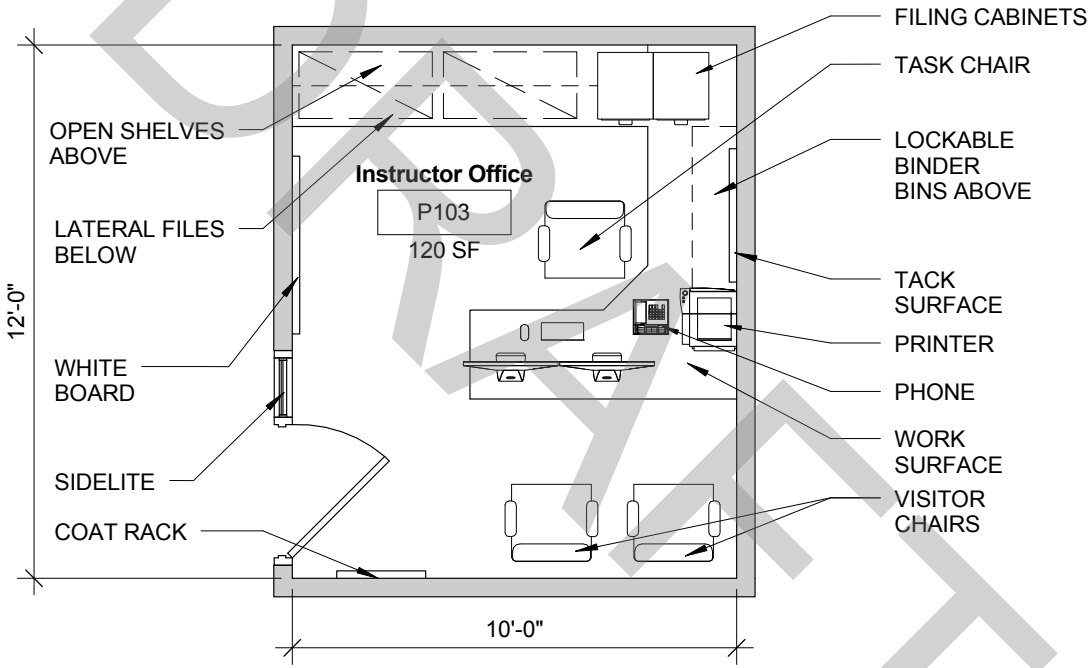
FILING CABINETS
TASK CHAIR
OPEN SHELVES ABOVE
LOCKABLE BINDER BINS ABOVE
Instructor Office
P103
120 SF
LATERAL FILES BELOW
TACK SURFACE
12'-0"
PRINTER
WHITE BOARD
PHONE
WORK SURFACE
SIDELITE
VISITOR CHAIRS
COAT RACK
10'-0"

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MISC. BUILDING

M101-101a Multipurpose Room

Space Requirements

Space Summary:

Type of Space:	Dividable classroom
Number Required:	1
Total Number:	1
Occupants:	30-200+
Area:	2000 SF
Primary Function:	Classroom use, occasional large presentation use. IVC capable.

Relationships:

Location:	First Level
Adjacencies:	None required
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Finishes:

Floor:	Static-Free carpet
Walls:	Painted gypsum board
Ceiling:	Gypsum board- sound proof
Specialty Finishes:	None required
Sound:	Sound proof wall divider

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	10'-0"

Privacy/Security:

Ability to lock doors during closing hours

Doors:

Type:	Solid core wood with clear finish. Folding partiion.
Frame:	Painted hollow metal with
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

Multiple white boards, Lockable cabinets for a/v equipment; storage for chairs and tables when not in use. Folding partition, STC 50

Moveable Furnishings:

-2 instructor desks 8', stack able chairs, stackable tables for lecture classes

Equipment:

(2) ceiling mounted document cameras; (2) 80" LCD screeens per side, speakers, phones, IVC cameras

Technical Requirements

Mechanical:

Ventilation:	7.5 CFM/person + 0.06 CFM/sq.ft.
Summer Design Temp:	72 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	30 (NC/RC)
Special Systems:	Theater-style sound system
Plumbing:	None required

Electrical:

Power:	2 duplex receptacle per wall and at instructor station, 10 floor outlets (per room). Additional capacity for equipment listed.
Phone/Data:	2 devices on opposing walls and at instructor station; 1 wireless airport; 10 devices (per room) for student speaker phones
Video:	A/V system with internet connection
Audio:	Ceiling speaker with volume control

Lighting:

Fixture Type:	T-8 Fluorescent lay-in indirect
Accent Lighting:	Where appropriate
Foot Candles:	40-45
Controls:	Occupancy sensor with zoned lighting, must be able to turn off light bank directly over the projector screens, with partition sensing controls

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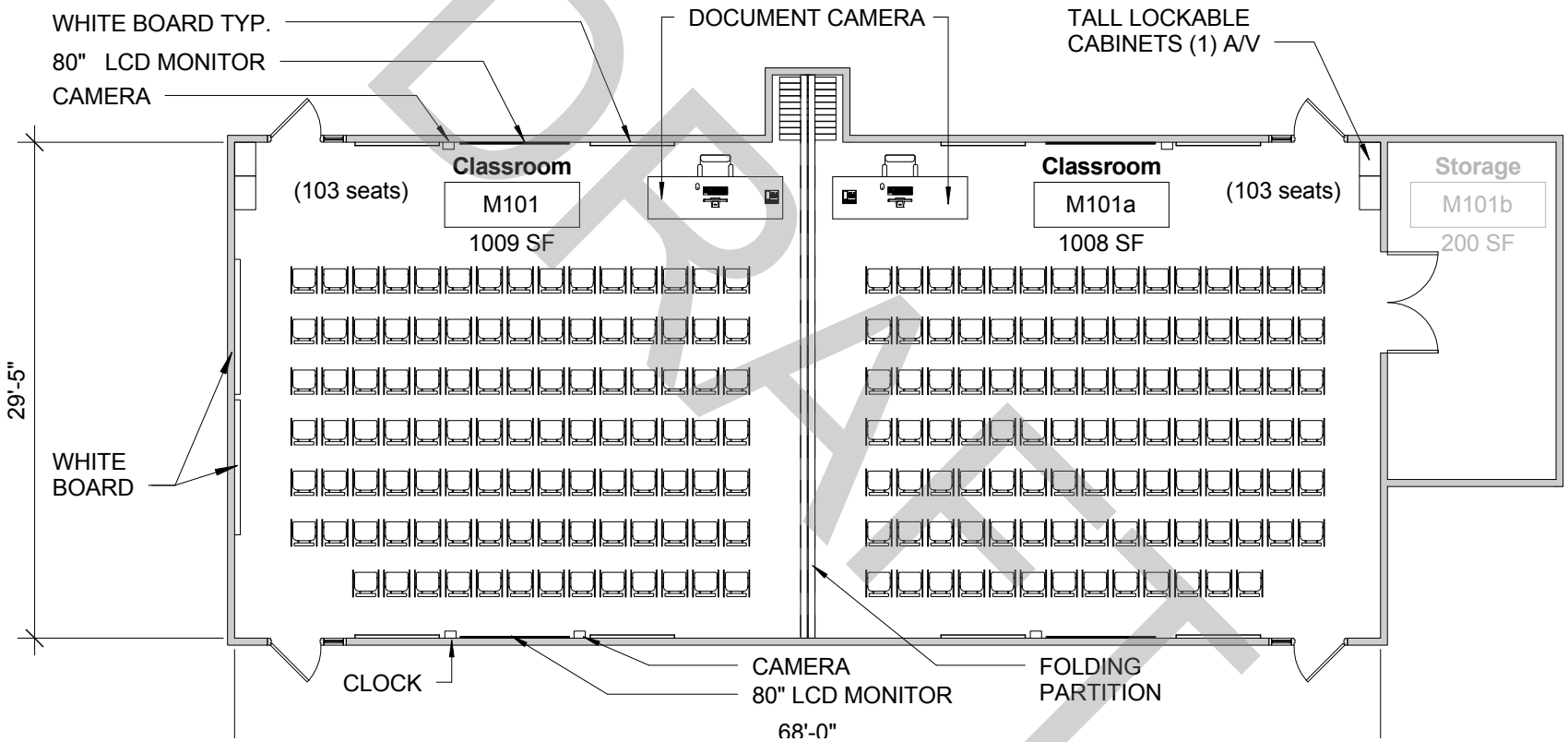
WHITE BOARD TYP.
80" LCD MONITOR
CAMERA
DOCUMENT CAMERA
TALL LOCKABLE CABINETS (1) A/V
Classroom
M101
1009 SF
(103 seats)
Classroom
M101a
1008 SF
(103 seats)
Storage
M101b
200 SF
29'-5"
WHITE BOARD
CLOCK
CAMERA
80" LCD MONITOR
FOLDING PARTITION
68'-0"
DRAFT

M101b Table and Chair Storage

Space Requirements

Space Summary:

Type of Space:	Storage
Number Required:	1
Total Number:	1
Occupants:	0
Area:	200 SF
Primary Function:	Provide a storage area for tables and chairs

Relationships:

Location:	First Level
Adjacencies:	None required
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Finishes:

Floor:	VCT or hard, durable surface, w/4” rubber base
Walls:	Painted gypsum board
Ceiling:	Suspended 2’x2’ ACT
Specialty Finishes:	None required
Sound:	None required

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	9’-0”

Privacy/Security:

No additional security required

Doors:

Type:	Solid core wood with clear finish.
Frame:	Painted hollow metal
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-None required

Moveable Furnishings:

-None required

Equipment:

-None required

Technical Requirements

Mechanical:

Ventilation:	20 CFM/person (min.) (100% Exhaust)
Summer Design Temp:	95 ° F
Winter Design Temp:	68 ° F
Controls:	No temp control, freeze protection only
Sound Criteria:	35 (NC/RC)
Special Systems:	None required
Plumbing:	None required

Electrical:

Power:	2 duplex receptacles per wall
Phone/Data:	None required
Video:	Rough-in for future capacity
Audio:	Rough-in for future capacity

Lighting:

Fixture Type:	T-8 Fluorescent lay-in direct
Accent Lighting:	None required
Foot Candles:	10/15
VCP:	70
Controls:	Occupancy sensor

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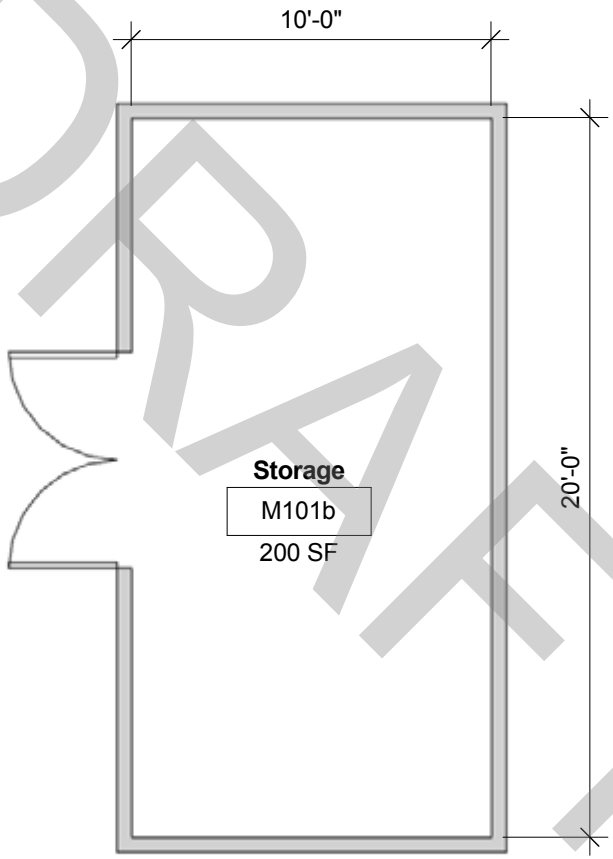

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M103 Tutoring Rooms

Space Requirements

Space Summary:

Type of Space:	Tutoring Rooms
Number Required:	1
Total Number:	1
Occupants:	8
Area:	450 SF
Primary Function:	Tutoring for a variety of disciplines, including math, chemistry, biology, anatomy, etc. May involve multiple subjects being tutored at the same time.

Relationships:

Location:	First Level
Adjacencies:	None required
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Welcoming and inviting

Finishes:

Floor:	Carpet
Walls:	Painted gypsum board
Ceiling:	Suspended 2'x4' ACT
Specialty Finishes:	None required
Sound:	Sound and vibration isolation required

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	10'-0"

Privacy/Security:

Visible for safety, but not in open lounge area

Doors:

Type:	Solid core wood with clear finish.
Frame:	Painted hollow metal with glazed sidelite
Special:	Sound Isolation

Windows:

Type:	Interior
Glazing:	Clear
Natural Light:	None required

Casework/Fixed Equipment:

-None required

Moveable Furnishings:

-4 tables; 32 chairs

Equipment:

-several whiteboards, Tack board

Technical Requirements

Mechanical:

Ventilation:	5 CFM/person + 0.06 CFM/sq.ft.
Summer Design Temp:	72 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	35 (NC/RC)
Special Systems:	None required
Plumbing:	None required

Electrical:

Power:	Multiple duplex receptacles per wall. Additional capacity for equipment listed.
Phone/Data:	2 devices on opposing walls
Video:	Rough-in for future capacity
Audio:	Ceiling Speakers with volume control

Lighting:

Fixture Type:	T-5 Fluorescent lay-in indirect
Accent Lighting:	None required
Foot Candles:	40
Controls:	Occupancy sensor

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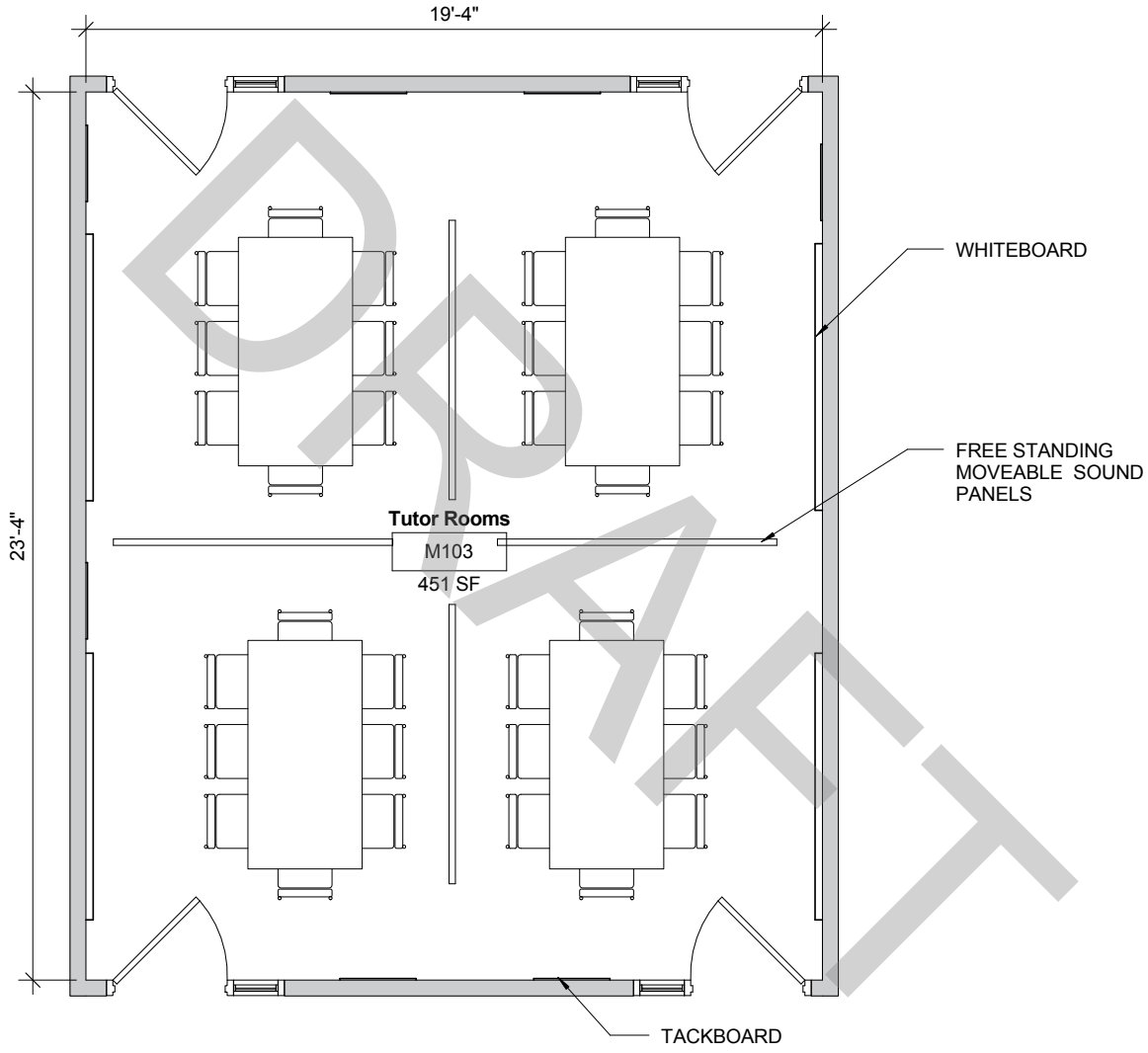
19'-4"
23'-4"
WHITEBOARD
FREE STANDING
MOVEABLE SOUND
PANELS
Tutor Rooms
M103
451 SF
TACKBOARD

DRAFT

M104 Study/Lounge Space

Space Requirements

Space Summary:

Type of Space:	Lounge
Number Required:	1
Total Number:	1
Occupants:	8
Area:	700 SF each
Primary Function:	Space for students to hang out and study

Relationships:

Location:	First Level
Adjacencies:	None required
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Welcoming and inviting

Finishes:

Floor:	Carpet
Walls:	Painted gypsum board
Ceiling:	Suspended 2'x4' ACT
Specialty Finishes:	None required
Sound:	None required

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	10'-0"

Privacy/Security:

Visible for safety, but not in open lounge area

Doors:

Type:	Solid core wood with clear finish.
Frame:	Painted hollow metal with glazed sidelite
Special:	Sound Isolation

Windows:

Type:	Interior
Glazing:	Clear
Natural Light:	None required

Casework/Fixed Equipment:

-None required

Moveable Furnishings:

-Tables, chairs

Equipment:

None required

Technical Requirements

Mechanical:

Ventilation:	5 CFM/person + 0.06 CFM/sq.ft.
Summer Design Temp:	72 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	35 (NC/RC)
Special Systems:	None required
Plumbing:	None required

Electrical:

Power:	2 duplex receptacles per wall. Additional capacity for equipment listed.
Phone/Data:	2 devices on opposing walls
Video:	Rough-in for future capacity
Audio:	Ceiling Speakers with volume control

Lighting:

Fixture Type:	T-8 Fluorescent or LED lay-in indirect
Accent Lighting:	None required
Foot Candles:	40
Controls:	Occupancy sensor

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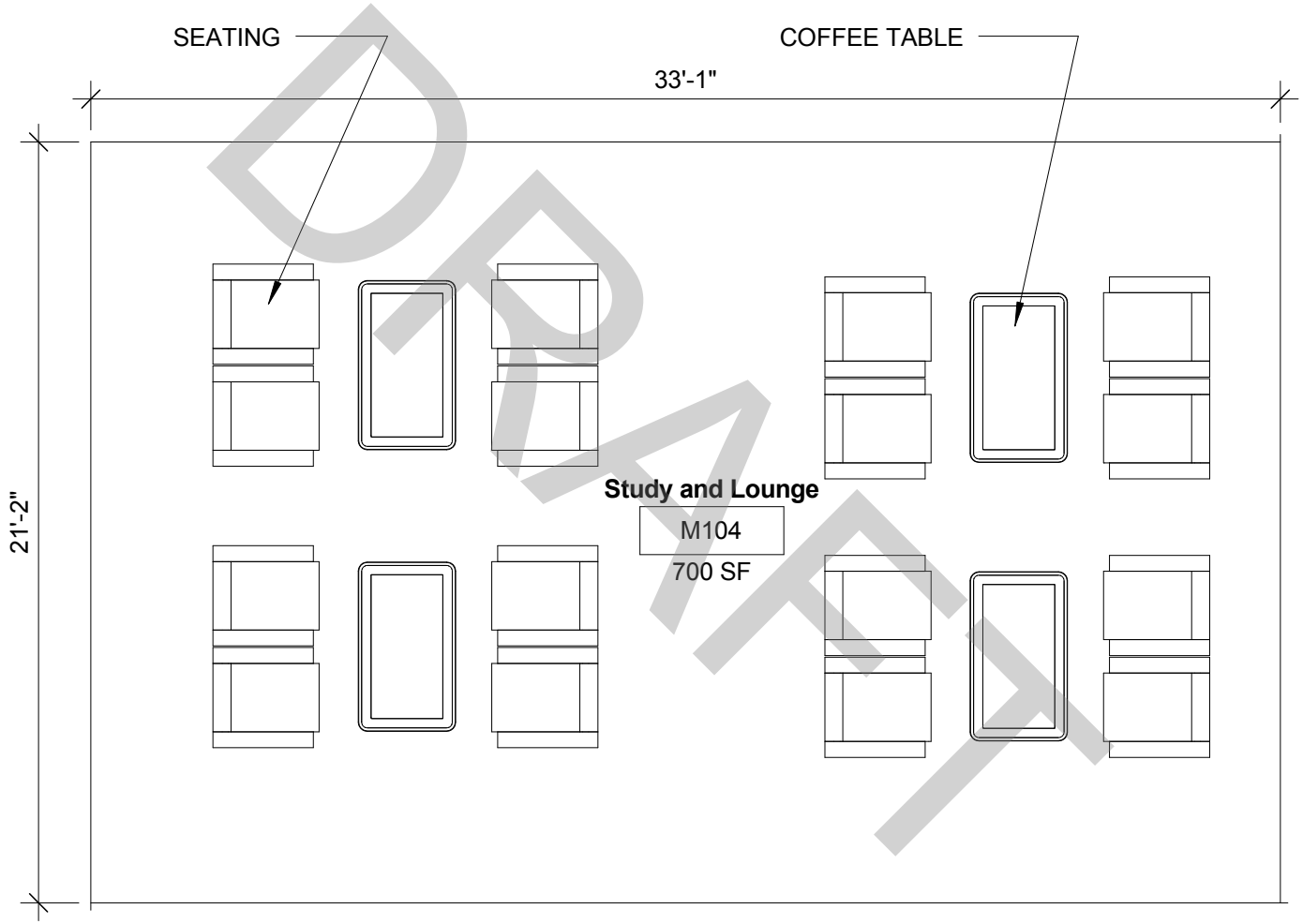

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M105 Faculty/Staff Break Room

Space Requirements

Space Summary:

Type of Space:	Lounge/Kitchen
Number Required:	1
Total Number:	1
Occupants:	10
Area:	300
Primary Function:	A place for faculty and staff to eat, relax, socialize in small groups. Support the food for large events.

Relationships:

Location:	Second Level
Adjacencies:	Large auditorium; Multi-purpose; Shower and locker rooms
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Comfortable, relaxing, easy to keep clean

Finishes:

Floor:	Linoleum or VCT
Walls:	Painted gypsum board
Ceiling:	Suspended 2'x4' ACT
Specialty Finishes:	None required
Sound:	None required

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	10'-0"

Privacy/Security:

Secure catering equipment and dishes

Doors:

Type:	Solid core wood with clear finish.
Frame:	Painted hollow metal with glazed sidelite
Special:	Sound Isolation

Windows:

Type:	Interior
Glazing:	Clear
Natural Light:	None required

Casework/Fixed Equipment:

-Cupboards/cabinets (enough to store food service equipment--large trays, water coolers, silverware, utensils, large bowls, etc.)
-Counter top

Moveable Furnishings:

-Comfortable lounge chairs, dining table and chairs

Equipment:

-Full size refrigerator; microwave; sink; oven/stove; dishwasher

Technical Requirements

Mechanical:

Ventilation:	5 CFM/person + 0.06 CFM/sq.ft.
Summer Design Temp:	72 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	35 (NC/RC)
Special Systems:	Cooking exhaust 0.30 CFM/sq.ft. min.
Plumbing:	140° F hose to sinks and dishwasher, food disposal.

Electrical:

Power:	2 duplex receptacles per wall. Additional capacity for equipment listed.
Phone/Data:	2 devices on opposing walls
Video:	1 device
Audio:	Ceiling Speakers with volume control

Lighting:

Fixture Type:	T-8 Fluorescent or LED lay-in indirect
Accent Lighting:	None required
Foot Candles:	40
Controls:	Occupancy sensor

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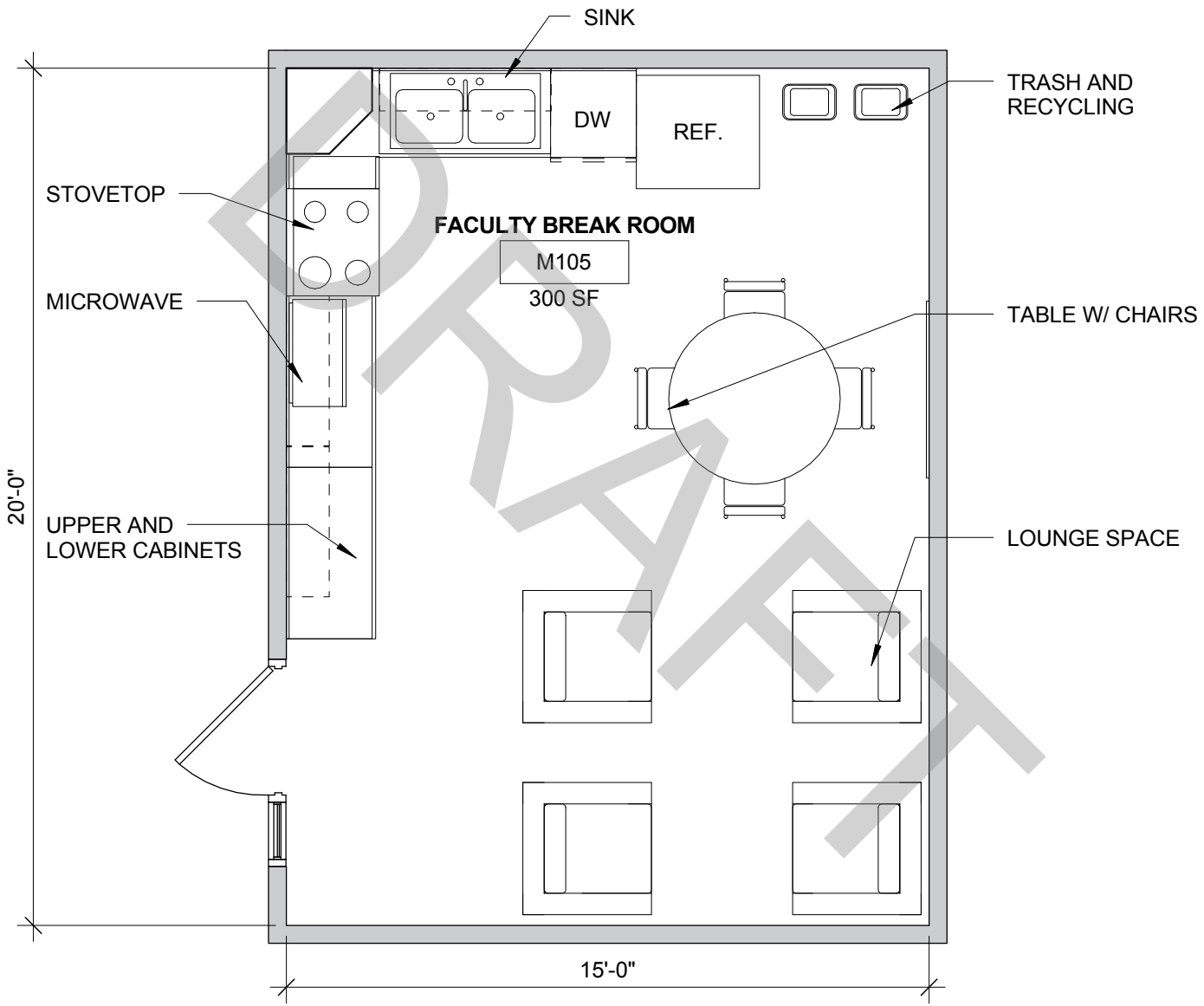

SINK
DW
REF.
TRASH AND
RECYCLING
STOVETOP
FACULTY BREAK ROOM
M105
300 SF
MICROWAVE
TABLE W/ CHAIRS
20'-0"
UPPER AND
LOWER CABINETS
LOUNGE SPACE
15'-0"

DRAFT

M105a Faculty/Staff Work Room

Space Requirements

Space Summary:

Type of Space:	Office work space
Number Required:	1
Total Number:	1
Occupants:	10
Area:	300
Primary Function:	Place for photocopying, printing, sorting and distributing mail.

Relationships:

Location:	Second Level
Adjacencies:	Faculty offices; direct adjacency to facilitator office; receiving dock
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Finishes:

Floor:	Carpet
Walls:	Painted gypsum board
Ceiling:	Suspended 2'x 4' ACT
Specialty Finishes:	None required
Sound:	Sound and smell isolation required

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	10'-0"

Privacy/Security:

Secure entrance from public

Doors:

Type:	Solid core wood with clear finish.
Frame:	Painted hollow metal with glazed sidelite
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-Counter tops; cupboards; drawers; mailslots; plenty of storage space

Moveable Furnishings:

-Small table, (4) chairs

Equipment:

-Photocopier; colored printer; tack board

Technical Requirements

Mechanical:

Ventilation:	5 CFM/person + 0.06 CFM/sq.ft.
Summer Design Temp:	72 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	35 (NC/RC)
Special Systems:	Exhaust 0.5 CFM/SQFT, negative pressurization, no recirculation air
Plumbing:	None required

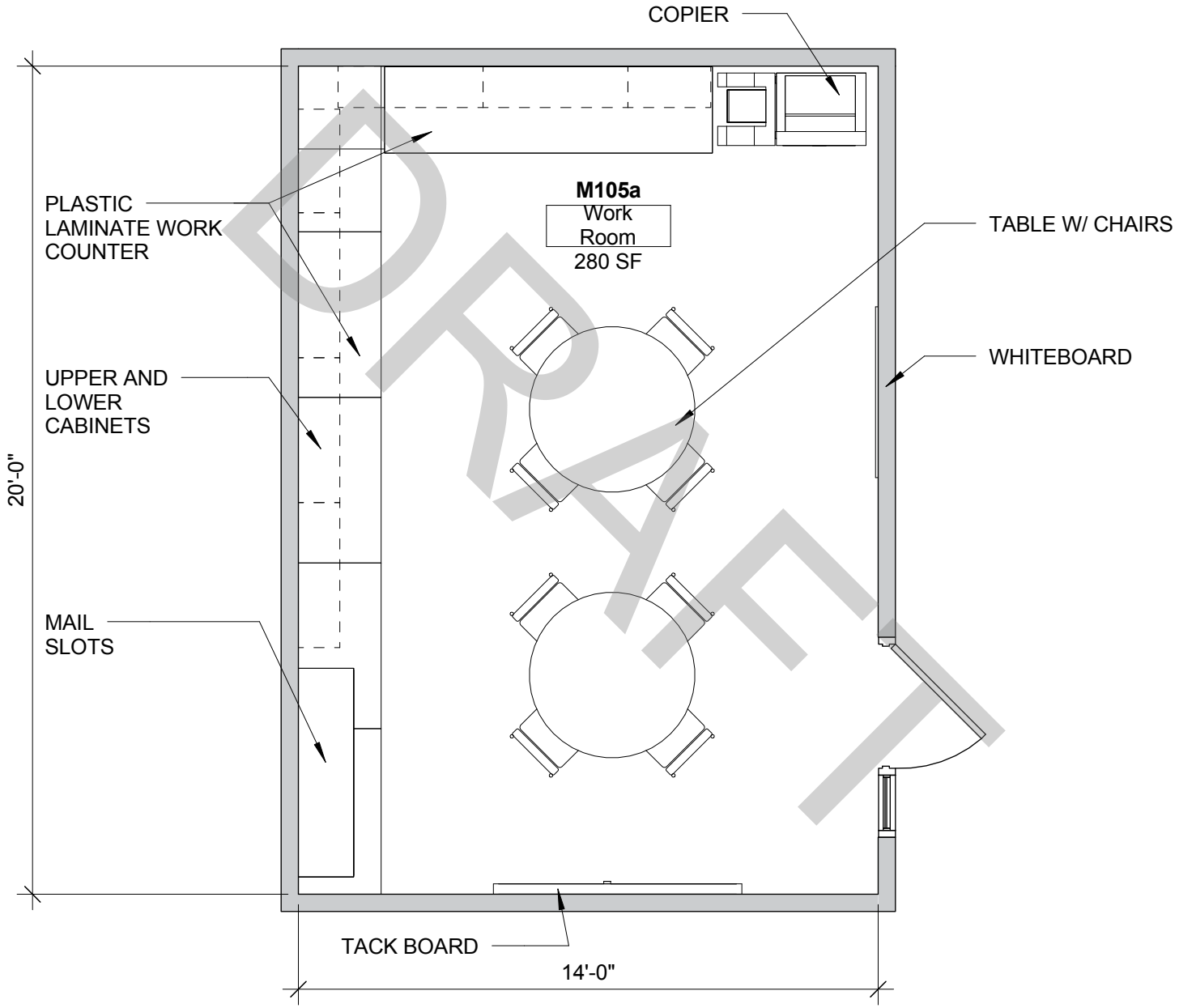
Electrical:

Power:	2 duplex receptacles per wall. Additional capacity for equipment listed.
Phone/Data:	2 devices on opposing walls; networked photocopier/printer
Video:	Rough-in for future capacity
Audio:	Ceiling Speakers with volume control

Lighting:

Fixture Type:	T-8 Fluorescent or LED lay-in indirect
Accent Lighting:	None required
Foot Candles:	40
Controls:	Occupancy sensor

DRAFT


COPIER
PLASTIC LAMINATE WORK COUNTER
M105a
Work Room
280 SF
TABLE W/ CHAIRS
WHITEBOARD
UPPER AND LOWER CABINETS
20'-0"
MAIL SLOTS
TACK BOARD
14'-0"

DRAFT

M106 Facilitator Office/ Reception Area

Space Requirements

Space Summary:

Type of Space:	Office/Reception
Number Required:	1
Total Number:	1
Occupants:	1-3
Area:	120 SF
Primary Function:	Default reception desk for the building. Phoning, printing, checking computers, organizing course materials, greeting visitors. Will serve as a central location for communicating with other facilitators, professors, and other campuses.

Relationships:

Location:	First Level
Adjacencies:	Classrooms; Receiving area; front entrance
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Functional, but welcoming.

Finishes:

Floor:	Carpet
Walls:	Painted gypsum board
Ceiling:	Painted gypsum board
Specialty Finishes:	None required
Sound:	Secure and sound proof ceiling, insulated for sound control.

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	9’-0”

Privacy/Security:

Secured when closed

Doors:

Type:	Solid core wood with clear finish.
Frame:	Painted hollow metal with
Special:	Sound Isolation

Windows:

Type:	Interior
Glazing:	Low-e
Natural Light:	None required

Casework/Fixed Equipment:

-Lockable cabinets for iPads, radio devices, and other equipment; lateral files; coat rack

Moveable Furnishings:

-1 Desk; (1) filing cabinets; (1) rolling chairs

Equipment:

-1 Computer; printer/photocopier/fax; (1) phones; shredder
-Whiteboard

Technical Requirements

Mechanical:

Ventilation:	5 CFM/person + 0.06 CFM/sq.ft.
Summer Design Temp:	72 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	35 (NC/RC)
Special Systems:	Exhaust 0.5 CFM/SQFT, negative pressurization, no recirculation air
Plumbing:	None required

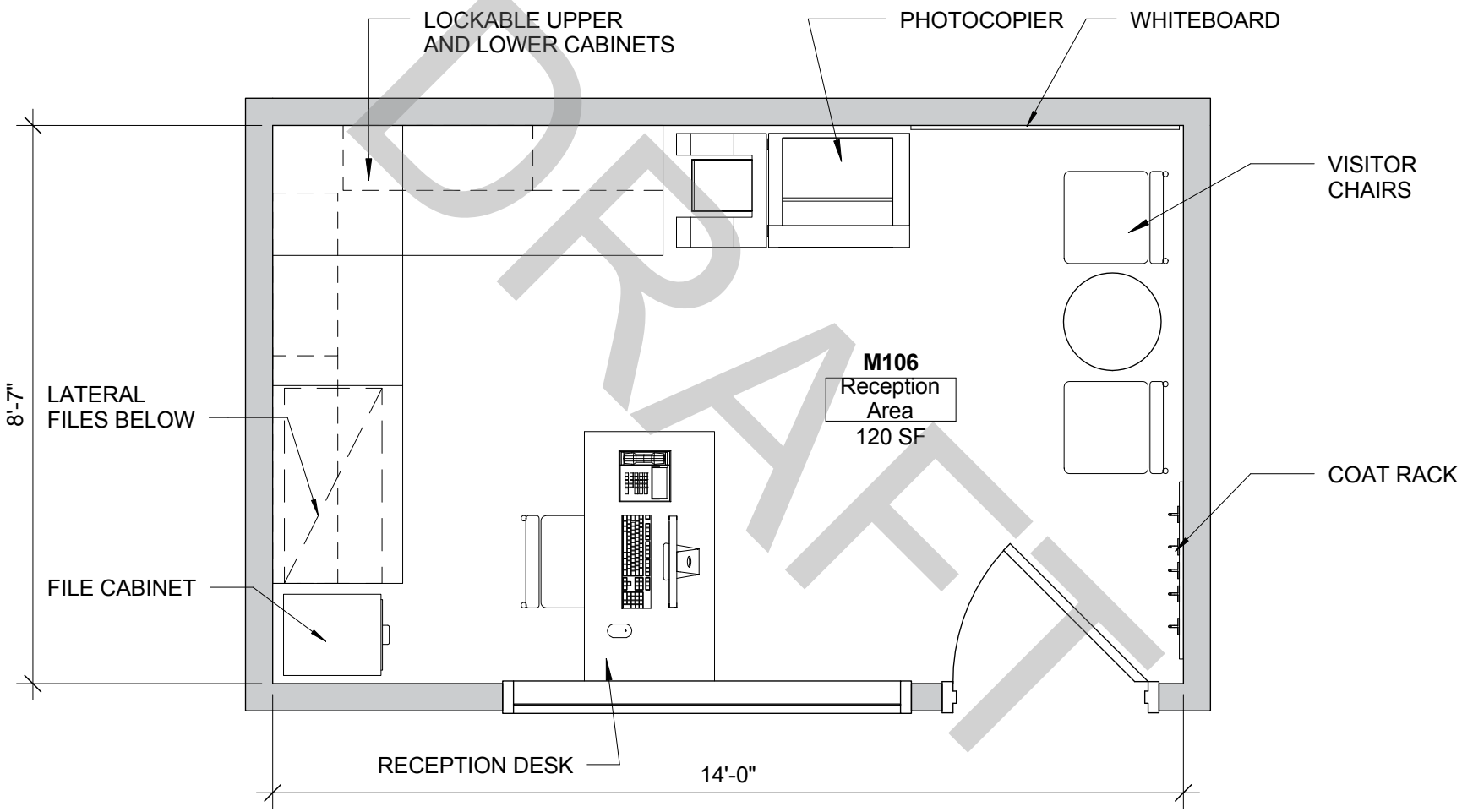
Electrical:

Power:	1 duplex receptacle per wall. 1 fourplex receptacle at desk. Additional capacity for equipment listed.
Phone/Data:	2 devices on opposing walls, and at desk
Video:	Rough-in for future capacity
Audio:	Speaker with volume control

Lighting:

Fixture Type:	T-8 Fluorescent or LED lay-in indirect
Accent Lighting:	Task lighting at work surface
Foot Candles:	40
Controls:	Occupancy sensor

DRAFT


LOCKABLE UPPER
AND LOWER CABINETS
PHOTOCOPIER
WHITEBOARD
VISITOR
CHAIRS
M106
Reception
Area
120 SF
LATERAL
FILES BELOW
8'-7"
COAT RACK
FILE CABINET
RECEPTION DESK
14'-0"

DRAFT

M109 General Conference Room

Space Requirements

Space Summary:

Type of Space:	Conference Room
Number Required:	1
Total Number:	1
Occupants:	10-20
Area:	300 SF
Primary Function:	Provide conference for staff, faculty, IVC collaboration, hosting advisory board meetings, and small civic meetings.

Relationships:

Location:	Second Level
Adjacencies:	Reception, faculty offices, restrooms
Separation:	None required

Architectural Requirements

Design/Aesthetic:

Finishes:

Floor:	Carpet
Walls:	Painted gypsum board
Ceiling:	Painted gypsum board
Specialty Finishes:	None required
Sound:	None required

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	9’-0”

Privacy/Security:

None required

Doors:

Type:	Solid core wood with clear finish.
Frame:	Painted hollow metal with glazed sidelite
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-Upper and lower cabinets

Moveable Furnishings:

-Conference table, chairs, IVC, coat rack

Equipment:

-Sink, refrigerator, warming plates, recessed 80” smart board, 80” LCD, cameras

Technical Requirements

Mechanical:

Ventilation:	5 CFM/person + 0.06 CFM/sq.ft.
Summer Design Temp:	72 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	25-30 (NC/RC)
Special Systems:	Co2 monitoring and demand control ventilation
Plumbing:	Hand sink, supply, waste and vent

Electrical:

Power:	1 duplex receptacle per wall. 1 four-plex floor box under table. Additional capacity for equipment listed.
Phone/Data:	1 device on opposing walls, 1 floor box under table
Video:	A/V system with internet connection
Audio:	Speaker with volume control

Lighting:

Fixture Type:	T-8 Fluorescent video conference type with dimming ballast
Accent Lighting:	CFL or LED
Foot Candles:	50
Controls:	Dimming control and relay

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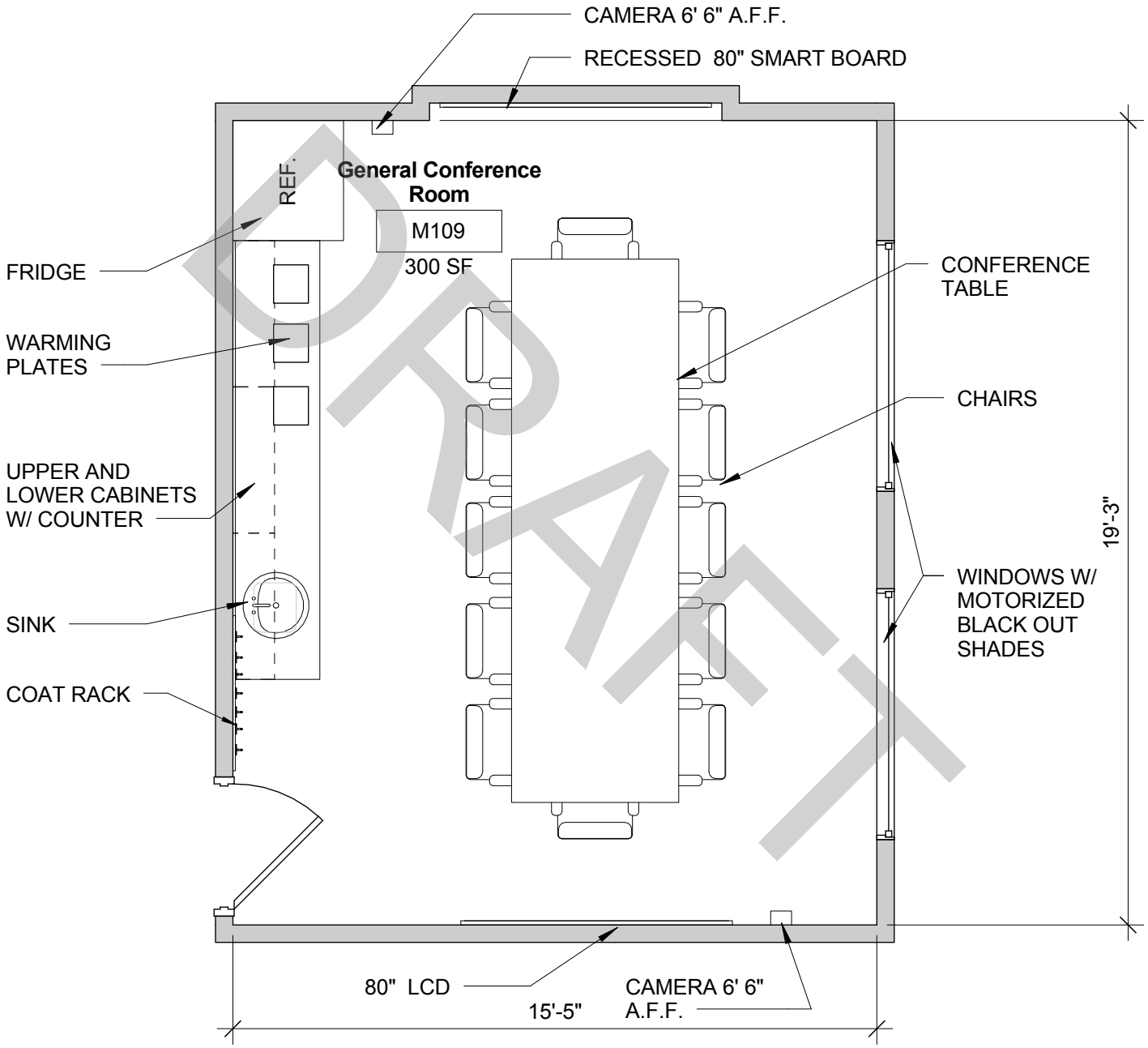
CAMERA 6' 6" A.F.F.
RECESSED 80" SMART BOARD
REF.
General Conference Room
M109
300 SF
FRIDGE
WARMING PLATES
UPPER AND LOWER CABINETS W/ COUNTER
SINK
COAT RACK
CONFERENCE TABLE
CHAIRS
WINDOWS W/ MOTORIZED BLACK OUT SHADES
19'-3"
80" LCD
15'-5"
CAMERA 6' 6" A.F.F.
DRAFT

10 Building Support

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BUILDING SUPPORT

S101-104 Restrooms

Space Requirements

Space Summary:

Type of Space:	Enclosed Public Rest room
Number Required:	2 per gender
Total Number:	4
Occupants:	3
Area:	300 SF
Primary Function:	Building Support Space

Relationships:

Location:	First Level and Second Level
Adjacencies:	None required
Separation:	Separation between stalls and genders

Architectural Requirements

Design/Aesthetic:

None required

Finishes:

Floor:	Ceramic Tile, slope to floor drain
Walls:	Ceramic Tile
Ceiling:	Suspended 2'x2' ACT
Specialty Finishes:	None required
Sound:	Sound proof insulated walls

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	9'-0"

Privacy/Security:

Separated/private stalls

Doors:

Type:	Solid core wood with clear finish.
Frame:	Painted hollow metal
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-Water closet; Urinal; Lavatory; Toilet Partition; Urinal Screen; Mirror; Grab Bars; Dispensers; Waste Receptacles

Moveable Furnishings:

None required

Equipment:

None required

Technical Requirements

Mechanical:

Ventilation:	1.0 CFM/sq.ft. (100% Exhaust)
Summer Design Temp:	72 ° F
Winter Design Temp:	70 ° F
Controls:	Individual direct digital controls
Sound Criteria:	40 (NC/RC)
Special Systems:	6 min. air exchange exhaust
Plumbing:	Wall hung flush valve water closets and urinals; wall hung lavatories; floor drains; water, waste & venting

Electrical:

Power:	1 GFCI duplex outlet per wall
Phone/Data:	None required
Video:	None required
Audio:	Ceiling speaker with volume control

Lighting:

Fixture Type:	T-8 Fluorescent lay-in indirect
Accent Lighting:	Required at mirrors
Foot Candles:	30
Controls:	Occupancy sensor

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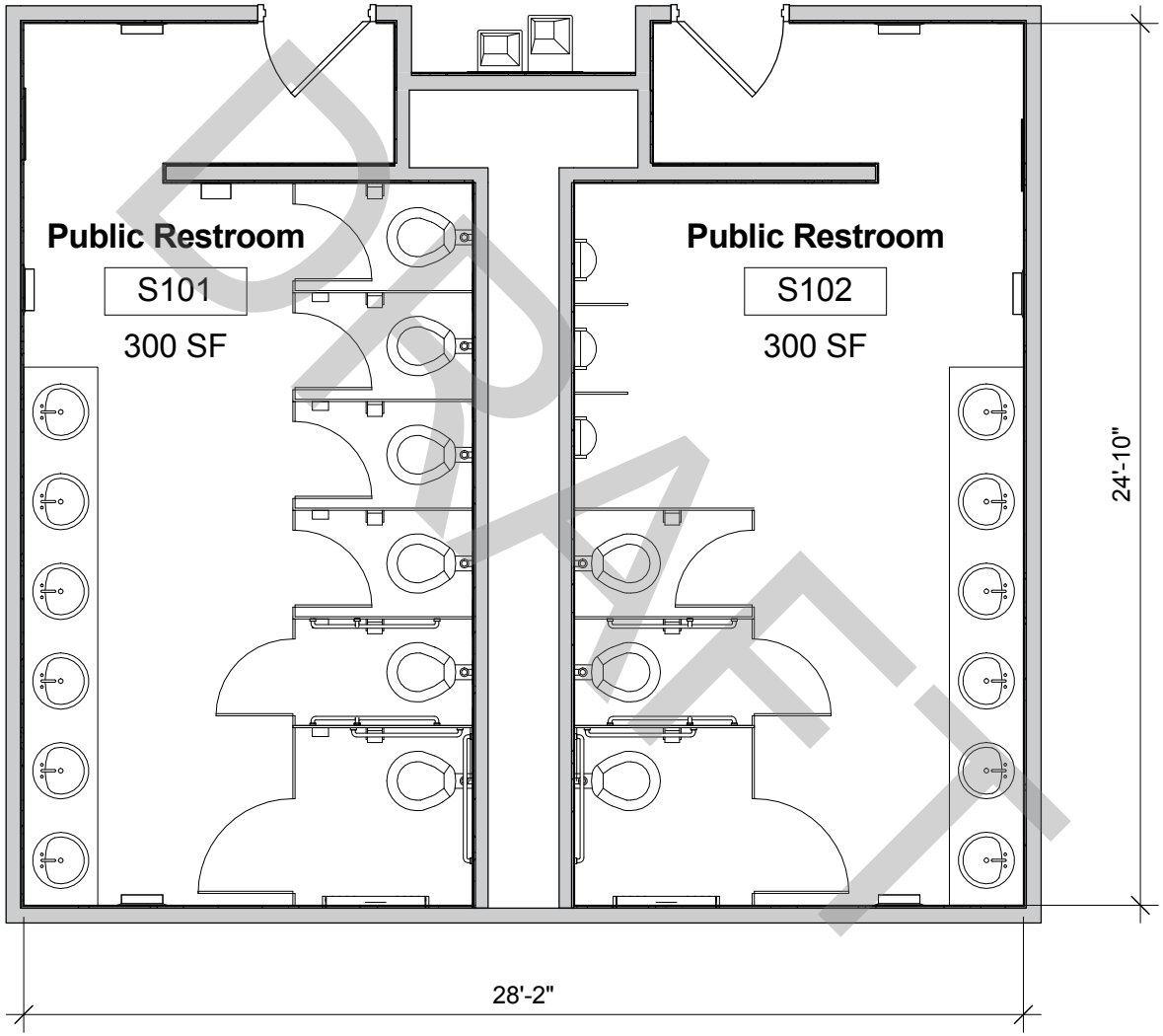
Public Restroom
S101
300 SF
Public Restroom
S102
300 SF
24'-10"
28'-2"

DRAFT

S105-107 ELECTRICAL ROOM

Space Requirements

Space Summary:

Type of Space:	Electrical Room
Number Required:	3
Total Number:	3
Occupants:	0
Area:	460 SF
Primary Function:	Provide central distribution for building electrical systems

Relationships:

Location:	First Level and Second Level
Adjacencies:	Centrally located
Separation:	Quiet areas, Main telecommunications room and closets

Architectural Requirements

Design/Aesthetic:

None required

Finishes:

Floor:	Sealed concrete
Walls:	Painted gypsum board
Ceiling:	Suspended 2'x2' ACT
Specialty Finishes:	None required
Sound:	Sound proof insulated walls

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	9'-0"

Privacy/Security:

None required

Doors:

Type:	Solid core wood with clear finish.
Frame:	Painted hollow metal
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-None required

Moveable Furnishings:

-None required

Equipment:

-See Electrical Design Criteria in the Building Requirement Section of this document for Equipment list.

Technical Requirements

Mechanical:

Ventilation:	None required
Summer Design Temp:	74 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	30 (NC/RC)
Special Systems:	5 min. air exchange exhaust
Plumbing:	None required

Electrical:

Power:	1 duplex outlet every 10'-0"
Phone/Data:	1 device per wall
Video:	Rough-in for future capacity
Audio:	Rough-in for future capacity

Lighting:

Fixture Type:	T-8 Fluorescent lay-in indirect
Accent Lighting:	None required
Foot Candles:	40
Controls:	Manual Switch

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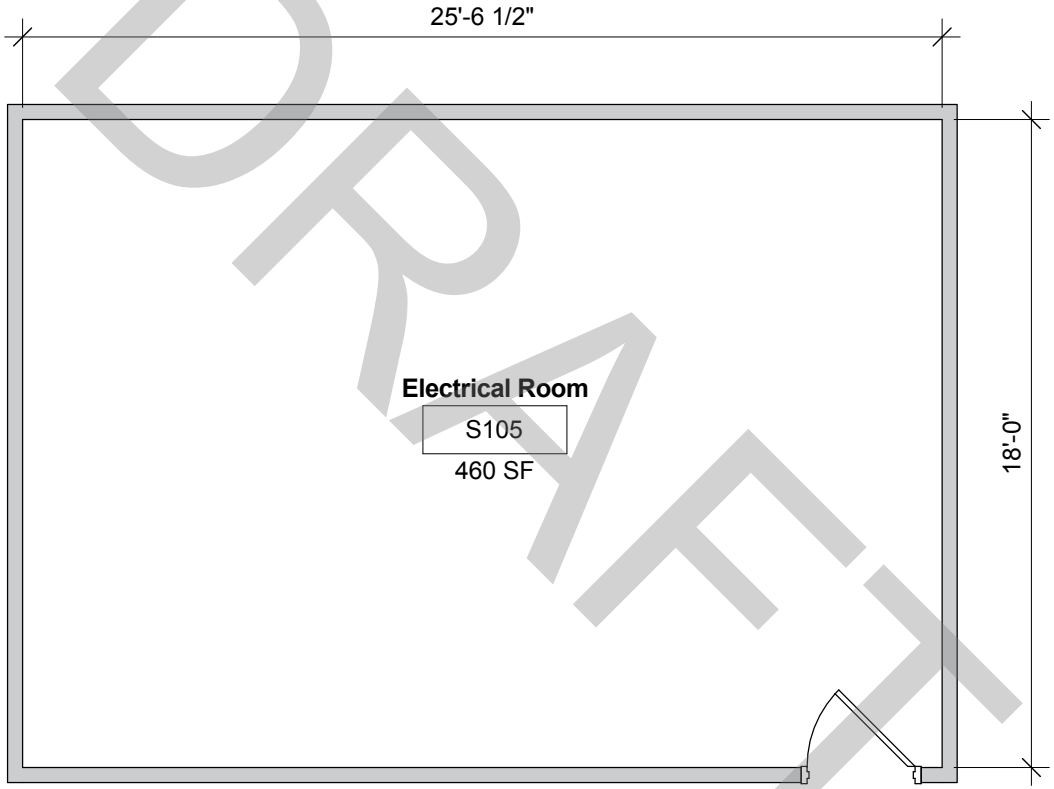

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S108-109 Mechanical Room

Space Requirements

Space Summary:

Type of Space:	Mechanical Room
Number Required:	1
Total Number:	1
Occupants:	0
Area:	1500 SF
Primary Function:	Accommodate mechanical equipment, piping, ducts and control systems

Relationships:

Location:	First Level and Second Level
Adjacencies:	Centrally located for piping/ducts
Separation:	Quiet areas; High traffic public areas

Architectural Requirements

Design/Aesthetic:

None required

Finishes:

Floor:	Sealed concrete; slope floor to drains
Walls:	Painted gypsum board
Ceiling:	Suspended 2'x2' ACT
Specialty Finishes:	None required
Sound:	Sound proof insulated walls

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	9'-0"

Privacy/Security:

None required

Doors:

Type:	Solid core wood with clear finish.
Frame:	Painted hollow metal
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-None required

Moveable Furnishings:

-None required

Equipment:

-See Mechanical Design Criteria in the Building Requirement Section of this document for Equipment list.

Technical Requirements

Mechanical:

Ventilation:	.5 CFM/person (min.)
Summer Design Temp:	78 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	30 (NC/RC)
Special Systems:	10 min. air exchange exhaust; provides summer cooling; emergency boiler shut off.
Plumbing:	Hot and cold water hose bib floor drain; water, waste and venting

Electrical:

Power:	1 duplex outlet every 10'-0"
Phone/Data:	Data connection to DDC controls; 1 device minimum
Video:	Rough-in for future capacity
Audio:	Rough-in for future capacity

Lighting:

Fixture Type:	T-8 Fluorescent lay-in indirect
Accent Lighting:	None required
Foot Candles:	40
Controls:	Manual Switch

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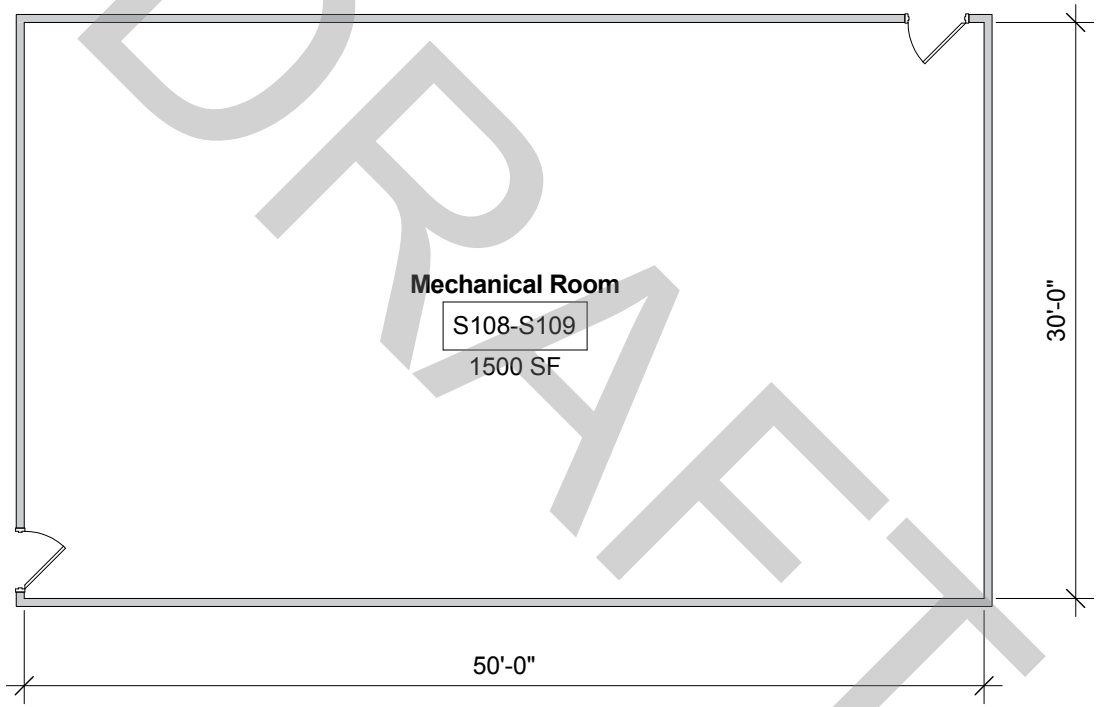

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S110-111 Janitor Closet

Space Requirements

Space Summary:

Type of Space:	Custodial Closet
Number Required:	2
Total Number:	2
Occupants:	0
Area:	80 SF
Primary Function:	Building Support Space

Relationships:

Location:	First Level and Second Level
Adjacencies:	None required
Separation:	High traffic public areas

Architectural Requirements

Design/Aesthetic:

None required

Finishes:

Floor:	Sealed concrete; slope floor to drain
Walls:	Epoxy painted gypsum board
Ceiling:	Suspended painted gypsum board
Specialty Finishes:	None required
Sound:	None required

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	9'-0"

Privacy/Security:

None required

Doors:

Type:	Solid core wood with clear finish.
Frame:	Painted hollow metal
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-Mop/Broom rack; Wall mounted shelving

Moveable Furnishings:

-None required

Equipment:

-None required

Technical Requirements

Mechanical:

Ventilation:	1.0 CFM/sq.ft. (100% Exhaust)
Summer Design Temp:	78 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	30 (NC/RC)
Special Systems:	10 min. air exchange exhaust
Plumbing:	Floor mounted mop sink; Floor drain; water, waste, and venting

Electrical:

Power:	1 GFCI duplex outlet per wall
Phone/Data:	Rough-in for future capacity
Video:	Rough-in for future capacity
Audio:	Rough-in for future capacity

Lighting:

Fixture Type:	T-8 Fluorescent lay-in indirect
Accent Lighting:	None required
Foot Candles:	30
Controls:	Occupancy sensor

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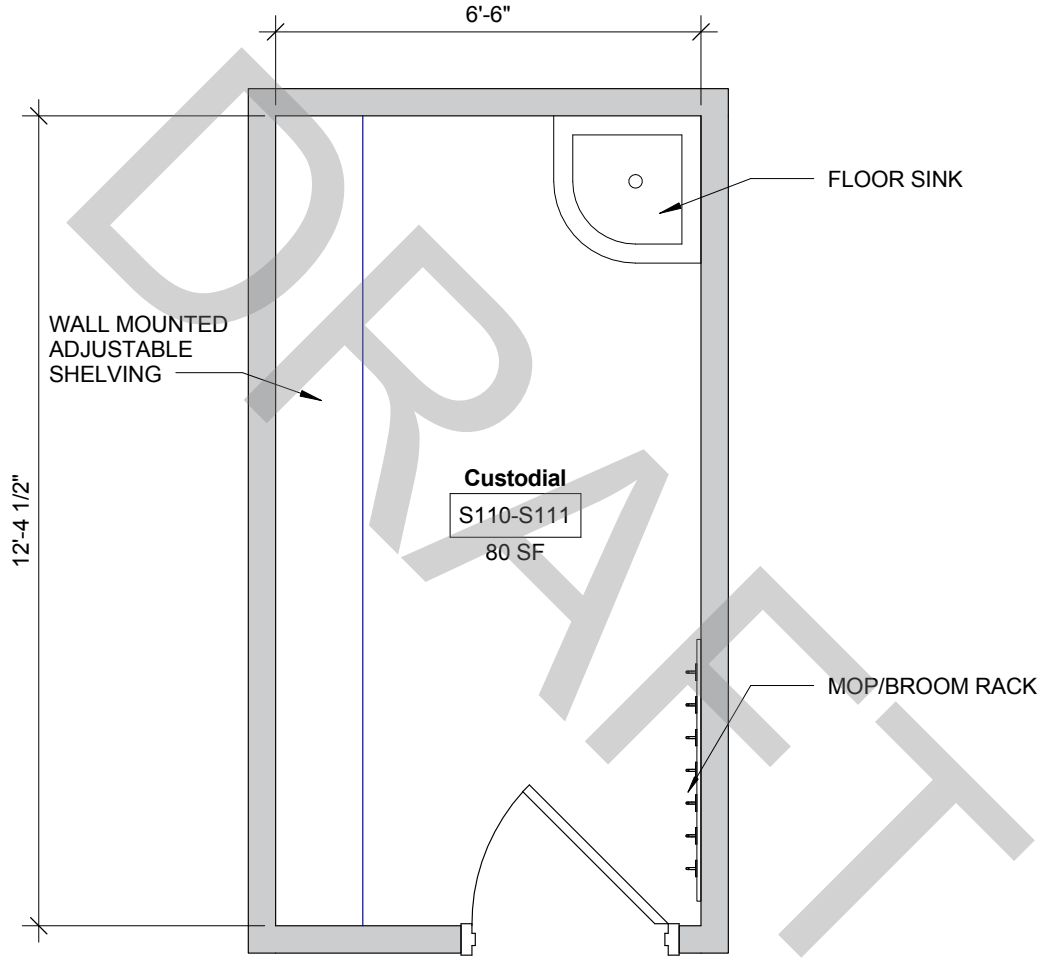
6'-6"
12'-4 1/2"
FLOOR SINK
WALL MOUNTED
ADJUSTABLE
SHELVING
Custodial
S110-S111
80 SF
MOP/BROOM RACK

DRAFT

S112-113 Elevator/Equipment Room

Space Requirements

Space Summary:

Type of Space:	Elevator/Equipment Room
Number Required:	2
Total Number:	2
Occupants:	0
Area:	160 SF
Primary Function:	Accommodate elevator equipment

Relationships:

Location:	First Level and Second Level
Adjacencies:	Elevator Shaft
Separation:	Quiet areas, high traffic public areas

Architectural Requirements

Design/Aesthetic:

None required

Finishes:

Floor:	Sealed concrete
Walls:	Painted gypsum board
Ceiling:	Suspended 2'x2' ACT
Specialty Finishes:	None required
Sound:	Sound proof insulated walls

Architectural Requirements

Ceiling Height:

Above Finish Floor (AFF):	9'-0"

Privacy/Security:

None required

Doors:

Type:	Solid core wood with clear finish.
Frame:	Painted hollow metal
Special:	Sound Isolation

Windows:

Type:	None required
Glazing:	None required
Natural Light:	None required

Casework/Fixed Equipment:

-There is to be nothing in this room except elevator related equipment. Duct work and piping are not to be run through this room.

Moveable Furnishings:

-None required

Equipment:

-See Electrical Design Criteria in the Building Requirement Section of this document for Equipment list.

Technical Requirements

Mechanical:

Ventilation:	100% Exhaust
Summer Design Temp:	74 ° F
Winter Design Temp:	68 ° F
Controls:	Individual direct digital controls
Sound Criteria:	30 (NC/RC)
Special Systems:	Independent Ventilation System (E-pwr); 100% exhaust
Plumbing:	None required

Electrical:

Power:	1 GFCI duplex outlet per wall
Phone/Data:	1 device minimum
Video:	Rough-in for future capacity
Audio:	Rough-in for future capacity

Lighting:

Fixture Type:	T-8 Fluorescent lay-in indirect
Accent Lighting:	None required
Foot Candles:	30
Controls:	Manual Switch

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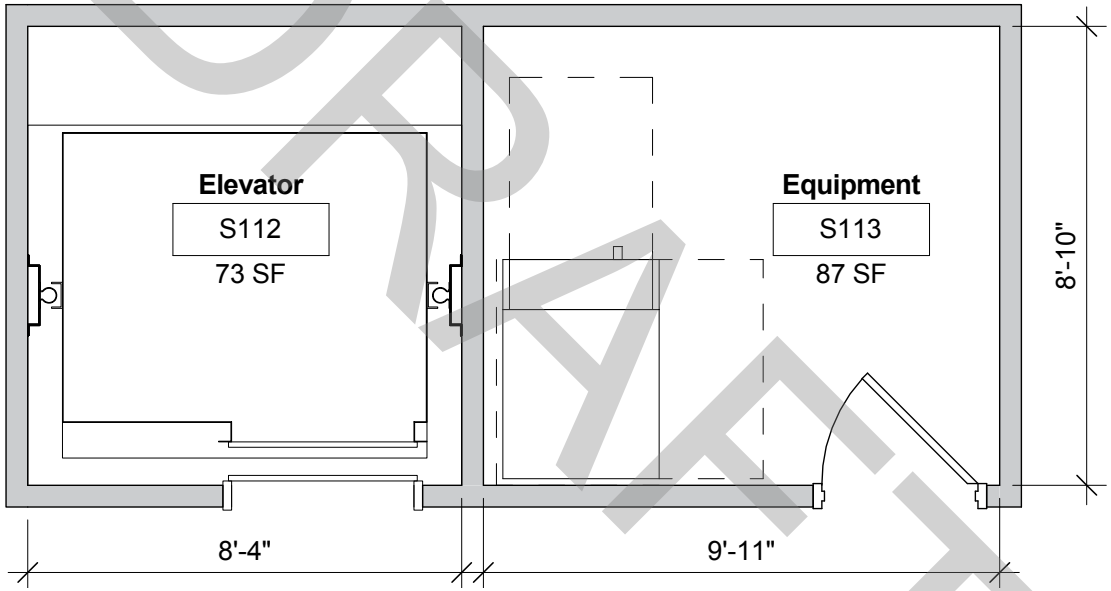

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11 Appendices

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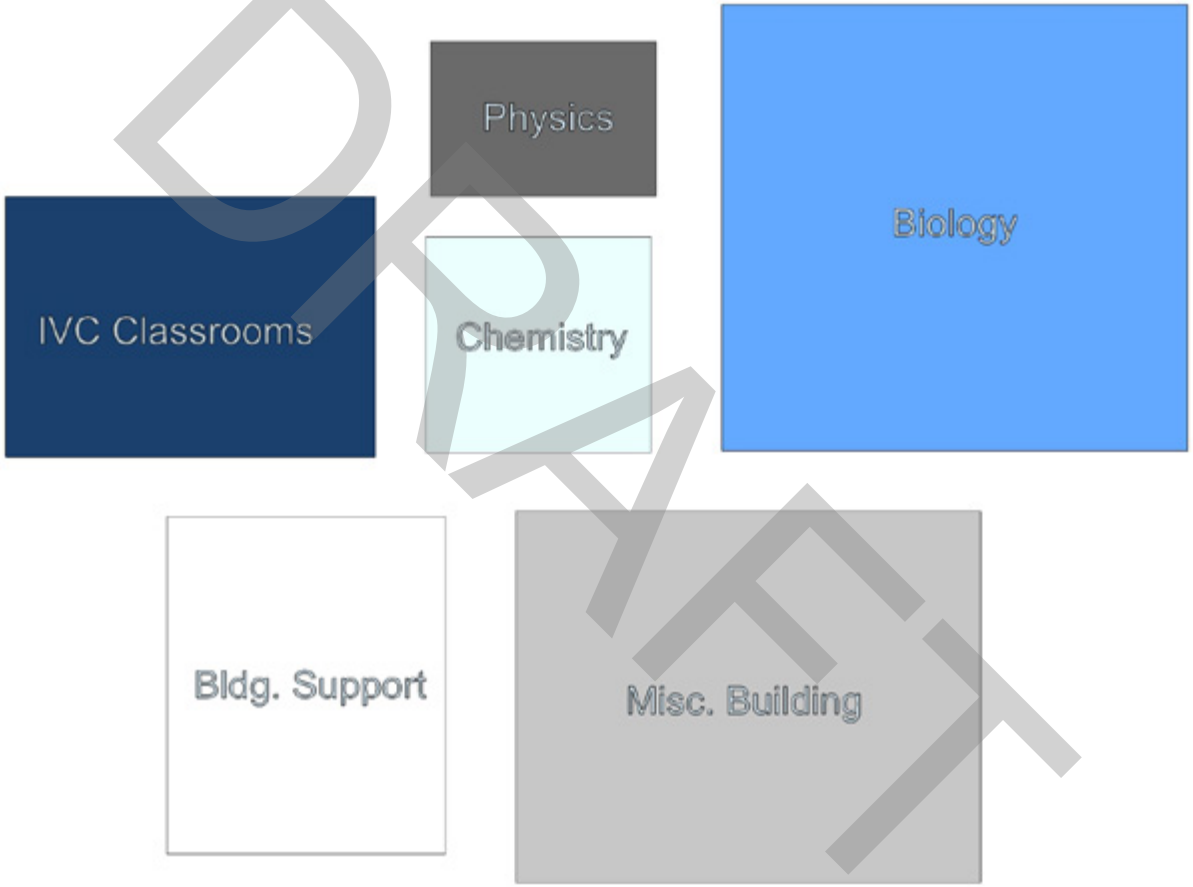
APPENDICES

11 Appendices

Appendix I-Alternate Adjacency Diagrams



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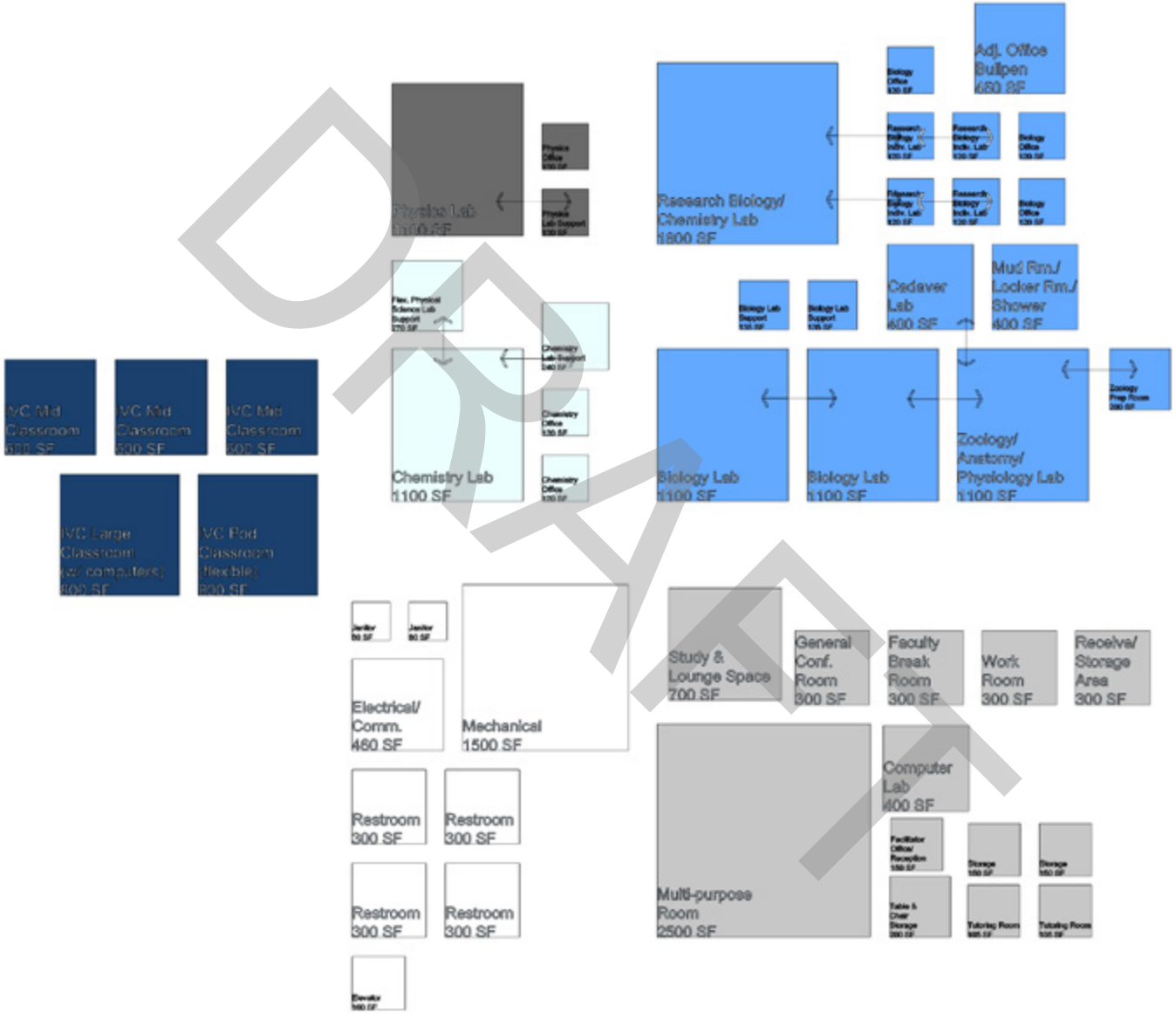
Adj. Office Bullpen 480 SF
Research Biology/ Chemistry Lab 1800 SF
Cadaver Lab 600 SF
Mud Rm./ Locker Rm./ Shower 400 SF
Chemistry Lab 1100 SF
Biology Lab 1100 SF
Biology Lab 1100 SF
Zoology/ Anatomy/ Physiology Lab 1100 SF
Electrical/ Comm. 460 SF
Mechanical 1500 SF
Study & Lounge Space 700 SF
General Conf. Room 300 SF
Faculty Break Room 300 SF
Work Room 300 SF
Receiva/ Storage Area 300 SF
Computer Lab 400 SF
Restroom 300 SF
Restroom 300 SF
Restroom 300 SF
Restroom 300 SF
Multi-purpose Room 2500 SF

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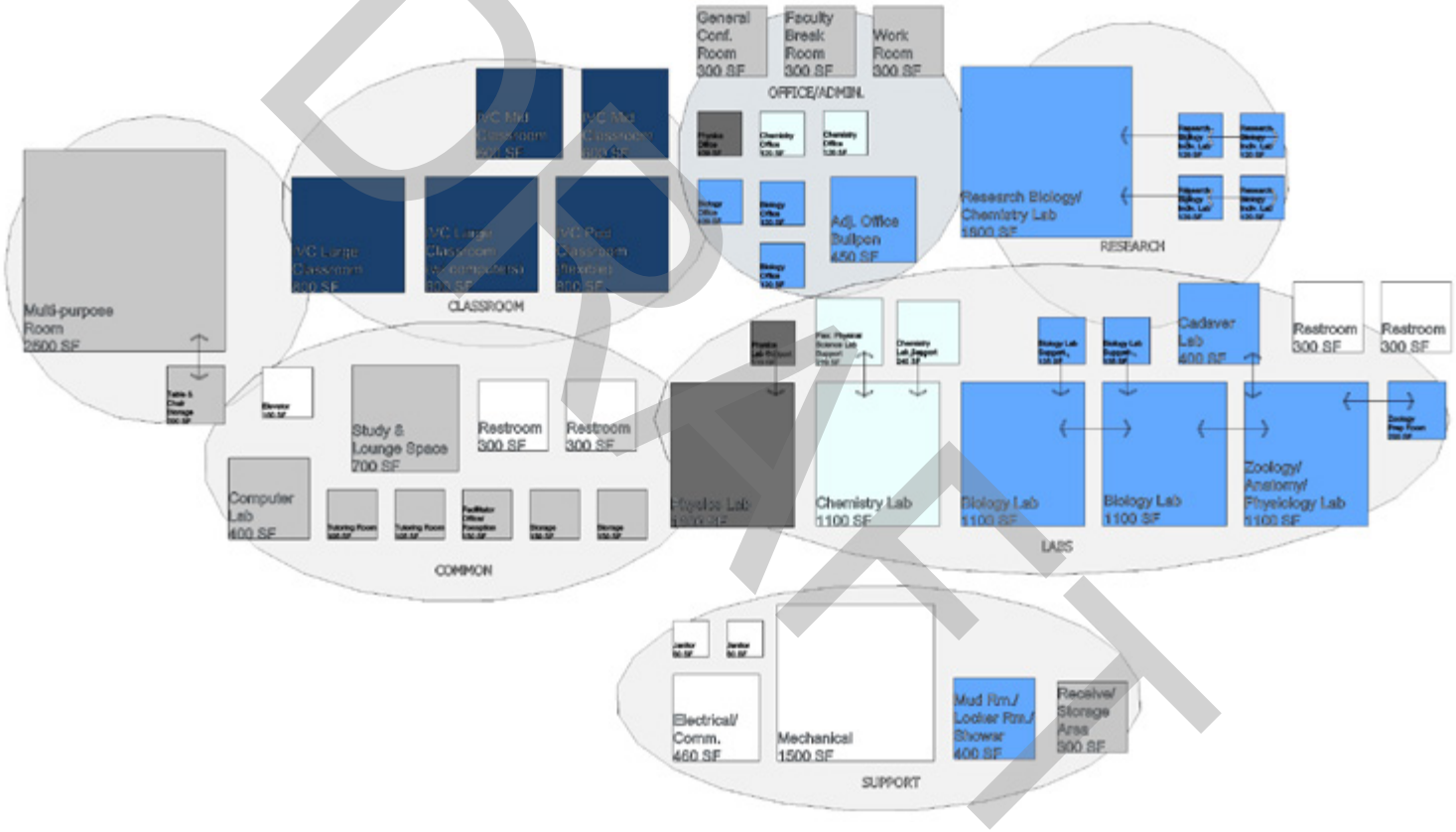
11 Appendices

Appendix I-Alternate Adjacency Diagrams



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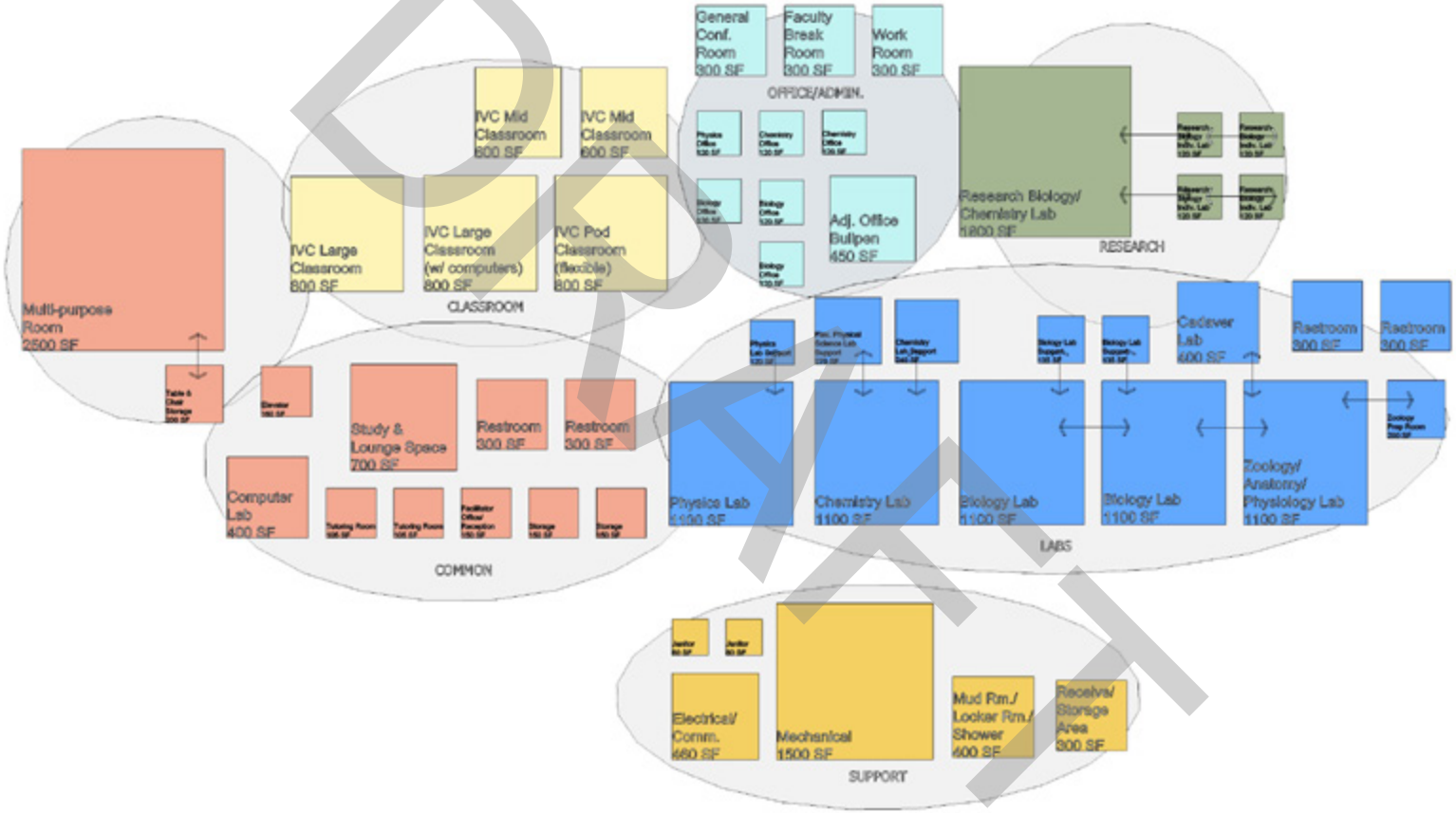
General Conf. Room 300 SF
Faculty Break Room 300 SF
Work Room 300 SF
OFFICE/ADMIN.
IVC Mid Classroom 600 SF
IVC Mid Classroom 600 SF
IVC Large Classroom 800 SF
IVC Large Classroom (w/ computers) 800 SF
IVC Pod Classroom (flexible) 800 SF
CLASSROOM
Adj. Office Bullpen 450 SF
Research Biology/ Chemistry Lab 1800 SF
RESEARCH
Multi-purpose Room 2500 SF
Study & Lounge Space 700 SF
Restroom 300 SF
Restroom 300 SF
Computer Lab 400 SF
COMMON
Cadaver Lab 400 SF
Restroom 300 SF
Restroom 300 SF
Physics Lab 1100 SF
Chemistry Lab 1100 SF
Biology Lab 1100 SF
Biology Lab 1100 SF
Zoology/ Anatomy/ Physiology Lab 1100 SF
LABS
Electrical/ Comm. 480 SF
Mechanical 1500 SF
Mud Rm./ Locker Rm./ Shower 400 SF
Receiving/ Storage Area 300 SF
SUPPORT

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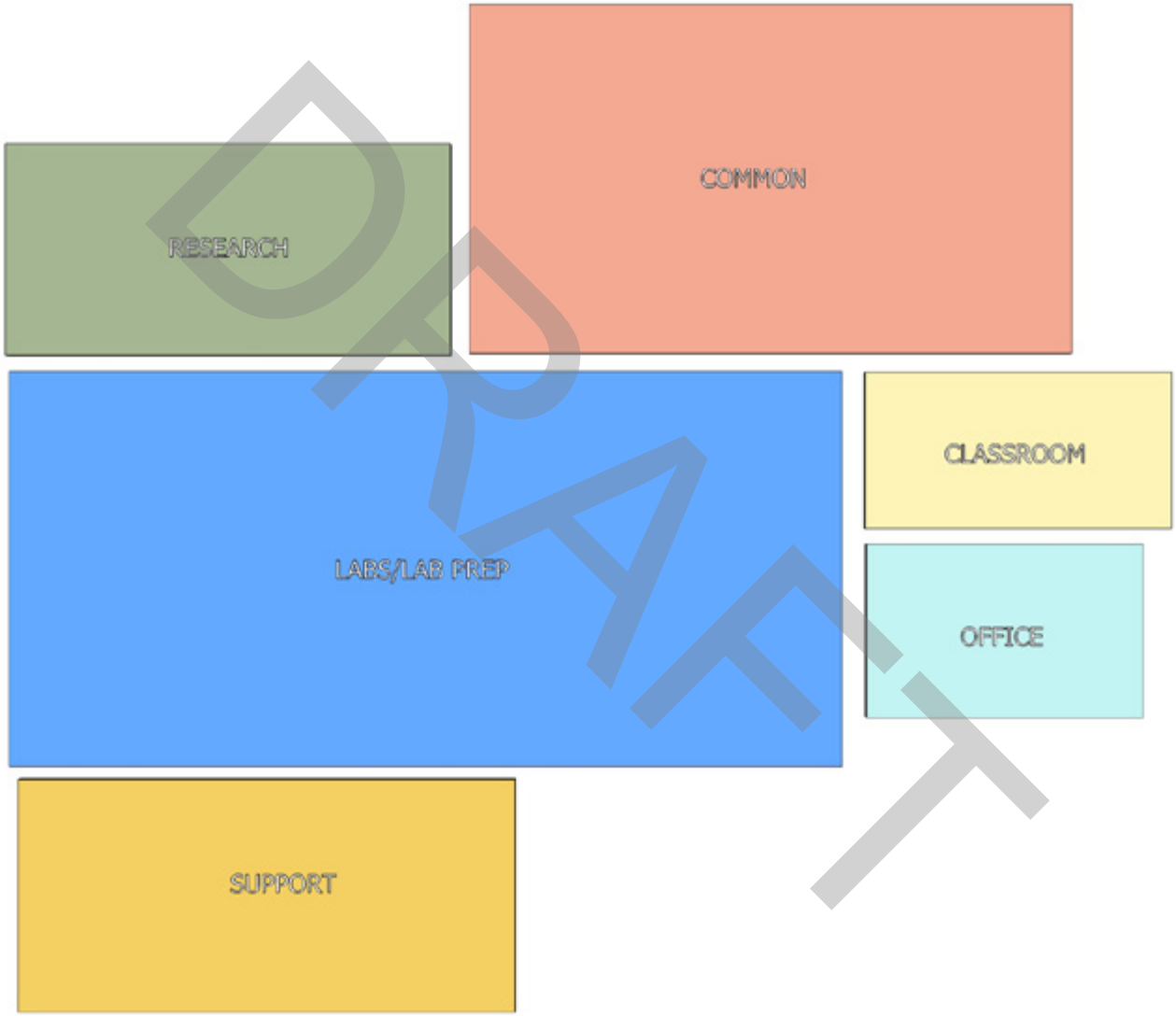
11 Appendices

Appendix I-Alternate Adjacency Diagrams



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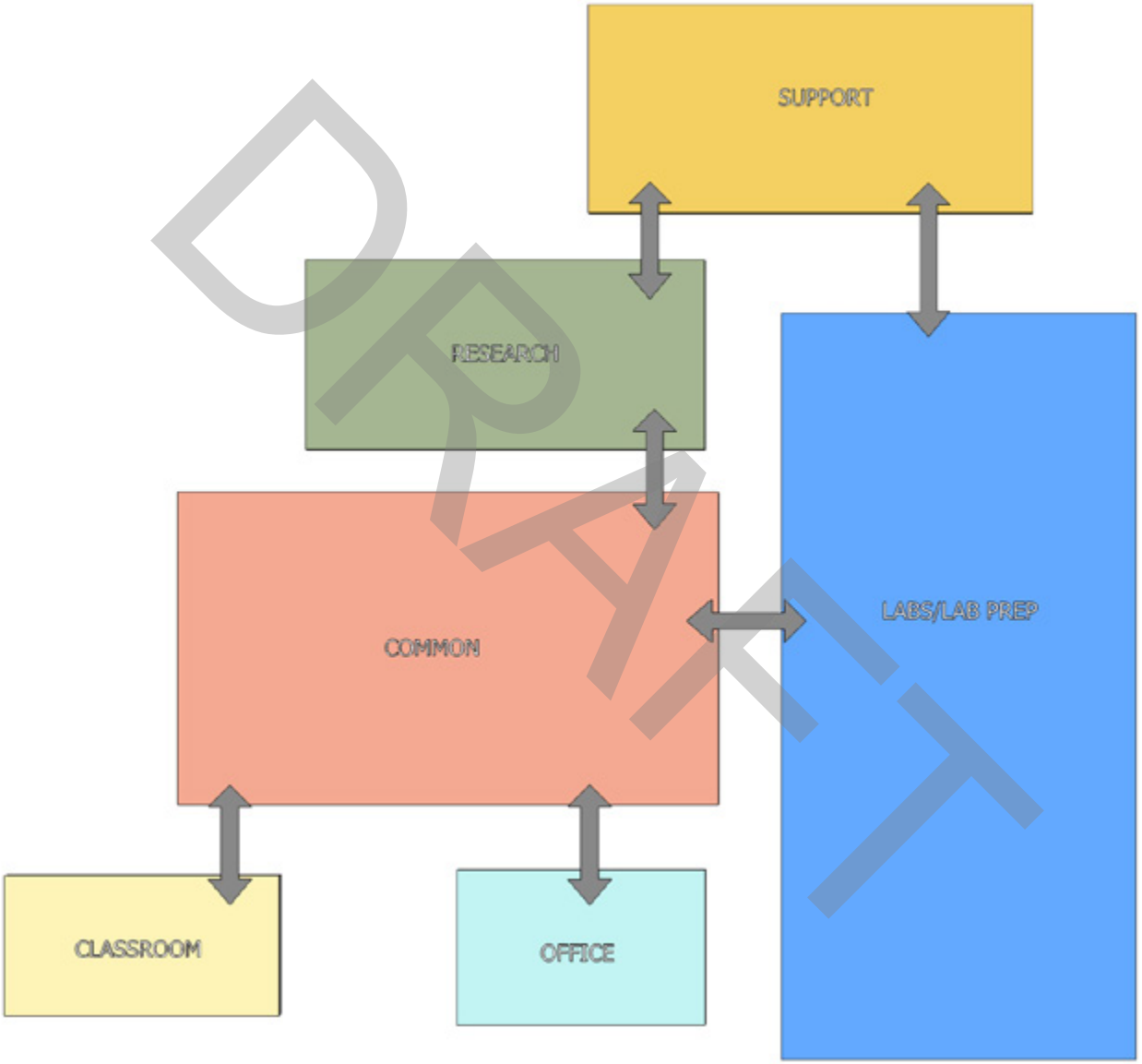

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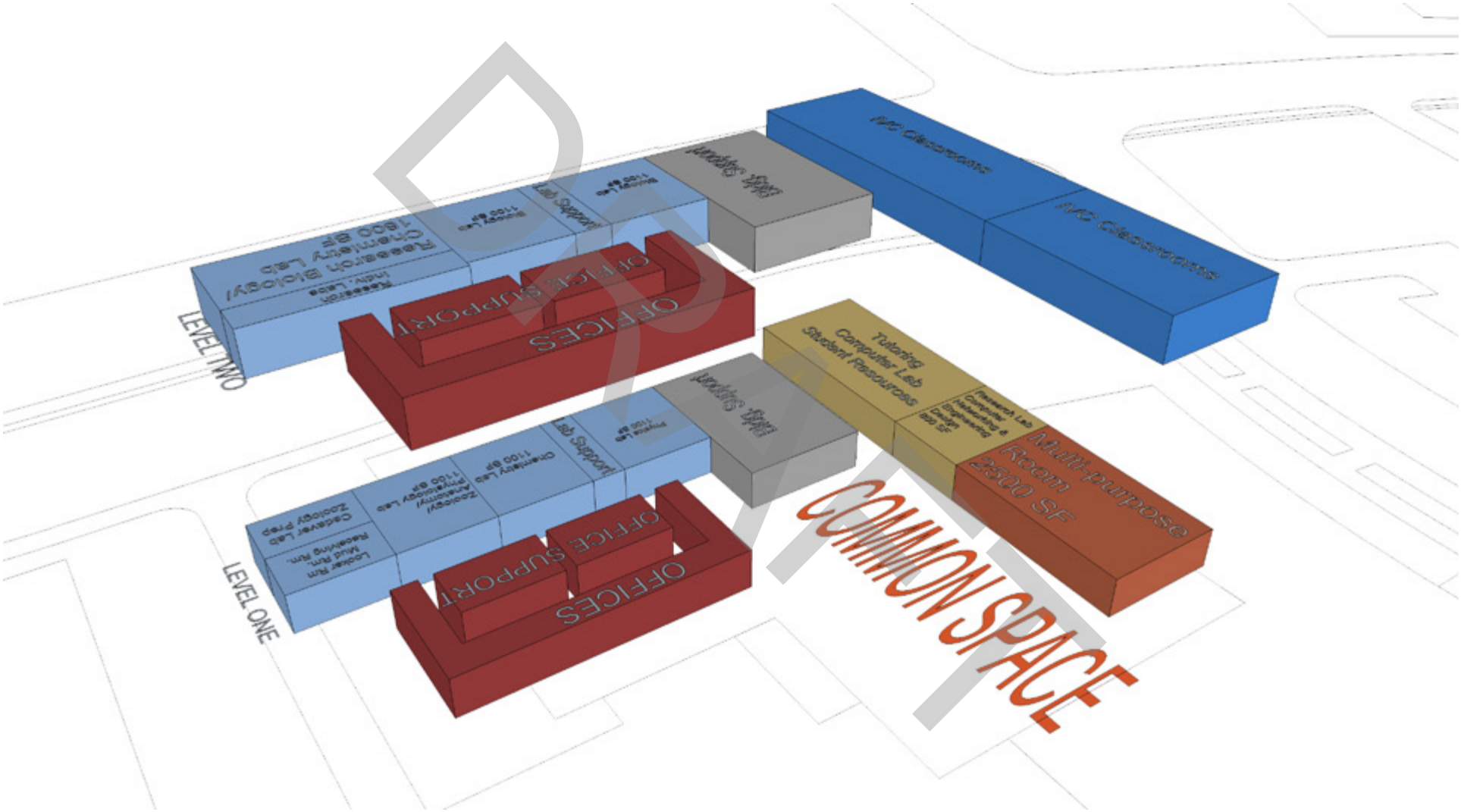
11 Appendices

Appendix II-Alternate Stacking Diagrams



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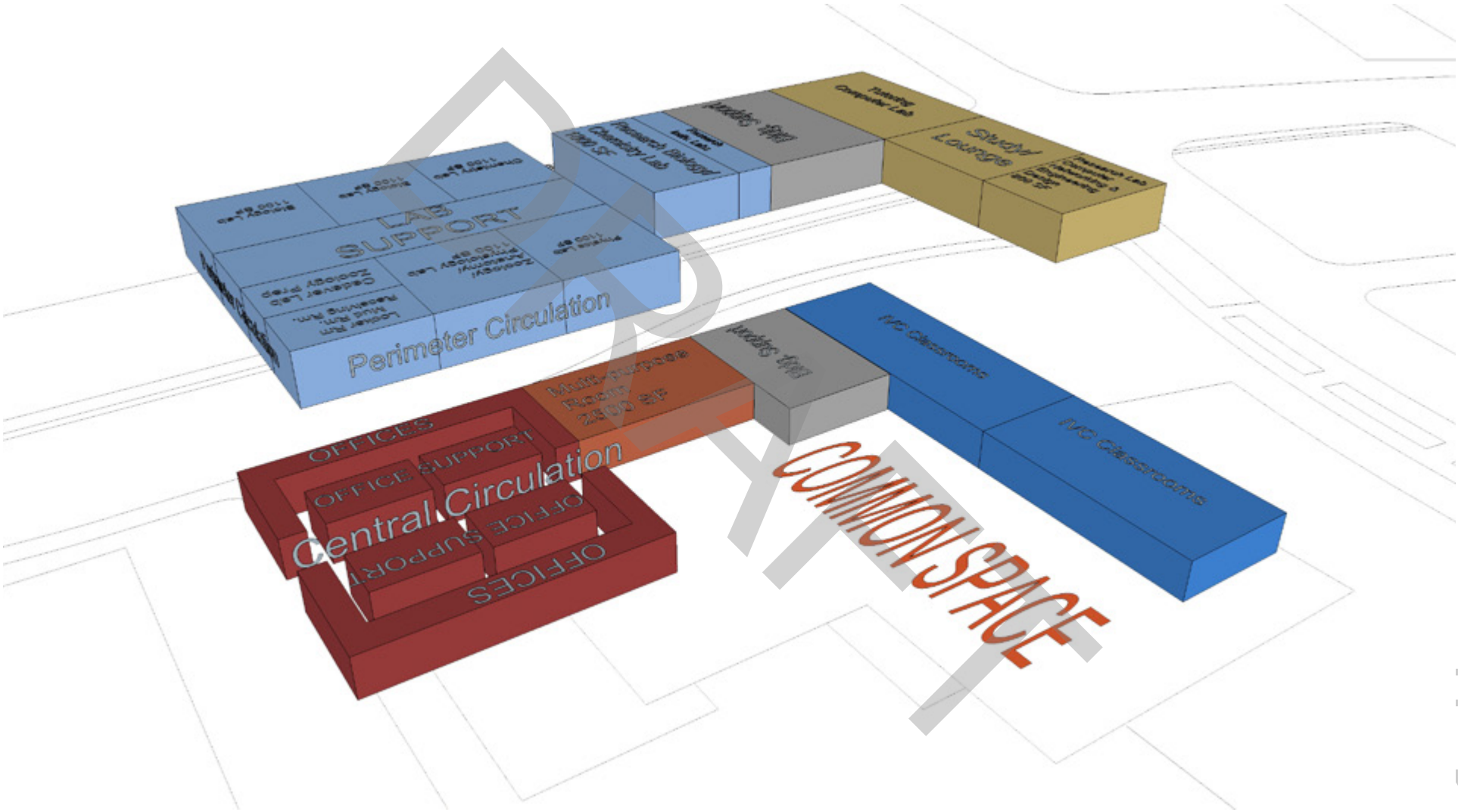
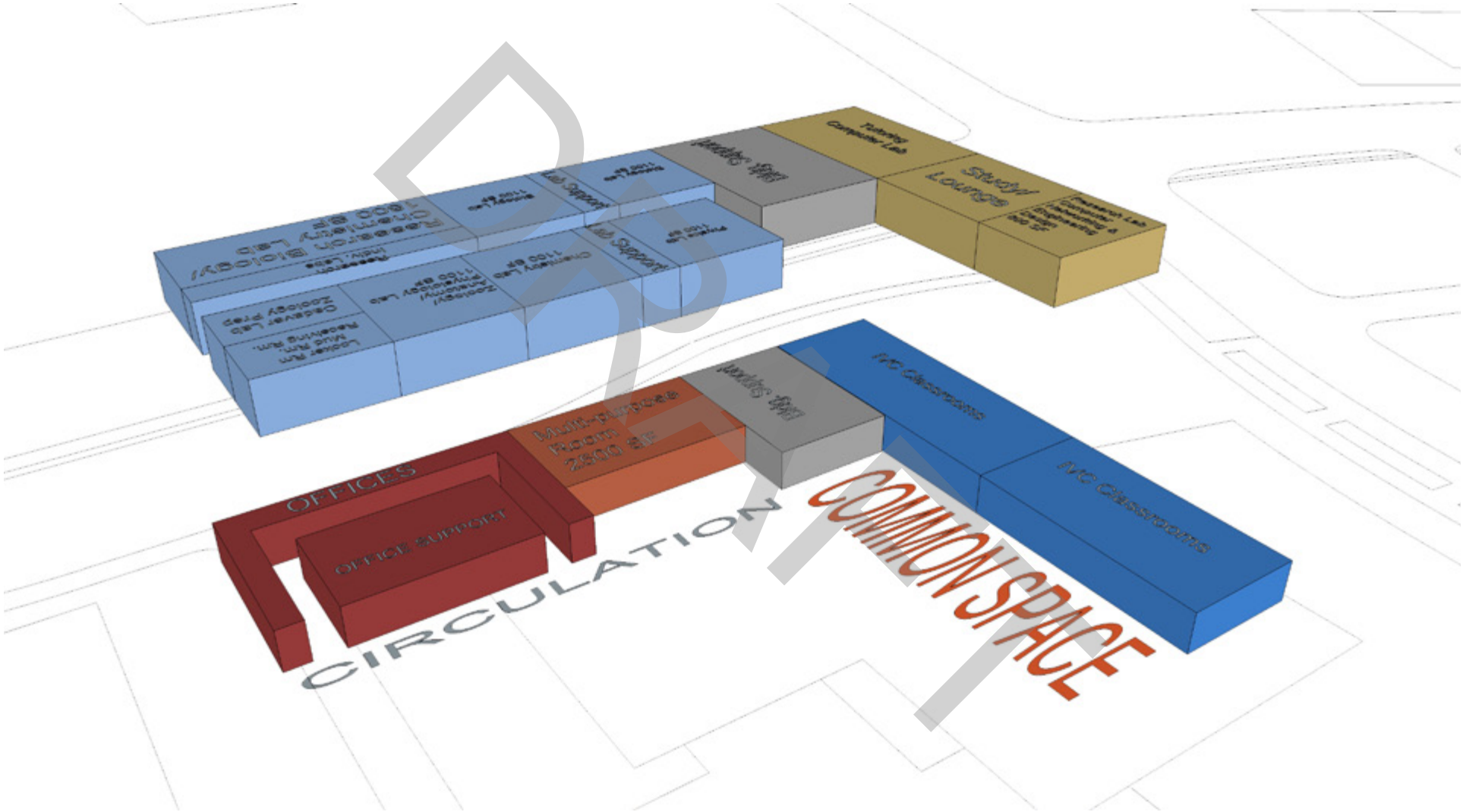
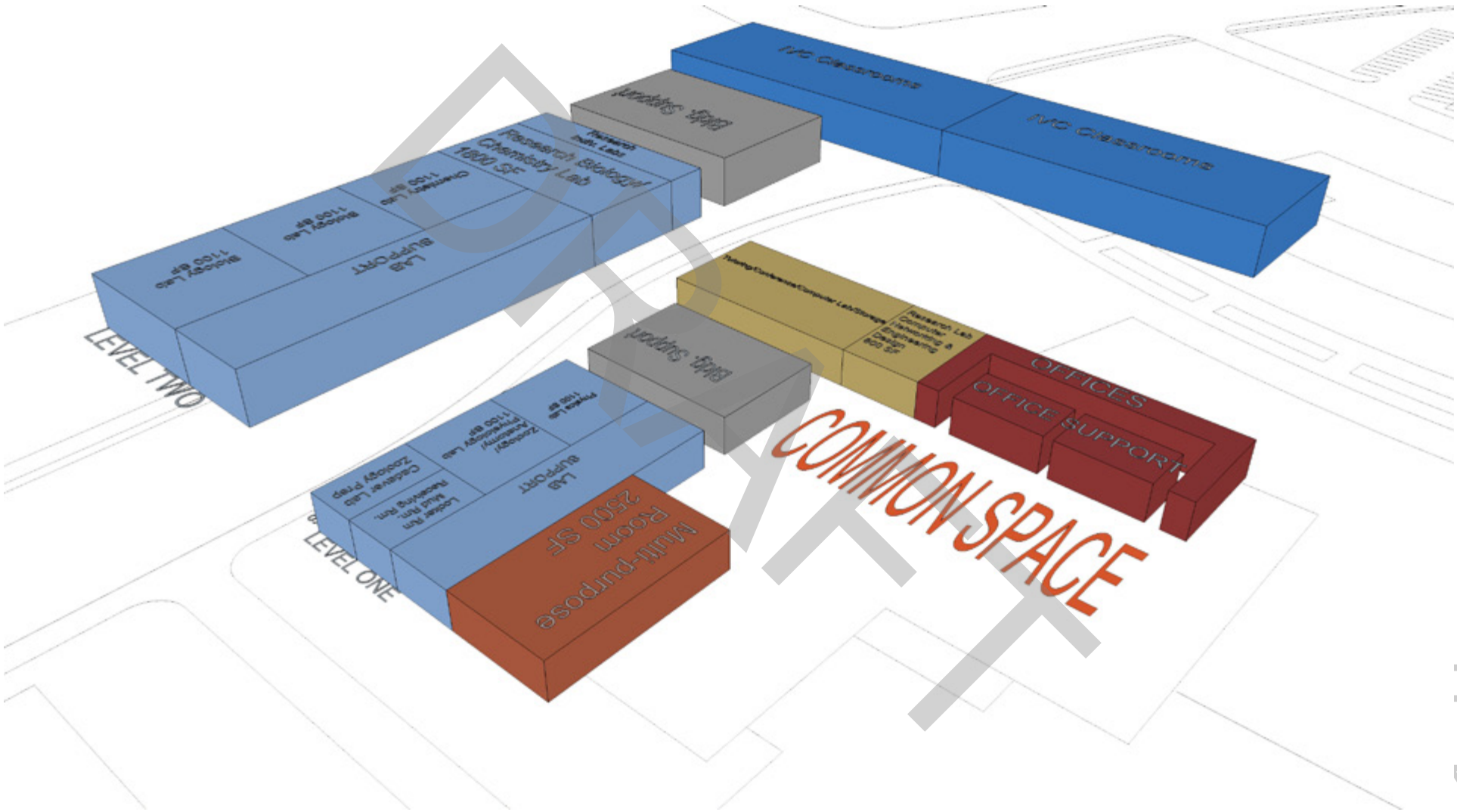

LAB SUPPORT
Perimeter Circulation
Research Biology Chemistry Lab 1000 SF
Models Shop
Tutoring Computer Lab
Study Lounge
Multi-purpose Rooms 2500 SF
OFFICES
OFFICE SUPPORT
Central Circulation
OFFICE SUPPORT
OFFICES
IVC Classrooms
IVC Classrooms
COMMON SPACE
DRAFT

11 Appendices

Appendix II-Alternate Stacking Diagrams




LEVEL ONE
LEVEL TWO
Lab Support
Zoology/ Anatomy/ Physiology Lab 1100 SF
Physics Lab 1100 SF
Locker Rm.
Mud Rm.
Restroom Rm.
Cadaver Lab
Zoology Prep
Lab Support
Multi-purpose Room 2500 SF
Lab Support
Research Lab Computer Networking & Engineering Design 800 SF
Meeting/Conference/Computer Lab/Storage
OFFICES
OFFICE SUPPORT
COMMON SPACE
Lab Support
Research Biology/ Chemistry Lab 1800 SF
Chemistry Lab 1100 SF
Biology Lab 1100 SF
Biology Lab 1100 SF
Lab Support
IVC Classroom
IVC Classroom

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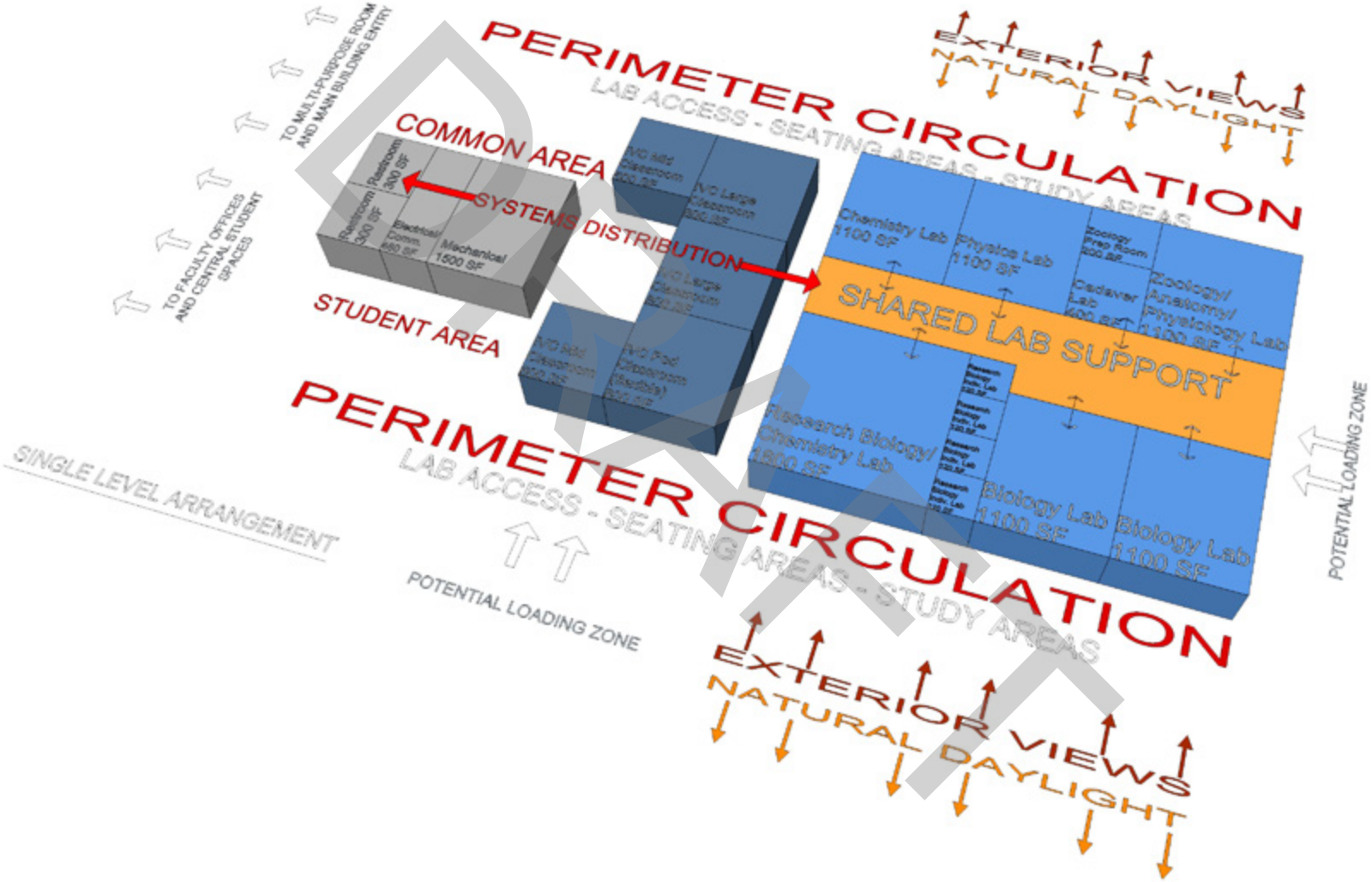
11 Appendices

Appendix II-Alternate Stacking Diagrams



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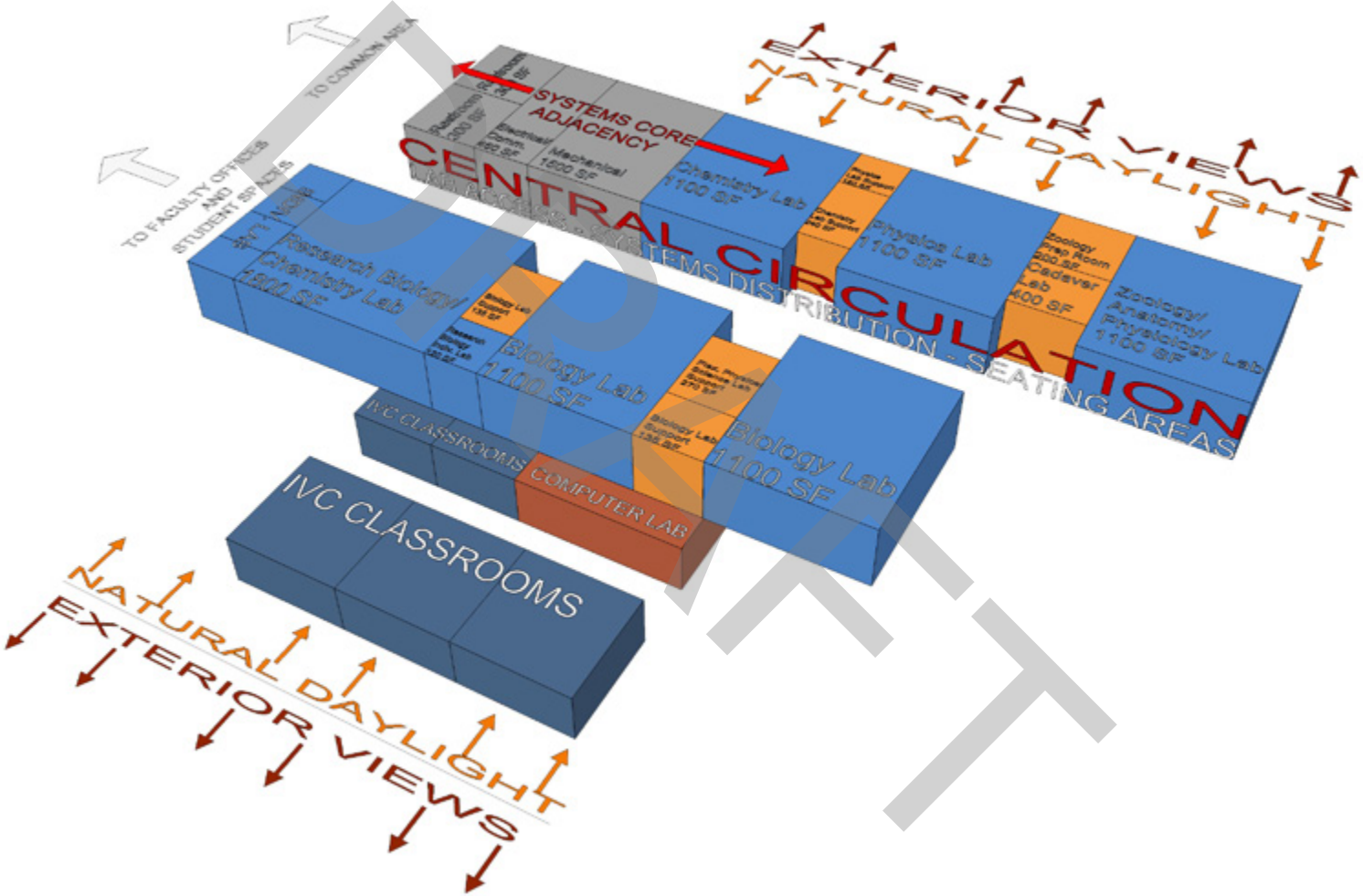
TO COMMON AREA
TO FACULTY OFFICES AND STUDENT SP ACES
SYSTEMS CORE ADJACENCY
Radiation 200 SF
Electrical Comm. 150 SF
Mechanical 1500 SF
Chemistry Lab 1100 SF
Physics Lab 1100 SF
Zoology Prep Room 200 SF
Cadaver Lab 400 SF
Zoology/ Anatomy/ Physiology Lab 1100 SF
Research Biology/ Chemistry Lab 1800 SF
Biology Lab 1100 SF
Biology Lab 1100 SF
IVC CLASSROOMS
COMPUTER LAB
IVC CLASSROOMS
CENTRAL CIRCULATION
SYSTEMS DISTRIBUTION - SEATING AREAS
EXTERIOR VIEWS
NATURAL DAYLIGHT
NATURAL DAYLIGHT
EXTERIOR VIEWS

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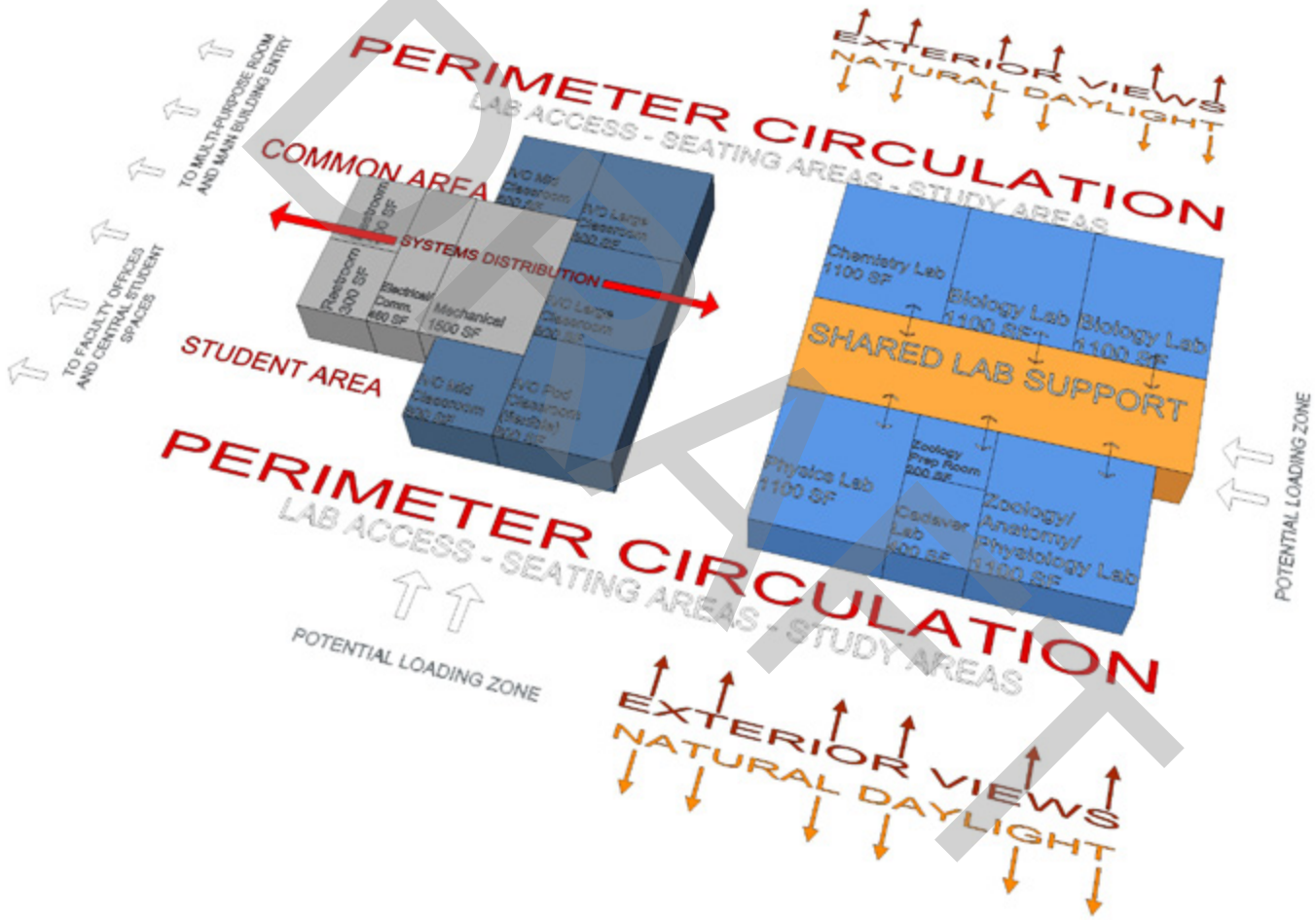
11 Appendices

Appendix II-Alternate Stacking Diagrams



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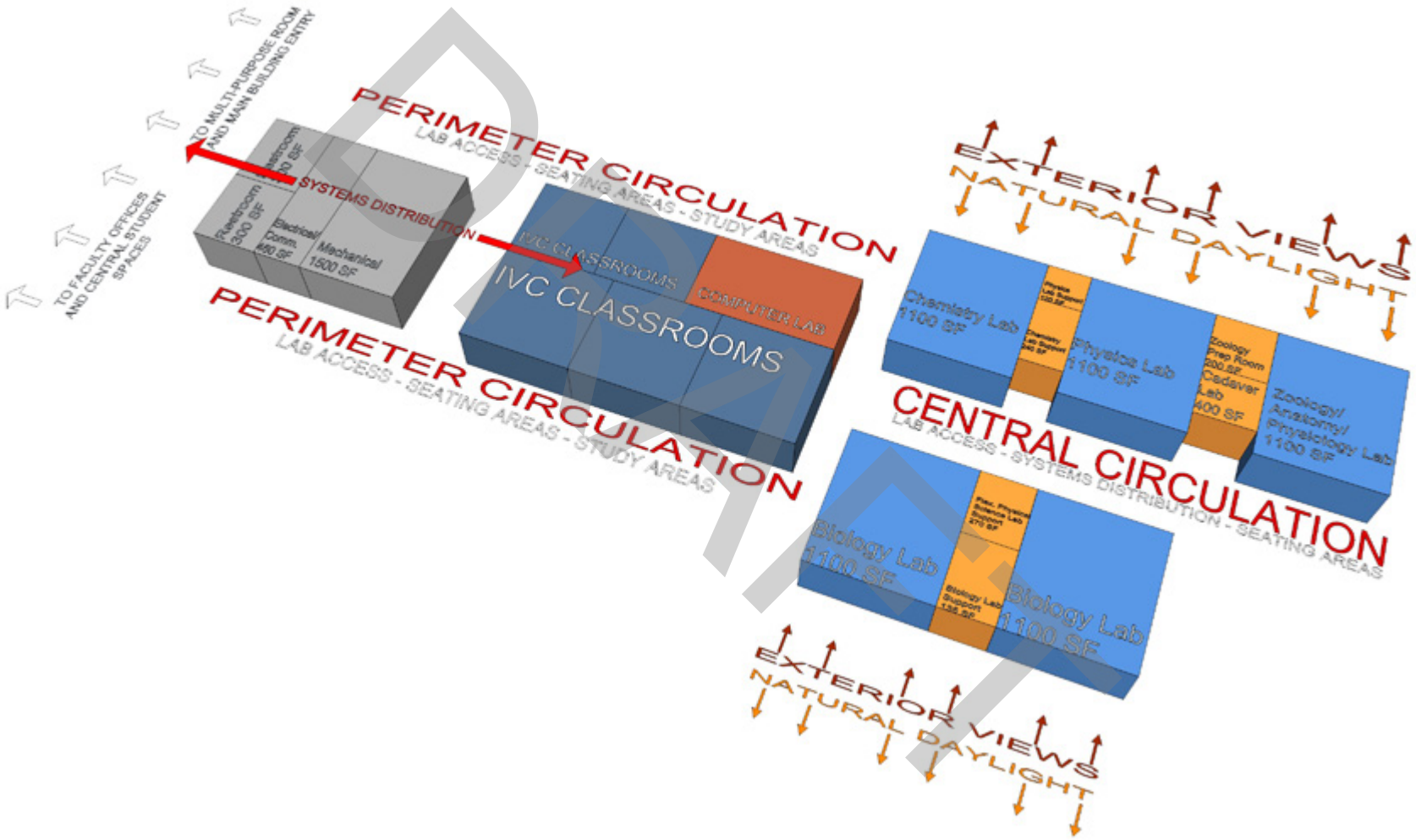
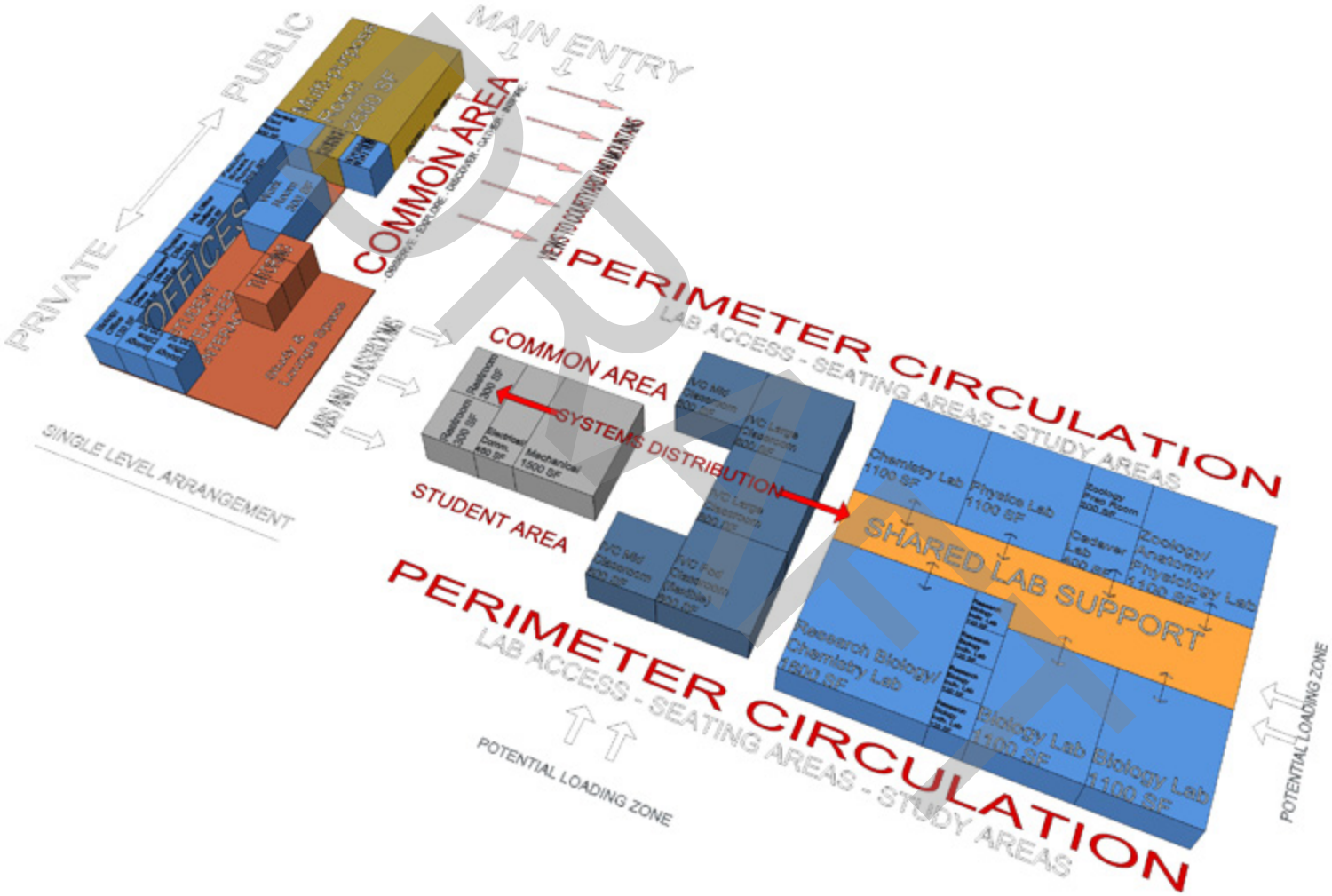
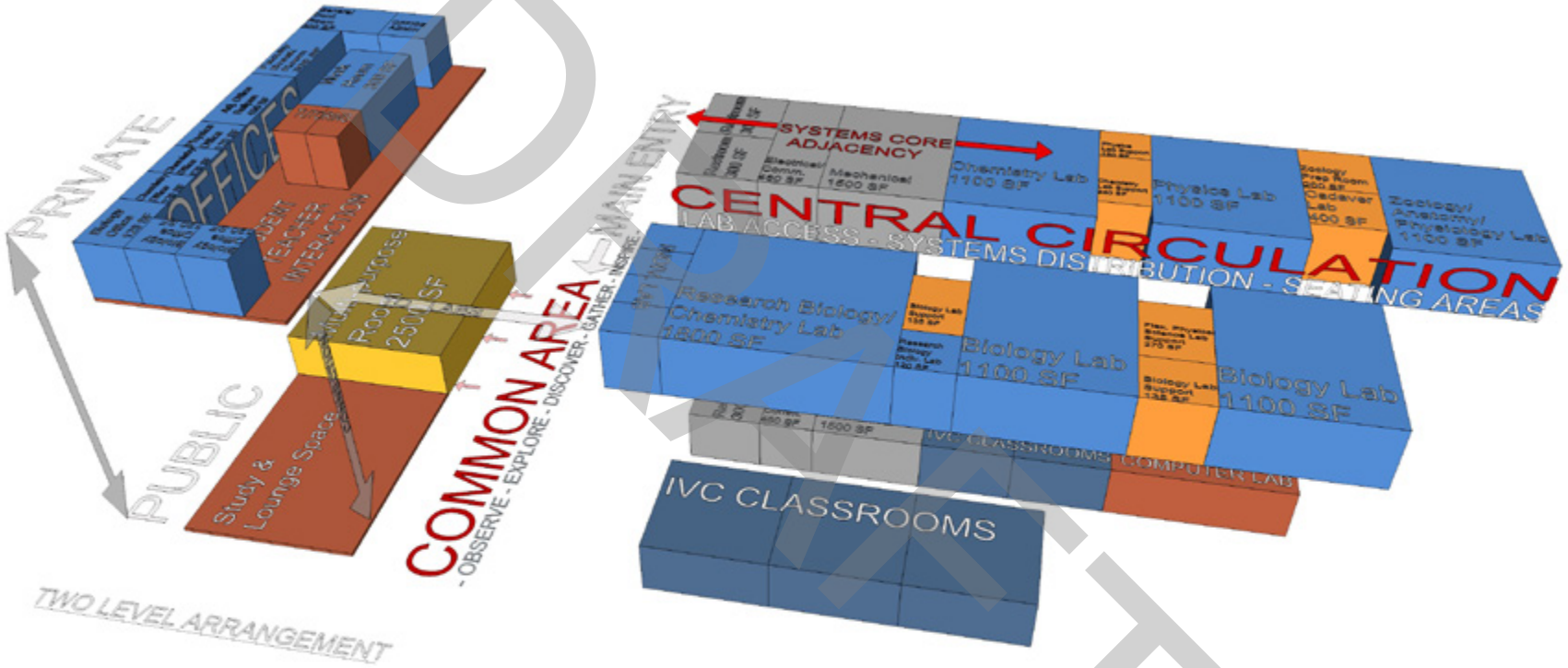

TO MULTI-PURPOSE ROOM AND MAIN BUILDING ENTRY
TO FACULTY OFFICES AND CENTRAL STUDENT SPACES
SYSTEMS DISTRIBUTION
Electrical/ Comm. 850 SF
Mechanical 1500 SF
PERIMETER CIRCULATION
LAB ACCESS - SEATING AREAS - STUDY AREAS
IVC CLASSROOMS
COMPUTER LAB
IVC CLASSROOMS
PERIMETER CIRCULATION
LAB ACCESS - SEATING AREAS - STUDY AREAS
EXTERIOR VIEWS
NATURAL DAYLIGHT
Chemistry Lab 1100 SF
Physics Lab 1100 SF
Zoology Prep Room 200 SF
Cadaver Lab 400 SF
Zoology/ Anatomy/ Physiology Lab 1100 SF
CENTRAL CIRCULATION
LAB ACCESS - SYSTEMS DISTRIBUTION - SEATING AREAS
Biology Lab 1100 SF
Biology Lab 1100 SF
EXTERIOR VIEWS
NATURAL DAYLIGHT

11 Appendices

Appendix II-Alternate Stacking Diagrams




PRIVATE
PUBLIC
OFFICES
STUDENT TEACHER INTERACTION
Study & Lounge Space
COMMON AREA
-OBSERVE - EXPLORE - DISCOVER - GATHER - INSPIRE
MAIN ENTRY
SYSTEMS CORE ADJACENCY
Mechanical 1600 SF
Chemistry Lab 1100 SF
Physics Lab 1100 SF
Cadaver Lab 400 SF
Zoology/ Anatomy/ Physiology Lab 1100 SF
CENTRAL CIRCULATION
LAB ACCESS - SYSTEMS DISTRIBUTION - SEATING AREAS
Research Biology/ Chemistry Lab 1800 SF
Biology Lab 1100 SF
Biology Lab 1100 SF
IVC CLASSROOMS
COMPUTER LAB
IVC CLASSROOMS
TWO LEVEL ARRANGEMENT

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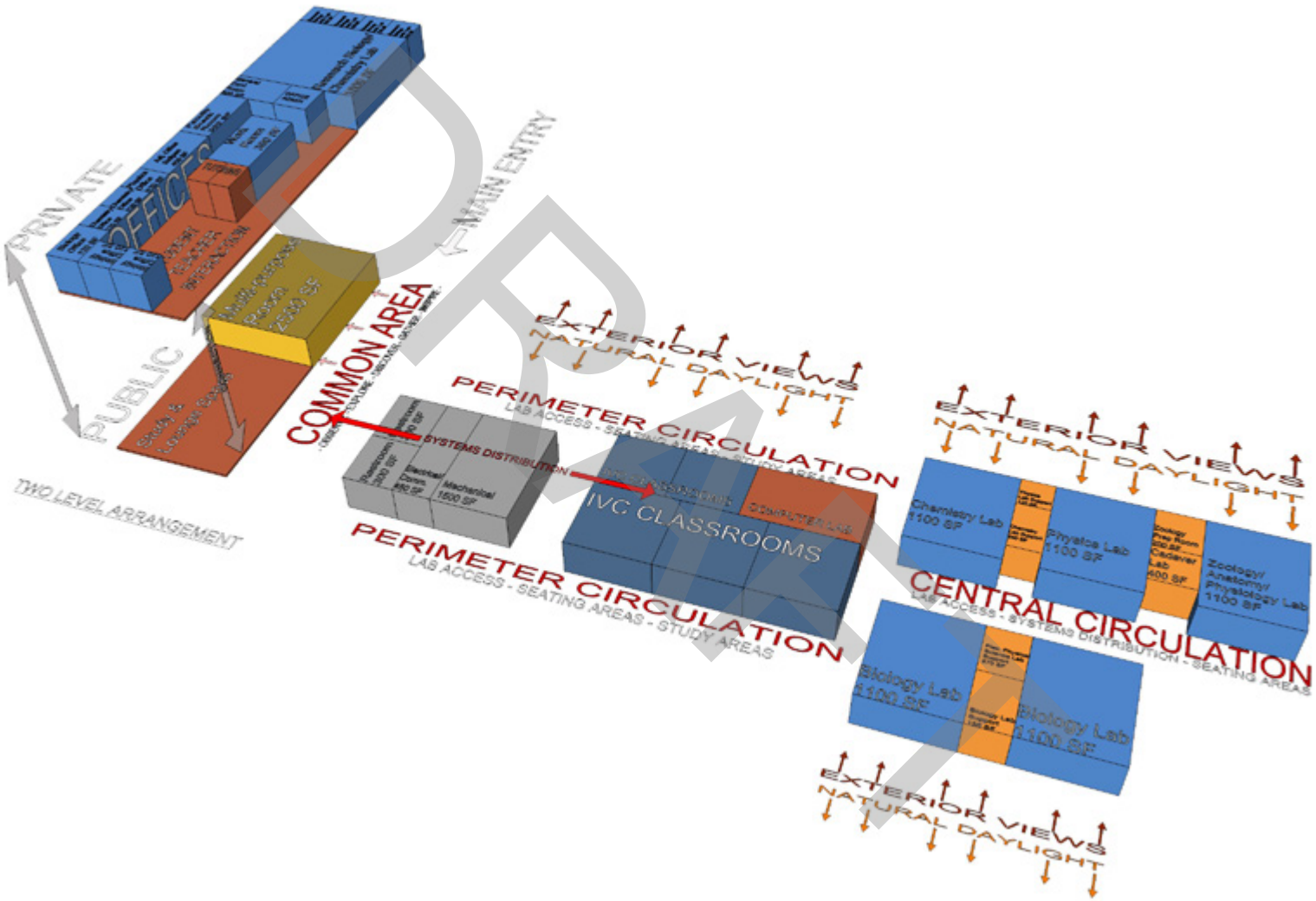
11 Appendices

Appendix II-Alternate Stacking Diagrams



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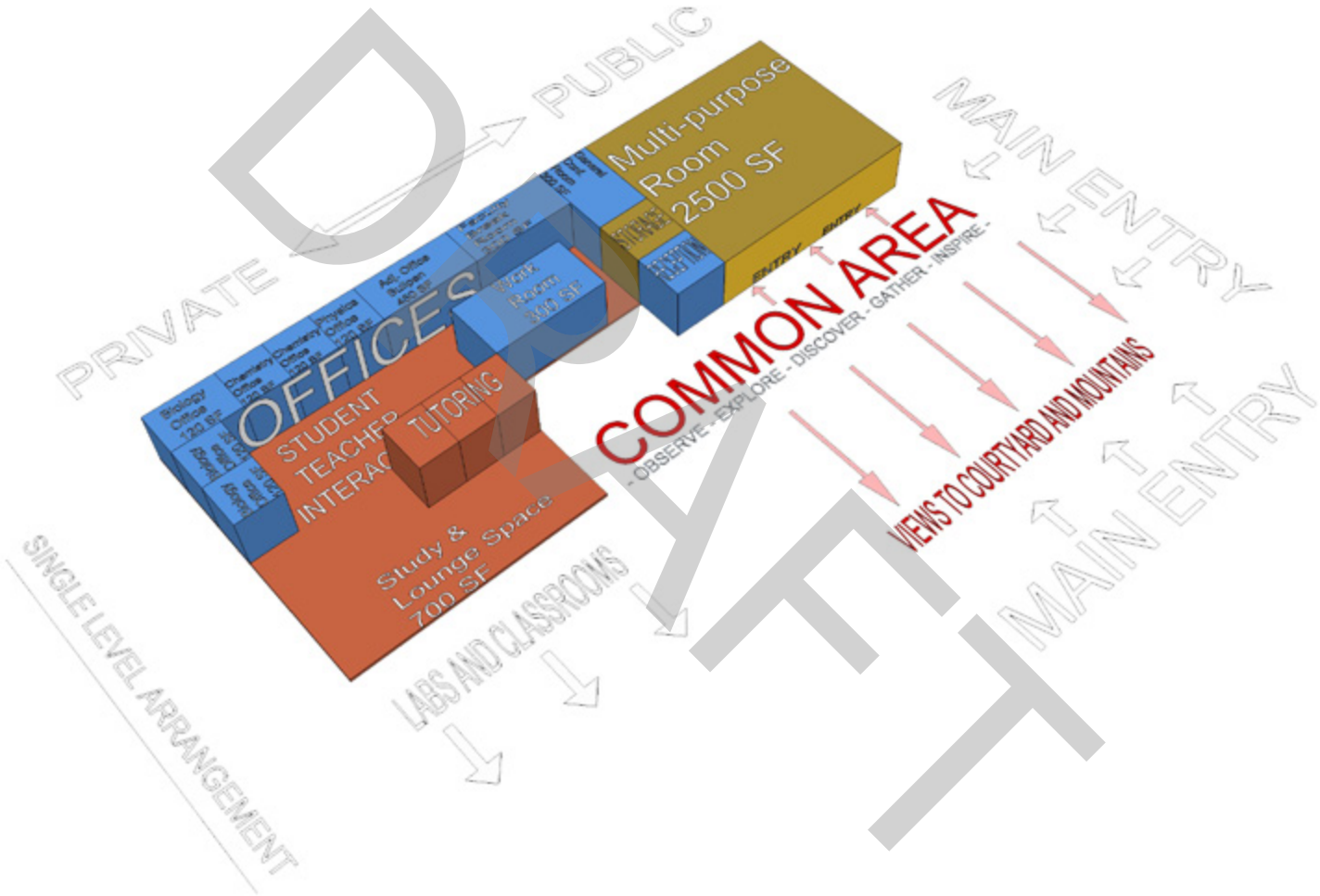
PUBLIC
PRIVATE
SINGLE LEVEL ARRANGEMENT
OFFICES
Biology Office 120 SF
Chemistry Office 120 SF
Chemistry Office 120 SF
Physics Office 120 SF
Adj. Office Bungen 400 SF
Workroom Copy Room Storage 300 SF
Storage Room 300 SF
STUDENT TEACHER INTERACTION
TUTORING
Study & Lounge Space 700 SF
Multi-purpose Room 2500 SF
STORAGE
RESTROOMS
ENTRY
ENTRY
COMMON AREA
- OBSERVE - EXPLORE - DISCOVER - GATHER - INSPIRE -
VIEWS TO COURTYARD AND MOUNTAINS
LABS AND CLASSROOMS
MAIN ENTRY
MAIN ENTRY
MAIN ENTRY

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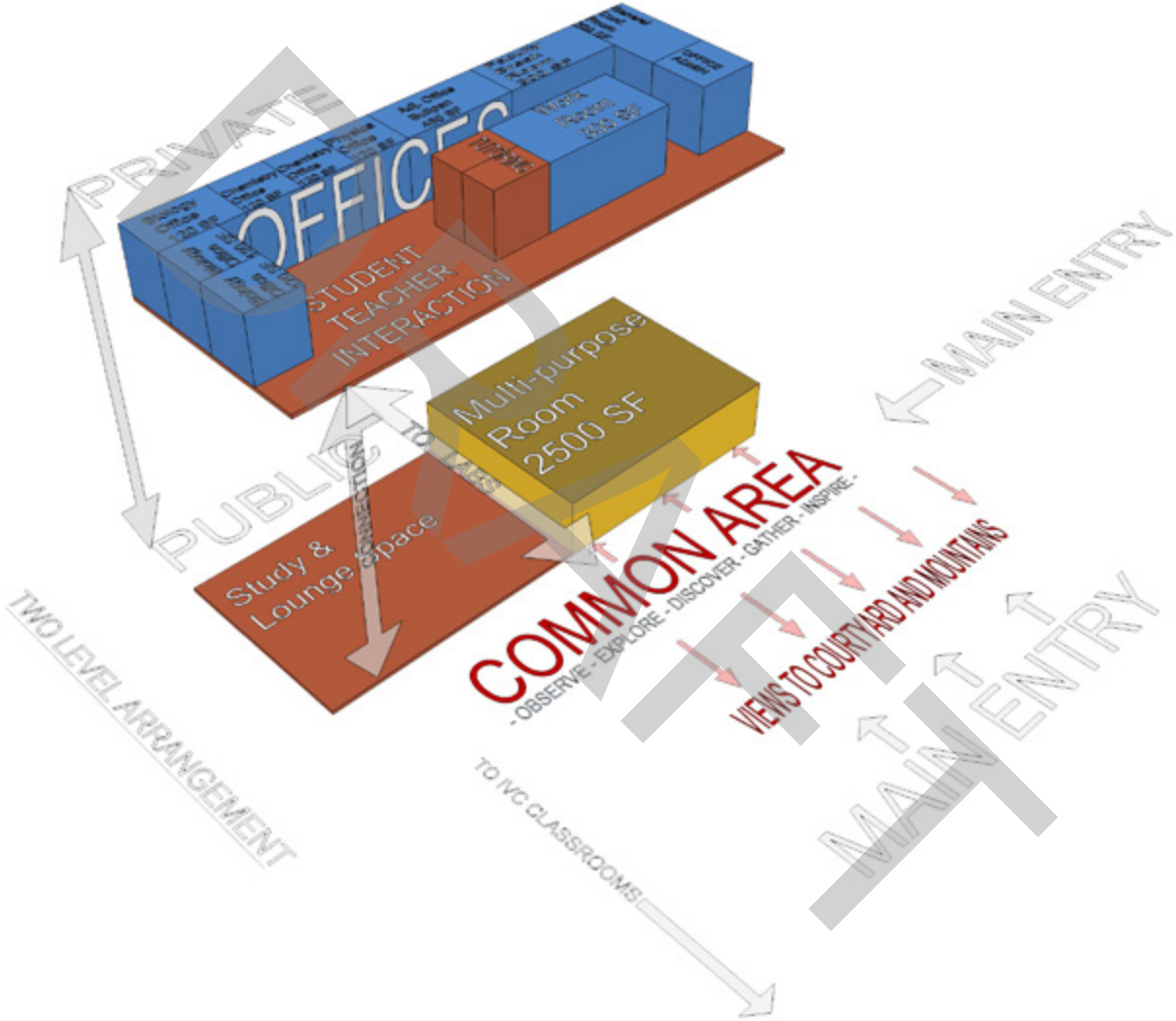
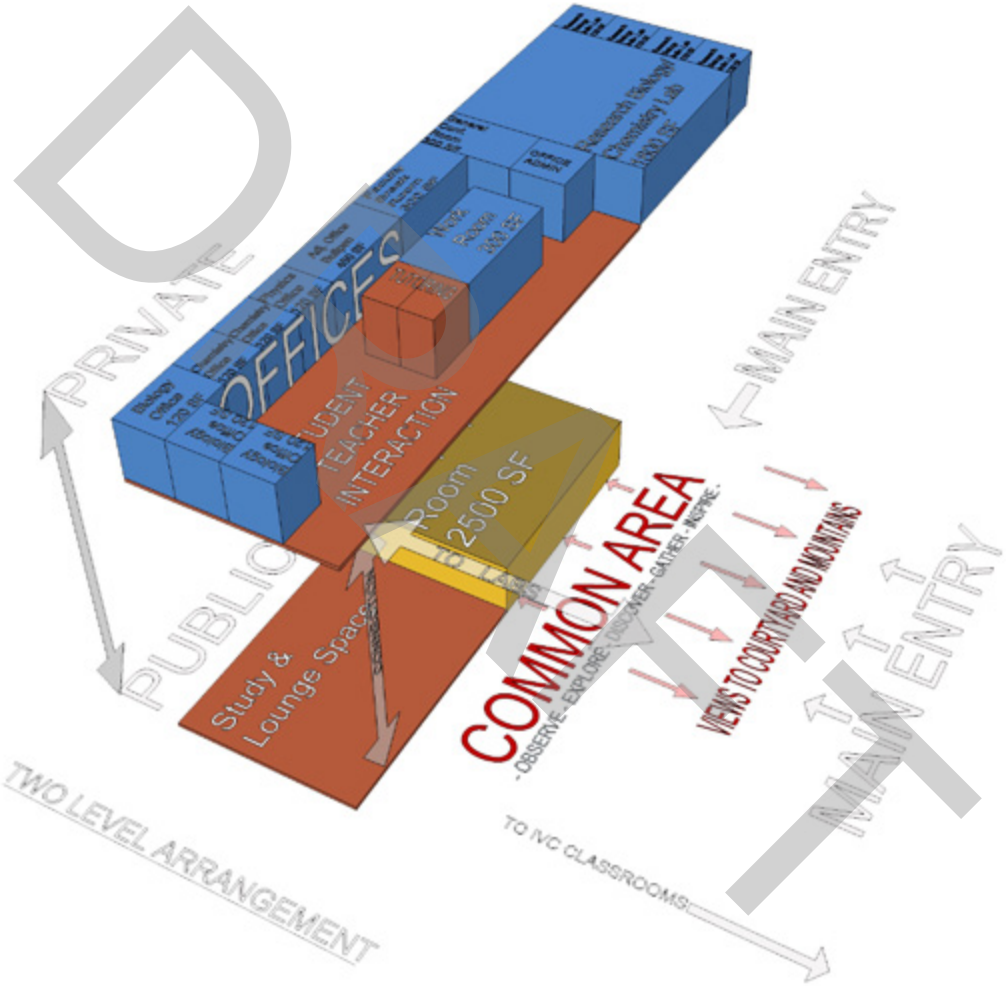
11 Appendices

Appendix II-Alternate Stacking Diagrams




PRIVATE
PUBLIC
TWO LEVEL ARRANGEMENT
OFFICES
STUDENT TEACHER INTERACTION
Study & Lounge Space
Room 2500 SF
COMMON AREA
-OBSERVE-EXPLORE-DISCOVER-GATHER-INSPIRE-
VIEWS TO COURTYARD AND MOUNTAINS
MAIN ENTRY
MAIN ENTRY
TO IVC CLASSROOMS

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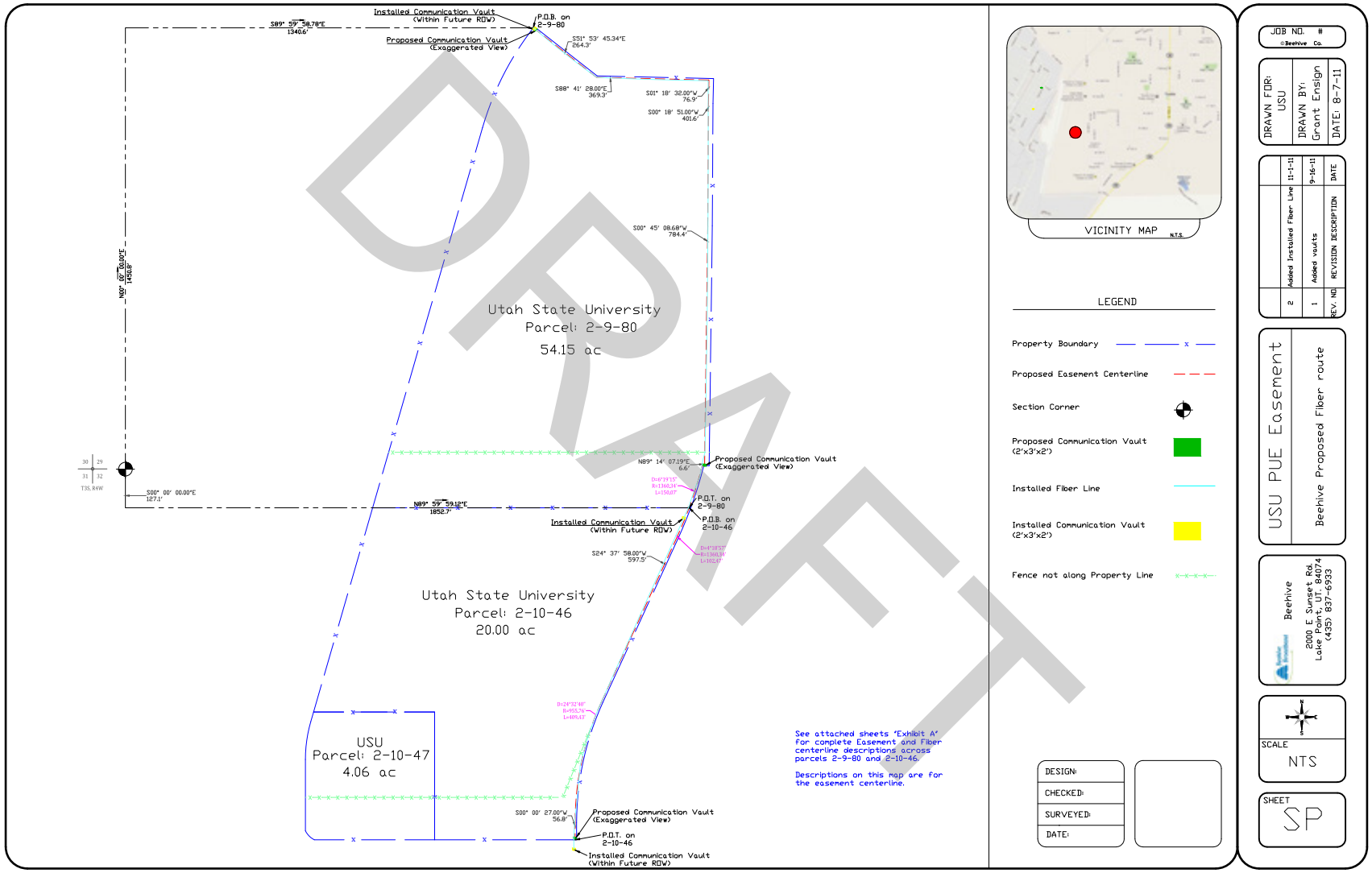
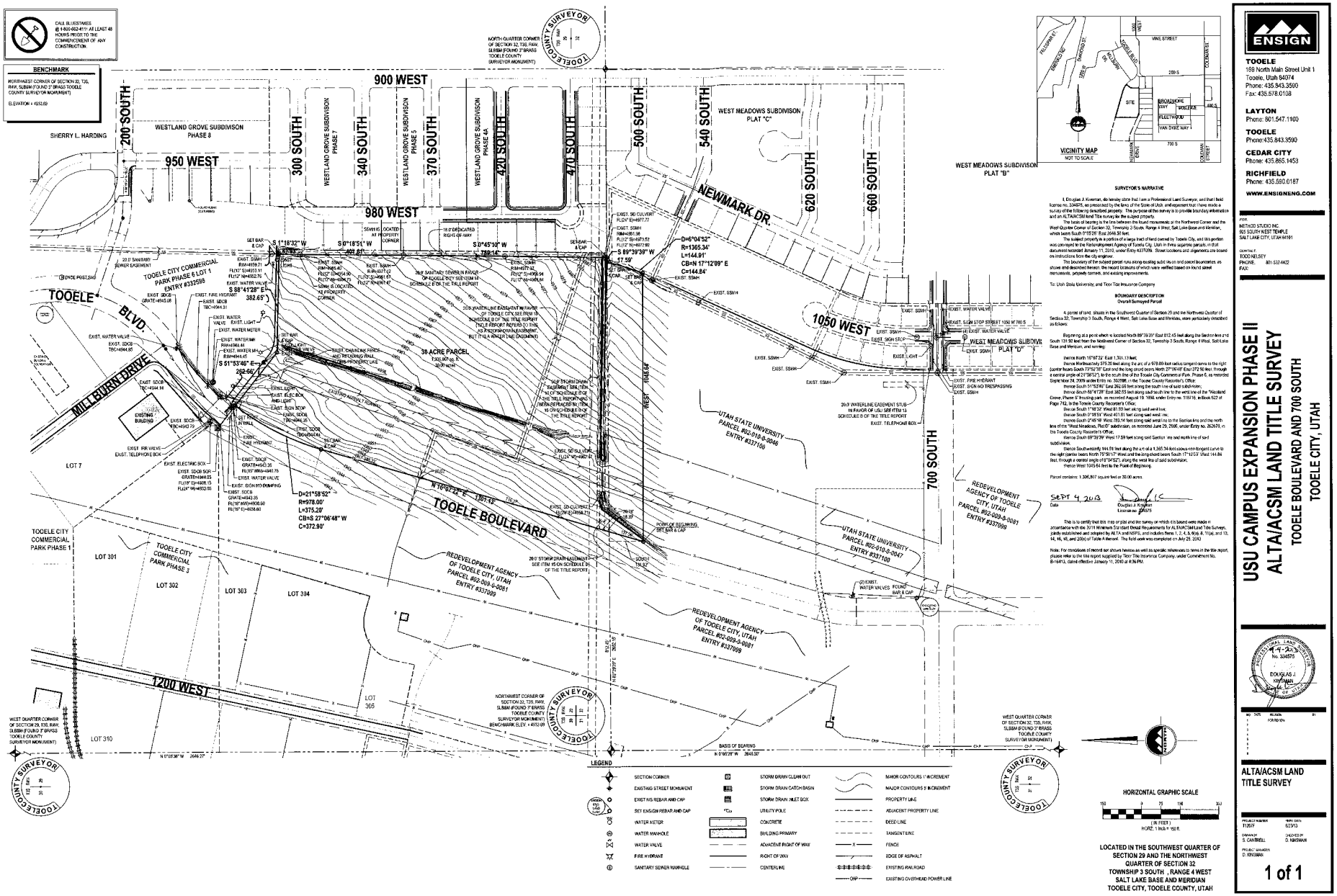
14 Appendices

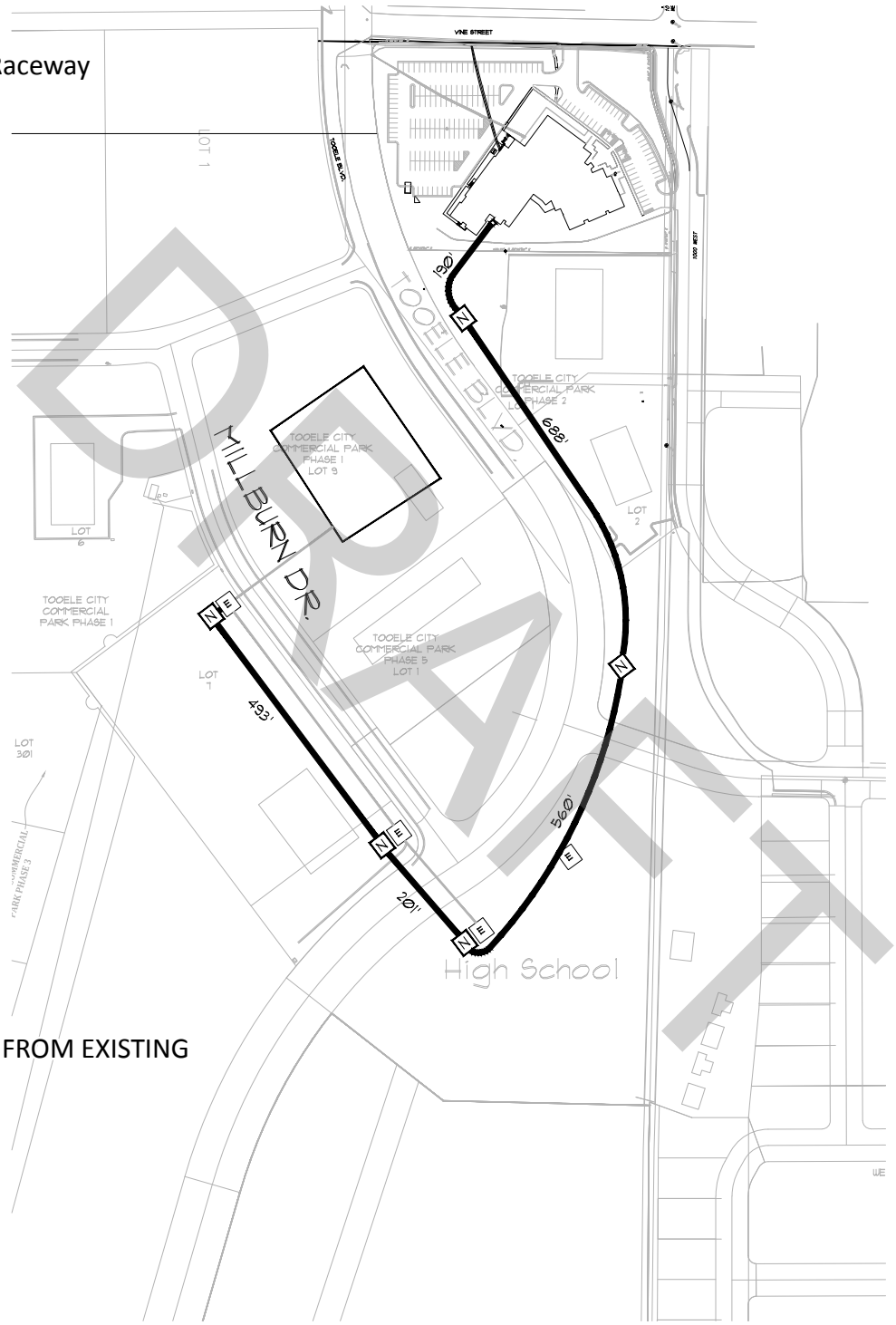
Appendix III-Proposed Fiber Route/ALTA Survey




USU CAMPUS EXPANSION PHASE II
ALTA/ACSM LAND TITLE SURVEY
TOOELE BOULEVARD AND 700 SOUTH
TOOELE CITY, UTAH
ENSIGN
TOOELE
169 North Main Street Unit 1
Tooele, Utah 84074
Phone: 435.843.3590
Fax: 435.578.0108
LAYTON
Phone: 801.547.1100
TOOELE
Phone:435.843.3590
CEDAR CITY
Phone: 435.865.1453
RICHFIELD
Phone: 435.590.0187
WWW.ENSIGNENG.COM
FOR:
METHOD STUDIO INC.
155 SOUTH WEST TEMPLE
SALT LAKE CITY, UTAH 84101
CONTACT:
TODD NELSEY
PHONE: 801.532.4402
FAX:
ALTA/ACSM LAND TITLE SURVEY
1 of 1
SURVEYOR'S NARRATIVE
BOUNDARY DESCRIPTION
Overall Surveyed Parcel
VICINITY MAP
NOT TO SCALE
HORIZONTAL GRAPHIC SCALE
LOCATED IN THE SOUTHWEST QUARTER OF SECTION 29 AND THE NORTHWEST QUARTER OF SECTION 32 TOWNSHIP 3 SOUTH , RANGE 4 WEST SALT LAKE BASE AND MERIDIAN TOOELE CITY, TOOELE COUNTY, UTAH
LEGEND
900 WEST
950 WEST
980 WEST
1050 WEST
1200 WEST
TOOELE BOULEVARD
MILLBURN DRIVE
NEWMARK DR.
700 SOUTH
WEST MEADOWS SUBDIVISION PLAT "C"
WEST MEADOWS SUBDIVISION PLAT "B"
WESTLAND GROVE SUBDIVISION PHASE 8
WESTLAND GROVE SUBDIVISION PHASE 7
WESTLAND GROVE SUBDIVISION PHASE 5
WESTLAND GROVE SUBDIVISION PHASE 4A
TOOELE CITY COMMERCIAL PARK PHASE 6 LOT 1
TOOELE CITY COMMERCIAL PARK PHASE 1
TOOELE CITY COMMERCIAL PARK PHASE 3
38 ACRE PARCEL
UTAH STATE UNIVERSITY PARCEL #02-010-0-0046 ENTRY #337100
UTAH STATE UNIVERSITY PARCEL #02-010-0-0047 ENTRY #337100
REDEVELOPMENT AGENCY OF TOOELE CITY, UTAH PARCEL #02-009-0-0081 ENTRY #337099
SHERRY L. HARDING
LOT 7
LOT 301
LOT 302
LOT 303
LOT 304
LOT 305
LOT 310
EXISTING BUILDING
NORTH QUARTER CORNER OF SECTION 32, T3S, R4W, SLB&M (FOUND 3" BRASS TOOELE COUNTY SURVEYOR MONUMENT)
WEST QUARTER CORNER OF SECTION 29, T3S, R4W, SLB&M (FOUND 3" BRASS TOOELE COUNTY SURVEYOR MONUMENT)
NORTHWEST CORNER OF SECTION 32, T3S, R4W, SLB&M (FOUND 3" BRASS TOOELE COUNTY SURVEYOR MONUMENT) BENCHMARK ELEV. = 4932.69
BASIS OF BEARING
N 0°05'28" W 2646.53'
POINT OF BEGINNING
SECTION CORNER
EXISTING STREET MONUMENT
EXISTING REBAR AND CAP
SET EN/SON REBAR AND CAP
WATER METER
WATER MANHOLE
WATER VALVE
FIRE HYDRANT
SANITARY SEWER MANHOLE
STORM DRAIN CLEAN OUT
STORM DRAIN CATCH BASIN
STORM DRAIN INLET BOX
UTILITY POLE
CONCRETE
BUILDING PRIMARY
ADJACENT RIGHT OF WAY
RIGHT OF WAY
CENTERLINE
MINOR CONTOURS 1' INCREMENT
MAJOR CONTOURS 5' INCREMENT
PROPERTY LINE
ADJACENT PROPERTY LINE
DEED LINE
TANGENT LINE
FENCE
EDGE OF ASPHALT
EXISTING RAILROAD
EXISTING OVERHEAD POWER LINE

14 Appendices

Appendix IV-Proposed UEN Raceway



PROPOSED UEN RACEWAY FROM EXISTING BUILDING TO TATC HUB

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