



# Staff Analysis and Report to the Board

**Board Meeting Date: 12/18/2018**

**Senior Lead: Claire Hertz**

**Department Lead: Dan Jung**

**Staff Lead: Jen Sohm**

## **BACKGROUND**

Since 2016, the Benson High School Modernization Project Team has worked, engaged and collaborated on the development of a comprehensive, equitable, integrated and visionary high school master plan design with authentic school community engagement. The Benson Polytechnic Site Specific Educational Specifications have progressed over the last 2 ½ years, with input from school staff, community, school partners, industry outreach, Office of Teaching & Learning (OTL), PPS Career and Technical Education (CTE) and the project's Steering Committee. The resulting document, including appropriate references to the Comprehensive High School Ed Spec, has guided the master planning by integrating CTE & core academic educational program needs, while incorporating flexibility for the future.

As November is the last month for programming, the project team will include follow up with stakeholders and incorporate final adjustments to the final Benson Polytechnic Site Specific Educational Specifications.

**Board Resolution 5515** authorized OSM to proceed with 2017 Health and Safety Modernization Bond Sequencing Plan. This established target dates for students to occupy the modernized Benson Polytechnic High School as:

- Phase 1 occupied in August 2022
- Phase 2 occupied in August 2023
- Phase 3 occupied in August 2024

**Board Resolution 5394** referred the Benson High School Modernization project to voters as a part of the May 2017 bond.

**Board Resolution 5160** directed the development of educational specifications and master plan the Benson Campus to the indicated student capacities: Benson Polytechnic High School: common areas and classrooms for 1,700.

**Board Resolution 4608** affirmed the Long Range Facility Plan (LRFP) premise that the quality of the educational environment contributes to the success of students and teachers and affirmed the goals, guiding principles and methodologies of the Plan as the basis for capital investments in District facilities.

## **Facility Goals**

- Goal One: Every PPS school shall provide an equitable and effective learning environment that maximizes the achievement of every student.
- Goal Two: Every PPS school shall be safe, healthy, accessible and designed to meet students' essential needs.
- Goal Three: PPS shall optimize utilization of all schools while taking the academic program needs of each school into account.

## **Guiding Principles**

In every facilities planning and capital investment decision, PPS will:

- A: Develop partnerships
- B: Embrace sustainability
- C: Demonstrate fiscal responsibility
- D: Practice inclusivity

## **LRFP Recommendations**

The LRFP Advisory Committee identified a set of capital and non-capital recommendations, many of which are relevant to Benson Campus Master Plan:

### ***Capital***

- *Express a bold vision for the master plan, particularly the first phase. The plan should inspire the public to rally behind the District while maximizing student success.*
- *Use a strategic approach that fully renovates/replaces schools to reduce the deferred maintenance backlog. Use the bulk of the money from each capital phase to modernize schools.*
- *Demonstrate that PPS can do the work successfully. The first phase of the master plan is critical in building public trust. It is needed to build credibility.*
- *Allocate funds to fix the worst facility needs. This needs to occur in each phase.*
- *These funds would focus on fixing the building shell first to minimize further building deterioration.*
- *Plan for a "robust program" capacity for each rebuilt or fully renovated facility.*
- *Endeavor to significantly rebuild/fully renovate the portfolio over a 24- to 40-year time frame.*
- *Priority should be given to capital projects that reduce future operational costs in order to make more operational funds available for the classroom.*
- *Screen all future capital projects through the guiding principles.*
- *Address capacity and create modern learning environments by providing facilities that are flexible.*
- *Consider replacing existing schools that require major renovation.*
- *Invest prudently in schools identified for future replacement.*
- *Upgrade strategically selected school facilities to act as emergency shelters immediately following a major earthquake.*

### ***Non-Capital***

- *Create school facilities that support and enhance evidence-based and emerging best practices in terms of school size and educational program.*
- *Pursue partnerships to leverage community support and innovation.*
- *Actively manage existing properties to allow future flexibility with regard to changing demographic needs and best practices in teaching, and to maximize value to the district and community.*



- Consider “options other than new” (non-capital options) to meet capacity demands (including limiting transfers, etc.)

## **RELATED POLICIES/BEST PRACTICES**

The **2012 PPS School Construction Bond** included the master planning for Benson High School, as well as budget for incremental seismic & ADA improvements due to the focus option educational program, poor seismic rating and the inaccessibility of the main entrance. Poor facility condition, particularly seismic and ADA deficiencies, was prioritized for the majority of 2012 bond work.

The **2014 Bond Development Committee** reviewed the 2012 bond measure, 32 year financing plan and evaluation criteria in order to recommend Benson as part of the subsequent school bond with the prioritized criteria:

- *District's only Career Technical Education (CTE) Focus Option*
- *Significant Seismic Needs*
- *Larger percentage of historically underserved students*
- *Also, offers potential to leverage private or institutional partnership*

On December 1, 2015, the **Board of Education adopted, by Resolution 5177, their priorities for 2015-2017**. Portland Public Schools' vision is this: Every student, every teacher, and every school succeeding. The school district's mission is that every student by name is prepared for college, career and participation as an active community member, regardless of race, income or zip code. The priorities included:

*Ensure that the School Building Improvement Bond continues tracking on time and on budget and delivers innovative, 21st century schools.*

**The Benson Polytechnic Master Planning Guiding Principles**, established in 2016:

1. Honor the unique history and culture of Benson Polytechnic High School.
2. Engage with the local business, government, and post-secondary partners to create strong connections between education and industry.
3. Provide hands-on, project-based learning opportunities that are imbued with rigor and relevancy.
4. Provide agile, flexible, and adaptable facilities that support changing educational needs.
5. Provide learning environments that inspire creativity and collaboration among students.
6. Support a comprehensive educational experience for students.
7. Celebrate diversity and provide a sense of inclusion and belonging among students and families.
8. Position Benson Polytechnic as a national model for STEAM and Career Technical Education (CTE).

## **ANALYSIS OF SITUATION**

As the District's only Comprehensive Focus Option High School with Enhanced CTE, Benson Polytechnic High School serves students from all PPS neighborhoods. Benson's CTE programs of study include:

Arts and Communications: Radio Broadcasting, Digital Media Production and Design & Applied Arts.

Health Occupations: Medical Professions, Nursing and Dental

Industry and Engineering: Architectural Design, Automotive/Transportation, Building Construction, Computer Science, Electrical, Engineering, Manufacturing Technology

The Benson High School campus is the only PPS high school campus that is a designated Portland Historic Landmark, with the oldest buildings constructed in 1916-1917. At 368,000 square feet, Benson is the largest PPS school building, which includes impressively sized CTE shops that meet the needs of its unique technical educational programming. The school occupies one of the most constrained high school sites in Portland, includes year round and evening use and is one of the largest energy users. With its age, the building includes the most significant building condition, health and safety deficiencies. With the building structure containing unreinforced masonry (URM), Benson is listed on the City of Portland's URM database, making it a high priority for seismic retrofit. The building's inaccessibility issues, such as the main entry, and lack of enough elevators to access all classrooms, makes it an ADA upgrade priority in order to comply with Section 504 of the Rehabilitation Act of 1973 prohibiting discrimination based upon disability.

The campus is in the Kerns neighborhood of northeast Portland and occupies a densely developed 7.67 acre site that is located between NE Irving Street to the north, NE 12th Avenue to the west, NE 15th Avenue to the east, and Buckman Field, which is owned by Portland Parks and Recreation. The property also includes the 1.5 acre parking lot east of Buckman Field, but does not include the playing fields, track, and tennis courts to the south of the school complex. The main school building is situated at the top of terraced front courtyard that is framed to the north and south by opposing wings. The main school building, auditorium, and old gymnasium retain character defining features of the Classical Revival style, featuring a distinctive three part plan consisting of the main building, gymnasium wing, and auditorium wing that form the west part of the campus. The school's main entrance of the school historically significant due to the distinctively Georgian-Revival wood paneling and pilasters.

Due to Benson's historical significance, the master plan and pre-design diligence processes have established that the modernization will include mostly renovation and rehabilitation of the historically significant buildings to the west, north and northeast corner, and with new construction to replace the majority of less-historically significant buildings in the center of the school, to the south and to the east.

### **FISCAL IMPACT**

The total project budget identified in the **2017 Bond** materials for the Benson High School Modernization project was \$202,000,000.

**Board Resolution 5515** authorized OSM to proceed with 2017 Health and Safety Modernization Bond Sequencing Plan. This established Benson Polytechnic as the last modernization project in the bond 2017 program schedule. Project escalation has been increased to account for the increased construction costs for occupied school construction phase completion in 2022, 2023 and 2024.

**Board Resolution 5632** authorized the use of bond funds to construct necessary improvements to complete the Middle School Implementation Plan. This reduced the Benson High School modernization budget to \$198,206,690

**Board Resolution 5709** approved Lincoln High School at \$242,500,000 and **Board Resolution 5710** approved Madison High School at \$199,000,000. The additional funds of \$116,086,619 for these two projects has been deducted from the Benson High School modernization budget, reducing it to \$82,120,071.

Per Board approval at the **October 9 Work Session**, Kellogg Middle School budget has increased by \$14.8M. The additional funds for this project will be deducted from the Benson High School modernization budget further reducing the project budget to approximately \$67,320,071.

The **Middle School Implementation Plan** costs will be paid for through the Construction Excise Tax; therefore the \$11.4M will be added to the Benson High School modernization budget, which will increase it to \$78,720,071

The proposed **Benson Campus Master Plan target budget**, based on current cost estimates and forecast data, is \$296,000,000.

Cost reduction options are starting to be developed by the project team and reviewed by the Benson Tech Steering Committee to decrease the project costs.

The District, School Board and Superintendent are committed to the modernization of Benson Campus. The School Board is expected to launch a new facilities bond campaign in 2020 to support ongoing Benson campus construction.

Please see the attached Master Plan Report for more detailed project cost information.

## **COMMUNITY ENGAGEMENT**

Starting in January 2016 and continuing through May 2016, the OSM Project Team with DOWA/IBI Group Architects started and completed the Preliminary Master Planning and Ed Spec process. By November 2016, Bassetti Architects was awarded the contract for pre-design and to continue design work for the project. This started with the Pre-Design Diligence analysis and further development of the Benson Tech Ed Specs and Master Plan.

The **Master Plan Committee** (MPC) engagement, starting in January 2016, continued until May 2018 and included:

- Sixteen (16) Master Plan Committee meetings
- Two (2) Public Design Workshops
- One (1) Open House
- Local school tours

In addition, during the master planning and pre-design processes, stakeholder engagement has included:

- **Public agency engagement**, including early assistance meeting at City of Portland Bureau of Development Services, Portland Landmarks Commission presentations, State Historic Preservation Office tour and plan review, and Portland Parks and Recreation staff master plan review.

- **Student Engagement** has included student representatives on the DAG and MPC from 2016 - 2018, 2016 master plan workshop, 2017 lunch surveys and outreach, 2018 architecture class project and class visits.
- **Benson Polytechnic teachers, administration and staff:** planning meetings, admin and all staff update meetings, as well as ed spec department representatives engagement and workshop.
- **Office of Teaching & Learning, STEAM and CTE** has been involved in ed specs, master plan and industry outreach planning.
- **District office/BESC & Operations & other Departments,** 2017 focus group meetings with overall updates through 2018.
- **Benson Tech Modernization Steering Committee** started meeting in May 2018 and includes monthly meetings with PPS leadership including Business & Operations, Instruction & School Communities, Office of Teaching & Learning, CTE, Partnerships, Facilities, Maintenance, School Modernization, Bond Program Manager, School principal, BOE representative and Communications.

In order to align with District CTE and MPC goals for the Ed Spec and Master Plan, industry outreach was conducted with over 10 tours and interviews in order to gather input from local, professional resources. The results helped inform the ed spec to meet the needs of industry, consider future technologies and innovative ideas.

The Design Advisory Group (DAG) was formed in September 2018. The purpose of the DAG is to advise the project team on the project design by developing a comprehensive, equitable, integrated and visionary high school design; DAG concerns and aspirations will influence the plan and design. There has been three DAG meetings to date. In total, the Project Team anticipates at a minimum:

- Seven (7) Design Advisory Group meetings.
- One (1) Public Design Workshop
- One (1) Open House.

Multiple Pathways representatives will be invited to the DAG meetings in 2019. Staff is currently outlining additional engagement meetings with Benson Campus stakeholders (co-located schools, programs and partners), including: Alliance High School (at Benson and Meek); Clinton DART School at Benson and other Portland DART Schools; Reconnection Services Center; PISA (Portland International Scholars Academy); Pioneer School; Summer & Evening Scholars; Teen Parent Program; and Virtual Scholars.

### **TIMELINE FOR IMPLEMENTATION / EVALUATION**

The Benson High School Modernization project schedule has targeted schematic design commencing January 2019 in order to stay on schedule for construction starting in 2021.

The RFP for selecting the CMGC for the project will advertise in December and award is desired by February, as this complex historic renovation benefits from early contractor involvement in the design process and provides useful information on estimating, cost reductions and phasing.

The Master Plan includes spaces necessary to meet the 1700 student design capacity but for which specific programming has yet to be identified. Potential options for this un-programmed space now includes: additional CTE programs as a result of CTE Visioning, Multiple Pathways to Graduation Programs and/or Schools, PPS Comprehensive High School wrap around services, expanded visual or performing arts spaces, etc. The intended use of these spaces will be determined by March 2019.

### **BOARD OPTIONS WITH ANALYSIS**

Staff requests approval of the proposed Benson Polytechnic High School Site Specific CTE Focus Option Educational Specifications, Master Plan & Resolution. Additional cost reductions and value engineering will be determined and evaluated as additional project information is developed; these reductions will be evaluated through the Benson Steering Committee and updates on major revisions would be provided to the Board. Staff will return to the Board in spring 2019 to review project planning and programming options.

### **STAFF RECOMMENDATION**

Staff is recommending the Board accept the Educational Specifications and Master Plan Design for Benson Campus as defined in resolution                     .

**I have reviewed this staff report and concur with the recommendation to the Board.**



**Guadalupe Guerrero**  
Superintendent  
Portland Public Schools

December 4, 2018  
Date

### **ATTACHMENTS & LINKS**

- A. **Resolution** Authorizing Benson Campus Master Plan as Part of the 2017 Capital Bond Program
- B. [Benson Master Plan Report and Site Specific Ed Spec](#)
- C. [Due Diligence Report](#), available on [BensonBond.pps.net](#)
- D. [Focus Option Educational Specification, 2017](#), available on BensonBond.pps.net
- E. DAG and MPC presentation documents & notes, available at [BensonBond.pps.net](#)

F. [Benson Tech Steering Committee Meetings](#)

G. [Benson Tech Industry Outreach Tour Notes](#)

H. [PPS Long Range Facilities Plan](#)

**PPS District Priorities FY 2018-19**

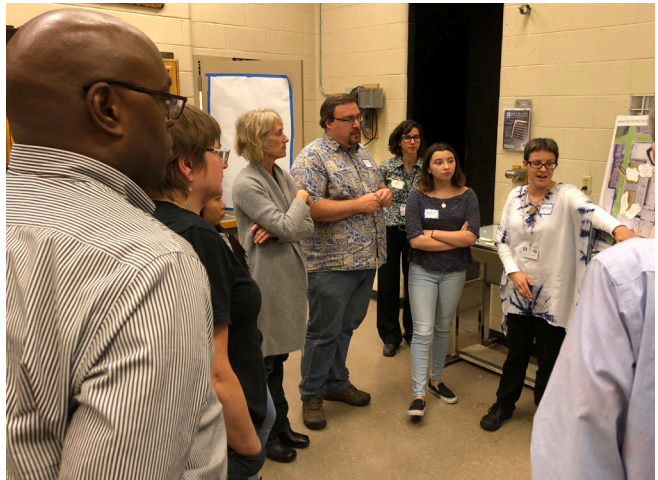
- *Set a clear Vision and Strategic Plan*
- *Create equitable opportunities and outcomes for all students*
- *Build management and accountability systems and structures*
- *Allocate budget, funding and resources focused on improving outcomes for students*

<b>MULTIPLE PATHWAYS TO GRADUATION @ BENSON -CURRENT USE</b>	<b>Room #</b>	<b>Approx. SF Area</b>	
Night & Summer School Office	H1002A	989	Plus Shared Classrooms
Reconnection Services	127	751	
Alliance High School/Reconnection Program	C102,C112A,C128	7,165	
Pioneer High School	K1002	912	
PISA (Portland International Scholars Academy)	2nd fl Auditorium, 203, 205	2,568	1 Shared Classroom
Clinton School & DART (Discovering and Rising Together)	2nd fl F Wing	7,123	
Virtual Scholars	125	2,569	Shared Meeting Room
		<b>22,077</b>	<b>Total SF (Square Feet)</b>



# BENSON POLYTECHNIC HIGH SCHOOL

## MASTER PLAN REPORT





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# PROJECT BACKGROUND



## CONTRIBUTING HIGH SIGNIFICANCE

- + Building A, Main Building (1917)
- + Building B, Auditorium (1929)
- + Building C, Old Gymnasium (1925)

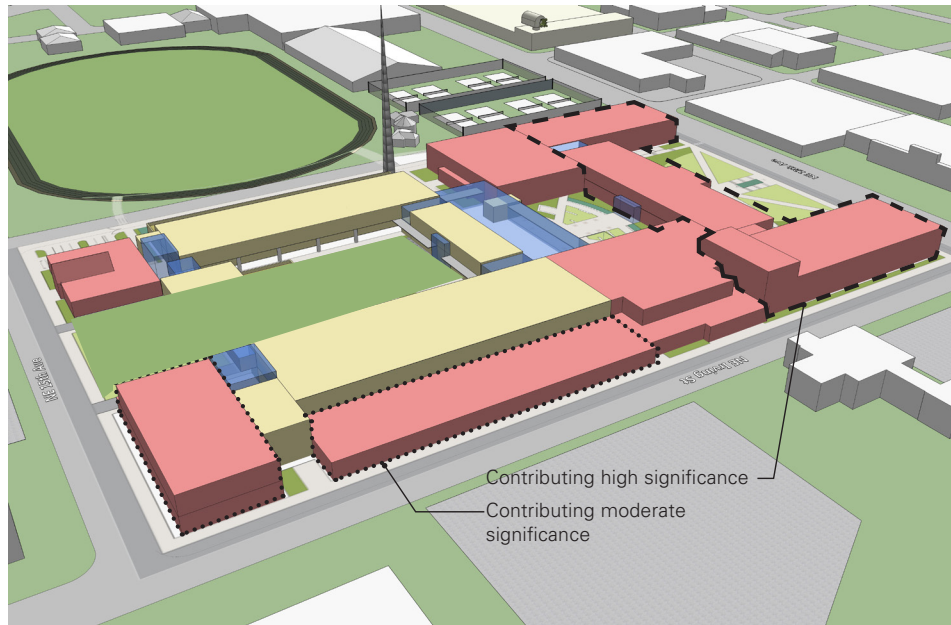
## CONTRIBUTING MODERATE SIGNIFICANCE

- + Building G, North Shop Wing (1917)
- + Building J, South Shop Wing (1918)
- + Building K, Foundry Building (1917)

## NON-CONTRIBUTING

- + Building D, Library Addition (1991)
- + Building E, Library Science Addition (1917/53/91)
- + Building F, Gymnasium (1964)
- + Building H, Aeronautics/Automotive Shops (1953)
- + Building L, KBPS (1991)

■ Contributing High Significance   
 ■ Contributing Moderate Significance   
 ■ Non-Contributing



VIEW FROM NE

■ Existing building structure to remain  
■ New building

## STUDENT DESIGN CAPACITY

1,700

## PROPOSED BUILDING AREA

+/- 368,000 SF

The modernization of Benson Polytechnic will restore the historic 1916 Main Classroom building, the 1927 Old Gymnasium and the 1930 Auditorium Building, as well as the North Wing Shops and Foundry Building, both constructed in 1916. Renovation to include: 1960 Gym, Radio Building, and 1990s remodeled addition. The South Wing Shops Building may or may not be restored depending on function and cost.

The master plan approach places the Commons at the new heart of the school, serving multiple uses such as cafeteria, student and community gatherings, foyer for athletic events, informal studies and access to various exterior spaces.

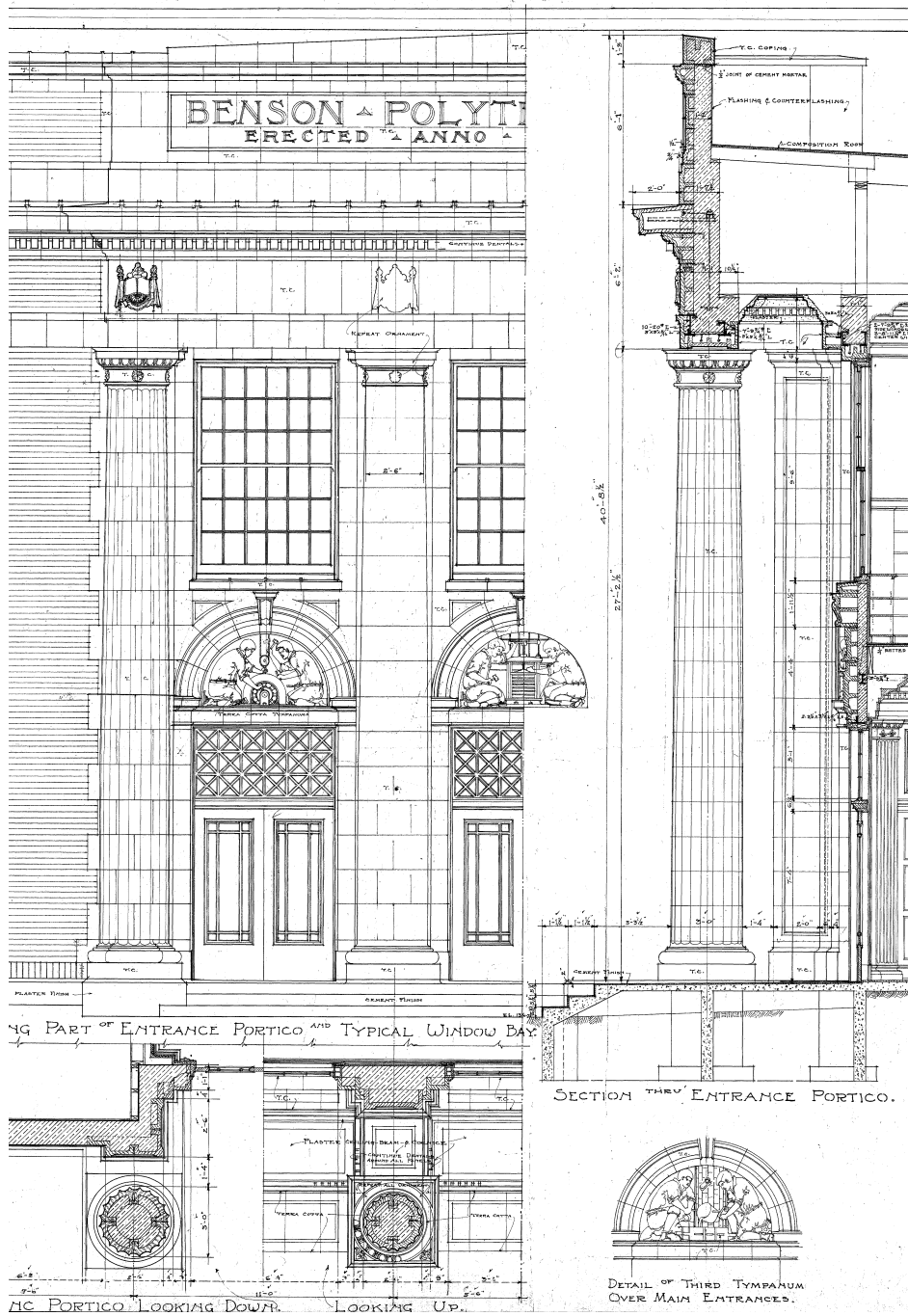
Four exterior spaces are also being introduced and enhanced in the master plan:

- + The existing west entry lawn with ADA access and entry gathering space
- + A new central social courtyard
- + A new east CTE work courtyard
- + A new south plaza

Internal layouts of core academic classrooms and CTE programs within the school restoration will provide a spatially adjacent arrangement of core academic, SPED, and CTE programs, that doesn't currently exist at the school. The design also looks to maximize opportunities for natural daylighting into all learning spaces, and a flexibility in building systems that will allow for accommodation of evolving educational programs. The design approach seeks to integrate all of these considerations in a manner that will propel Benson Polytechnic High School into the 21st Century as a reinvigorated national model for career learning educational institutions.

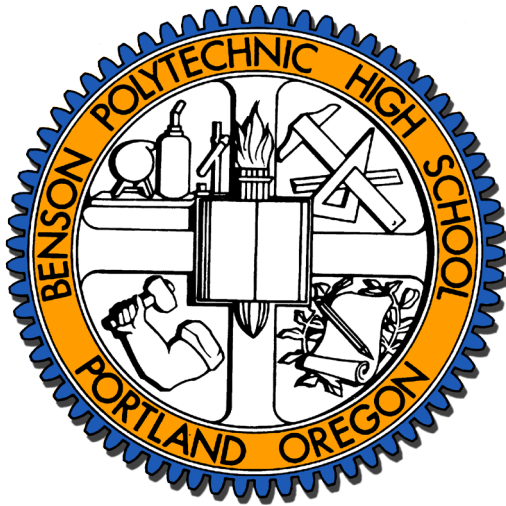
## KEY PROJECT CHALLENGES

- + Historic landmark requires Portland Landmarks Commission review
- + Constrained urban site
- + Extensive health and safety upgrades required, including seismic upgrade of unreinforced masonry (URM) buildings and providing ADA and universal access throughout campus
- + Phased construction with student occupancy
- + Planning for CTE spaces, equipment and educational programming to continue during construction.



Main Building construction, circa. 1916

# MASTER PLANNING GUIDING PRINCIPLES

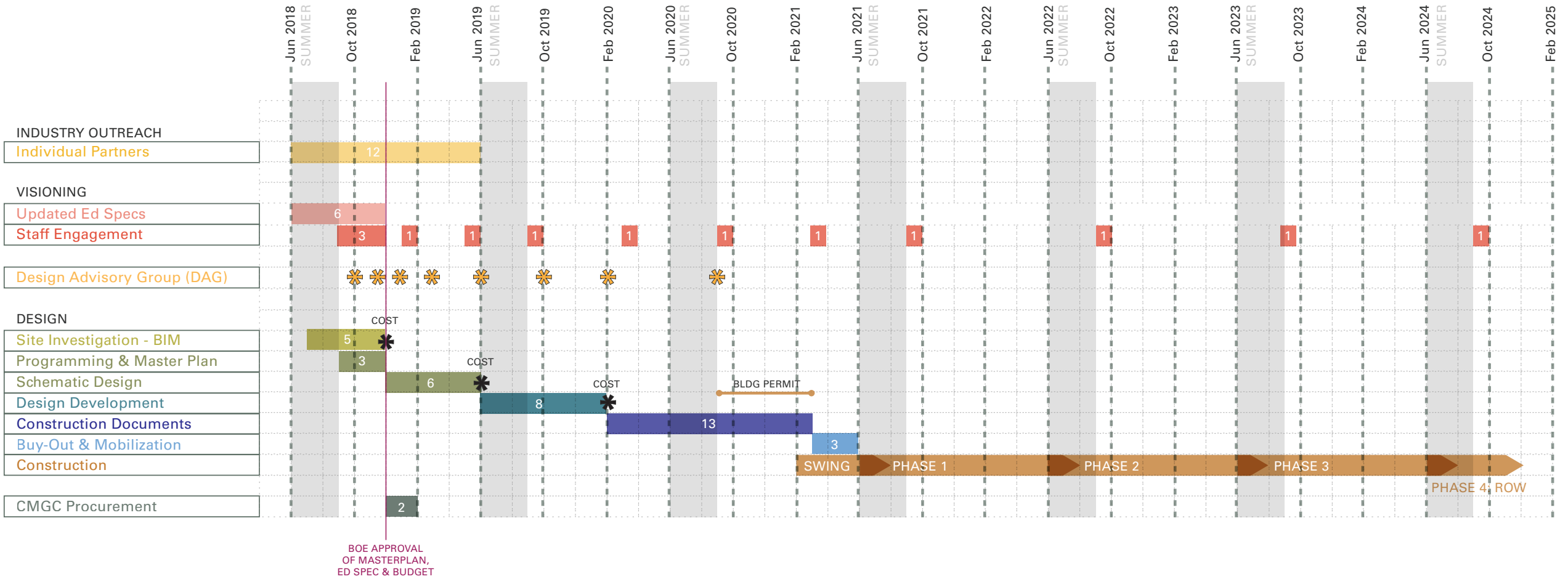


1. Honor the unique history and culture of Benson Polytechnic High School.
2. Engage with the local business, government, and post-secondary partners to create strong connections between education and industry.
3. Provide hands-on, project-based learning opportunities that are imbued with rigor and relevancy.
4. Provide agile, flexible, and adaptable facilities that support changing educational needs.
5. Provide learning environments that inspire creativity and collaboration among students.
6. Support a comprehensive educational experience for students.
7. Celebrate diversity and provide a sense of inclusion and belonging among students and families.
8. Position Benson Polytechnic as a national model for STEAM and Career Technical Education (CTE).

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# SCHEDULE



# STAKEHOLDER ENGAGEMENT

## MASTER PLANNING COMMITTEE

January 2016 - May 2018

- + 16 meetings
- + 6 school tours
- + 2 public workshops
- + 1 open house

## DESIGN ADVISORY GROUP

Started October 2018.

Advisory; provide input; concerns and aspirations reflected in alternatives developed

- + Largest student and application response of any PPS Modernization project
- + 3 Meetings in Programming Phase

## STEERING COMMITTEE

District leadership decision makers

- + Meeting monthly since May 2018
- + 6 meetings in Programming Phase

## SCHOOL STAKEHOLDERS

Benson Tech administration, staff, CTE and Core department leads

- + Weekly meetings with Benson Admin
- + 3 Ed Spec work sessions with CTE and Core Dept. Leads
- + 25 Meetings with CTE, Academic Staff & School stakeholders including: Digital Media CTE, Radio CTE, Electrical CTE, Engineering CTE, World Language/Spanish/Leadership, Counseling, Computer Engineering CTE, Architecture CTE, Geometry Tech, Language Arts/English, Construction CTE, Science, Robotics, Math, PE/Health, Athletics, Library, Automotive CTE, Applied Art CTE, Social Studies, Special Education, Manufacturing CTE, afterschool programs, November 2016, February 2017, October 2018
- + All Staff Meeting Updates, Periodically 2016 -2018

## SCHOOL COMMUNITY

- + 2 Public/Community Master Plan Design Workshops, Spring 2016
- + 1 Public/Community Open House, Spring 2016
- + Benson Tech Show, February 2017, March 2018
- + Benson Polytechnic Centennial Celebration, Oregon Historical Society, June 2017
- + Benson Tech Site Council Presentation, November 2017

## STUDENTS

- + 13 student representatives on Design Advisory Group
- + Architecture class project, 2018
- + All-student survey, Spring 2017
- + Master Plan Lunch Chats, Spring 2017
- + Afterschool master plan activity, Spring 2016
- + Benson Tech Leadership class presentations, Spring 2016
- + Student representation on Master Planning Committee from 2016 -2018

## DISTRICT STAKEHOLDERS

BESC Departments, Operations, and OTL

- + Meetings to review master plan & ed specs with PPS OTL/CTE starting in April 2016 through 2018
- + Aviation HS Visit with CTE, September 2017
- + Industry Outreach Planning Meetings with CTE
- + Summer 2017-Spring 2018

## INDUSTRY & POST SECONDARY OUTREACH

Site visits, facility tours, industry leader interviews

## PUBLIC AGENCY

- + Bureau of Development Services Early assistance meeting, May 2016
- + Portland Landmarks Commission, May 2016, September 2017
- + State Historic Preservation Office, September 2017





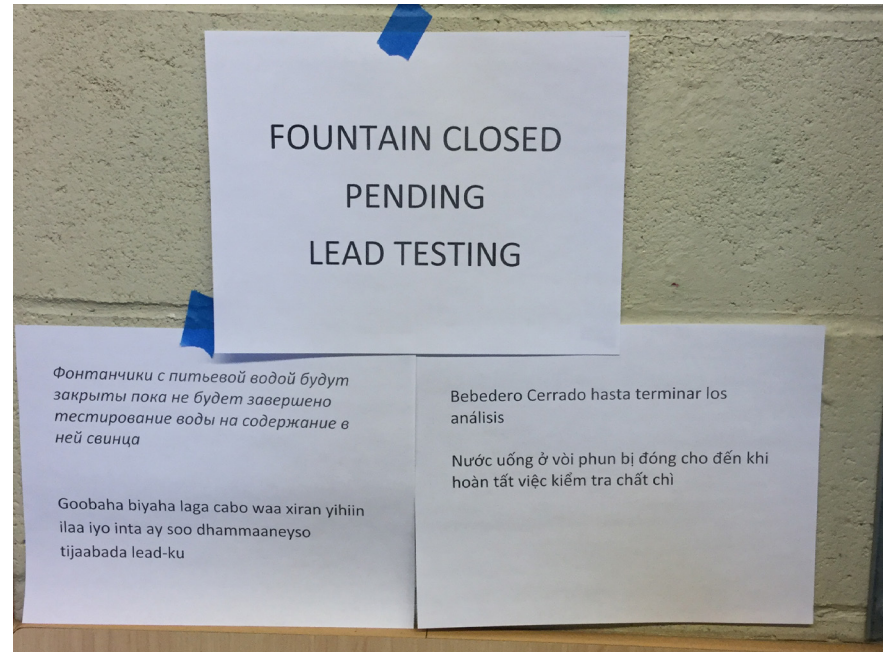
# UNIVERSAL DESIGN

- + Main entry at school front is accessible & welcoming to all visitors, students and staff.
- + New common spaces will be centrally located and universally accessible
- + Sped classrooms distributed throughout learning clusters of cte & core
- + Vertical visual & enhanced connectors between floors
- + Inaccessible learning spaces in existing building will be provided with new elevator access
- + Accessible & inclusive restrooms provided on each floor
- + Accessible & inclusive showers and dressing rooms will be provided



# HEALTH & SAFETY

- + Water Quality: Modernization would include replacement of plumbing piping and fixtures.
- + Fire /Life Safety: Aged fire alarm and sprinkler systems will be upgraded for improved safety.
- + Asbestos: Abatement and removal.
- + Lead Paint: Abatement and removal.
- + Building Envelope: Modernization would upgrade exterior walls, windows and roof to repair damage, improve energy efficiency and increase durability.
- + ADA: Substantial upgrades to make all areas of the school universally accessible and compliant with current codes.
- + Seismic: URM buildings and other structures would receive a complete structural upgrade to meet current building codes. Commons and Gym to be designed to immediate occupancy classification.
- + Security Systems/Fencing: Secure entry and video surveillance system upgrades to control access. Exterior service access and central plazas to be fenced and secured during school hours.
- + Auditorium/Stage: Aging theatrical lighting and rigging systems to be updated for improved safety and maintainability.
- + Radon: Modernization would provide a new radon mitigation system below new foundations.





# UPDATED ED SPEC AND MASTER PLAN PROCESS

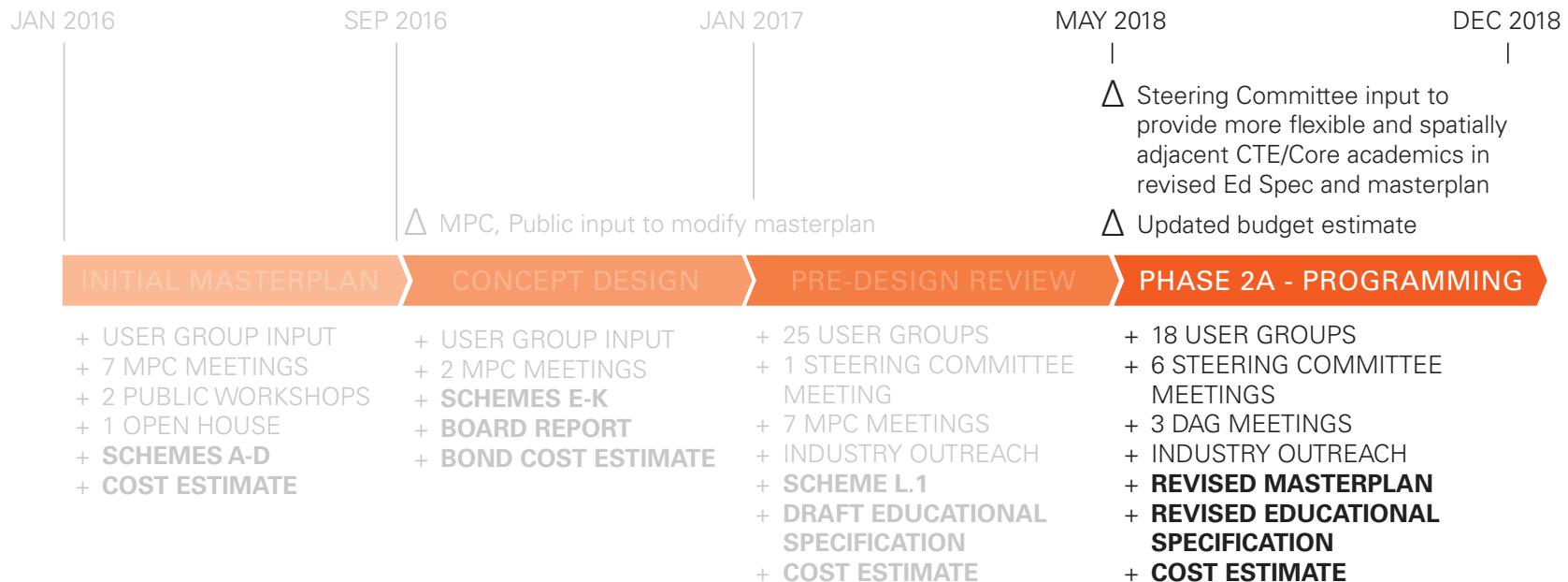
In June 2017, the design team completed a Pre-Diligence report and Focus Option Educational Specification to support the Benson Modernization. These documents were developed out of extensive investigation of existing conditions, input received from over 20 user groups and other various stakeholders, and the Master Planning Committee.

Key themes incorporated into the master plan scheme included:

- + New central Commons at the heart of the school.
- + Maintaining and modernizing historic buildings to the west and north and the KBPS building (located in the southeast corner of the site).
- + Providing a protected courtyard at the center and a shared work courtyard to the east.
- + Addressing service and delivery access from the east and south.
- + Integrating core academic classrooms and CTE shops within the school for better collaboration.
- + Enhancing daylighting, transparency, and natural ventilation.
- + Providing flexible and adaptable spaces that will meet the needs of Benson Tech now and in the future.
- + Balancing program, budget and phasing considerations.
- + Comprehensive site and building ADA access/universal design improvements

With the transition to the Programming phase, the design team expanded engagement to include new district leadership guidance and input in the form of a Steering Committee. Through this process, the design team received valuable input on new recommendations for rethinking the site specific educational specification and master plan.

Through subsequent input sessions and deeper outreach to industry partners and the formation of the Design Advisory Group, the team gathered information and references to inform a new updated Ed Spec and Master Plan, which are the subject of this report.



# UPDATED ED SPEC OVERVIEW

Educational specifications are a set of building design characteristics that establish the ways the facilities support programs and curriculum.

## COMPREHENSIVE HIGH SCHOOL ED SPEC

The comprehensive ed spec establishes a baseline of equitable facilities standards for school construction efforts across PPS.

## BENSON TECH SITE SPECIFIC ED SPEC

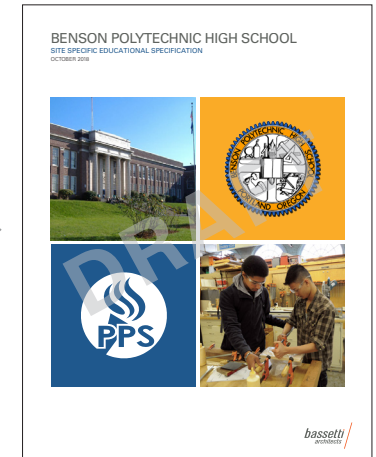
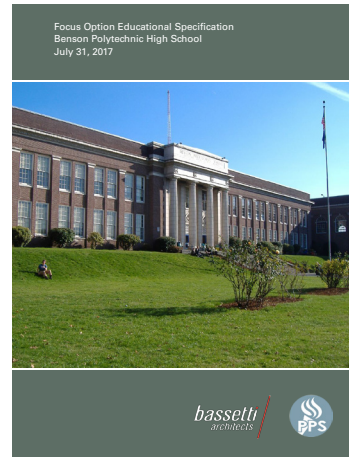
At Benson Polytechnic High School, an adapted site specific ed spec is required to define the unique needs of the Career Technical Education (CTE) and focus option aspects of the program, in addition to referencing the comprehensive ed spec for requirements of more general education support spaces.

The ed spec developed in July 2017 was a reflection of in-depth meetings with staff from each of the programs at Benson Tech, including CTE, Core academics, PE/Athletics, SPED, Counseling, Library Resource, Administration, etc. Through this work, a program summary and ed spec document was created that reflected the pedagogy and needs of the existing school expanded to accommodate 1,700 students.

After further review and feedback from the steering committee, industry and post-secondary outreach tours, and new leadership in Office of Teaching and Learning, input was provided that the ed spec and master plan should be updated to meet these additional criteria:

- + Utilize space efficiently and effectively to manage constraints and a changing industry.
- + Plan for future adaptations of CTE by providing less compartmentalization.
- + Design a flexible and adaptable building that can accommodate multiple scenarios.
- + Provide spatial adjacencies which enable greater collaboration between CTE and Core academic spaces.
- + Plan for growth by providing flexible options, not necessarily increasing size of existing CTE.

The updated ed spec document has been revised to increase spatial adjacencies in order to increase opportunities for collaboration.



### 1. INTRODUCTION

- 1.1 Executive Summary
- 1.2 Program Summary
- 1.3 Utilization Tables

### 2. ACADEMIC LEARNING COMMUNITY

- 2.0 Academic Learning Community
- 2.1 General Classroom
- 2.2 Science Lab
- 2.3 Extended Learning Area
- 2.4 Teacher Prep
- 2.5 Lab Prep - Chemical Storage
- 2.6 Conference Room
- 2.7 SPED Room and Small Classroom

### 3. CTE PROGRAMS

- 3.1 Applied Arts
- 3.2 Architecture
- 3.3 Automotive/Aviation
- 3.4 Computer Engineering
- 3.5 Construction
  - 3.5.1 Math Tech
- 3.6 Digital Media
- 3.7 Electric
- 3.8 Engineering
- 3.9 Health Occupations
- 3.10 Manufacturing
- 3.11 Radio

### 4. OTHER PROGRAMS\*

- 4.1 Robotics/Maker Space
- 4.2 Community Room/Alumni

### 5. PERFORMING ARTS\*

- 5.1 Theater
- 5.2 Concessions
- 5.3 Multi-Use/Green Room/Music

### 6. PE/Athletics\*

- 6.1 Circuit
- 6.2 Cardio
- 6.3 Auxiliary Gym/Indoors Track

### 7. Educational Support\*

- 7.1 Computer Lab - Large
- 7.2 Computer Lab - Small
- 7.3 Lobby

### 8. Wrap Around Services\*

- 8.1 Health Clinic

### INTRODUCTION

- WHAT IS AN ED SPEC?
- BENSON TECH BACKGROUND

### ED SPEC BACKGROUND

- PROCESS
- GUIDING PRINCIPLES
- ADDITIONAL GOALS

### PROGRAM

- PROGRAM DELIVERY COMPONENTS
- MODULAR SUITE TYPOLOGY
  - SUITE TYPE A
  - SUITE TYPE B
  - SUITE TYPE C
  - SUITE TYPE D
- SUITE COMBINATION ADAPTATIONS
- STUDENT GATHERING SPACES
- KEY BUILDING ADJACENCIES
- PROGRAM SUMMARY
- DETAILED PROGRAM

### TECHNICAL BUILDING CONSIDERATIONS

- STRUCTURAL GRID
- ACOUSTICS
- DAYLIGHTING
- ARTIFICIAL LIGHTING
- ELECTRICAL
- TECHNOLOGY AND COMMUNICATION
- MECHANICAL
- PLUMBING
- FINISHES
- SPECIALTIES
- WINDOWS, DOORS & HARDWARE
- FURNITURE & STORAGE
- EQUIPMENT

### OPENING DAY SCENARIO

- OPENING DAY PROGRAM
- ROOM DATA SHEETS

### APPENDIX



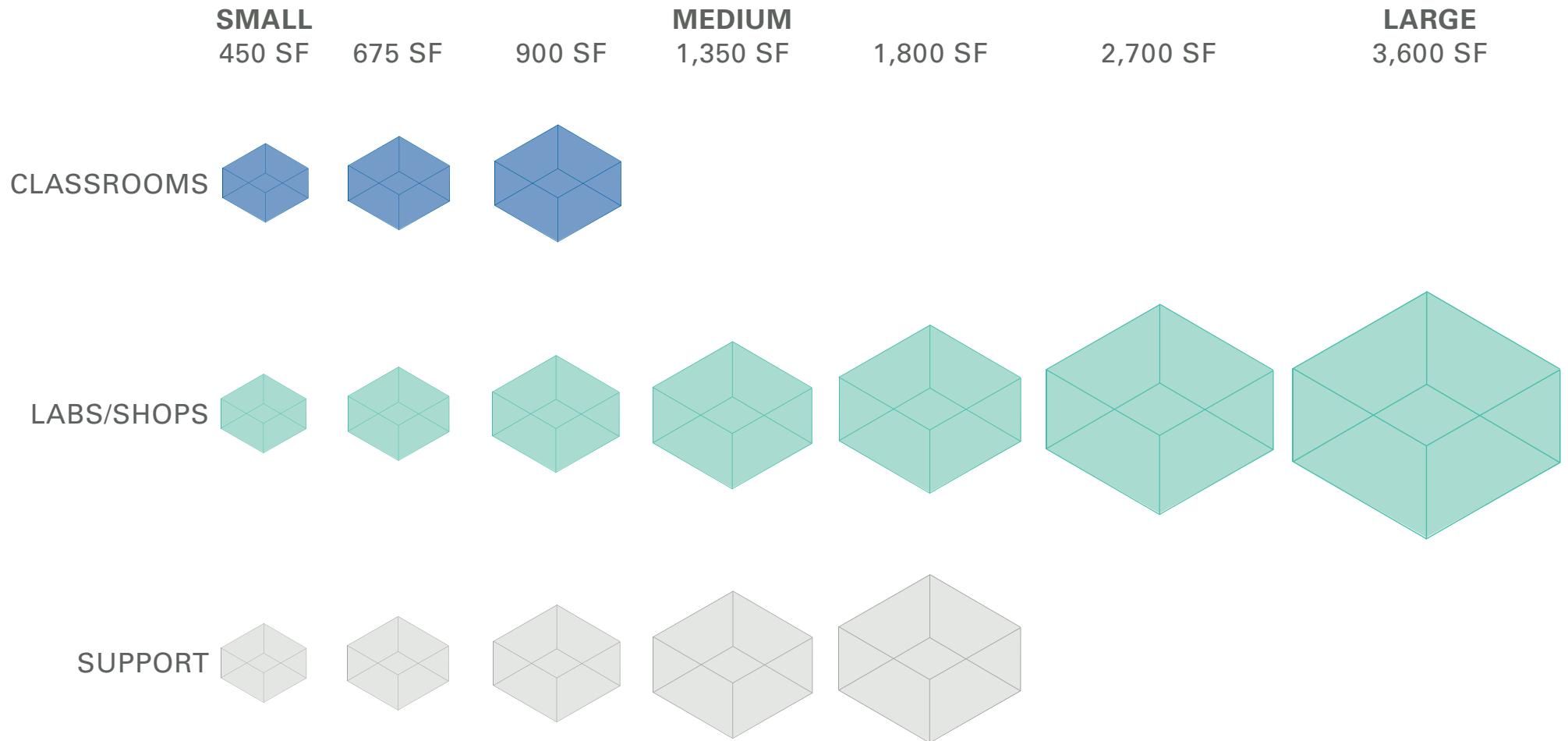
# STEERING COMMITTEE ED SPEC INPUT



Oregon Institute of Technology (OIT)

**Utilize space efficiently** and effectively to manage constraints and a changing industry.

# UPDATED ED SPEC RESPONSE TO INPUT / PROGRAM COMPONENT SIZES



Space components have been sized appropriately in the program, using a modular format to provide consistency and regularity for efficient use of space. Components can be combined when needed for larger spaces.



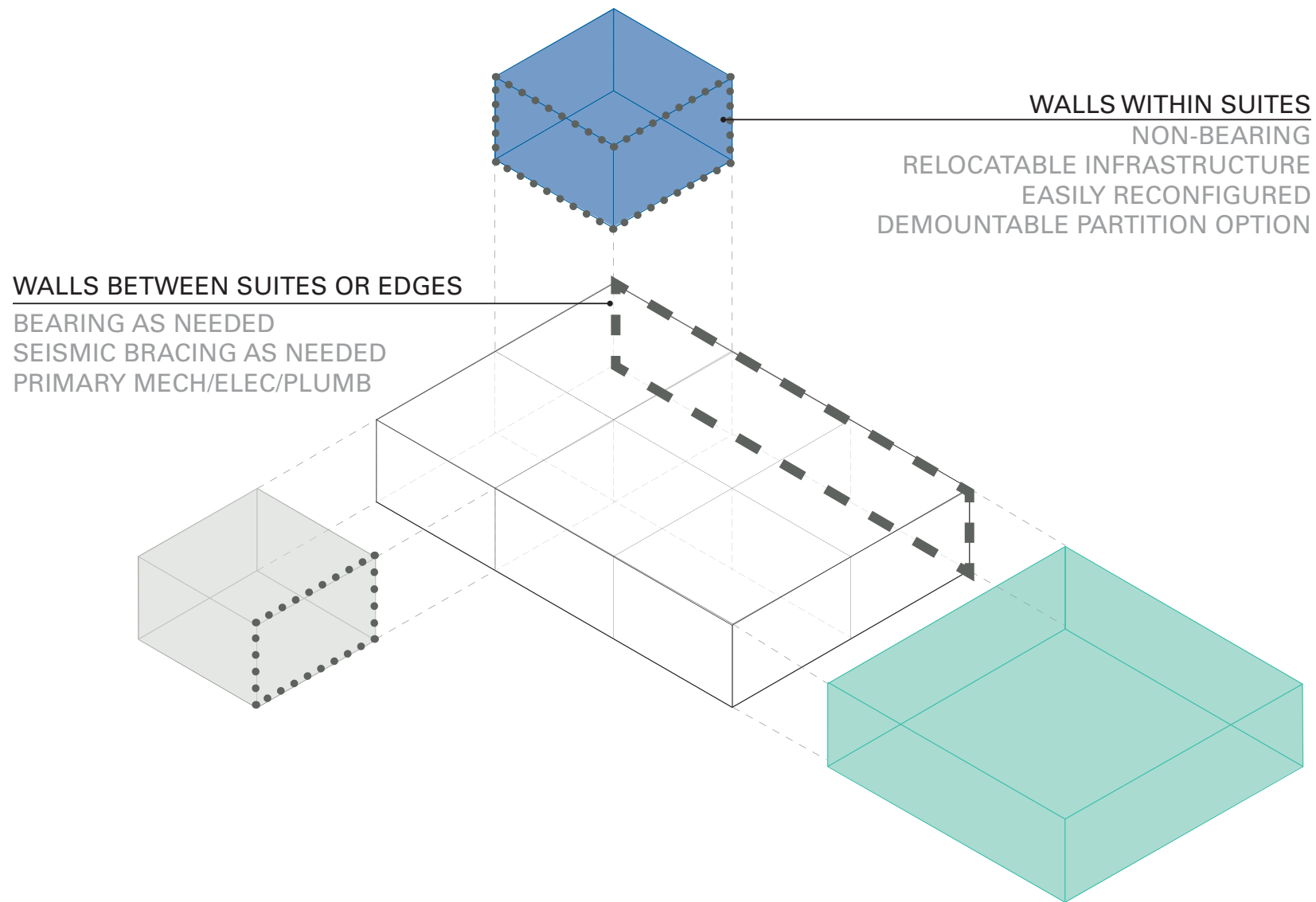
# STEERING COMMITTEE ED SPEC INPUT



Mount Hood Community College

Plan for future adaptations of CTE by providing **less compartmentalization.**

# UPDATED ED SPEC RESPONSE TO INPUT / SUITE DEVELOPMENT



CTE programs will have greater flexibility and adaptability by being arranged in suites that are more open, with careful thought about where bearing elements and infrastructure are placed to maintain adaptable space.



# STEERING COMMITTEE ED SPEC INPUT

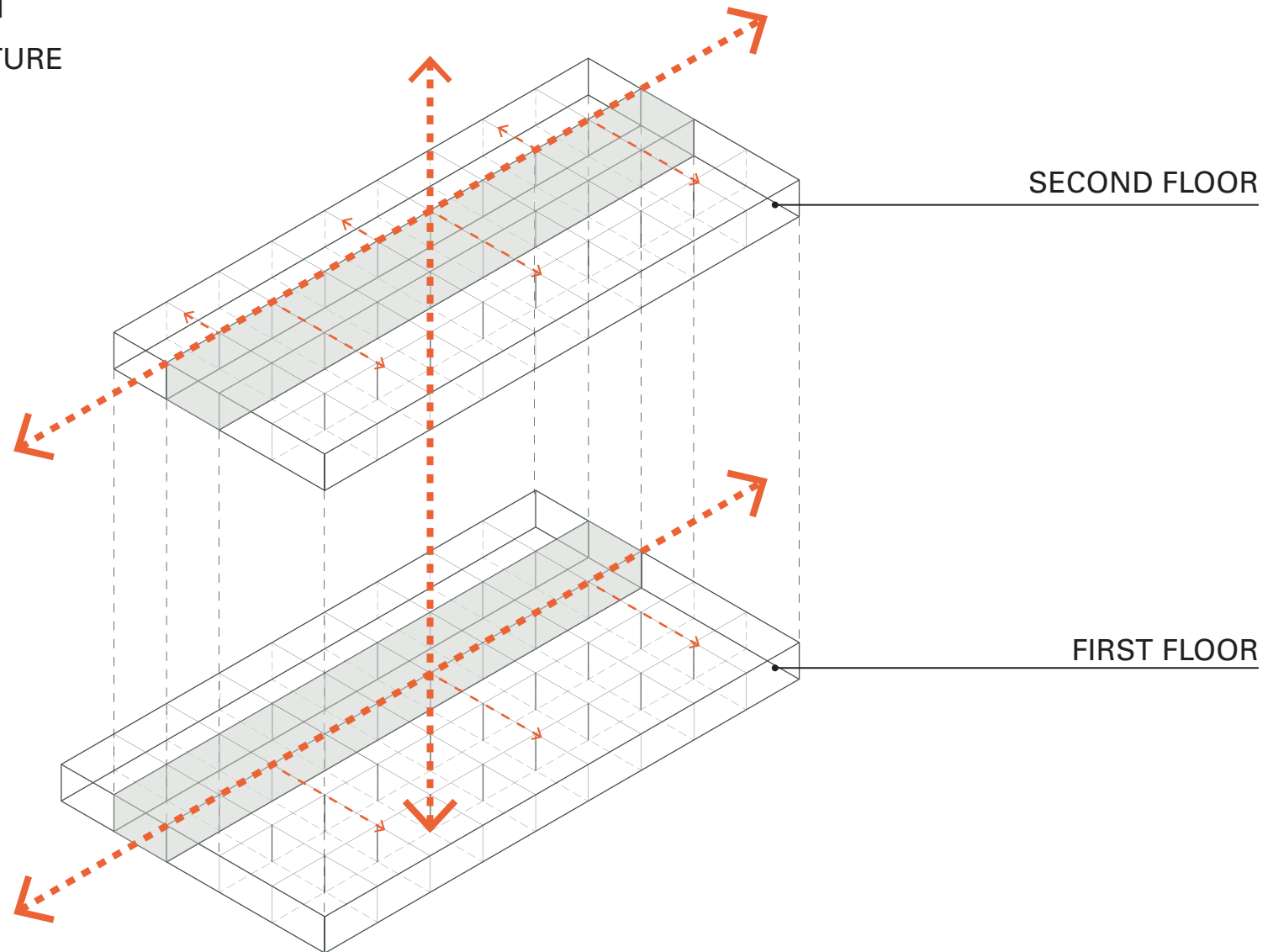


Clark College STEM Building

Design a **flexible and adaptable** building that can accommodate multiple scenarios.

# UPDATED ED SPEC RESPONSE TO INPUT / DESIGNING FOR FLEXIBILITY

- CIRCULATION / SUPPORT
- -> SYSTEMS INFRASTRUCTURE



The building's structural grid and central systems will be laid out in an efficient modular format that maximizes flexibility while supporting a wide range of potential arrangements and scenarios.



# STEERING COMMITTEE ED SPEC INPUT

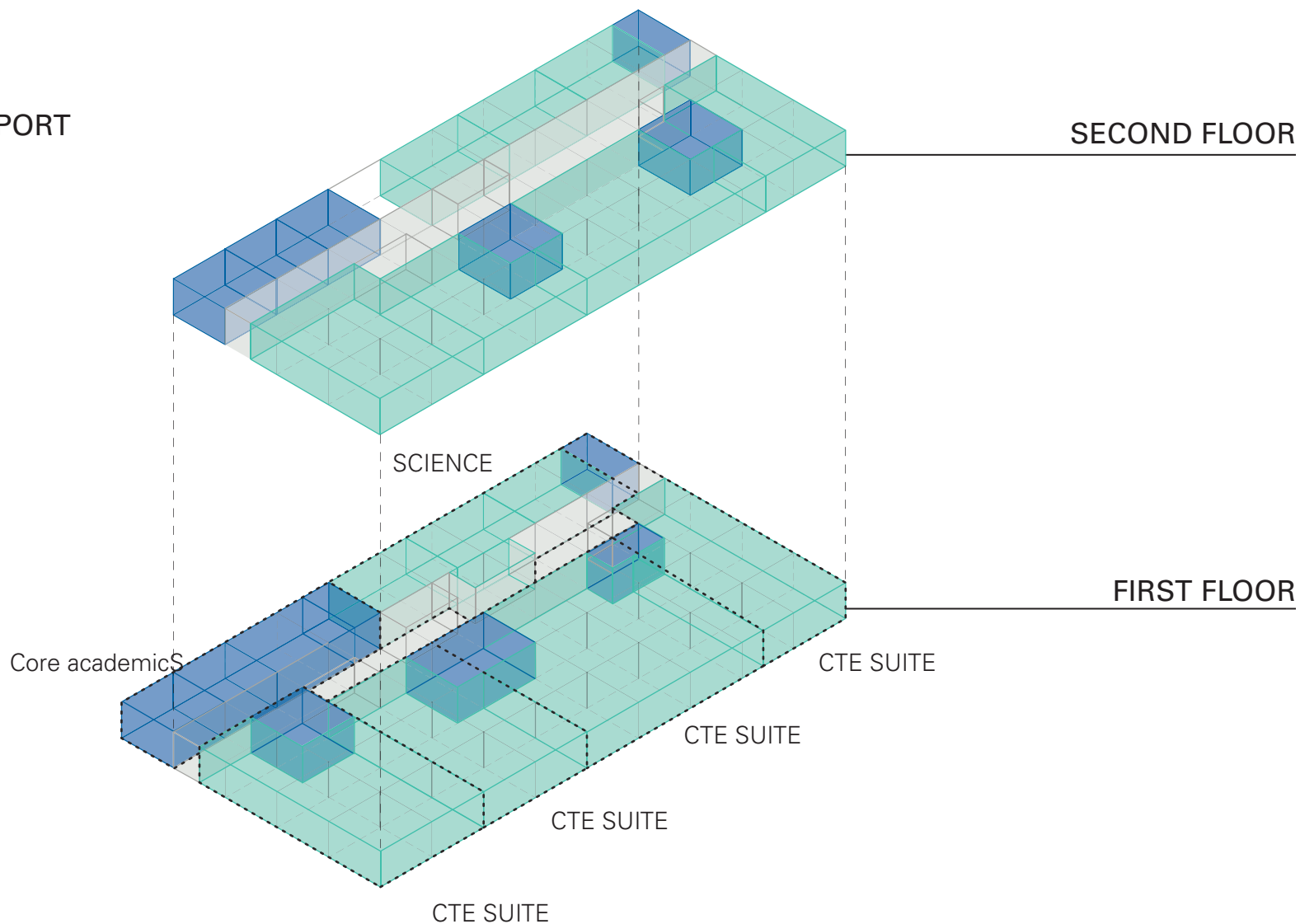


Raisbeck Aviation High School

Provide **spatial adjacencies** which **enable greater collaboration** between CTE and Core Academic spaces.

# UPDATED ED SPEC RESPONSE TO INPUT / KEY ADJACENCIES

- CLASSROOMS
- LABS / SHOPS
- CIRCULATION / SUPPORT



The building must be designed to support multiple scenarios, including arrangements that put Core Academics and CTE directly adjacent and across from each other.



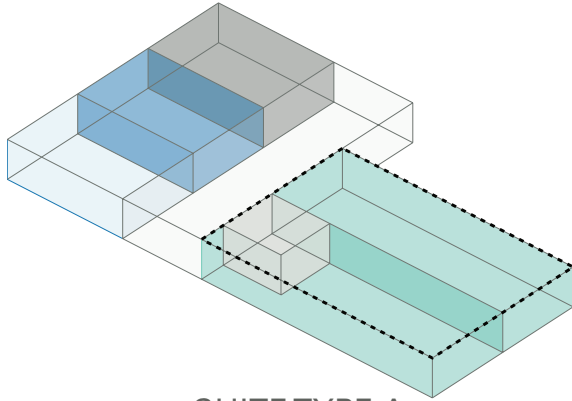
# STEERING COMMITTEE ED SPEC INPUT



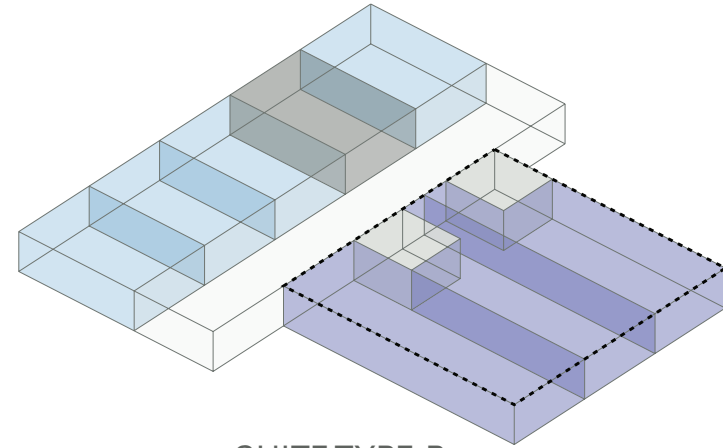
Raisbeck Aviation High School

**Plan for growth** by providing flexible options, not necessarily increasing size of existing CTE.

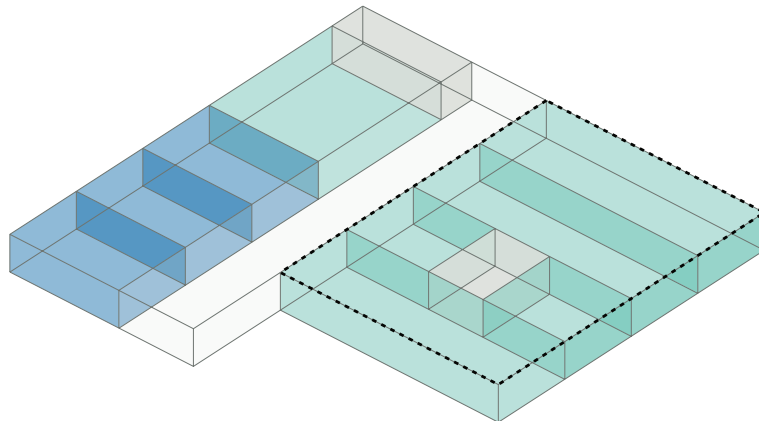
# UPDATED ED SPEC RESPONSE TO INPUT / SUITE DEVELOPMENT



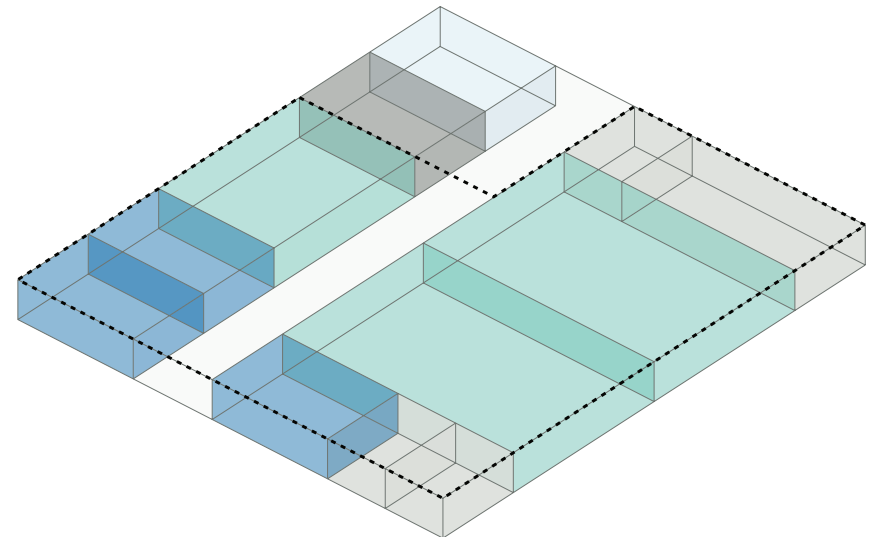
SUITE TYPE A  
3,600 SF



SUITE TYPE B  
5,400 SF



SUITE TYPE C  
7,200 SF



SUITE TYPE D  
14,400 SF

CTE programs are now organized within consistent suite types for greater parity between programs and to free up space for additional future programs that are yet to be determined. Un-programmed CTE Suite space has been reserved for potential new programs or current program growth, allowing flexibility in program development between now and opening day.

# SUITE TYPE A / 3,600 SF

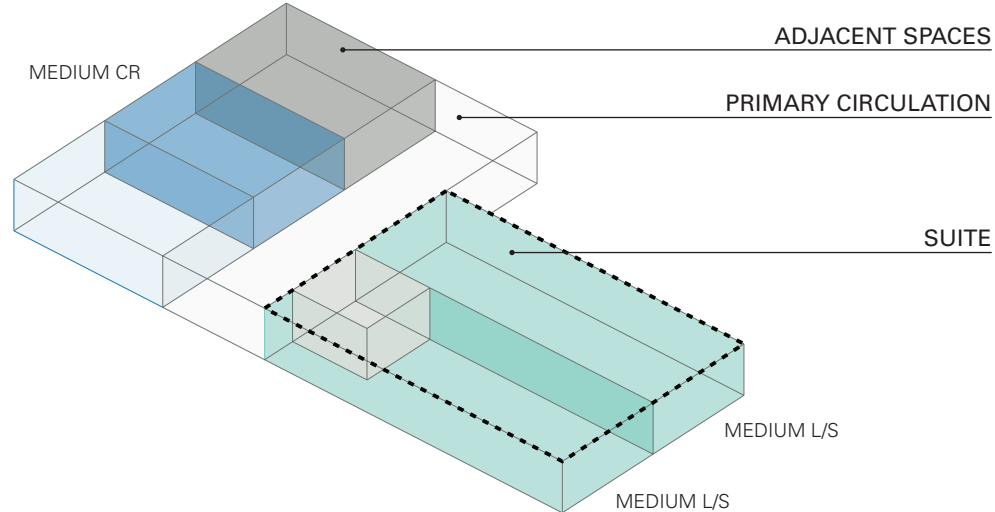
## CURRENT CTE PROGRAMS:

- + Architecture
- + Design & Applied Arts
- + Engineering
- + Computer Engineering

## OTHER EXAMPLE CTE PROGRAMS:

- + Business Management
- + Urban Planning

## EXAMPLE LAYOUT:



## LEGEND

- CLASSROOMS
- LABS / SHOPS
- COMPUTER LABS
- CIRCULATION / SUPPORT



# SUITE TYPE B / 5,400 SF

## CURRENT CTE PROGRAMS:

+ Radio

## OTHER EXAMPLE CTE PROGRAMS:

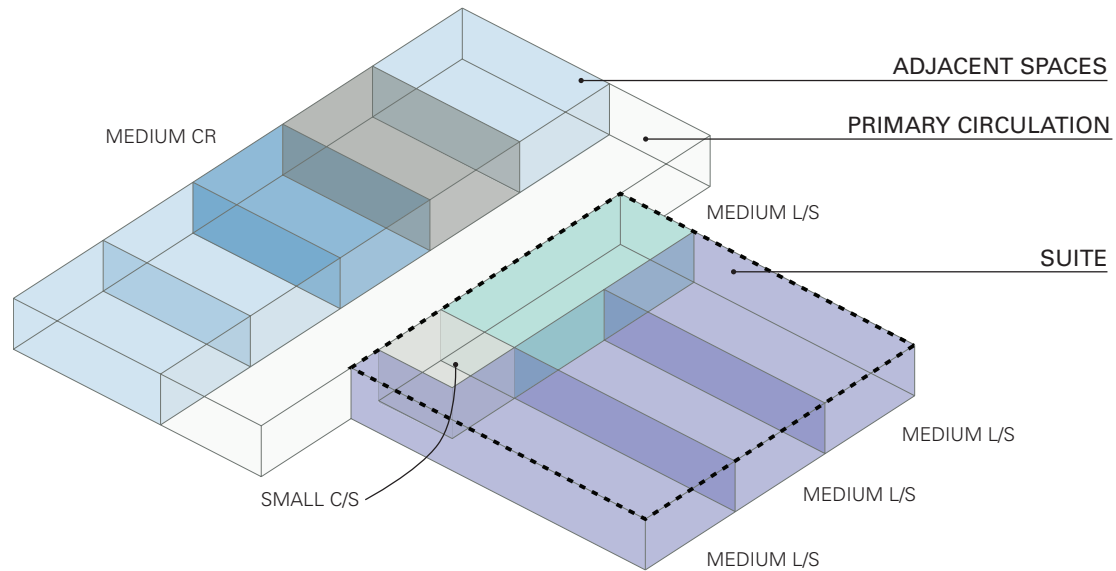
+ Education

+ Product Design

+ Aviation

+ Technical Theater

## EXAMPLE LAYOUT:



## LEGEND

- CLASSROOMS
- LABS / SHOPS
- COMPUTER LABS
- CIRCULATION / SUPPORT

# SUITE TYPE C / 7,200 SF

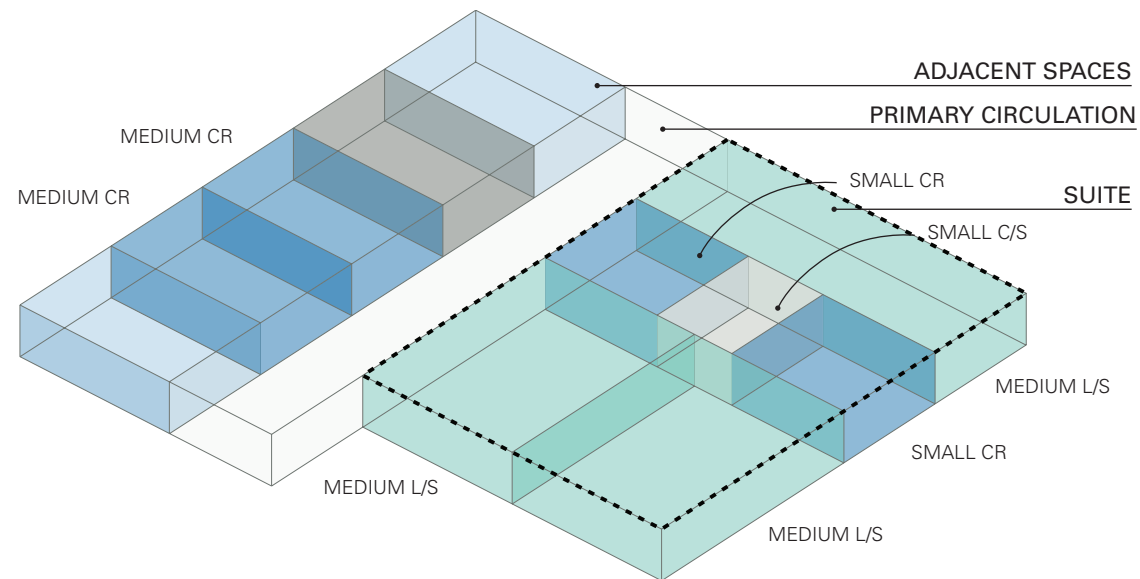
## CURRENT CTE PROGRAMS:

- + Health Occupations
- + Electric
- + Digital Media

## OTHER EXAMPLE CTE PROGRAMS:

- + Alternative Energy & Sustainability
- + Robotics

## EXAMPLE LAYOUT:



## LEGEND

- CLASSROOMS
- LABS / SHOPS
- COMPUTER LABS
- CIRCULATION / SUPPORT

# SUITE TYPE D / 14,400 SF

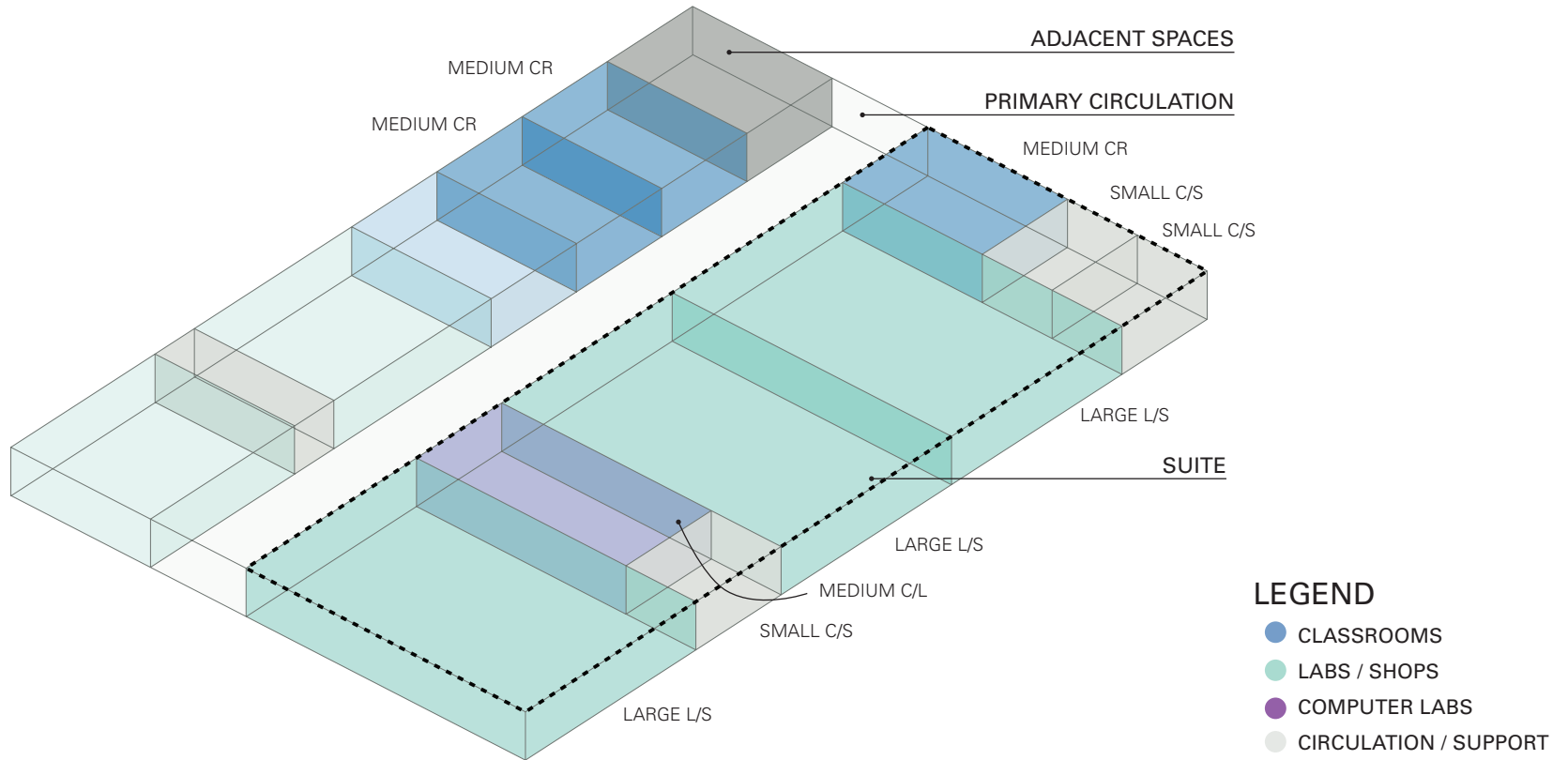
## CURRENT CTE PROGRAMS:

- + Automotive
- + Construction
- + Manufacturing

## OTHER EXAMPLE CTE PROGRAMS:

- + Hydraulics

## EXAMPLE LAYOUT:





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# BENSON TECH H.S. AREA PROGRAM SUMMARY / 1,700 STUDENT CAPACITY

PROGRAM COMPONENTS	AREA	QUANTITY	TOTAL	T/S	PPS COMP. HS ED SPEC	
					T/S	AREA
Suite Type A	3,600 SF	4	14,400 SF	8		
Suite Type B	5,400 SF	1	5,400 SF	3		
Suite Type C	7,200 SF	3	21,600 SF	11		
Suite Type D	14,400 SF	3	43,200 SF	11		
Un-Programmed Suite Types <sup>d</sup>	11,500 - 15,000 SF <sup>a</sup>		11,500 - 15,000 SF	6 <sup>a</sup>		
<b>CTE SUITES TOTAL</b>		<b>11+</b>	<b>96,100 - 99,600 SF</b>	<b>39</b>	<b>3</b>	<b>4,800 SF</b>
MAKERS LAB	1,800 SF	1	1,800 SF			1,200 SF
GENERAL CLASSROOMS	900 SF	33	29,700 SF	33	51	45,180 SF <sup>b</sup>
SCIENCE LABS & PREP	1,700 SF	9	15,300 SF	9	11	17,480 SF
SPED & ELL CLASSROOMS			5,700 SF	9	1 <sup>c</sup>	6,100 SF
FLEX / BREAKOUT SPACES			9,000 SF			8,000 SF <sup>b</sup>
TEACHER PLANNING / COLLABORATION			5,250 SF			9,800 SF <sup>b</sup>
EDUCATION SUPPORT			50,220 SF			55,480 SF
PE / ATHLETICS			42,695 SF	3	3	35,580 SF
BAND/ORCHESTRA/CHOIR			0 SF		2	5,170 SF <sup>b</sup>
FINE & VISUAL ARTS			INCL. IN CTE		2	3,080 SF
MULTI-PURPOSE / LARGE MEETING ROOM			3,500 SF			1,500 SF <sup>b</sup>
THEATER & SUPPORT			15,129 SF		1	14,600 SF
WRAP-AROUND SERVICES			5,315 SF			5,150 SF
<b>SPACE TOTALS</b>			<b>279,709 - 283,209 SF</b>			<b>213,120 SF</b>
<b>NET TO GROSS RATIO (29 - 36%)</b>			<b>81,115 - 101,955 SF</b>			<b>76,723 SF</b>
<b>GRAND TOTAL RANGE</b>			<b>360,824 - 385,164 SF</b>	<b>93</b>	<b>74</b>	<b>289,843 SF</b>

- Notes:
- a. Assumed amount. Final number will be determined when program is assigned.
  - b. Includes preferred/optional space(s). See Opening Day Area Program for specific details.
  - c. Comprehensive HS Ed spec updates yet to be incorporated include SPED spaces will be counted as teaching stations at lower student ranges.
  - d. Un-programmed space may include multi-purpose/large meeting room and/or potential auditorium balcony conversion to un-programmed CTE suites.

# COMP. H.S. ED SPEC UTILIZATION TABLES / 1,700 STUDENT CAPACITY

Ed Spec (1,700 Students)												
	Total SF	÷	SF/TS	=	TS	*	Util	*	Students per			
									Classroom Range	=	Stud - low	Stud - high
General Classroom	34,300		980		35		95%		20	30	665	998
Science	16,500		1,500		11		95%		20	30	209	314
Specialized Instruction			<i>varies</i>		18		90%		20	30	324	486
PE/Athletics			<i>varies</i>		4		75%		20	30	60	90
Special Education			<i>varies</i>		2		70%		20	30	28	42
Small Instructional	5,000		500		10		70%		20	30	140	210
<b>Total</b>	<b>281,370</b>				<b>80</b>						<b>1,426</b>	<b>2,139</b>

Proposed Program at 85% (1,700 Students)												
	Total SF	÷	SF/TS	=	TS	*	Util	*	Students per			
									Classroom Range	=	Stud - low	Stud - high
General Classroom	33,750		850		40		85%		20	30	675	1,013
Science	16,800		1,500		11		85%		20	30	190	286
Specialized Instruction			<i>varies</i>		20		75%		20	30	300	450
PE/Athletics			<i>varies</i>		5		50%		20	30	50	75
Special Education			<i>varies</i>		3		70%		20	30	42	63
Small Instructional	5,000		500		10		0%		20	30	0	0
<b>Total</b>	<b>281,370</b>				<b>89</b>						<b>1,257</b>	<b>1,886</b>

Proposed Program at 75% (1,700 Students)												
	Total SF	÷	SF/TS	=	TS	*	Util	*	Students per			
									Classroom Range	=	Stud - low	Stud - high
General Classroom	33,750		850		40		75%		20	30	596	893
Science	16,800		1,500		11		75%		20	30	168	252
Specialized Instruction			<i>varies</i>		20		75%		20	30	300	450
PE/Athletics			<i>varies</i>		5		50%		20	30	50	75
Special Education			<i>varies</i>		3		70%		20	30	42	63
Small Instructional	5,000		500		10		0%		20	30	0	0
<b>Total</b>	<b>281,370</b>				<b>89</b>						<b>1,156</b>	<b>1,733</b>

Yellow cells denotes variables

# BENSON TECH H.S. UTILIZATION TABLES / 1,700 STUDENT CAPACITY

BPHS Proposed Program @ 1,700 Student Design Capacity with Academic Teacher Planning (95% CR Utilization)												
	Total SF	÷	TS	=	TS	*	Util	*	Students per			
									Classroom Range	=	Stud - low	Stud - high
General Classrooms	31,500		900		33		95%		20	30	627	941
Science Labs	15,300		1,700		9		95%		20	30	171	257
Career Technical Ed (CTE) Suites			<i>varies</i>		39		75%		15	25	439	731
PE/Athletics			<i>varies</i>		3		75%		20	30	45	68
Special Education & ELL	5,700		<i>varies</i>		9		70%		5	15	32	95
Small Instruction					0		70%		20	30	0	0
<b>Total</b>	<b>368,000</b>				<b>93</b>						<b>1,313</b>	<b>2,090</b>

BPHS Proposed Program @ 1,700 Student Design Capacity with Academic Teacher Planning (85% CR Utilization)												
	Total SF	÷	TS	=	TS	*	Util	*	Students per			
									Classroom Range	=	Stud - low	Stud - high
General Classrooms	31,500		900		33		85%		20	30	561	842
Science Labs	15,300		1,700		9		85%		20	30	153	230
Career Technical Ed (CTE) Suites			<i>varies</i>		39		75%		15	25	439	731
PE/Athletics			<i>varies</i>		3		50%		20	30	30	45
Special Education & ELL	5,700		<i>varies</i>		9		70%		5	15	32	95
Small Instruction					0		0%		20	30	0	0
<b>Total</b>	<b>368,000</b>				<b>93</b>						<b>1,214</b>	<b>1,942</b>

BPHS Proposed Program @ 1,700 Student Design Capacity with Academic Teacher Planning (75% CR Utilization)												
	Total SF	÷	TS	=	TS	*	Util	*	Students per			
									Classroom Range	=	Stud - low	Stud - high
General Classrooms	31,500		900		33		75%		20	30	495	743
Science Labs	15,300		1,700		9		75%		20	30	135	203
Career Technical Ed (CTE) Suites			<i>varies</i>		39		75%		15	25	439	731
PE/Athletics			<i>varies</i>		3		50%		20	30	30	45
Special Education & ELL	5,700		<i>varies</i>		9		70%		5	15	32	95
Small Instruction					0		0%		20	30	0	0
<b>Total</b>	<b>368,000</b>				<b>93</b>						<b>1,130</b>	<b>1,816</b>

Note: CTE Suites include Un-Programmed CTE Suite teaching stations.

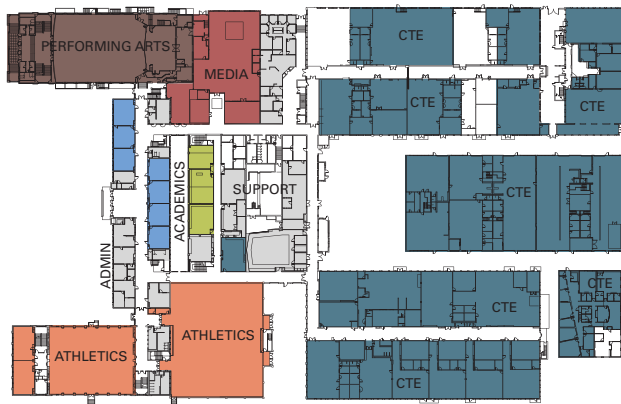


# UPDATED MASTER PLAN OVERVIEW

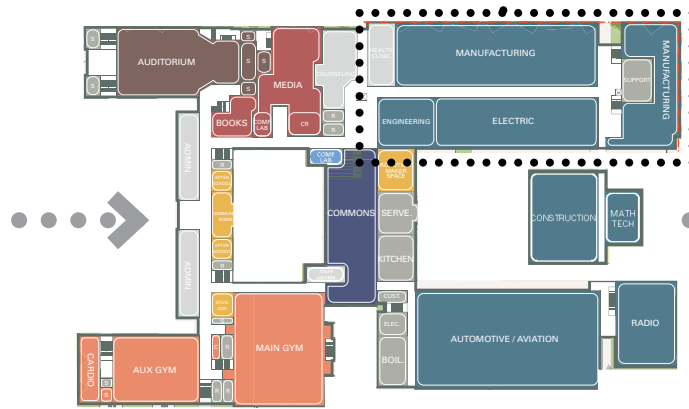
As the updated ed spec reflects an intensified spatially adjacent CTE & Core Academic pedagogy in response to input from OTL and the Steering Committee, the original master plan has also been updated to support this approach.

The original master plan provided spatially adjacent CTE and Core Academics by locating learning communities on the second floor, directly above the CTE shops on the ground floor. This was a great improvement from the existing plan, which has all core academic classrooms and science labs on the west side of campus, with all CTE on the east side. The updated approach pulls more of the general classrooms and science to the ground floor, and stacks them on the outside edges so that CTE can maintain proximity to the central CTE courtyard. This arrangement also takes advantage of the modular structural grid and a wide corridor/support space zone between them, to provide both an acoustical buffer and in-between collaboration spaces.

While the plan has been updated, the essence of the original master plan remains intact, and continues to support the original common themes and goals.



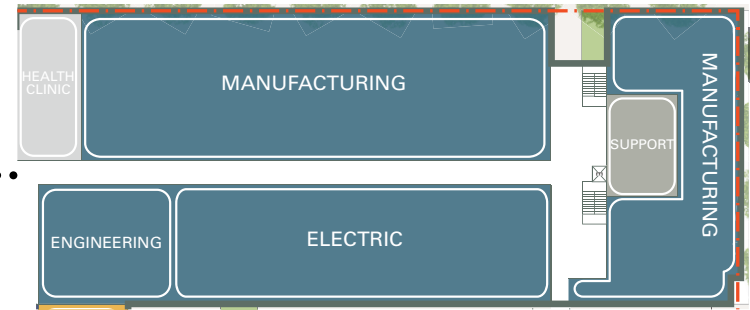
EXISTING GROUND FLOOR



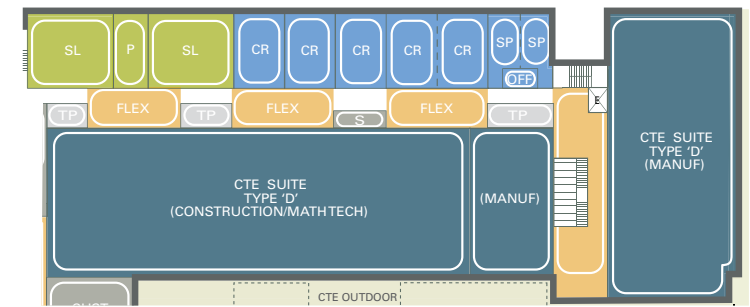
ORIGINAL MASTER PLAN GROUND FLOOR



UPDATED MASTER PLAN GROUND FLOOR



NE WING OF ORIGINAL MASTER PLAN



NE WING OF UPDATED MASTER PLAN

## UPDATES SINCE NOVEMBER MASTER PLAN REPORT:

The Benson Tech Programming phase was completed at the end of November. This pre-design process included programming and master plan review meetings with school staff & district stakeholders to review the master plan and resulted in the following updates:

- + Health Clinic relocated to main floor from the lower level auditorium
- + Wrap around services including Teen parent childcare & food/clothes closet relocated from auditorium building to gym building
- + Media and Counseling areas are reconfigured
- + CTE Un-programmed areas re-located to auditorium building
- + Revisions of proportions and/or adjacencies of CTE programs including: Computer engineering, Digital Media, Manufacturing, Architecture, Engineering, and Arts
- + Increased # of Core academic classrooms to ensure adequate capacity for 1700, based on Benson Administration feedback
- + Reconfigure SPED, to smaller paired rooms and increased total from 6 to 8.

## MASTER PLAN DESIGN REFINEMENT INCLUDES:

- + Teacher Planning reconfiguration for closer proximity to both core academic and CTE, as well as spread out for more visibility to corridors and flex areas.
- + Flex area reconfiguration
- + Net to Gross (Circulation & Walls)– Reconciled net to gross ratio to confirm within range. We are currently within 1.2% of assumption and will continue to refine as we develop plans in more detail in SD.

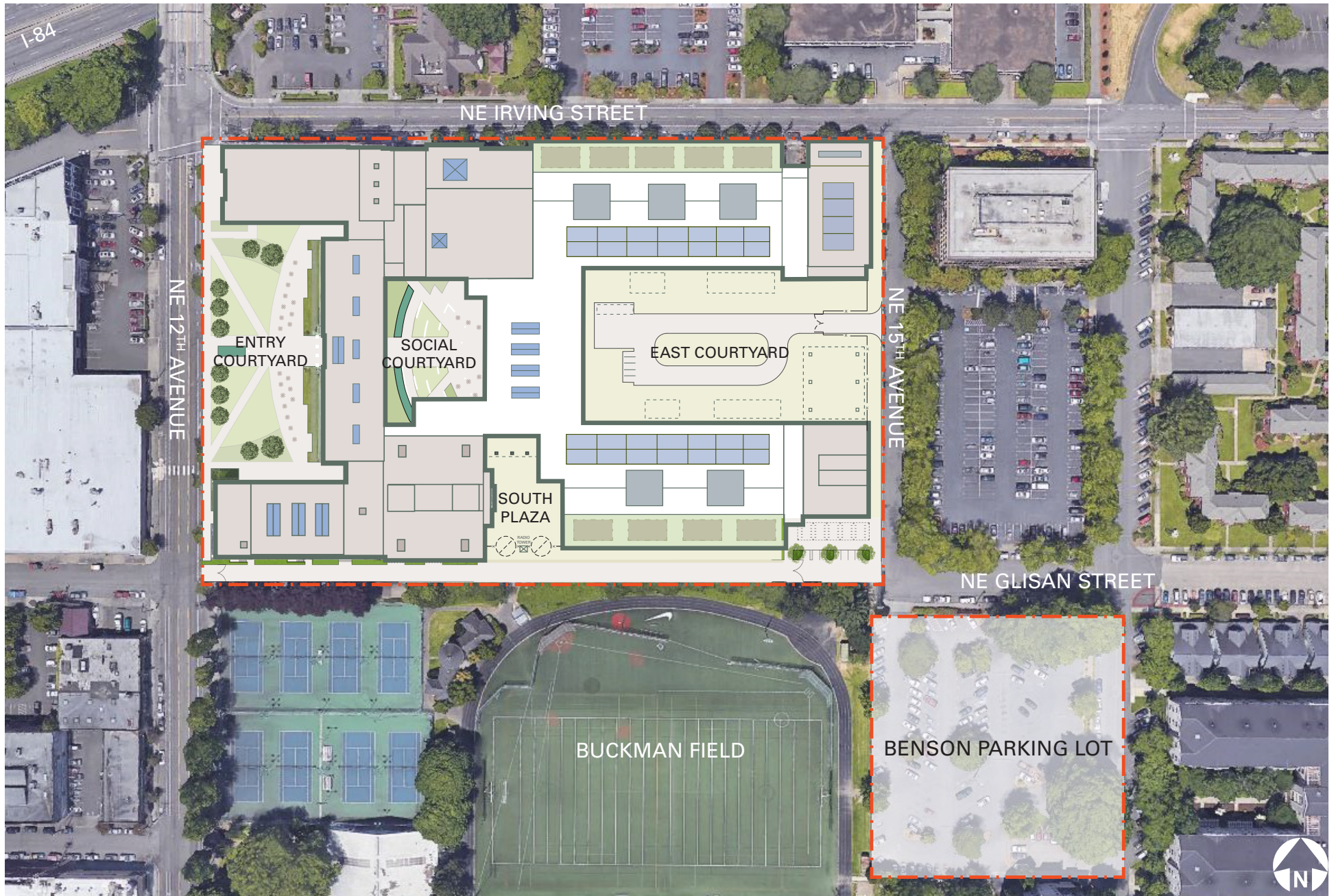
*“The lower level is not a preferred location for the Wellness Clinic.”*

*“Love the learning stairs and social courtyard!”*

*“Clear lines of sight in the hallways are important for supervision.”*

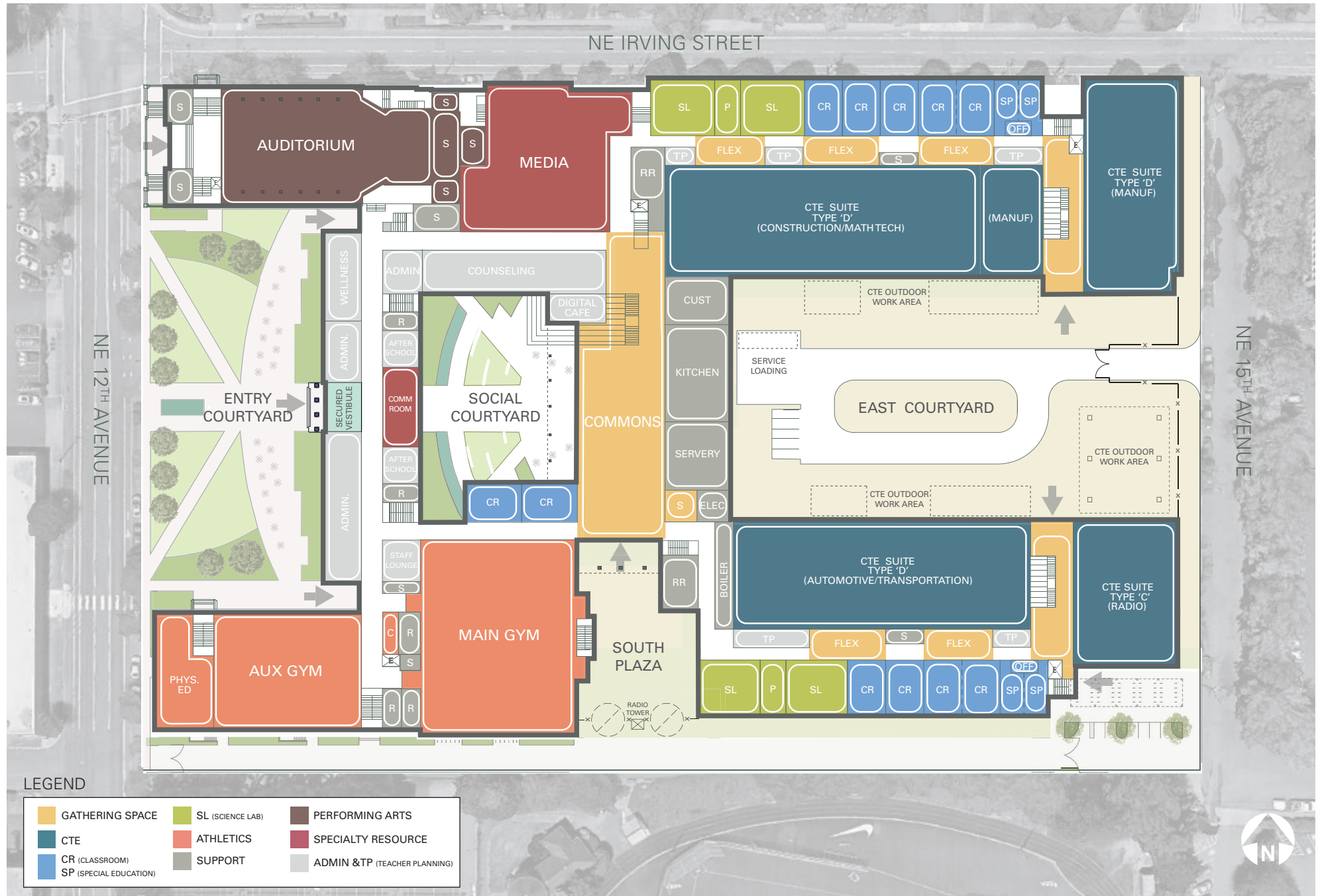


# SITE PLAN



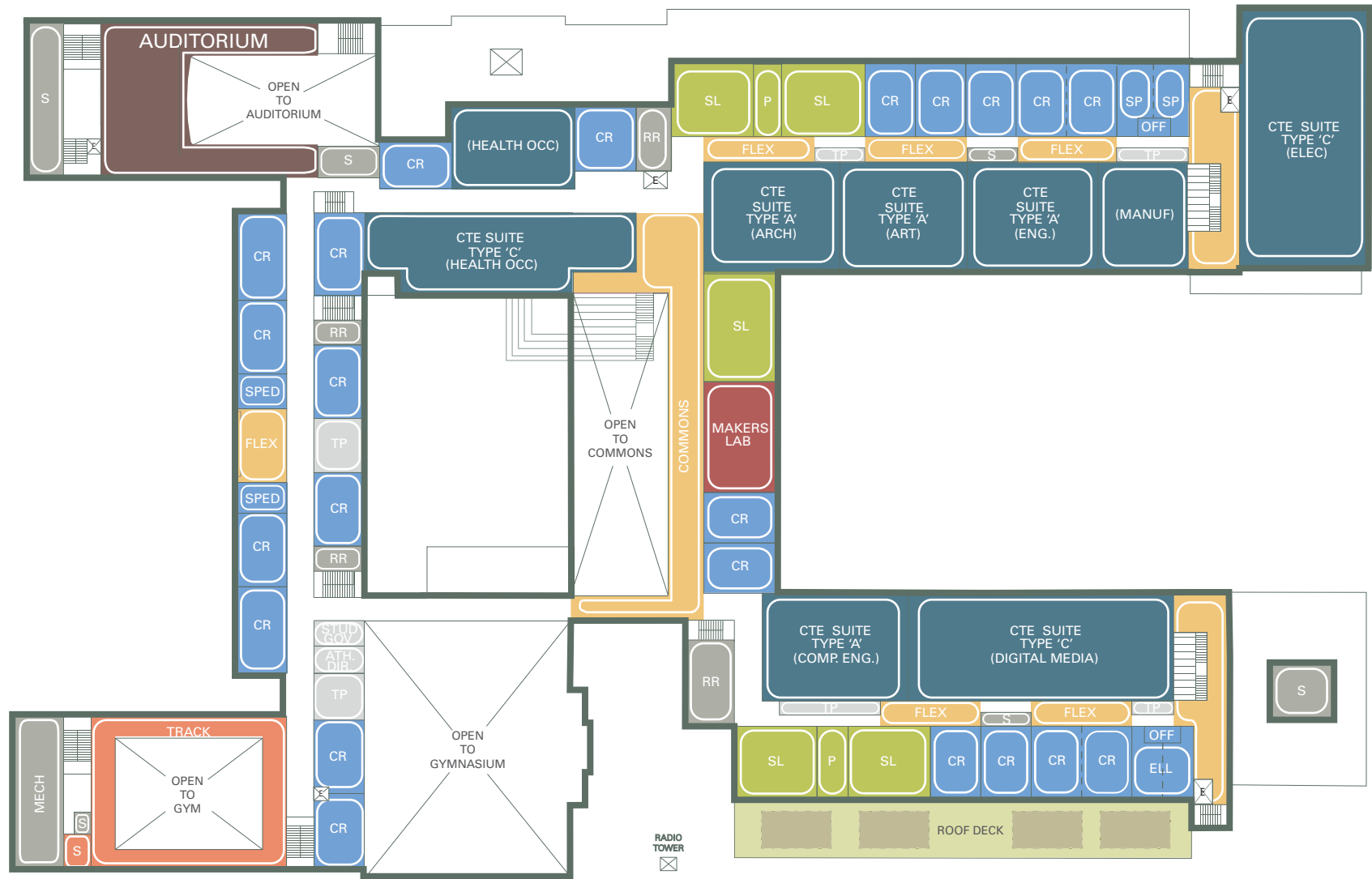


# MASTER PLAN / MAIN LEVEL





# MASTER PLAN / UPPER LEVEL

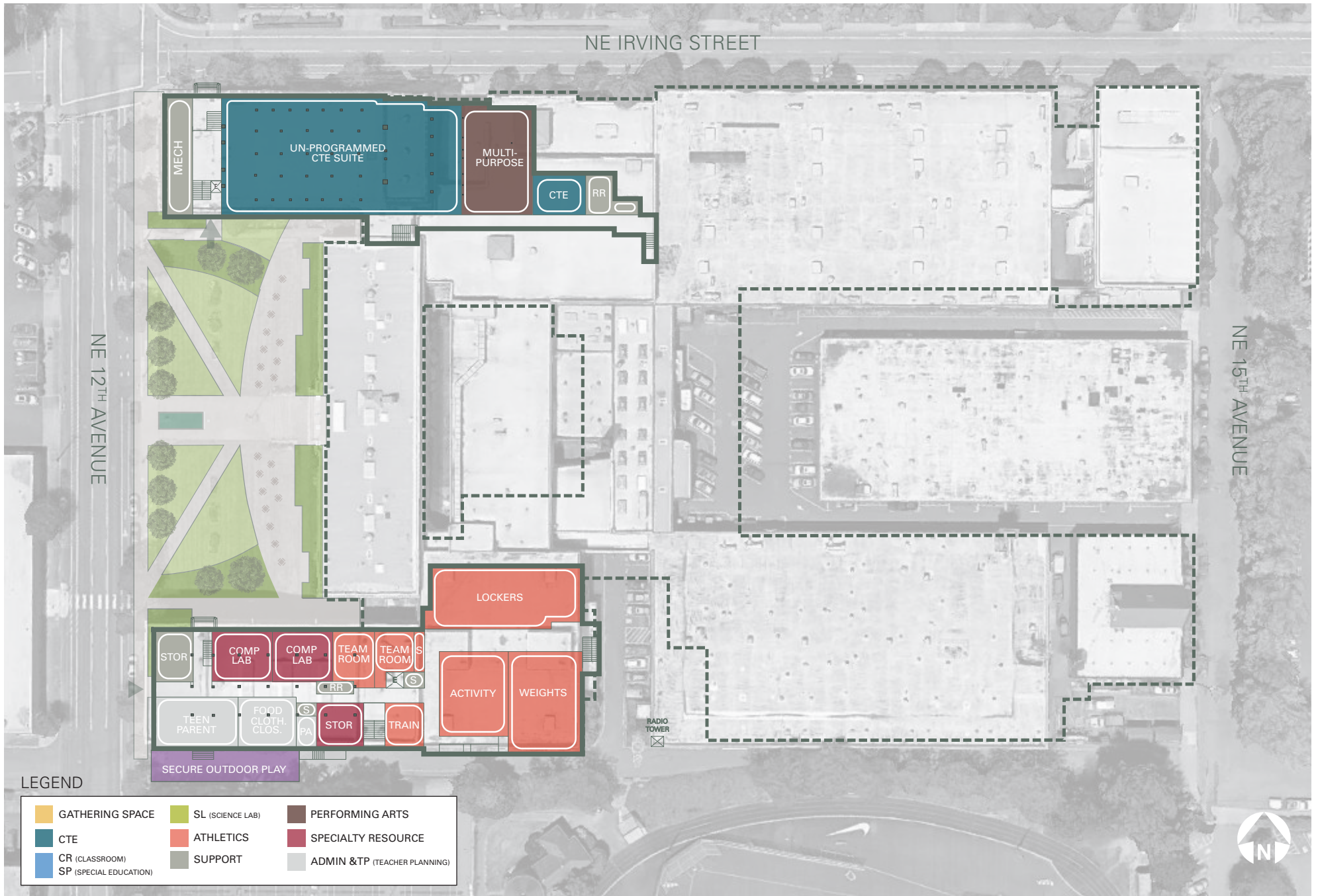


## LEGEND

<span style="color: orange;">■</span> GATHERING SPACE	<span style="color: green;">■</span> SL (SCIENCE LAB)	<span style="color: brown;">■</span> PERFORMING ARTS
<span style="color: teal;">■</span> CTE	<span style="color: red;">■</span> ATHLETICS	<span style="color: maroon;">■</span> SPECIALTY RESOURCE
<span style="color: blue;">■</span> CR (CLASSROOM)	<span style="color: grey;">■</span> SUPPORT	<span style="color: lightgrey;">■</span> ADMIN & TP (TEACHER PLANNING)
<span style="color: lightblue;">■</span> SP (SPECIAL EDUCATION)		



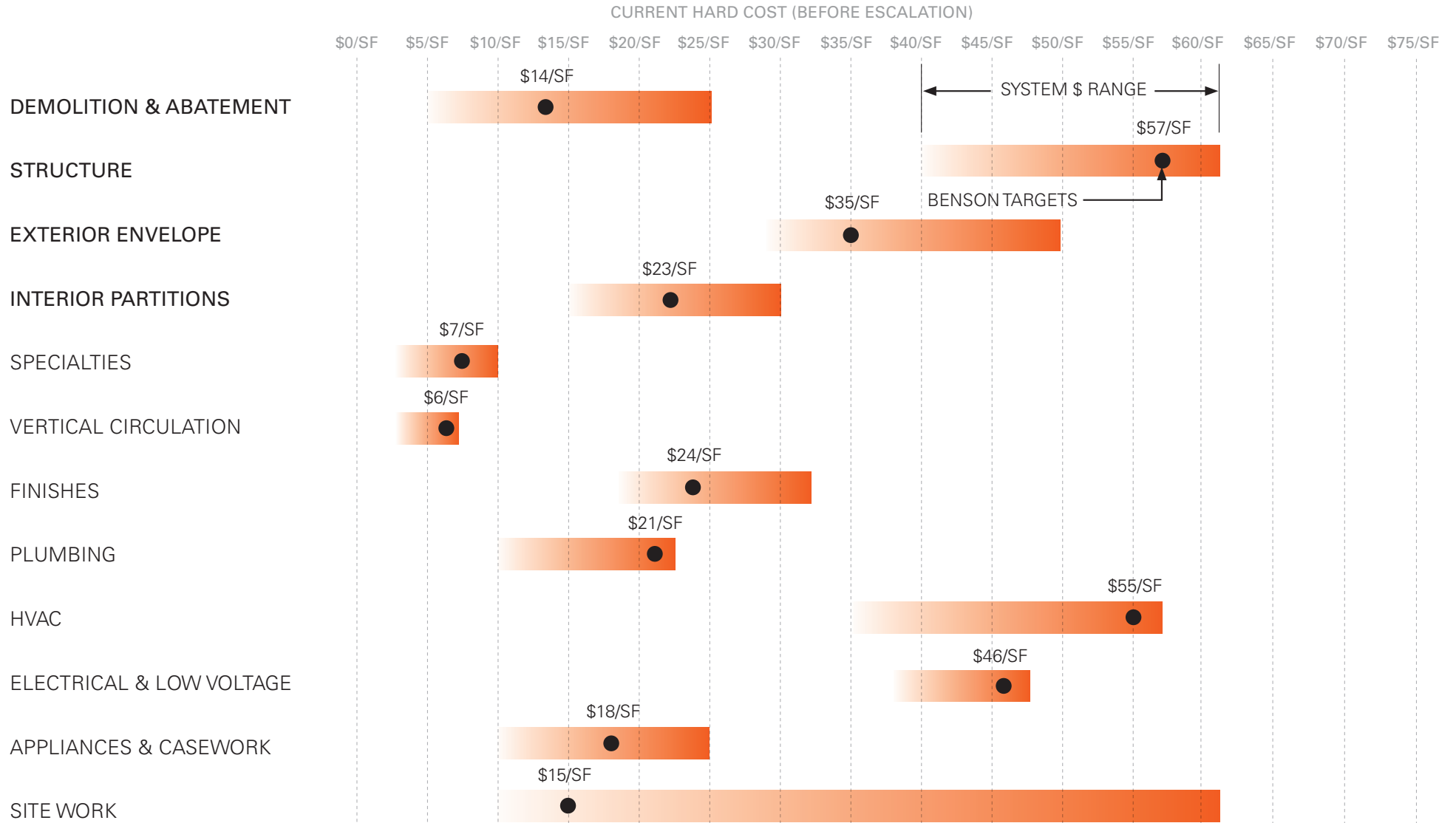
# MASTER PLAN / LOWER LEVEL



# BUDGET APPROACH / COST MODEL BY SYSTEMS

Due to the fact that the Benson Modernization project is in Programming and Master Planning phase, more conceptual models of cost estimating have been used. To more accurately test cost assumptions, the team is using a system based cost model approach for deriving appropriate targets based on current cost trends in each category. The table below illustrates the low to high ranges for various systems, and where the design team has targeted the Benson Tech project based on current information and understanding of the program needs.

For example, structural systems are on the highest end of the range due to the extensive seismic upgrades needed for the historic URM buildings, as well as increased structural capacity to support weight for CTE shops. As the project moves forward into schematic design, these targets will continue to be referenced as design targets to help stay within budget throughout the project.



# BUDGET DETAIL

## BENSON POLYTECH HIGH SCHOOL SUMMARY OF PROBABLE COST

1/2

	QTY	UNIT	\$/UNIT	TOTAL \$
<b>Building</b>	<b>368,000</b>	<b>SF</b>		
Demolition			9.31	3,425,231
Abatement			4.00	1,472,000
Slab & Foundations			14.00	5,152,000
Vertical Structure			43.00	15,824,000
Exterior Walls			12.88	4,738,000
Exterior Doors & Windows			3.61	1,328,889
Roofing & Appurtenances			18.00	6,624,000
Interior Framing			12.44	4,579,556
Interior Doors & Windows			9.56	3,516,444
Specialties			5.67	2,085,333
Stairs			3.00	1,104,000
Wall Finishes			8.56	3,148,444
Floor Finishes			4.78	1,758,222
Ceiling Finishes			8.00	2,944,000
Painting			2.50	920,000
Conveying System			2.30	846,400
Fire Sprinklers			3.67	1,349,333
Plumbing			17.00	6,256,000
HVAC			55.00	20,240,000
Electrical & Low Voltage			46.22	17,009,778
Equip (incl. AV) Appliances & Fixed Furnishings			14.78	5,438,222
Casework			3.25	1,196,000
Site: Earthwork & Erosion control			2.00	736,000
<b>Building Hardcost:</b>				<b>111,691,853</b>
<b>Site</b>				
Site Hardscape			4.14	1,523,489
Site Furnishings & Appurtenances			1.44	530,350
Site Landscaping			2.00	736,000
Site Stormwater Management			2.05	754,947
Site Utilities			2.50	920,000
<b>Site Hardcost:</b>				<b>4,464,785</b>
<b>Historical &amp; Seismic</b>				
Historic Exterior Allowance				3,500,000
Seismic upgrade of Commons, Main Gym and Aux Gym				905,220
Seismic upgrade of radio tower				200,000
<b>Historical &amp; Seismic Hardcost:</b>				<b>4,605,220</b>

ARCH: Bassetti  
DWG DATE: 4/26/17  
DESIGN LEVEL: Cncpt

CONSTRUCTION FOCUS, INC.  
541-686-2031  
EUGENE, OREGON

ESTIMATE DATE: Oct. 22, 2018  
REVISION #: 3  
CONST. START: 2 QTR\_2023

## BENSON POLYTECH HIGH SCHOOL SUMMARY OF PROBABLE COST

2/2

	QTY	UNIT	\$/UNIT	TOTAL \$
<b>Markups</b>				
CMGC Contingency		per district	5.00%	6,197,581
Design & Estimating Contingency		per district	15.00%	20,213,164
Temp/Phasing			4.00%	6,198,704
General Conditions			6.00%	9,669,978
Bond & Insurances			2.40%	4,100,071
Overhead and Profit			4.50%	7,872,136
1.5% Solar Requirement			1.50%	2,742,127
Escalation			25.00%	46,387,652
<b>Markups Hardcost:</b>				<b>103,381,413</b>
<b>Swing &amp; Temporary Spaces</b>				
Swing Space Allowance				2,787,500
Temporary Structure Allowance				2,055,600
Escalation for Swing/Temp				726,465
<b>Swing &amp; Temporary Spaces Hardcost:</b>				<b>5,569,565</b>
<b>TOTAL BUDGET:</b>				<b>229,712,837</b>

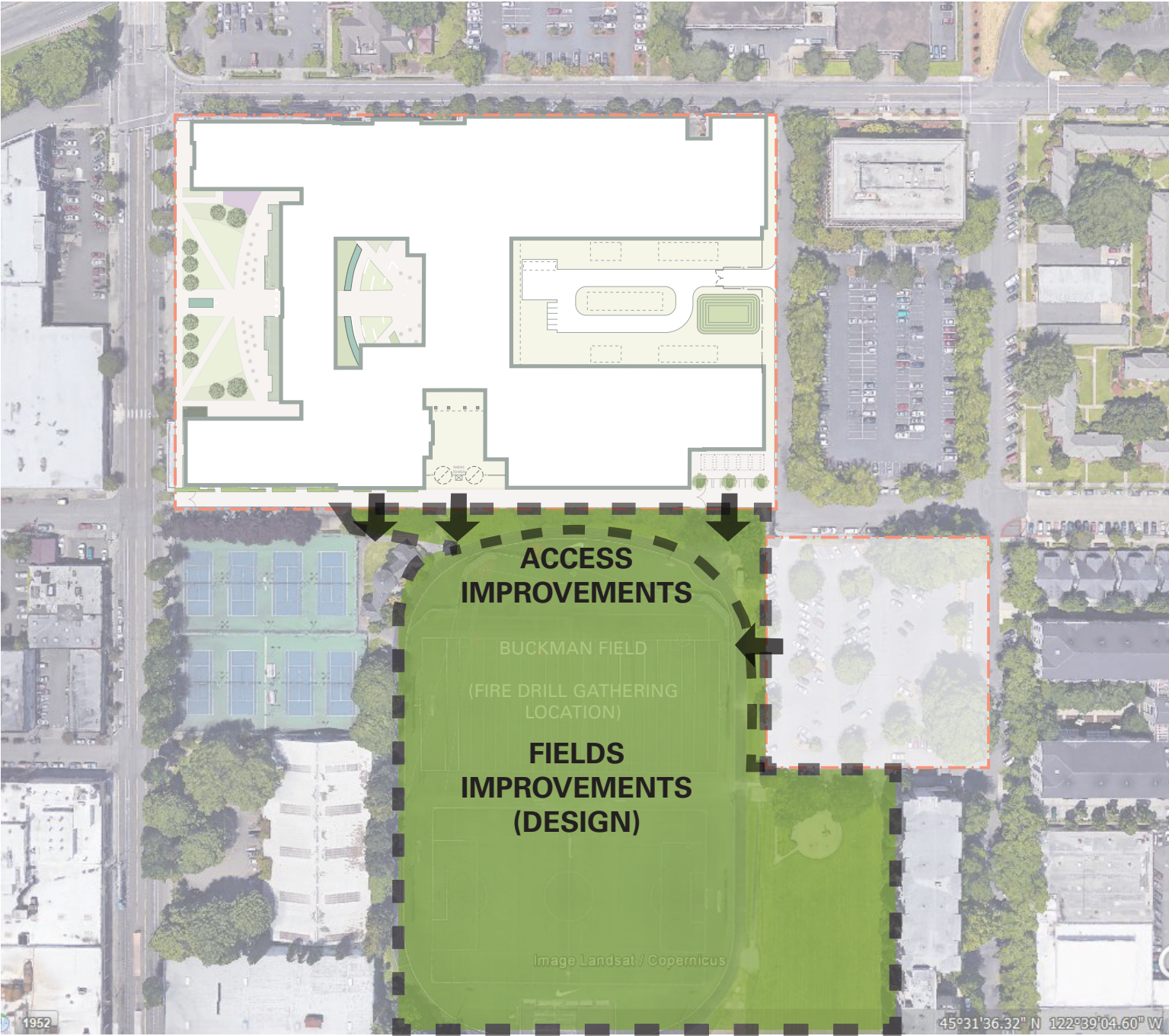
ARCH: Bassetti  
DWG DATE: 4/26/17  
DESIGN LEVEL: Cncpt

CONSTRUCTION FOCUS, INC.  
541-686-2031  
EUGENE, OREGON

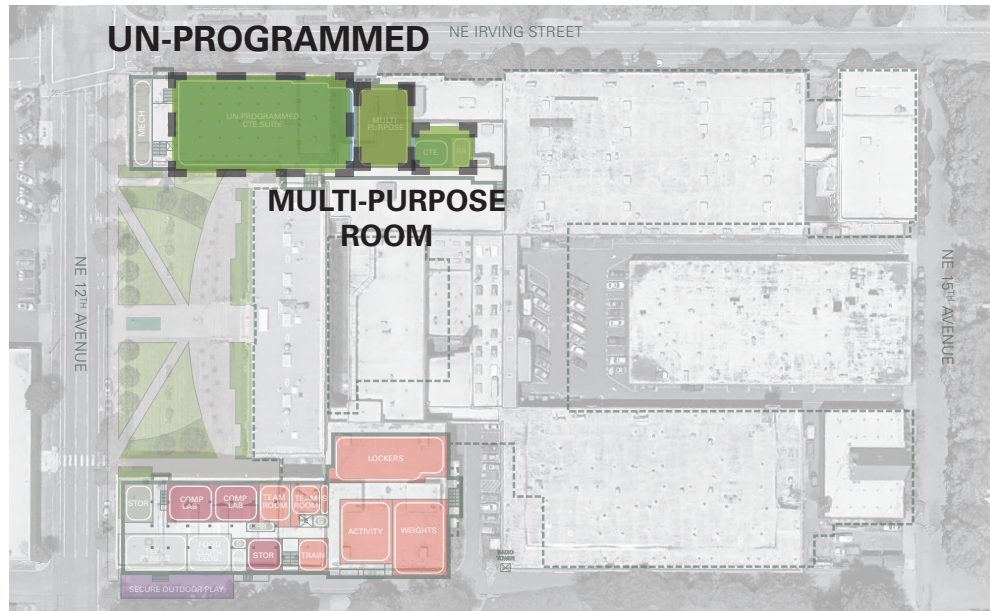
ESTIMATE DATE: Oct. 22, 2018  
REVISION #: 3  
CONST. START: 2 QTR\_2023



# SITE PLAN / SCOPE ADJUSTMENTS



# MASTER PLAN / UN-PROGRAMMED SPACE SUMMARY



LOWER LEVEL

## UN-PROGRAMMED OPTIONS

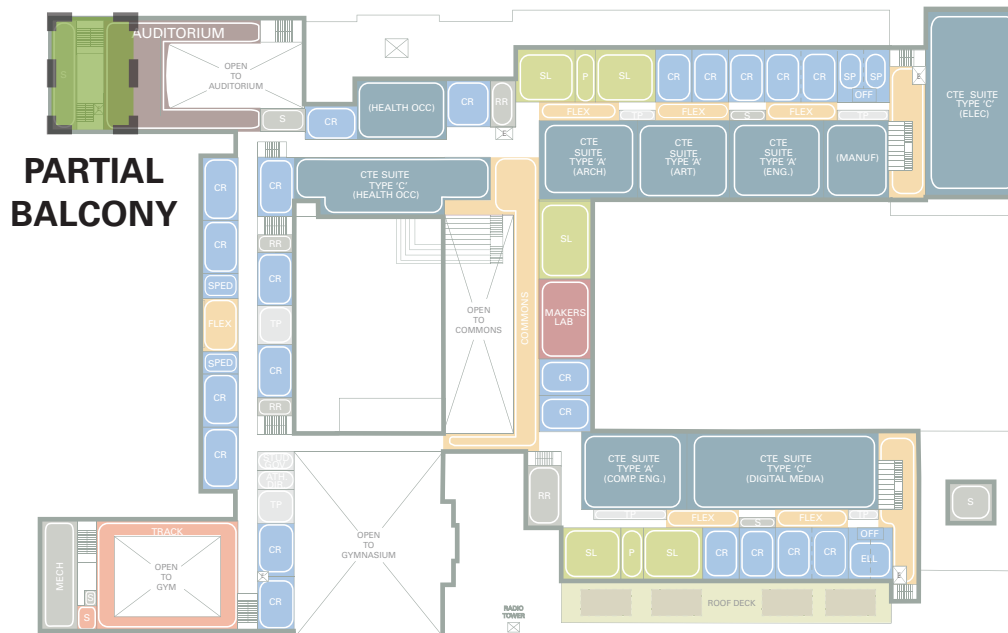
- + CTE SUITE(S)
- + BAND/CHOIR/MUSIC ARTS
- + MULTIPLE PATHWAYS TO GRADUATION

## UN-PROGRAMMED SUMMARY

11,500 SF	LOWER LEVEL
3,500 SF	MULTI-PURPOSE
15,000 SF	TOTAL

## OTHER POTENTIAL SPACES

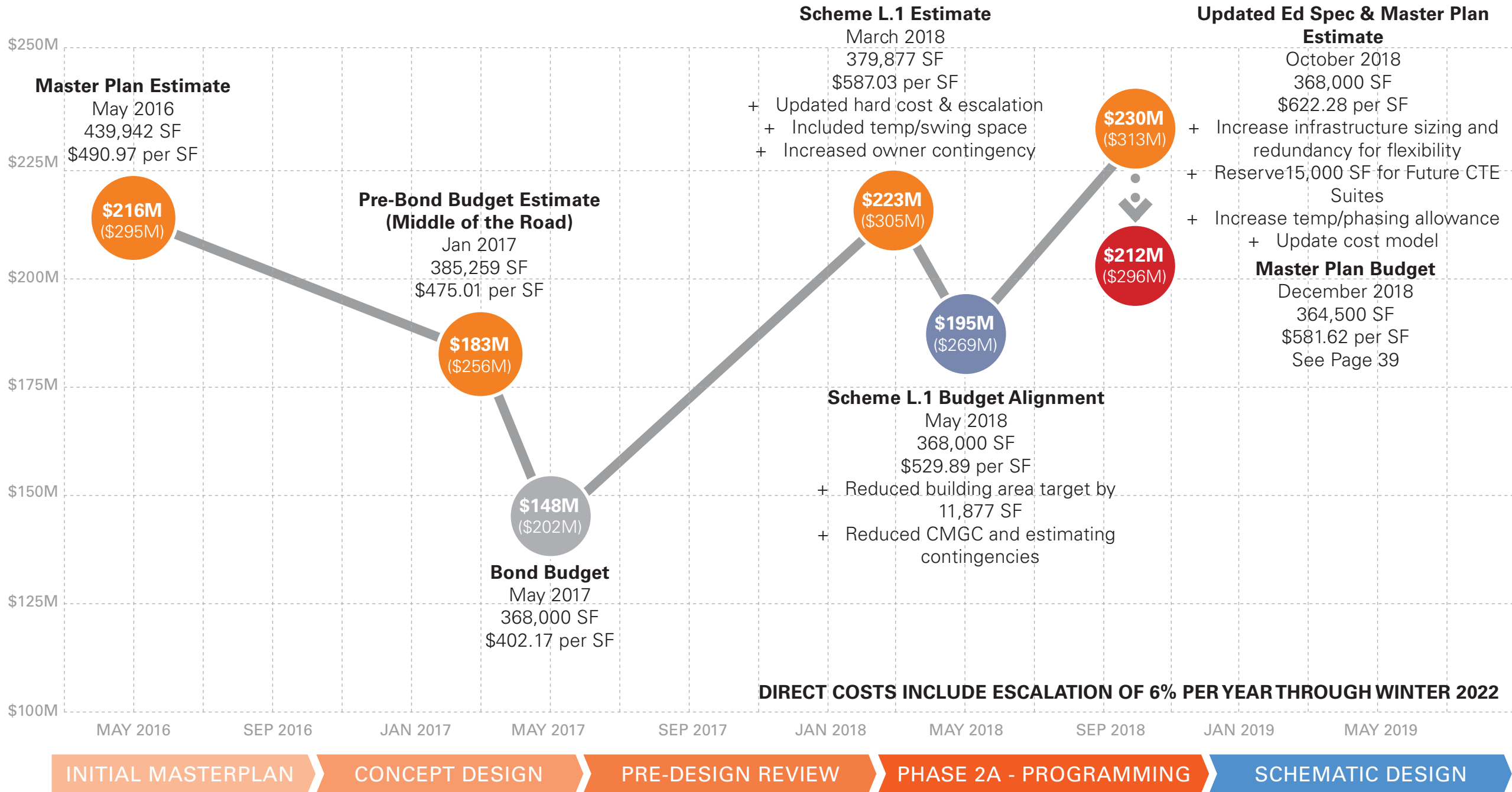
3,000 SF	PARTIAL BALCONY CONVERSION TO PROGRAM SPACE
----------	---



UPPER LEVEL

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# BUDGET PROGRESSION / DIRECT CONSTRUCTION COST TIME LINE





# BUDGET UPDATE

TARGET AREA		ITEM	COMMENTS	CURRENT ESTIMATE
Renovation	231,200 SF	<b>HARD COST</b>	Renovated building and site work	\$220,652,000
New Construction	136,800 SF	<b>SWING /TEMP FACILITIES</b>	Interior TI and potential modular building	\$5,570,000
Total	368,000 SF	<b>1.5% GREEN ENERGY</b>	Required by State of Oregon	\$2,648,000
Reduction	(3,500 SF)	<b>OFF-SITE / PUBLIC WORKS</b>	Allowance	\$700,000
New Total	364,500 SF	<b>TOTAL HARD COSTS</b>		<b>\$229,570,000</b>
		<b>SOFT COSTS</b>	Permit fees, consultants	\$34,437,000
		<b>FF&amp;E</b>	CTE Equipment and furnishings	\$15,000,000
		<b>CONTINGENCY</b>	15% of total cost	\$34,437,000
		<b>ESCALATION</b>	6% per year included in Hard Costs	INC. ABOVE
		<b>PROJECT TOTAL</b>		<b>\$313,444,000</b>
		<b>Reduced D/E Contingency</b>	From 15% to 12% for Design/Estimating	(\$8,000,000)
		<b>Value Engineering</b>	Target 2.5% of Hard Costs	(\$7,444,000)
		<b>Reduce Area by 3,500 SF</b>	Incorporate Teen Parent, Food/Clothes Closet	(\$3,000,000)
		<b>Add Field ADA Access</b>	For PE/Athletics, Fire Drill	\$1,000,000
		<b>MASTER PLAN BUDGET</b>		<b>\$296,000,000</b>

## PREVAILING ASSUMPTIONS

- + 1,700 student capacity based on Board resolution
- + Multiple Pathways to Graduation programs not included in current design based on Board resolution
- + 3-year construction project on occupied site, construction starting in 2021

# APPENDIX

Via Electronic Link:

Steering Committee Notes

Design Advisory Group Notes

Master Planning Committee Process and Documents

Industry Outreach Tour Notes

Pre-Design Diligence Report, June 2017

Focus Option Educational Specification, Benson Polytechnic High School, July 2017

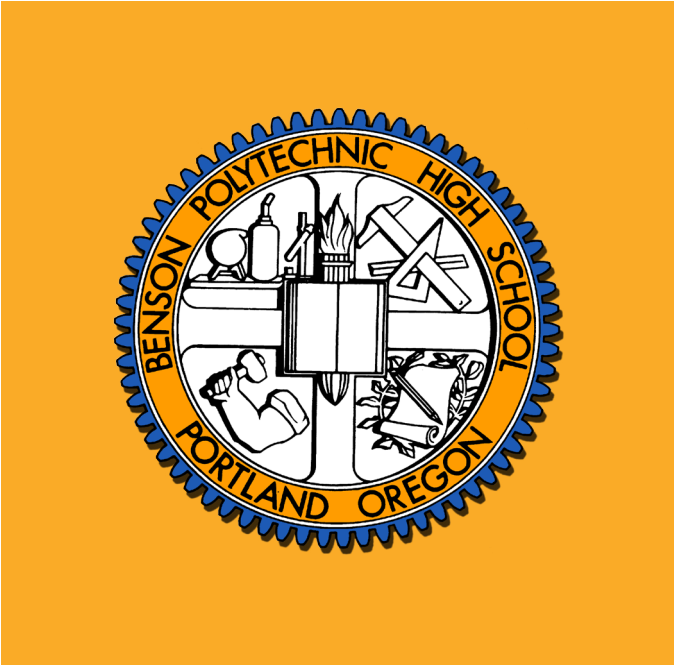
Benson Polytechnic High School, Site Specific Educational Specification, December 4, 2018

THANK YOU.

# BENSON POLYTECHNIC HIGH SCHOOL

## SITE SPECIFIC EDUCATIONAL SPECIFICATION

DECEMBER 11, 2018





## ACKNOWLEDGMENT

Bassetti Architects and Portland Public Schools would like to thank all of those who have participated in the process of developing this document.

### Portland Public Schools Leadership

Guadalupe Guerrero  
Claire Hertz  
Aurora Terry  
Jeanne Yerkovich  
Dan Jung  
Jen Sohm

Superintendent  
Deputy Superintendent, Business & Operations  
Senior Director, College and Career Readiness  
Director, Career Technical Education, Career Pathways  
Senior Director, Office of School Modernization  
Project Design Manager, Office of School Modernization

### Steering Committee Members

Curtis Wilson Jr  
Jeanne Yerkovich  
Paul Anthony  
Dan Jung  
Harry Esteve  
David Mayne  
Jonathan Garcia  
Aurora Terry  
Tim Carmen  
Marina Cresswell  
Elisa Schorr  
Jere High  
Claire Hertz  
Scott Perala  
Joe LaFontaine  
Kregg Cuellar  
Dr. Luis Valentino  
Sara King  
Marshall Haskins  
Dr. Yvonne Curtis  
Stephanie Soden  
Joe LaFontaine

Principal, Benson Polytechnic High School  
Director, Career Technical Education, Career Pathways  
Director, Board of Education  
Senior Director, Office of School Modernization  
Director of Strategic Community Outreach  
Bond Communication Manager  
Senior Director, Strategic Partnerships and External Affairs  
Senior Director, College and Career Readiness  
Facilities Operations Manager  
CRBE/Heery Bond Manager  
High School Programs Director  
Director of Operations and Maintenance  
Deputy Superintendent, Business & Operations  
CBRE/Heery, Bond Program Manager  
Interim Senior Director of High Schools  
Chief of Schools  
Chief Academic Officer  
Director of Planning and Asset Management  
Athletic Director  
Deputy Superintendent  
Chief of Staff  
Director of High School Systems

### Benson Polytechnic High School

Curtis Wilson Jr. - Principal  
Tonya Mjelde - VP Curriculum  
Barry Phillips - VP Administrative  
RoiSan Anderson - Principals Secretary  
Sara Callies - Instructional Specialist  
Jessica Murchison - Leadership  
Ilsa Brewer - Language Arts  
Andrea Leech - Science  
Tom Ustach - Social Studies  
Kayla Stolte - Math  
Sanjay Bedi - Athletic Director  
Megan Hill - Social Studies  
Julie Morris - Librarian  
Monty Catabay - Health

Michelle Cvitanich - PE/ Health  
Linda McLellan - PE  
Joe Rozewski - Art  
Tammy Hite - Architecture  
Bret Anderson - Automotive  
David Beckler - Computer Science  
Luke Hotchkiss - Construction  
Todd Williams - Digital Media  
Jorge Maceo - Electric  
Brian Gerber - Engineering  
Nicole Kennedy - HOSA  
Barth Clooten - Manufacturing  
Steve Naganuma - Radio Broadcasting  
Amy Henry - Counseling

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## 1.0 INTRODUCTION

### 1.1 WHAT IS AN ED SPEC?

Educational specifications are a set of building design characteristics that establish the ways facilities support programs and curriculum. This document will be used as a management tool for design development and cost control.

The district has comprehensive educational specifications that establish a baseline of equitable facilities standards for school construction efforts across PPS.

At Benson Polytechnic High School, an adapted, site specific educational specification, or “ed spec,” is required to define the unique needs of Career Technical Education (CTE) and focus option aspects of the CTE programs, in addition to the comprehensive program requirements. Some general spaces refer back to the [PPS Comprehensive High School Educational Specifications](#), which is available on the district website, and are noted as such in the program summary.

All graphic diagrams are conceptual and not to be considered as design solutions. The diagrams represent building and program space needs and important adjacencies. Design solutions will be explored in schematic and design development phases.

### 1.2 BENSONTECH BACKGROUND

Benson Polytechnic High School is Portland, Oregon’s premier four-year CTE-focused high school, building on a history that spans 100 years. Benson Polytechnic High School offers the academic rigor and the practical training that prepares students for college and the highly skilled, highly paid 21st-century work force. The 9-acre campus is situated in Portland’s inner east side commercial area.

Benson Tech is among the most diverse high schools in the Northwest, with a combination of Caucasian, Hispanic, African-American, Asian, Native American, and Pacific Islander students. BPHS fosters an environment of mutual respect and understanding that prepares students to excel in global society. Within an environment that fosters diversity, Benson’s mission is to integrate hands-on career technical education and core academics today for the innovations of tomorrow.

Currently, freshmen and sophomores are enrolled in a rotation of career/technical exploratory courses. Freshmen have eight quarter rotations, and sophomores have four semester rotations. After exploring a variety of classes, juniors will select one of the three career academies and a major focus within the academy. All Benson career/technology majors provide students with the opportunity to earn community college credit. Students also participate in rigorous college preparatory academic courses and rich career experiences.

The current CTE programs of study are as follows:

#### ARTS AND COMMUNICATIONS

- + Radio Broadcasting (KBPS)
- + Digital Media Production
- + Design & Applied Arts

#### HEALTH OCCUPATIONS

- + Medical Professions
- + Nursing
- + Dental

#### INDUSTRY AND ENGINEERING

- + Manufacturing
- + Engineering
- + Automotive & Aviation
- + Building Construction
- + Electrical
- + Architectural Design
- + Computer Science

Background text cited from Benson 2017/18 Course Guide (<http://www.bensonhs.pps.k12.or.us/files/course-guide/Benson%20Course%20Guide%2018-19.pdf>) and PPS website (<https://www.bensonhs.pps.k12.or.us/>)







## 2.0 BACKGROUND

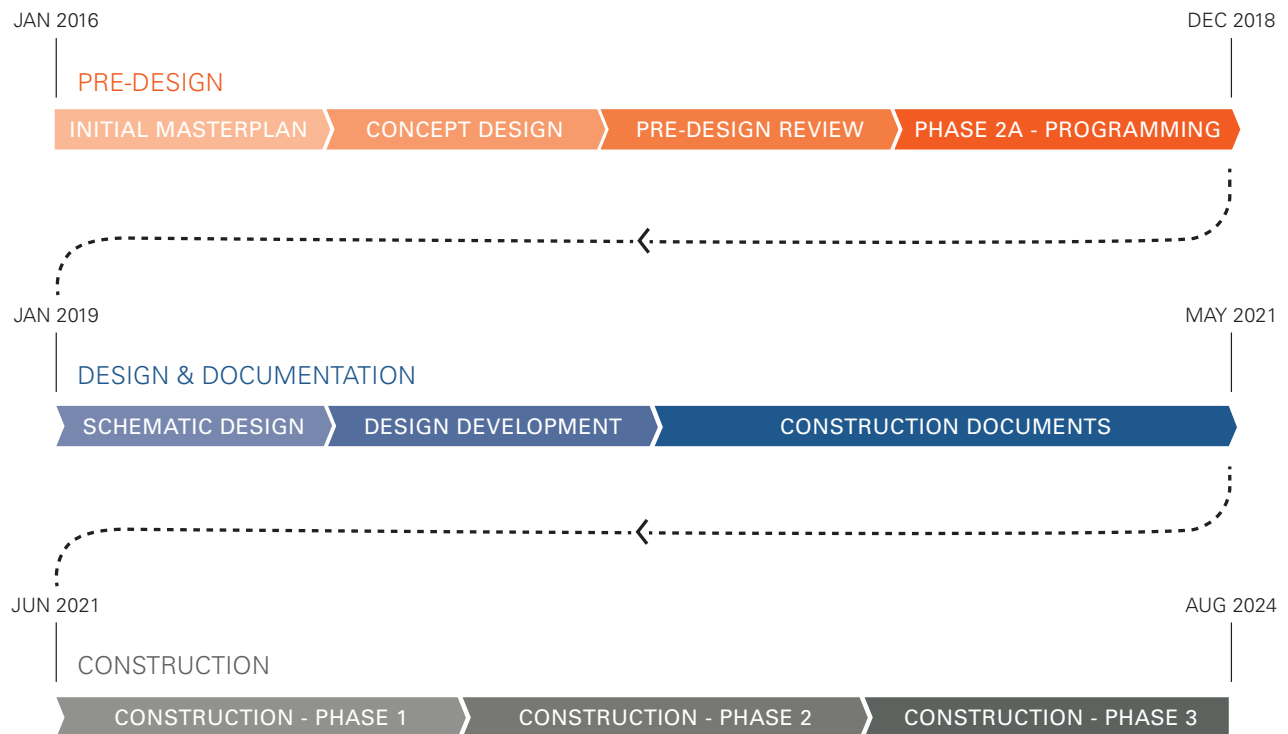
Benson Polytechnic High School is one of three PPS high schools being modernized and/or rebuilt through the May 2017 Bond. It was partially master planned as part of the 2012 School Building Improvement Bond. The goal of planning is to develop a comprehensive, equitable, integrated and visionary high school campus with authentic school and community engagement. Phased three-year construction on Benson Tech is scheduled to begin in 2021.<sup>1</sup>

### SCOPE OF WORK

The modernization of Benson Polytechnic will restore the historic 1916 Main Classroom Building, the 1927 Old Gymnasium, and the 1930 Auditorium Building, as well as the North Wing Shops and Foundry Building, both constructed in 1916. Renovation to include: 1960 Gym, Radio Building, and 1990s remodeled addition. The South Wing Shops Building may or may not be restored depending on function and cost. The master plan approach places the Commons at the new heart of the school, serving multiple uses such as cafeteria, student and community gatherings, foyer for athletic events, informal studies, and access to various exterior spaces.

Internal layouts within the school restoration will provide a spatially adjacent arrangement of core academic, SPED, and CTE programs that doesn't currently exist at the school. The design also maximizes natural daylighting for/in all learning spaces, and includes a flexibility in building systems that allows for accommodation of evolving educational programs. The design approach seeks to integrate all of these considerations in a manner that will propel Benson Polytechnic High School into the 21st Century as a reinvigorated national model for career learning educational institutions.

## 2.1 PROCESS



Beginning with master planning that started in January 2016, the Benson Tech modernization project timeline has evolved out of extensive stakeholder input and district guidance. This Educational Specification is a culmination of input received throughout the Pre-Design process, and will be a guideline used during the design phase that is intended to begin in 2019.

<sup>1</sup>From Portland Public Schools website: <https://www.pps.net/site/Default.aspx?PageID=1838>

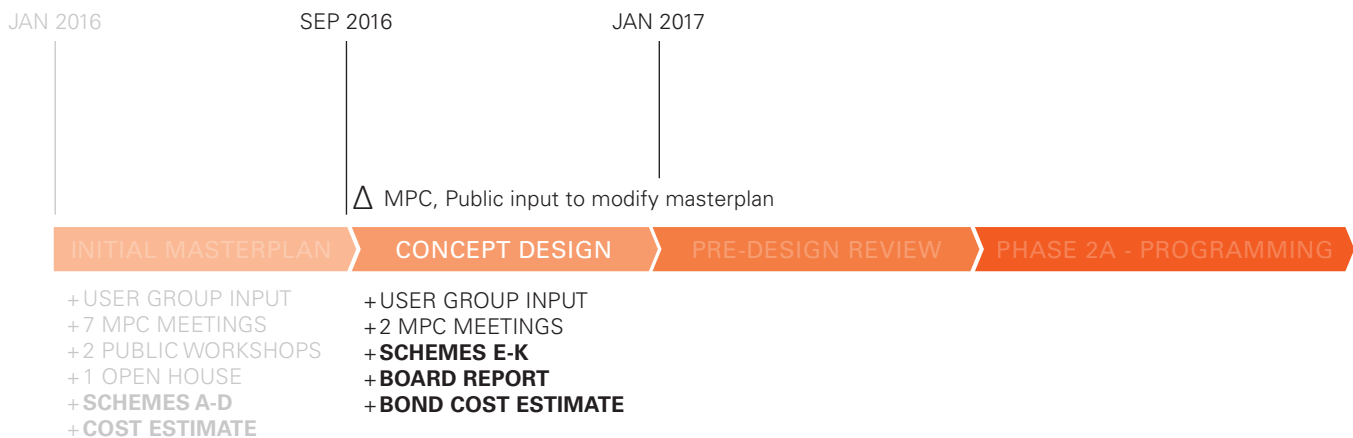
### INITIAL MASTER PLAN

The project kicked off with an initial master planning process in Fall 2015, and concluded with a Master Plan Report by DOWA-IBI Group, which included existing conditions assessment, a preliminary educational specification, and a conceptual design that was based on multiple stakeholder engagement sessions and recommendations by the Master Plan Committee (MPC). A set of guiding principles was also developed in this phase of work.



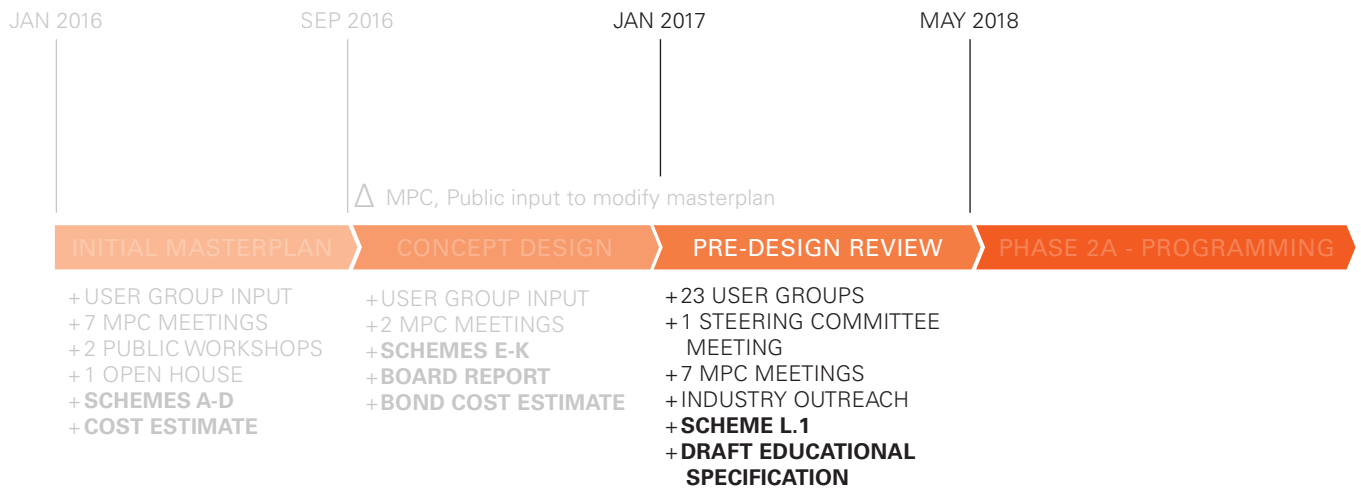
### CONCEPT DESIGN

After the completion of the initial master planning phase, Bassetti Architects and the sub-consultant project team moved forward for further study and due diligence in preparation for the upcoming bond vote. At the conclusion of this phase, the set of deliverables included an updated master plan based on subsequent MPC input, and an executive summary and cost estimate provided by the district's consulting cost estimator. This information was presented to the board in January 2017 and was approved for inclusion in the May 2017 Bond, which was approved by voters a few months later.



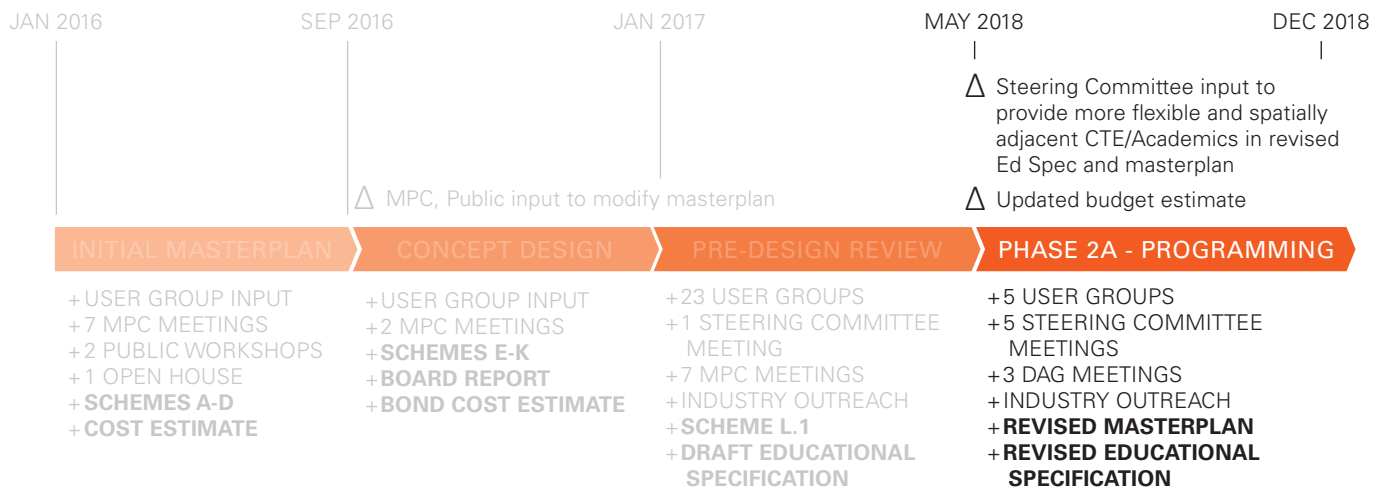
## PRE-DESIGN REVIEW

The Ed Spec completed in July 2017 was a reflection of in-depth meetings with staff from each of the programs at Benson Tech, including CTE, Core Academics, PE/Athletics, SPED, Counseling, Library Resource, and Administration in over 25 user group focus meetings. Through this work, a program summary and ed spec document was created that reflected the pedagogy and needs of the existing school expanded to accommodate 1,700 students.



## PROGRAMMING

All 2017 Bond projects include District Steering Committee Meetings to guide project decision making. Benson Polytechnic Steering Committee started meeting in May 2018. Through the Steering Committee, Office of Teaching and Learning (OTL), further staff engagement, and a robust industry outreach program, the design team received recommendations for revisions and further development of the site specific educational specification and master plan.





## 2.2 STAKEHOLDER ENGAGEMENT

### MASTER PLANNING COMMITTEE

January 2016 - May 2018

- + 16 Meetings
- + 6 School Tours

### DESIGN ADVISORY GROUP

Started October 2018.

Advisory; provide input; concerns and aspirations reflected in alternatives developed

- + Largest student and application response of any PPS Modernization project
- + 3 Meetings in Programming Phase

### STEERING COMMITTEE

District leadership decision makers

- + Meeting monthly since May 2018
- + 6 meetings in Programming Phase

### SCHOOL STAKEHOLDERS

Benson Tech Administration, Staff, CTE and Core Department leads

- + Weekly meetings with Benson Admin
- + 3 Ed Spec work sessions with CTE and Core Department leads
- + 25 Meetings with CTE, Academic Staff and School Stakeholders including: Digital Media CTE, Radio CTE, Electrical CTE, Engineering CTE, World Language/Spanish/Leadership, Counseling, Computer Engineering CTE, Architecture CTE, Geometry Tech, Language Arts/English, Construction CTE, Science, Robotics, Math, PE/Health, Athletics, Library, Automotive CTE, Applied Art CTE, Social Studies, Special Education, Manufacturing CTE, after school programs, November 2016 , February 2017, October 2018
- + All Staff Meeting Updates, Periodically 2016 -2018



#### SCHOOL COMMUNITY

- + 2 Public/Community Master Plan Design Workshops, Spring 2016
- + 1 Public/Community Open House, Spring 2016
- + Benson Tech Show, February 2017, March 2018
- + Benson Polytechnic Centennial Celebration, Oregon Historical Society, June 2017
- + Benson Tech Site Council Presentation and Project Updates, November 2017-2018

#### STUDENTS

- + 13 student representatives on Design Advisory Group
- + Architecture class project, 2018
- + All-student survey, Spring 2017
- + Master Plan Lunch Chats, Spring 2017
- + After school master plan activity, Spring 2016
- + Benson Tech Leadership class presentations, Spring 2016
- + Student representation on Master Planning Committee from 2016 -2018

#### DISTRICT STAKEHOLDERS

BESC Departments, Operations, and OTL

- + Meetings to review master plan & ed specs with PPS OTL/CTE starting in April 2016 through 2018
- + Aviation HS Visit with CTE, September 2017
- + Industry Outreach Planning Meetings with CTE
- + Summer 2017-Spring 2018

#### INDUSTRY & POST SECONDARY OUTREACH

Site visits, facility tours, industry leader interviews

#### PUBLIC AGENCY

- + Bureau of Development Services Early Assistance meeting, May 2016
- + Portland Landmarks Commission, May 2016, September 2017
- + State Historic Preservation Office, September 2017



## 2.3 GUIDING PRINCIPLES

The Master Plan Committee (MPC) developed a set of Guiding Principles that define the goals and aspirations for the project throughout its development. These principles are the lens through which we review design decisions to ensure the design is developed with a balanced approach that meets the needs of the school and broader community.

### **HONOR THE UNIQUE HISTORY AND CULTURE OF BENSON POLYTECHNIC HIGH SCHOOL**

- + Holds a rich, 100-year history.
- + Honor the past, embrace the future.
- + Deliver integrated academic and career technical education and opportunities to students.

### **SUPPORT A COMPREHENSIVE EDUCATIONAL EXPERIENCE FOR STUDENTS**

- + Campus should include sufficient onsite resources to allow students to conveniently access school-based sports and/or performing and fine arts programs.
- + Students' educational experiences are bolstered through their participation in elective courses and extracurricular opportunities.

### **ENGAGE WITH THE LOCAL BUSINESS, GOVERNMENT, AND POST-SECONDARY PARTNERS TO CREATE STRONG CONNECTIONS BETWEEN EDUCATION AND INDUSTRY**

- + Link educational content to real-life applications.
- + Support partnerships with industry, government, and post-secondary education.
- + Design spaces to model real-world work environments.
- + Make certain the curriculum at Benson is relevant to our local workforce needs.
- + Develop a compelling story of "partner buy-in."

### **PROVIDE AGILE, FLEXIBLE, AND ADAPTABLE FACILITIES THAT SUPPORT CHANGING EDUCATIONAL AND INDUSTRY NEEDS**

- + Make spaces adaptable to changing needs brought about by economic shifts, industry advances, and new equipment.
- + Encourage collaboration with a variety of group settings and flexible furnishings.
- + Design open and inviting spaces that draw students into centers of activity and discussion.
- + Develop spaces that support innovative educational approaches.

### **PROVIDE HANDS ON, PROJECT-BASED LEARNING OPPORTUNITIES THAT ARE IMBUED WITH RIGOR AND RELEVANCY**

- + Provide students with state of the art and industry-standard tools, materials, equipment, and technology.
- + Support "learning by doing"
- + Allow students to directly experience real world applications of abstract academic concepts.
- + Provide spaces that can adapt to new industry innovations and education delivery methodologies.

### **POSITION BENSON POLYTECHNIC AS THE NATIONAL MODEL FOR STEAM AND CAREER TECHNICAL EDUCATION**

- + Continue the ability of the community to feel a sense of pride when speaking of Benson Polytechnic High School's exemplary CTE programs and innovative learning approaches.
- + Premier resource for the development of CTE programs locally, nationally and internationally



## PROVIDE LEARNING ENVIRONMENTS THAT INSPIRE CREATIVITY AND COLLABORATION AMONG STUDENTS

- + Spaces should foster exploration, collaboration, and creativity
- + Facility should include multi-sensory environments and inspire students to “tell their stories” by expanding their horizons for investigating, designing, and creating

## CELEBRATE DIVERSITY AND PROVIDE A SENSE OF INCLUSION AND BELONGING AMONG STUDENTS AND FAMILIES

- + School environment should reflect appreciation of different cultures, socioeconomic backgrounds, and learning modalities

## 2.4 ADDITIONAL INPUT

After further review and feedback from the steering committee, industry and post-secondary outreach tours, and new leadership in the Office of Teaching and Learning, input was provided that the ed spec and master plan was updated to meet these additional criteria:

### INPUT FROM STEERING COMMITTEE

- + Utilize space efficiently and effectively to manage constraints and a industry changes
- + Plan for future adaptations of CTE by providing less compartmentalization.
- + Design a flexible and adaptable building that can accommodate multiple scenarios.
- + Provide spatial adjacencies which enable greater collaboration between CTE and Core academic spaces.
- + Plan for growth by providing flexible options, not necessarily increasing size of existing CTE.

### DISTRICT CTE VISIONING

The district is currently undergoing a Career Learning and CTE 5-year master plan visioning process that will serve to create structures to ensure quality, equity, accountability, and efficient implementation of programming that includes global innovation and local labor market context. This effort may provide information for future or modification of Benson Tech's CTE programs, but should not impact master plan and project schedule.







ROTARY LIFT



## 3.0 PROGRAM

### 3.1 PROGRAM DELIVERY COMPONENTS

The first step in breaking down the wide range of program needs at Benson Tech is to identify and define the building blocks of the program or components that make up the various spatial needs of each activity.

#### Classrooms



Classrooms are versatile spaces that support team learning for a wide range of program needs. Classrooms should all be similar in nature for use by multiple programs, and have easy access to flex areas such as break out spaces and other shared spaces. Adjacency of Classrooms to Labs/Shops for collaboration and shared use promotes a project-based learning pedagogy. Classrooms include: General Classrooms, SPED, CTE Classrooms.



#### Labs/Shops

Labs and Shops enable project-based learning and are flexible in their design so they are easily adaptable to new technology for years to come. Labs/Shops include: Science Labs, Computer Labs, CTE Shops.



#### Support Spaces

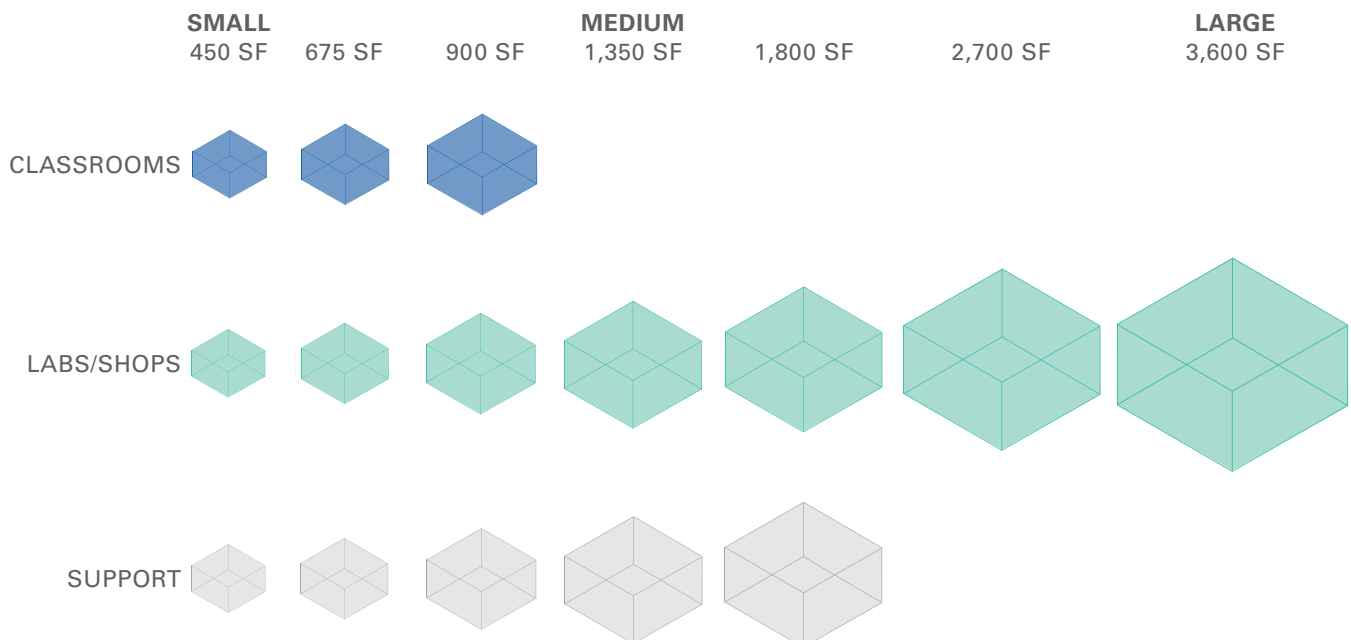
Support Spaces provide the secondary level of resources needed for programs to function. Support Spaces include: Teacher Planning, Conference Rooms, Storage, Restrooms.



#### Gathering Spaces

Gathering Spaces are the spaces that foster collaboration. Gathering spaces include: Commons, Flex / Breakout.

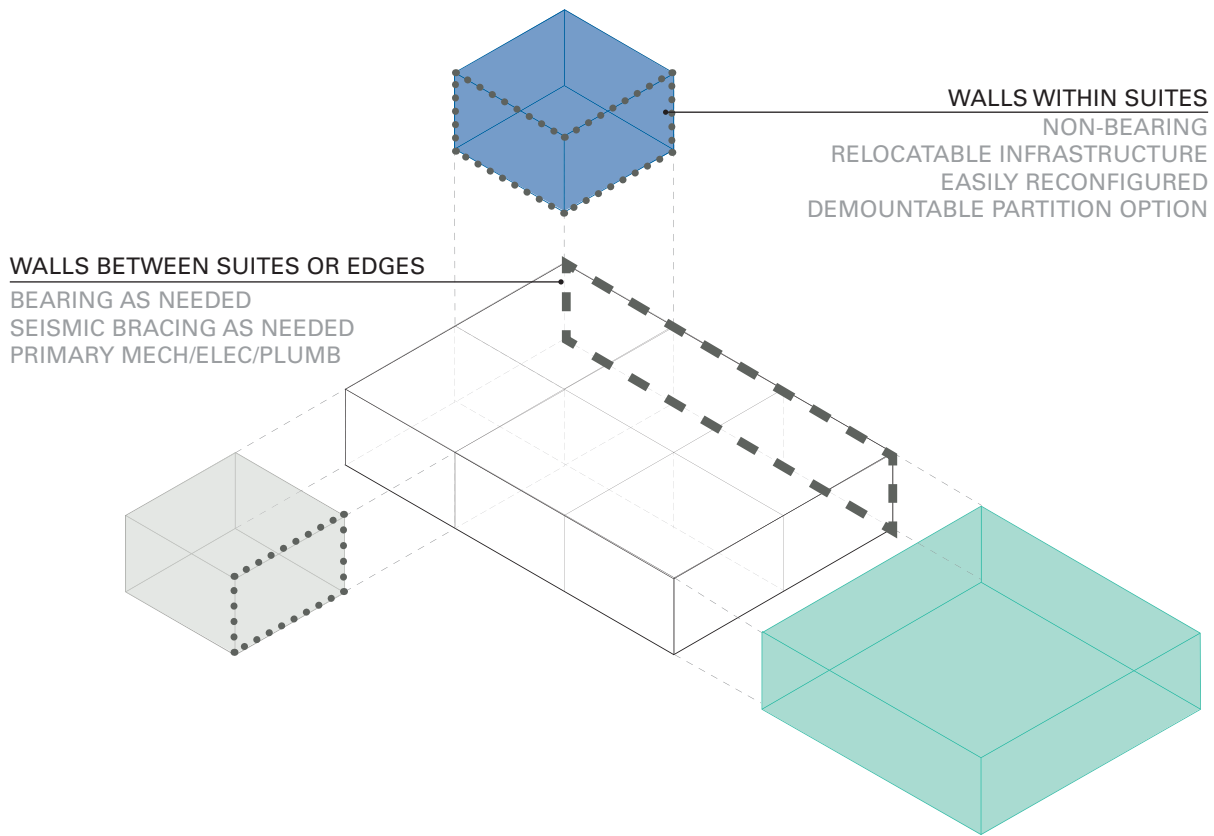
Once the components have been defined, we then look at sizing them appropriately based on current activities and industry examples of similar type of spaces. Space components have been sized appropriately in the program, using a modular format to provide consistency and regularity for efficient use of space. Components can be combined when needed for larger spaces.



### 3.2 MODULAR SUITE TYPOLOGY

CTE programs are now organized within consistent suite types for greater parity between programs and to free up space for additional future CTE programs that are yet to be determined. Future CTE space has been reserved for potential new CTE programs or current program growth, allowing flexibility in program development between now and opening day.

CTE programs will also have greater flexibility and adaptability by being arranged in suites that are more open, with careful consideration in the placement of elements and infrastructure are placed to maintain adaptable space.





## SUITE A - 3,600 SF

### CURRENT CTE PROGRAMS:

- + Architecture
- + Design & Applied Arts
- + Engineering
- + Computer Engineering

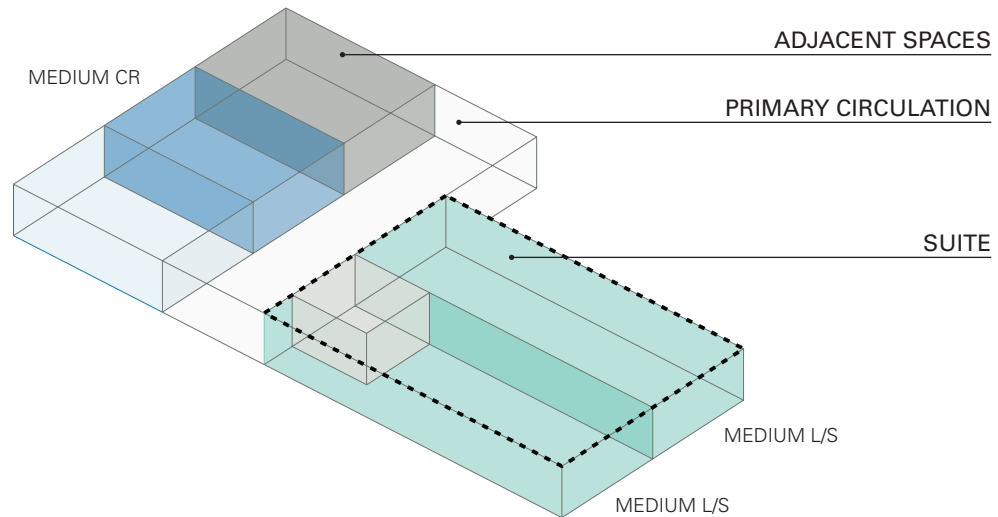
### OTHER EXAMPLE PROGRAMS:

- + Business Management
- + Urban Planning

### LEGEND

- CLASSROOMS
- LABS / SHOPS
- COMPUTER LABS
- CIRCULATION / SUPPORT

### EXAMPLE LAYOUT:



## SUITE B - 5,400 SF

### CURRENT CTE PROGRAMS:

- + Radio

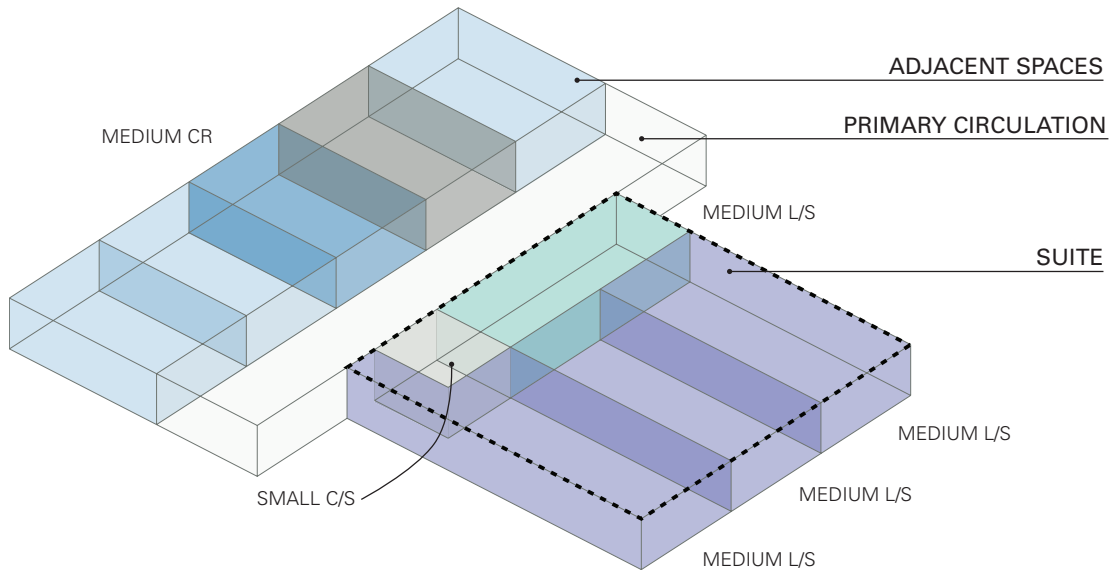
### OTHER EXAMPLE PROGRAMS:

- + Education
- + Product Design
- + Aviation
- + Technical Theater

### LEGEND

- CLASSROOMS
- LABS / SHOPS
- COMPUTER LABS
- CIRCULATION / SUPPORT

### EXAMPLE LAYOUT:



## SUITE C - 7,200 SF

### CURRENT CTE PROGRAMS:

- + Digital Media
- + Health Occupations
- + Electric

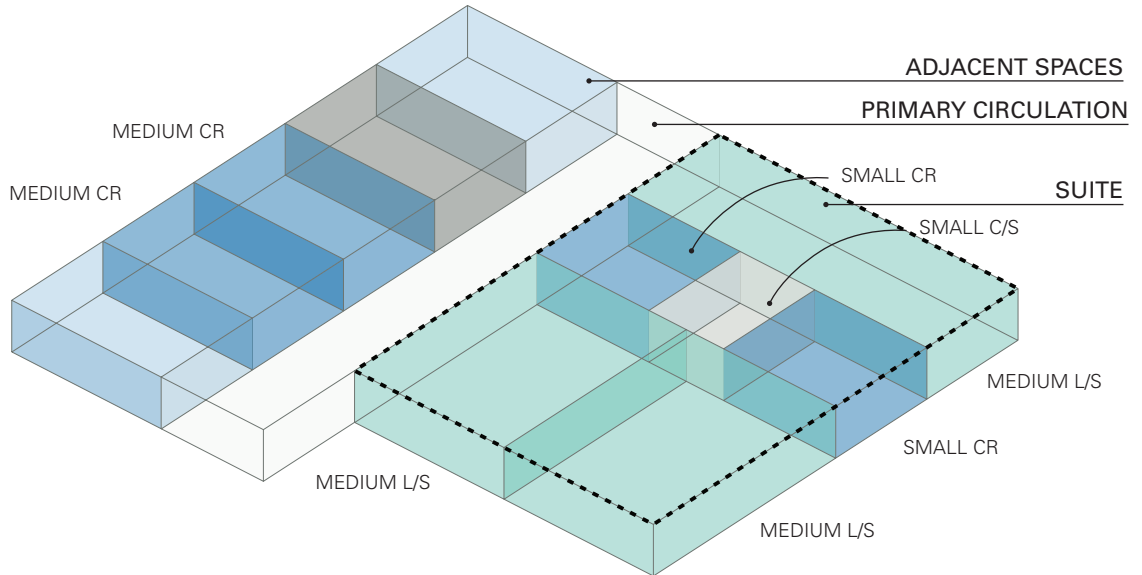
### OTHER EXAMPLE PROGRAMS:

- + Alternative Energy & Sustainability
- + Robotics

### LEGEND

- CLASSROOMS
- LABS / SHOPS
- COMPUTER LABS
- CIRCULATION / SUPPORT

### EXAMPLE LAYOUT:





## SUITE D - 14,400 SF

### CURRENT CTE PROGRAMS:

- + Construction
- + Automotive
- + Manufacturing

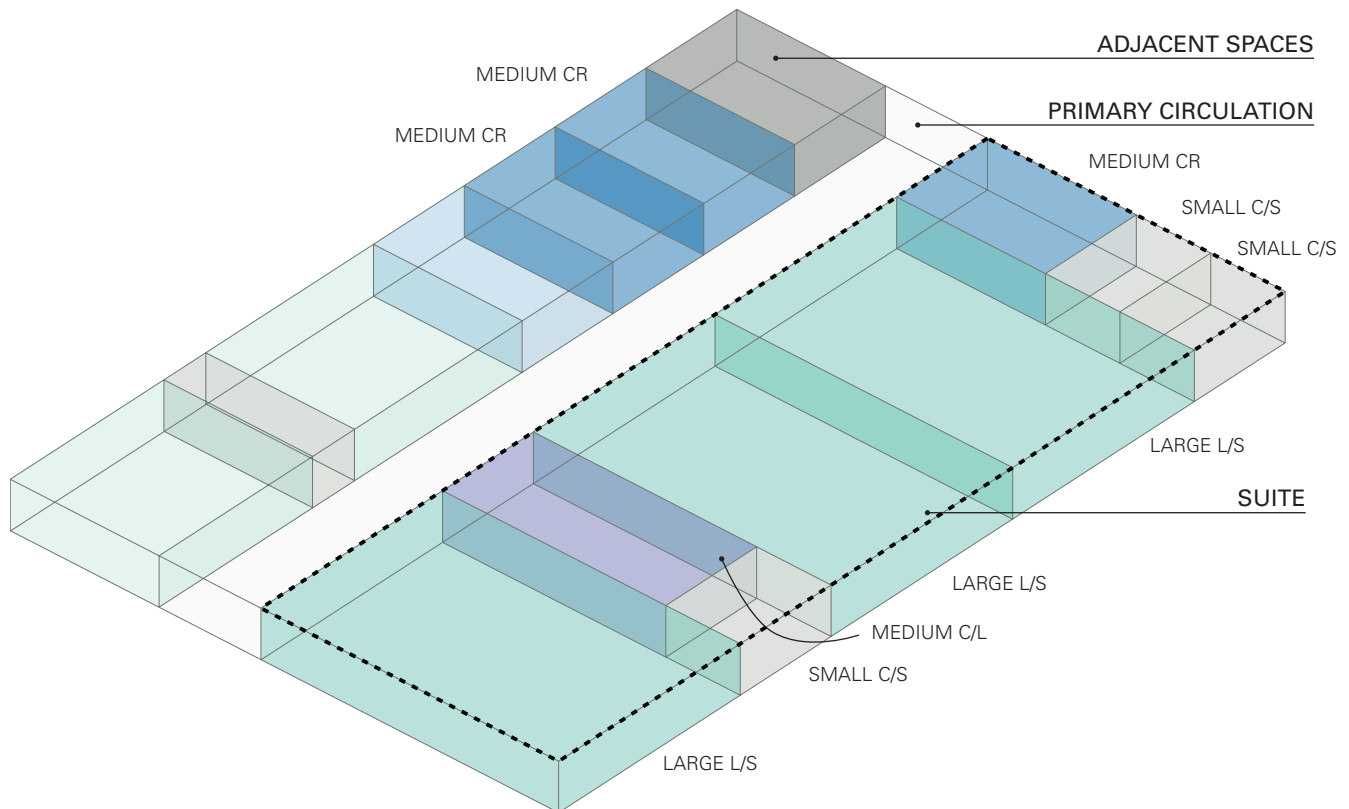
### OTHER EXAMPLE PROGRAMS:

- + Hydraulics

### LEGEND

- CLASSROOMS
- LABS / SHOPS
- COMPUTER LABS
- CIRCULATION / SUPPORT

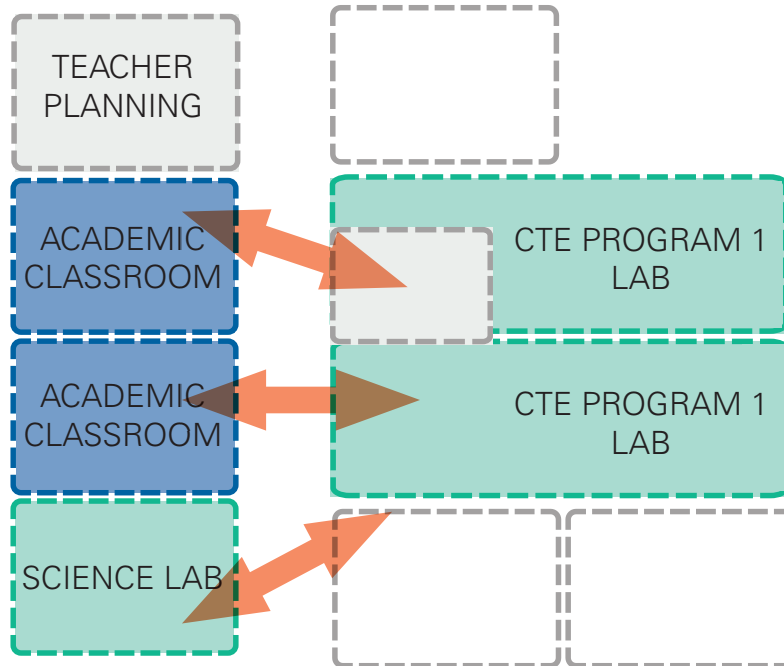
### EXAMPLE LAYOUT:



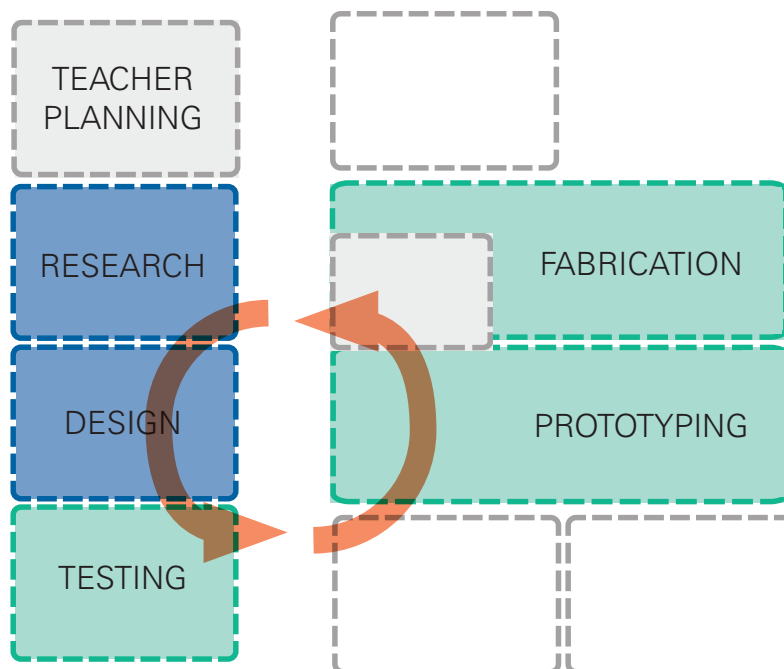
### 3.3 SUITE ADAPTABILITY

The arrangement of spaces with close spatial adjacency to each other will allow more flexibility and adaptability for supporting a wider range of content delivery adaptations. By scenario planning multiple approaches, we can help ensure that the building can support not just a program-based approach, which is similar to the existing pedagogy at Benson Tech, but also support more integrated or project-based approaches, if the pedagogy evolves over time through staff development.

#### EXAMPLE PROGRAM BASED APPROACH:



#### EXAMPLE PROJECT BASED APPROACH:





Natrona County High School  
Commons



Roosevelt High School  
Media Center



Natrona County High School  
Flex Space

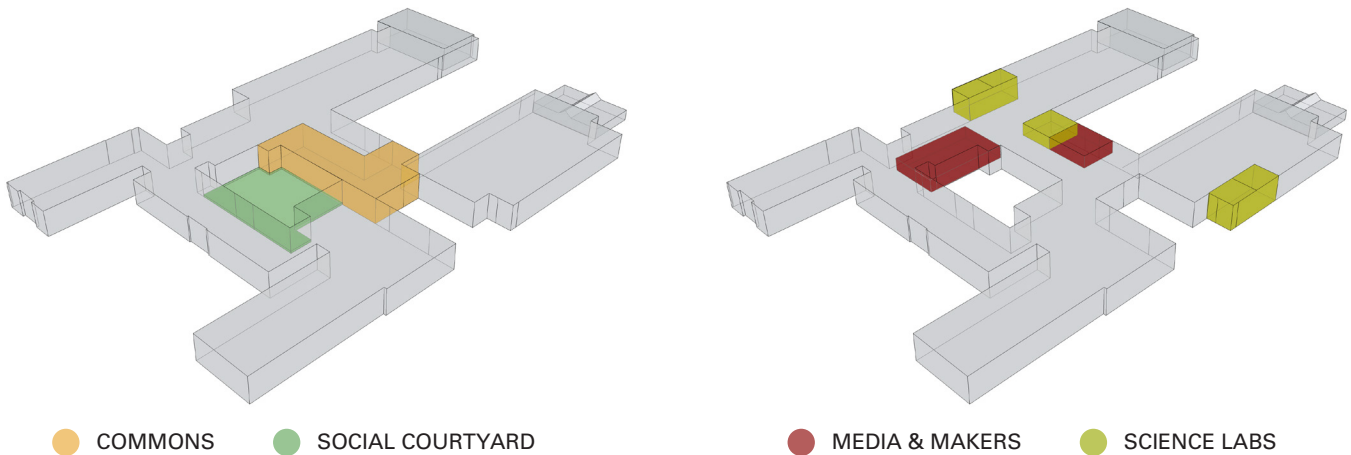


## 3.4 STUDENT GATHERING SPACES

### STUDENT COMMONS

The Student Commons serves as the heart of the school and the center of student life, and provides a sense of whole school community. The main functions of this space are to serve dining and assembly needs while providing a hub for circulation. It provides a variety of gathering places to encourage greater social interaction between students, faculty, family, and the community. There will be direct access from the Student Commons to an outdoor gathering space. School dances, informal gatherings, and after-hours community-use are among the various intended activities.

Other resources that will be centrally located to support programs are the Media Center, Maker's Lab and Science Labs.



### FLEX AREAS

Flex Areas are a central and prominent space within the learning communities. Small groups of students can “break out” from the learning settings to work individually, in teams, or on projects. It is also the central hub of each learning community, providing a small social setting to compliment the larger Student Commons. Mobile furnishings and equipment for a variety of activities are available. Computer access to networked information resources is available for individuals and small groups. This area is readily accessible to the individual learning settings and easily supervised from either the learning settings or the teacher planning areas.



### 3.5 UTILIZATION TABLES

BPHS Proposed Program @ 1,700 Student Design Capacity with Academic Teacher Planning (95% CR Utilization)												
	Total SF	÷	TS	=	TS	*	Util	*	Students per			
									Classroom Range	=	Stud - low	Stud - high
General Classrooms	31,500		900		33		95%		20	30	627	941
Science Labs	15,300		1,700		9		95%		20	30	171	257
Career Technical Ed (CTE) Suites			<i>varies</i>		39		75%		15	25	439	731
PE/Athletics			<i>varies</i>		3		75%		20	30	45	68
Special Education & ELL	5,700		<i>varies</i>		9		70%		5	15	32	95
Small Instruction					0		70%		20	30	0	0
<b>Total</b>	<b>368,000</b>				<b>93</b>						<b>1,313</b>	<b>2,090</b>

BPHS Proposed Program @ 1,700 Student Design Capacity with Academic Teacher Planning (85% CR Utilization)												
	Total SF	÷	TS	=	TS	*	Util	*	Students per			
									Classroom Range	=	Stud - low	Stud - high
General Classrooms	31,500		900		33		85%		20	30	561	842
Science Labs	15,300		1,700		9		85%		20	30	153	230
Career Technical Ed (CTE) Suites			<i>varies</i>		39		75%		15	25	439	731
PE/Athletics			<i>varies</i>		3		50%		20	30	30	45
Special Education & ELL	5,700		<i>varies</i>		9		70%		5	15	32	95
Small Instruction					0		0%		20	30	0	0
<b>Total</b>	<b>368,000</b>				<b>93</b>						<b>1,214</b>	<b>1,942</b>

BPHS Proposed Program @ 1,700 Student Design Capacity with Academic Teacher Planning (75% CR Utilization)												
	Total SF	÷	TS	=	TS	*	Util	*	Students per			
									Classroom Range	=	Stud - low	Stud - high
General Classrooms	31,500		900		33		75%		20	30	495	743
Science Labs	15,300		1,700		9		75%		20	30	135	203
Career Technical Ed (CTE) Suites			<i>varies</i>		39		75%		15	25	439	731
PE/Athletics			<i>varies</i>		3		50%		20	30	30	45
Special Education & ELL	5,700		<i>varies</i>		9		70%		5	15	32	95
Small Instruction					0		0%		20	30	0	0
<b>Total</b>	<b>368,000</b>				<b>93</b>						<b>1,130</b>	<b>1,816</b>

### 3.6 PROGRAM SUMMARY

PROGRAM COMPONENTS	AREA	QUANTITY	TOTAL	T/S	PPS COMP. HS ED SPEC	
					T/S	AREA
Suite Type A	3,600 SF	4	14,400 SF	8		
Suite Type B	5,400 SF	1	5,400 SF	3		
Suite Type C	7,200 SF	3	21,600 SF	11		
Suite Type D	14,400 SF	3	43,200 SF	11		
Un-Programmed Suite Types <sup>d</sup>	11,500 - 15,000 SF <sup>a</sup>		11,500 - 15,000 SF	6 <sup>a</sup>		
<b>CTE SUITES TOTAL</b>		<b>11+</b>	<b>96,100 - 99,600 SF</b>	<b>39</b>	<b>3</b>	<b>4,800 SF</b>
MAKERS LAB	1,800 SF	1	1,800 SF			1,200 SF
GENERAL CLASSROOMS	900 SF	33	29,700 SF	33	51	45,180 SF <sup>b</sup>
SCIENCE LABS & PREP	1,700 SF	9	15,300 SF	9	11	17,480 SF
SPED & ELL CLASSROOMS			5,700 SF	9	1 <sup>c</sup>	6,100 SF
FLEX / BREAKOUT SPACES			9,000 SF			8,000 SF <sup>b</sup>
TEACHER PLANNING / COLLABORATION			5,250 SF			9,800 SF <sup>b</sup>
EDUCATION SUPPORT			50,220 SF			55,480 SF
PE / ATHLETICS			42,695 SF	3	3	35,580 SF
BAND/ORCHESTRA/CHOIR			0 SF		2	5,170 SF <sup>b</sup>
FINE & VISUAL ARTS			INCL. IN CTE		2	3,080 SF
MULTI-PURPOSE / LARGE MEETING ROOM			3,500 SF			1,500 SF <sup>b</sup>
THEATER & SUPPORT			15,129 SF		1	14,600 SF
WRAP-AROUND SERVICES			5,315 SF			5,150 SF
<b>SPACE TOTALS</b>			<b>279,709 - 283,209 SF</b>			<b>213,120 SF</b>
<b>NETTO GROSS RATIO (29 - 36%)</b>			<b>81,115 - 101,955 SF</b>			<b>76,723 SF</b>
<b>GRAND TOTAL RANGE</b>			<b>360,824 - 385,164 SF</b>	<b>93</b>	<b>74</b>	<b>289,843 SF</b>

Notes:

- a. Assumed amount. Final number will be determined when program is assigned.
- b. Includes preferred/optional space(s). See Opening Day Area Program for specific details.
- c. Comprehensive HS Ed spec updates yet to be incorporated include SPED spaces will be counted as teaching stations at lower student ranges.
- d. Un-programmed space may include multi-purpose/large meeting room and/or potential auditorium balcony conversion to un-programmed CTE suites.





ALWAYS  
FUNKY

Review Tapering Legs -  
Make rough cuts to aprons  
square & cut aprons to  
dimension

DEMO KITS



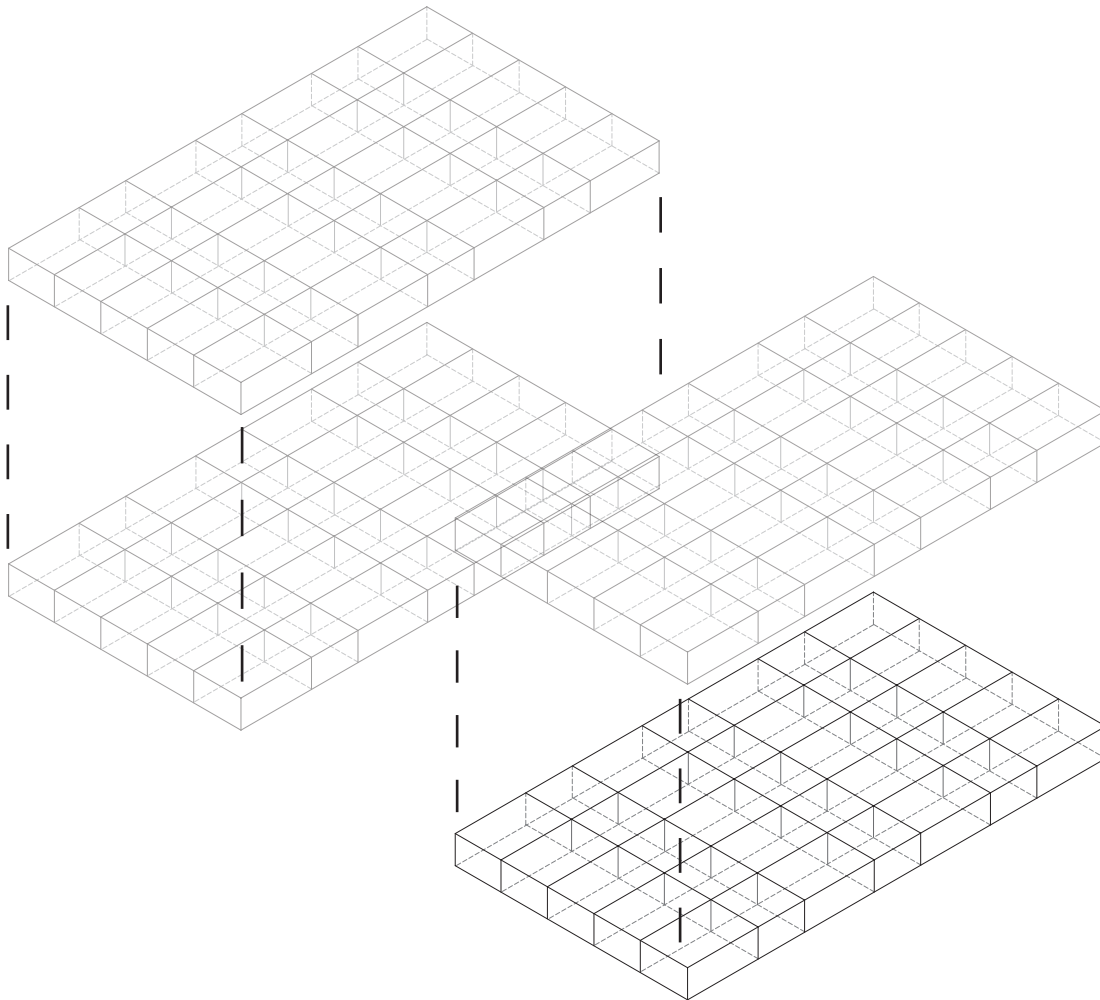
## 4.0 TECHNICAL BUILDING CONSIDERATIONS

### 4.1 OVERVIEW

This section is organized into a systems based description of the general requirements for typical spaces within the building. For more specific CTE program requirements, refer to Section 5.

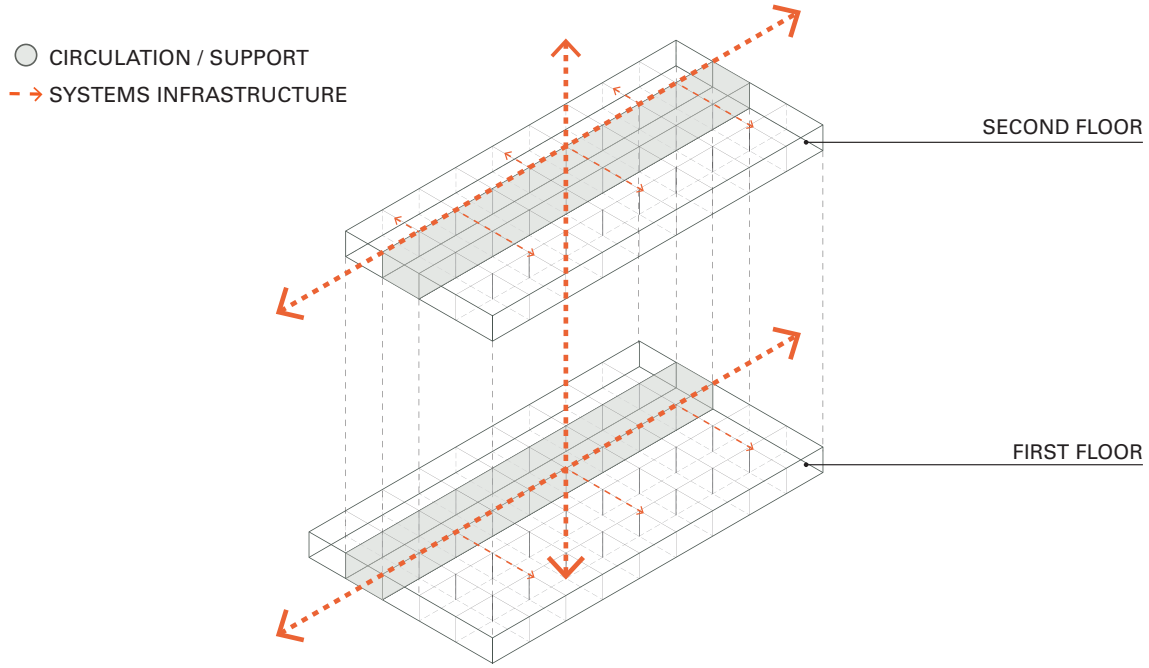
### 4.2 STRUCTURAL GRID

The building should be designed around an open structural grid that maximizes efficiency and allows maximum flexibility for fitting suites within. The current approach is to use a 26-foot wide grid to match existing bay sizes where the historic CTE wings occur, and translate this module throughout the building wherever possible. The grid is then sized to an appropriate 1,000 SF gross module for structural efficiency and consistency. The result is approximately 26 ft x 38 ft bays within the open area.



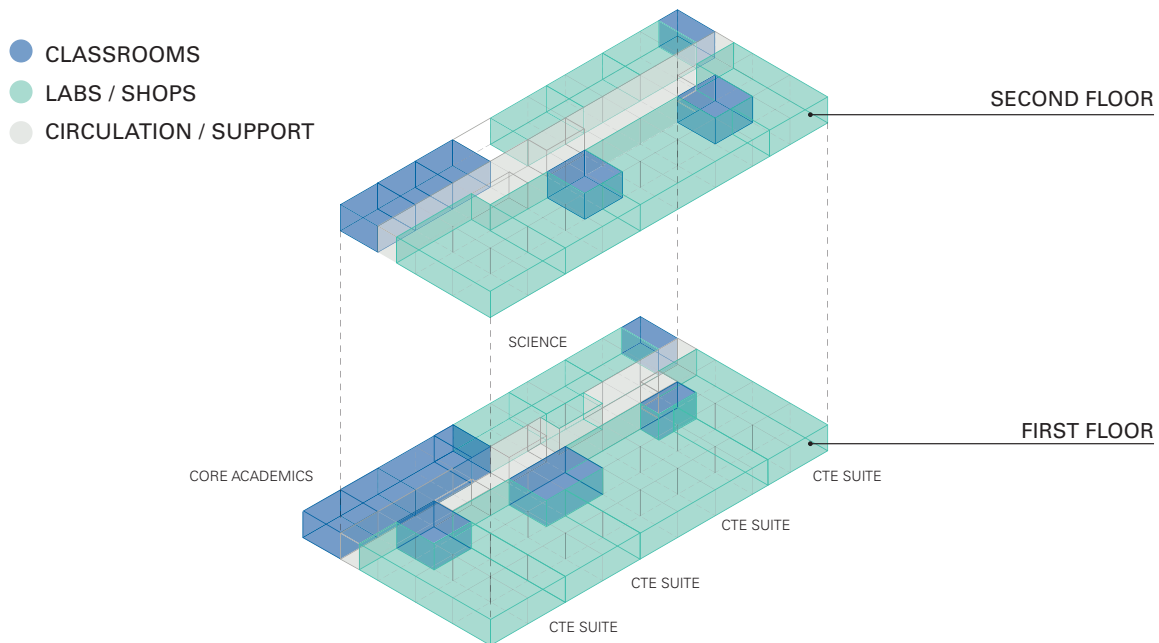
### 4.3 SYSTEMS FLEXIBILITY

The building's structural grid and central systems will be laid out in an efficient modular format that maximizes flexibility while supporting a wide range of potential arrangements and scenarios. The central system 'trunkline' will include power, data, mechanical, and plumbing.



### 4.4 SUPPORTING MULTIPLE SCENARIOS

The building must be designed to support multiple scenarios, including arrangements that put Core Academics and CTE directly adjacent and across from each other.





In the section following, technical building considerations are listed for each type of space that compose the program suites. Considering BPHS's specific site and program needs, Classrooms and Labs/Shops have various differences in space needs than the comprehensive high school. Technical considerations for administrative and support spaces can be referenced from the PPS Comprehensive High School Educational Specification.

## 4.5 ACOUSTICS

### Classrooms

- + Provide acoustic isolation between rooms. Walls directly separating teaching spaces to have an STC Rating of 50 or greater. Walls and floors/ceilings separating CTE spaces and classroom spaces to have an STC rating of 65.
- + Achieve a maximum background noise level of 40 dBA from heating, ventilating, and air-conditioning (HVAC) systems.
- + Include sufficient sound-absorptive finishes for compliance with the reverberation time requirements specified in ANSI Standard S12.60–2010, Part 1, Acoustical Performance Criteria, Design Requirements and Guidelines for Schools.

### Labs/Shops

- + Provide acoustic isolation between rooms. Walls and floor-ceilings assemblies separating CTE spaces and/or classroom spaces to have an STC rating of 65.
- + Include sufficient sound-absorptive finishes for compliance with the reverberation time requirements specified in ANSI Standard S12.60–2010, Part 1, Acoustical Performance Criteria, Design Requirements and Guidelines for Schools.
- + Shops producing higher noise levels to be located away from sound sensitive spaces and to be surrounded by buffer spaces such as corridors, storage, custodial closets, restrooms, and electrical / IDF rooms.

### Gathering Spaces

- + All walls and floor-ceiling assemblies to be rated STC 65
- + Commons: Typical acoustic requirements appropriate for student commons. Provide acoustic sound clouds or wall panels to reduce high sound levels. Buffer internal noise from the rest of the school.
- + Flex spaces: Typical acoustic requirements appropriate to learning spaces. Reference PPS Comprehensive High School Educational Specification.
- + Basement Spaces: Spaces below the Gymnasiums to have a high degree of acoustical separation. Floor-ceiling constructions should achieve minimum STC 65 and IIC 60. Spaces below the Auditorium and Media Center should have a high degree of acoustical separation.
- + Auditorium:
  - Existing reverberation time to be updated to 3 or more seconds to support speech focused programming
  - Hard seating to be replaced with upholstered seating with perforated seat bottoms
  - Add approximately 3,000 SF of acoustical absorptive material to the space
  - Achieve a maximum background noise level of 30 dBA from HVAC systems
- + Media Center
  - Walls and floor-ceilings to be rated STC 65 to ensure adequate sound isolation particularly at low frequencies
  - Include acoustically absorptive treatments to ensure high quality sound recording and reproduction capabilities
  - Achieve a maximum background noise level of 30 dBA from HVAC systems
- + Aux Gym: Reduce sound levels from HVAC system to 50 dBA
- + Gym: Reduce mid frequency reverberation time to 1.5 seconds to achieve LEED Silver
  - Replace and add approximately 7,000 SF of new acoustical absorptive materials to reach desired reverberation time of 1.5 seconds

- + Band / Multipurpose Room
  - Walls to be rated STC 65
  - Achieve a maximum background noise level of 30 dBA from HVAC systems
  - Incorporate 1,500 sq. ft. of acoustically absorptive material and 500 sq. ft. of diffusive material

## 4.6 DAYLIGHTING

### Classrooms

- + Provide ample natural daylight through windows, skylights (for second floor spaces) and/or clerestories.
- + Provide window shades to darken the room.
- + Coordinate lighting with natural light levels by using photo sensors or zones, wherever possible.

### Labs/Shops

- + Provide ample natural daylight through windows, skylights (for second floor spaces) and/or clerestories.
- + Provide window shades to darken the room.
- + Coordinate Lighting with natural light levels by using photo sensors or zones, wherever possible.

### Gathering Spaces

- + Provide ample natural daylight through windows, skylights, and/or clerestories.
- + Provide window shades to darken the room where presentations with projection will occur.
- + Reference PPS Comprehensive High School Education Specification

## 4.7 LIGHTING

### Classrooms

- + The lighting will be coordinated with the ceiling. In general, suspended accessible acoustical tile ceilings (min height 9 ft max height 12 ft) are expected.
- + 4000 Kelvin, Light Emitting Diode (LED) troffer luminaries, set flush in the suspended ceiling.
- + The replay lighting is controlled from low voltage switch and control stations, and utilizes automatic vacancy-sensing control. The luminaries are turned on manually via switch stations at the doors. The automatic vacancy sensors will turn off the power to the luminaries when no occupant is sensed for 20 minutes.
- + Direct/Indirect LED lighting with multiple switching options for energy conservation and note-taking during screen viewing
- + Luminaries located near windows expected to have a significant daylight contribution will be fitted with feedback-dimming controls. These controls will automatically dim the luminaries with daylight contribution to maintain the minimum acceptable illumination, with the daylight illumination supplying the remainder.
- + Zoned, independent dimming control of the teaching wall, teaching bench areas, student seating areas and automatic daylight harvesting near window walls (with integration into the manual dimming as a maximum illumination set point) will be provided

### Labs/Shops

- + Even with exhaust dust collection systems, long-term airborne dust and suspended vapors deposition is expected. The lighting in areas with dust and vapor presence (i.e., wood shop, foundry, machine shop, automotive, etc.) will utilize luminaries that are easy to keep clean.
- + The luminaries in these potentially light-source-obscuring environments are recommended:

- To be 4000 Kelvin, Light Emitting Diode, (LED) (for reduced maintenance).
  - Linear light output (reduced shadow casting on work surfaces).
  - Pendant-mounted (to locate level with the bottom of ducts, pipes and conduits).
  - Equipped with a permanently sealed, vapor-tight LED optical array housing (easy to dust off from the floor with a pole duster).
- + Use manual control lighting in shops with large, potentially dangerous machines or potentially dangerous processes. A deposition-obscured vacancy sensor could turn off the illumination when it is needed most.
  - + Zoned, independent dimming control of the teaching wall, teaching bench areas, student seating areas and automatic daylight harvesting near window walls (with integration into the manual dimming as a maximum illumination set point) will be provided

### Gathering Spaces

- + Reference PPS Comprehensive High School Education Specification

## 4.8 ELECTRICAL

### Classrooms

- + Power via 20 Ampere duplex receptacles set flush in new walls.
- + Power receptacles positioned to support the space equipment. Positioning of power outlets will be coordinated with the Architectural design.
- + Power available at counter tops, teaching instructor display, and whiteboard locations.

### Labs/Shops

- + Power to freestanding equipment shall be fed from overhead cordset drops. This provides additional ease of equipment relocation or replacement.
- + Provide overhead electrical bus for flexibility and easy access to additional power.
- + Provide power for equipment and hand tools in adjacent outdoor space.
- + Positioning of power drops and equipment connections will be coordinated with the School District Equipment Layout design.





- + Instructor Emergency power shutdown with key controlled power energization is expected to be provided for all shops and Laboratories.
- + General-use power via 20 ampere duplex receptacles set flush in new walls. The power receptacles will support the space's equipment.
- + The power receptacles for the individual student computer stations will be provided via the student computer desk table integral wiring system.
- + The student computer desk table integral wiring system will be plug-in cord connected to either wall or floor power outlets. Positioning of power outlets will be coordinated with the Architectural design.
- + Provide connection to alternative energy systems where applicable - PV and wind, for example, to allow incorporation into projects.
- + Provide dedicated power supply with excess capacity for fluctuations in power requirements of program.
- + A 277/480 Volt, three phase, campus power distribution system will be sized robustly to allow a reasonable 25 year future reconfiguration. Capacity to set future dry type transformers to supply additional future 120/208 Volt power will be provided.
- + A 120/208 Volt, three phase, campus power distribution system will be sized robustly to allow a reasonable 25 year future reconfiguration.

### Gathering Spaces

- + Reference PPS Comprehensive High School Education Specification

## 4.9 TECHNOLOGY AND COMMUNICATION

### Classrooms

- + Communication cabling to support technology interconnectivity.
- + Wireless access points, as well as t538b data jacks and device plates with Category 6 cable for network access.
- + Short throw projector access to both the network and HDMI-equipped instructional computers.
- + Wall projector at teaching wall
- + LCD screen for display.
- + Fire alarm visual and voice evacuation warning speaker system
- + Separate speakers for PA system
- + Audio reinforcement system through local speaker and amplifier system
- + VOIP telephone capability for staff communication



### Labs/Shops

- + Communication cabling to support technology interconnectivity
- + The student computer desk table integral wiring system will be plug-in cord connected to either wall or floor power outlets. Positioning of power outlets will be coordinated with the Architectural design.
- + Individual student and staff computer work stations will be connected to the IT rack patch panels in the telecom room via dedicated Category 6 cabling.
- + The cabling will route from wall cable whip boxes or floor whip boxes.
- + Individual student and staff computer work station 358B jacks will have the Category 6 cable routed via the student computer desk table cable management trough.
- + Patch cables will be used to connect the individual computers to the 358B jacks in the student computer desk table.

- + Wireless access points, as well as 358B data jacks and device plates with Category 6 cable for network access.
- + LCD screen for display
- + Short throw projector access to both the network and HDMI-equipped instructional computers.
- + Wall projector at teaching wall
- + Theater projector where applicable with HIFI sound and access to both the network and HDMI-equipped instructional computers.
- + Fire alarm visual and voice evacuation warning speaker system
- + Separate speakers for PA system
- + Audio reinforcement system through local speaker and amplifier system
- + VOIP telephone capability for staff communication

### Gathering Spaces

- + Reference PPS Comprehensive High School Education Specification

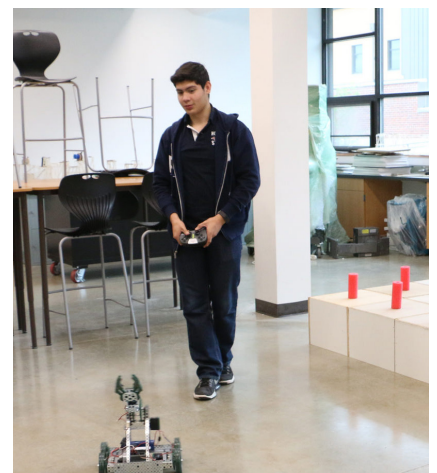
## 4.10 MECHANICAL

### Classrooms

- + Occupied Temp Setpoints - Cooling: 80°F ±2°F, Heating 68°F ±2°F.
- + Ventilation: Provide Code-required ventilation rates. Consider providing 30% above minimum ventilation rates required by ASHRAE 62.1.
- + Local Control: Thermostat per space, operable windows.
- + Thermal System: DOAS with radiant. Passive heating and cooling should be considered.

### Labs/Shops

- + Occupied Temp Setpoints - Cooling: 80°F ±2°F, Heating 68°F ±2°F.
- + Ventilation: Provide Code-required ventilation rates. Consider providing 30% above minimum ventilation rates required by ASHRAE 62.1.
- + Local Control: Thermostat per space, operable windows, local control of dedicated exhaust systems.
- + Thermal System: Make-up air units. Heating only with airside economizer cooling. Provide negative pressure in shop spaces relative to corridors.
- + Specialized Systems: General exhaust and dedicated local exhaust systems as needed. Provide shaft/stack space at regular intervals throughout the shop spaces for potential future connections.
- + Exhaust shall terminate above the roof and minimize potential for recirculation back into the building.



- + See opening day program and room data sheets for specific program requirements such as:
  - Welding exhaust/ metal dust collection where applicable;
  - Exhaust for soldering where applicable;
  - Fume hood exhaust where applicable;
  - Air suction where required in Health Occupations.

### Gathering Spaces

- + Reference PPS Comprehensive High School Education Specification

## 4.11 PLUMBING

### Classrooms

- + None required

### Labs/Shops

- + Utility sinks (wall-mounted, 3 basin)
- + Floor drains
- + Eyewash and emergency shower with floor drain
- + Compressed air spigot where applicable
- + Science Labs
  - Gas spigot at each lab station and at teaching station in chemistry labs
  - Emergency gas shut-off in chemistry labs
  - Sediment trap
  - DI/RO Water
  - Sinks with acid waste resistant piping located at teaching station and at lab perimeter, between peninsulas
  - Acid waste pipe to central acid waste neutralization tank
- + For CTE labs/shops, see opening day program and room data sheets for specific program requirements such as:
  - Oil waste piping where applicable;
  - Acid waste piping/treatment where chemicals will be used.



### Gathering Spaces

- + Drinking fountain with water bottle fill station
- + Reference PPS Comprehensive High School Education Specification

## 4.12 FINISHES

### Classrooms

- + Floors: Provide hard surface flooring
  - Resilient flooring meeting PPS Design Standards
- + Walls: Gypsum wallboard/ paint
- + Ceiling: Minimum 9 ft, maximum 12 ft
  - Suspended acoustical ceiling or
  - Gypsum board hard ceiling/paint (at limited areas, for example, soffits)



### Labs/Shops

- + Floors: Provide hard surface flooring
  - Exposed polished concrete floor
- + Walls: Durable finish for high impact
  - Impact resistant gypsum wallboard/ paint. Provide MDF or Plam wainscot where required in heavy duty shops.
  - Concrete or CMU where applicable
  - FRP panel or wall finish at sink backsplash
- + Ceiling: Minimum 12 ft, maximum 20 ft
  - Suspended acoustical ceiling or
  - Exposed structure with acoustical finish or
  - Gypsum board hard ceiling/paint in a spring-suspended ceiling system with insulation in the cavity. Sound absorptive panels

### Gathering Spaces

- + Reference PPS Comprehensive High School Education Specification

## 4.13 SPECIALTIES

### Classrooms

- + Whiteboards: Magnetic whiteboards and projection surface (two 4 ft x 8 ft)
- + Tackboards: On walls where possible (two, 4 ft x 8 ft)
- + Display Case: not required
- + Items to be stored in the space: Textbooks, office supplies, additional learning materials, student portfolios, teacher files and belongings.

### Labs/Shops

- + White boards: Magnetic whiteboards and projection surface (two 4 ft x 8 ft)
- + Tackboards: On walls where possible (two, 4 ft x 8 ft)
- + Student workbenches (1 per 4 students)
- + Display Case: In hallway or near front entrance
- + Countertops: Provide chemical resistant countertops in science labs and lab prep rooms

### Gathering Spaces

- + Reference PPS Comprehensive High School Education Specification

## 4.14 WINDOWS, DOORS & HARDWARE

### Classrooms

#### WINDOWS

- + Interior relites for transparency between corridor and learning space
- + High and low operable exterior windows for air circulation, configured and sized to provide optimal daylight
- + Operable roller shades to control natural light as needed at exterior windows and to provide privacy for lockdown purposes at interior relites
- + Windows facing the CTE courtyard to be acoustical laboratory rated assemblies. Windows to be fixed where possible and specified with minimum STC 50. Where windows facing the CTE courtyard are operable, window is to be specified with minimum STC 45.

## DOORS AND HARDWARE

- + Solid wood doors with sidelites next to doors
- + Refer to PPS District Standards for hardware and keying

## Labs/Shops

### WINDOWS

- + Interior relites for transparency between corridor and learning space
- + High and low operable exterior windows for air circulation, configured and sized to provide optimal daylight
- + Operable window shades to control natural light as needed at exterior windows and to provide privacy for lockdown purposes at interior relites
- + Windows facing the CTE courtyard to be acoustical laboratory rated assemblies. Windows to be fixed where possible and specified with minimum STC 50. Where windows facing the CTE courtyard are operable, window is to be specified with minimum STC 45.

## DOORS AND HARDWARE

- + Interior
  - Minimum 6 ft W x 8 ft H,
  - Sound seals on door, STC 50 minimum
  - Double sound control doors where applicable
  - Sidelights/transoms where applicable
- + Exterior
  - Insulated, minimum 6 ft W, 8 ft H, double door; 3 ft W door if overhead door also provided
  - STC 50 minimum
- + Overhead, insulated roll-up door(s) in shops where required. Minimum 8 ft W, 8 ft H, motorized
- + Refer to PPS District Standards for hardware and keying

## Gathering Spaces

### WINDOWS

- + Maximize transparency into adjoining spaces and common circulation areas to provide a safe, secure, and welcoming environment
- + Windows configured and sized for optimal daylight
- + Reference PPS Comprehensive High School Education Specification

### SKYLIGHTS / LIGHTWELLS

- + Translucent, insulated, located to avoid glare on video screens and projection surfaces
- + Consider in lieu of windows where exterior wall space is limited, or at interior spaces with no exterior walls
- + Reference PPS Comprehensive High School Education Specification

## DOORS AND HARDWARE

- + Double doors (with removable mullion) with full vision panels and/or sidelites
- + Refer to PPS District Standards for hardware and keying.
- + Reference PPS Comprehensive High School Education Specification

## 4.15 FURNITURE & STORAGE

### Classrooms

- + All furnishings to be mobile
- + 15 Student tables (2-person)
- + 30 Student chairs
- + 1 Teacher stand/sit desk
- + 1 Teacher chair
- + 2 Bookshelves (3 ft x 3 ft)
- + 2 Tall storage cabinets with adjustable shelving (3 ft x 7 ft)

### Labs/Shops

- + See specialized furniture needs and equipment inventory for shop spaces in Opening Day Room Data section

### Gathering Spaces

- + Reference PPS Comprehensive High School Education Specification

## 4.16 EQUIPMENT

### Classrooms

#### MOVABLE EQUIPMENT

- + Mobile technology cart
- + VOIP telephone

#### FIXED EQUIPMENT

- + LCD display
- + Short throw projector

### Labs/Shops

#### MOVABLE EQUIPMENT

- + Mobile computer cart
- + VOIP telephone

#### FIXED EQUIPMENT

- + LCD display
- + Short throw projector
- + Fume hoods in chemistry labs



In addition, see equipment lists for each CTE program in Opening Day section

### Gathering Spaces

- + Large format sound and video systems in Gym, Auditorium, and Commons
- + Reference PPS Comprehensive High School Education Specification







## 5.0 OPENING DAY

### 5.1 DETAILED AREA PROGRAM

Benson Tech Opening Day Area Program								PPS Comprehensive High School Ed Spec					Comparison
Program Components	CTE Suite Type	Quantity	Area (SF)	Total (SF)	Teaching Stations	Refer to PPS Comp. Ed Spec for Room Data	Notes	Program Components	Quantity	Area (SF)	Total (SF)	Teaching Stations	Delta (+/-)
<b>Design and Applied Arts</b>	<b>Type A</b>			<b>3,600</b>				<b>Fine &amp; Visual Arts</b>			<b>3,080</b>		<b>520</b>
2D Art Lab		1	1,350	1,350	1			Art Room (2D)	1	1,200	1,200	1	150
3D Art Lab		1	1,800	1,800	1			Art Room (3D)	1	1,500	1,500	1	300
Support		1	450	450				Kiln Room, Supply/Storage, Art Office	1	380	380		70
Outdoor Work Area			approx.	450			g						
<b>Architecture</b>	<b>Type A</b>			<b>3,600</b>									
Drafting Tech Lab		1	1,350	1,350	1								
Drafting Tech Classroom			900	-			e						
Architecture Lab		1	1,800	1,800	1								
Support		1	450	450									
Outdoor Work Area			approx.	450			g						
<b>Engineering</b>	<b>Type A</b>			<b>3,600</b>									
Design Lab		1	1,350	1,350	2								
Wood Fabrication Lab		1	900	900									
Metal Fabrication Lab		1	900	900			e						
Support		1	450	450									
<b>Computer Engineering</b>	<b>Type A</b>			<b>3,600</b>									
Technology Lab		1	1,350	1,350	1								
Technology Lab		1	1,800	1,800	1								
Support		1	450	450									
<b>Radio</b>	<b>Type B</b>			<b>5,709</b>									
Small Classroom		2	550	1,100	2		a						
Flex Area		1	412	412									
AM Radio Air Booth		1	115	115			a						
AM Radio Production		1	146	146			a						
AM Studio / Digital Station		1	254	254			a						
Comm Tech TV / Digital Media Studio		1	850	850	1		a						
Comm Tech Office / Streaming Station		1	165	165			a						
Comm Tech Control Room		1	264	264			a						
Listening Room		4	60	240			a						
Lobby/Reception		1	487	487			a						
Conference Room		1	225	225			a						
Engineering Office		1	90	90			a						
IT Office		1	72	72			a						
Storage Closet		2	25	50			a						
Storage		1	879	879			a						
Teacher Planning		3	120	360			a						
<b>Digital Media</b>	<b>Type C</b>			<b>7,200</b>									
Video & Graphic Design Lab		1	1,350	1,350	1								
Web Design Lab		1	1,350	1,350	1								
Photography Lab		1	1,350	1,350	1								
Digital Media Classroom		1	900	900									
Video & Sound Production Studios		2	450	900									
Print/Layout/Production		1	900	900									
Support		1	450	450									
<b>Electric</b>	<b>Type C</b>			<b>7,200</b>									
Electric Shop		2	1,800	3,600	2								
Automation Shop		1	1,800	1,800	1								
Electric Classroom (Small)		2	675	1,350									
Electric Classroom			900	-			e						
Support		1	450	450									
Outdoor Work Area			approx.	1,200			g						
<b>Health Occupations</b>	<b>Type C</b>			<b>7,200</b>									
Nursing Lab		1	1,350	1,350	1								
Medical Lab		1	1,350	1,350	1								
Dental Lab		1	1,350	1,350	1								
Science Lab (Anatomy)			1,600	-			e						
Health Occupations Classroom		1	900	900	1								
First Responder Classroom		1	900	900	1								
Medical Scenario Clinic		1	450	450									
Simulation Lab		1	450	450									
Support		1	450	450									
Outdoor Work Area			approx.	450			g						
<b>Transportation - Auto</b>	<b>Type D</b>			<b>14,400</b>									
Automotive Shop		1	1,800	1,800	1								
Automotive Shop		1	7,200	7,200	2								
Automotive Classroom		3	900	2,700									
Support		3	900	2,700									
Outdoor Work Area			approx.	2,500			g						

Benson Tech Opening Day Area Program								PPS Comprehensive High School Ed Spec					Comparison
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<b>Manufacturing</b>	<b>Type D</b>			<b>14,400</b>									
Manufacturing Shop		2	3,600	7,200	1								
Pattern Making Shop		1	900	900	1								
Foundry		1	900	900									
Fabrication & Welding Lab		1	3,600	3,600	1								
Design Lab		1	900	900	1								
CNC Shop		1	450	450									
Support		1	450	450									
Outdoor Work Area			approx.	1,250			g						
<b>Construction</b>	<b>Type D</b>			<b>14,400</b>									
Construction Shop		1	7,200	7,200	1								
Construction Shop - Tech Geometry		1	3,600	3,600	1								
Math Tech Classroom			1,800	-			e, f						
Construction Classroom		1	900	900	1		e						
Design Lab & Tech Algebra		1	1,350	1,350	1								
CNC Shop		1	450	450									
Support		2	450	900									
Outdoor Work Area			approx.	2,500			g						
<b>Un-Programmed CTE Suites</b>	<b>Varies</b>		<b>11,500</b>	<b>- 15,000</b>	<b>6</b>		<b>c</b>	<b>Career Preparation / CTE</b>			<b>4,800</b>	<b>3</b>	<b>10,200</b>
<b>CTE Suites Total</b>			<b>96,409</b>	<b>- 99,909</b>	<b>39</b>			<b>CTE Total + Fine &amp; Visual Arts</b>			<b>7,880</b>	<b>5</b>	<b>92,029</b>
<b>Makers Lab</b>		<b>1</b>	<b>1,800</b>	<b>1,800</b>		<b>Y</b>		<b>Makers Lab</b>	<b>1</b>		<b>1,200</b>		<b>600</b>
<b>Core Programs</b>				<b>29,700</b>				<b>Core Programs</b>			<b>40,180</b>		<b>(10,480)</b>
English		11	900	9,900	11	Y		English	11	980	10,780		(880)
Math		6	900	5,400	6	Y	d	Math	8	980	7,840		(2,440)
Social Studies		8	900	7,200	8	Y		Social Studies	8	980	7,840		(640)
Health		2	900	1,800	2	Y		Health	2	980	1,960		(160)
World Language		6	900	5,400	6	Y		World Language	6	980	5,880		(480)
Electives		0	900	-	0	Y	d	Electives	6	980	5,880		(5,880)
Smaller Instructional Spaces	(Included in CTE)							Smaller Instructional Areas (Preferred/Optional)	10	500	5,000		(5,000)
<b>General Classrooms</b>				<b>29,700</b>	<b>33</b>		<b>f</b>	<b>General Classrooms</b>			<b>45,180</b>	<b>51</b>	<b>(15,480)</b>
Science		9	1,600	14,400	9	Y		Science	11	1,500	16,500		(2,100)
Prep Room w/ Chemical Storage		4	225	900		Y		Prep Rooms	4	200	800		100
Chemical Storage	(Included above)							Chemical Storage	1	180	180		(180)
Outdoor Work Area			approx.	1,600			g						
<b>Science Labs &amp; Prep</b>				<b>15,300</b>	<b>9</b>			<b>Science Labs &amp; Prep</b>			<b>17,480</b>	<b>11</b>	<b>(2,180)</b>
SPED Low Intensity Classroom		8	500	4,000	8	Y	f	SPED Low Intensity Classroom	2	600	1,200		2,800
SPED Office		4	150	600		Y		SPED Office	1	100	100		500
SPED Storage		4	50	200		Y		SPED Storage	1	100	100		100
ELL Classroom		1	900	900	1	Y		ELL Classroom	1	800	800		100
Sensory Support	(Not required, per BPHS staff)							Sensory Support	1	900	900		(900)
Learning Resource Center	(Not required, per BPHS staff)							Learning Resource Center	3	900	2,700		(2,700)
SPED Reception	(Not required, per BPHS staff)							SPED Reception	1	100	100		(100)
SPED Toilet	(Not required, per BPHS staff)							SPED Toilet	1	200	200		(200)
<b>SPED &amp; ELL Classrooms</b>				<b>5,700</b>	<b>9</b>			<b>SPED &amp; ELL Classrooms</b>			<b>6,100</b>	<b>1</b>	<b>(400)</b>
<b>FLEX / Breakout Areas</b>				<b>9,000</b>		<b>Y</b>		<b>Flex/Breakout Areas (Preferred/Optional)</b>	<b>8</b>	<b>1,000</b>	<b>8,000</b>		<b>1,000</b>
<b>Teacher Planning / Collaboration Area</b>				<b>5,250</b>		<b>Y</b>		<b>Teacher Planning/Collaboration (Preferred/Optional)</b>	<b>10</b>	<b>980</b>	<b>9,800</b>		<b>(4,550)</b>
<b>Administration</b>				<b>5,220</b>				<b>Administration</b>			<b>5,460</b>		<b>(240)</b>
Reception/Lobby/Waiting		1	400	400		Y		Reception/Lobby/Waiting	1	500	500		(100)
Principal's Office		1	400	400		Y		Principal's Office	1	200	200		200
Principal's Secretary		1	125	125		Y		Principal's Secretary	1	125	125		0
Vice Principal's Office		2	200	400		Y		Vice Principal's Office	2	150	300		100
Vice Principal's Secretary		2	125	250		Y		Vice Principal's Secretary	2	120	240		10
Dean of Students		1	200	200		Y		Dean of Students	1	120	120		80
Attendance		1	200	200		Y		Attendance	1	120	120		80
Bookkeeper/Manager		1	200	200		Y		Bookkeeper/Manager	1	120	120		80
Resource Officer		1	200	200		Y		Resource Officer	1	200	200		0
Camera Monitors		1	100	100		Y		Camera Monitors	1	100	100		0
Restrooms		2	60	120		Y		Restrooms	2	60	120		0
Records Storage		1	200	200		Y		Records Storage	1	200	200		0



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Office Storage		1	125	125		Y		Office Storage	1	125	125		0
Workroom/Mail/delivery Process Center		1	300	300		Y		Workroom/Mail/delivery Process Center	1	300	300		0
Staff Room		1	500	500		Y		Staff Room	1	400	400		100
Conference Room		2	150	300		Y		Conference Room	2	150	300		0
Community Room/Alumni/Boosters		1	1,200	1,200		Y		Community Room/Alumni/Boosters	1	500	500		700
Business Manager	(Not required, per BPHS admin)							Business Manager	1	120	120		(120)
Health Office	(Provided in Wellness Center)							Health Office	1	120	120		(120)
Sick Room	(Provided in Wellness Center)							Sick Room	1	150	150		(150)
Sick Toilet	(Provided in Wellness Center)							Sick Toilet	1	100	100		(100)
Student Support/Mediation Office	(Not required, per BPHS admin)							Student Support/Mediation Office	1	700	700		(700)
Student Support/Mediation Support	(Not required, per BPHS admin)							Student Support/Mediation Support	1	300	300		(300)
<b>Counseling/Career</b>				<b>2,630</b>			<b>a</b>	<b>Counseling/Career</b>			<b>2,735</b>		<b>(105)</b>
Counseling Offices		6	120	720		Y		Counseling Offices	5	120	600		120
Counseling Secretary/Waiting		1	400	400		Y		Counseling Secretary/Waiting	1	400	400		0
Conference Room - Large		1	240	240		Y		Conference Room - Large	1	240	240		0
Conference Room - Medium		1	150	150		Y		Conference Room - Medium	1	150	150		0
Career Center		1	700	700		Y		Career Center	1	700	700		0
Career Counselor		1	120	120		Y		Career Counselor	1	100	100		20
Secure Records storage		1	180	180		Y		Secure Records storage	1	180	180		0
Restroom		2	60	120		Y		Restroom	2	60	120		0
Drug/Alcohol Counselor Office		1	125	125		Y		Drug/Alcohol Counselor Office	1	125	125		0
Career Center Office	(Not required, per BPHS staff)							Career Center Office	1	120	120		(120)
<b>SPED Support</b>				<b>870</b>				<b>SPED Support</b>			<b>600</b>		<b>270</b>
Speech Pathologist Office		3	120	360		Y		Speech Pathologist Office	2	120	240		120
Psychologist Office		3	120	360		Y		Psychologist Office	2	120	240		120
Conference Room		1	150	150		Y		Conference Room	1	120	120		30
<b>Student Activities</b>				<b>1,670</b>				<b>Student Activities</b>			<b>1,470</b>		<b>200</b>
Athletic Director		1	150	150		Y		Athletic Director	1	150	150		0
AD Support Staff		1	120	120		Y		AD Support Staff	1	120	120		0
Student Government		1	200	200		Y		Student Government	1	200	200		0
After School Program Space		2	600	1,200		Y		Wrap-Around Classrooms	2	500	1,000		200
<b>Technology Access</b>				<b>2,200</b>				<b>Technology Access</b>			<b>5,500</b>		<b>(3,300)</b>
Computer Lab (dedicated)		2	1,100	2,200		Y		Computer Lab (dedicated)	4	1,100	4,400		(2,200)
Computer Lab (non-specialized)	(Provided in CTE Suites)							Computer Lab (non-specialized)	1	1,100	1,100		(1,100)
<b>Student Center</b>				<b>12,620</b>				<b>Student Center</b>			<b>12,620</b>		<b>0</b>
Commons		1	7,800	7,800		Y		Commons	1	7,800	7,800		0
Main Servery		1	1,700	1,700		Y		Main Servery	1	1,700	1,700		0
Food Prep/Kitchen		1	1,500	1,500		Y		Food Prep/Kitchen	1	1,500	1,500		0
Dish Washing		1	200	200		Y		Dish Washing	1	200	200		0
Dry Storage/Cart Storage		1	500	500		Y		Dry Storage/Cart Storage	1	500	500		0
Cooler		1	200	200		Y		Cooler	1	200	200		0
Freezer		1	200	200		Y		Freezer	1	200	200		0
Office		1	120	120		Y		Office	1	120	120		0
Staff Restroom/Lockers/Dressing Room		2	75	150		Y		Staff Lockers/Dressing Rooms	1	150	150		0
Table Storage		1	250	250		Y		Table Storage	1	250	250		0
<b>Media Center/Library</b>				<b>11,200</b>			<b>a</b>	<b>Media Center/Library</b>			<b>11,200</b>		<b>0</b>
Library		1	8,000	8,000		Y		Library	1	8,000	8,000		0
Office		2	120	240		Y		Office	2	120	240		0
Workroom		1	200	200		Y		Workroom	1	200	200		0
Text Storage		1	750	750		Y		Text Storage	1	750	750		0
Collaboration Space		1	400	400		Y		Collaboration Space	1	400	400		0
Multi-use Room		3	150	450		Y		Multi-use Room	3	150	450		0
IT Repair/Tech Coordinator		1	180	180		Y		IT Repair/Tech Coordinator	1	180	180		0
Library Classroom		1	980	980		Y		Library Classroom (Preferred/Optional)	1	980	980		0
<b>Custodial</b>				<b>3,950</b>				<b>Custodial</b>			<b>3,850</b>		<b>100</b>
Custodial Office		1	250	250		Y		Custodial Office	1	250	250		0
Custodial Rooms		10	100	1,000		Y		Custodial Rooms	10	100	1,000		0
Receiving		1	200	200		Y		Receiving			-		200
Building Storage		2	1,000	2,000		Y		Building Storage	1	2,000	2,000		0
Material Storage		1	500	500		Y		Material Storage	1	500	500		0
Flammable Storage		1	200	200		Y		Flammable Storage	1	100	100		100
<b>Miscellaneous</b>				<b>9,860</b>				<b>Miscellaneous</b>			<b>12,045</b>		<b>(2,185)</b>
Lobby		1	800	800		Y	<b>a</b>	Lobby	1	2,000	2,000		(1,200)
Student Lockers		850	1	850		Y	<b>b</b>	Student Lockers	850	1	850		0
Boy's Restroom		6	250	1,500		Y		Boy's Restroom	6	250	1,500		0
Girl's Restroom		6	250	1,500		Y		Girl's Restroom	6	250	1,500		0
Gender Neutral Restroom		10	60	600		Y		Gender Neutral Restroom	1	60	60		540
Gender Neutral Shower		1	100	100		Y		Gender Neutral Shower	1	100	100		0
Staff Restroom		10	60	600		Y		Staff Restroom	10	70	700		(100)

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Breastfeeding Room (Staff)		1	50	50		Y		Breastfeeding Room (Staff)	0	-	-		50
Boiler Room		1	1,200	1,200		Y		Boiler Room	1	2,000	2,000		(800)
MDF		1	200	200		Y		MDF	1	180	180		20
IDF		10	100	1,000		Y		IDF	5	80	400		600
Main Electrical Room		1	240	240		Y		Main Electrical Room	1	240	240		0
Sub-Electrical Room		10	80	800		Y		Sub-Electrical Room	5	75	375		425
Fire Pump Room		1	100	100		Y		Riser Room	1	60	60		40
Elevator Machine Room		4	80	320		Y		Elevator Machine Room	1	80	80		240
Mechanical Fan Room		3	1,200	3,600		Y		Mechanical Fan Rooms (Preferred/Optional)	1	2,000	2,000		1,600
<b>Education Support</b>				<b>50,220</b>				<b>Education Support</b>			<b>55,480</b>		<b>(5,260)</b>
Gymnasium		1	14,107	14,107	2	Y	a	Gymnasium	1	13,000	13,000	2	1,107
Auxiliary Gym with Indoor Track, Bleachers, Storage		1	10,505	10,505	1	Y	a	Auxiliary Gym with Indoor Track, Bleachers, Storage	1	7,200	7,200	1	3,305
Activity Room (Mat, Dance)		1	2,505	2,505		Y	a	Activity Room (Mat, Dance)	1	2,750	2,750		(245)
Weight Room/Aerobics		1	3,148	3,148		Y	a	Weight Room/Aerobics	1	2,500	2,500		648
Circuit/Cardio		1	1,500	1,500		Y		Circuit/Cardio		-	-		1,500
Boy's PE Coach Office/Toilet/Shower/Locker		1	300	300		Y		Boy's PE Coach Office/Toilet/Shower/Locker	1	300	300		0
Girl's PE Coach Office/Toilet/Shower/Locker		1	300	300		Y		Girl's PE Coach Office/Toilet/Shower/Locker	1	300	300		0
Boy's Locker Room/Shower		1	1,900	1,900		Y		Boy's Locker Room/Shower	1	1,900	1,900		0
Girl's Locker Room/Shower		1	1,900	1,900		Y		Girl's Locker Room/Shower	1	1,900	1,900		0
Gender Neutral Locker Room/Shower		1	150	150		Y		Gender Neutral Locker Room/Shower	1	150	150		0
PE Storage		2	200	400		Y		PE Storage	2	200	400		0
Training Room		1	580	580		Y		Training Room	1	580	580		0
Team Room		2	800	1,600		Y		Team Room	1	800	800		800
Athletic Storage - Uniform/Equipment		1	1,000	1,000		Y		Athletic Storage - Uniform/Equipment	1	1,000	1,000		0
Athletic Storage - Field Equipment		1	1,000	1,000		Y		Athletic Storage - Field Equipment	1	1,000	1,000		0
Athletic Storage - Large		1	1,000	1,000		Y		Athletic Storage - Large	1	1,000	1,000		0
Athletic Storage - Small		1	500	500		Y		Athletic Storage - Small	1	500	500		0
Concessions		1	100	100		Y		Concessions	1	100	100		0
Laundry Room		1	200	200		Y		Laundry Room	1	200	200		0
<b>PE/Athletics</b>				<b>42,695</b>	<b>3</b>			<b>PE/Athletics</b>			<b>35,580</b>	<b>3</b>	<b>7,115</b>
Band Room	(Not provided at current facility)							Band Room	1	2,200	2,200	1	(2,200)
Large Instrument Storage Room	(Not provided at current facility)							Large Instrument Storage Room	1	250	250		(250)
Music Library & Uniform Storage	(Not provided at current facility)							Music Library & Uniform Storage	1	200	200		(200)
Small Equipment Storage	(Not provided at current facility)							Small Equipment Storage	1	200	200		(200)
Large Practice Rooms/Music Lab	(Not provided at current facility)							Large Practice Rooms/Music Lab	1	300	300		(300)
Small Practice Rooms	(Not provided at current facility)							Small Practice Rooms	2	100	200		(200)
Band/Choir Office	(Not provided at current facility)							Band/Choir Office	1	120	120		(120)
Choir Room	(Not provided at current facility)							Choir Room (Preferred/Optional)	1	1,500	1,500	1	(1,500)
Equipment & Robe Storage	(Not provided at current facility)							Equipment & Robe Storage (Preferred/Optional)	1	200	200		(200)
<b>Band/Orchestra/Choir</b>								<b>Band/Orchestra/Choir</b>			<b>5,170</b>	<b>2</b>	<b>(5,170)</b>
<b>Multi-Purpose / Large Meeting Room</b>		<b>1</b>	<b>3,500</b>	<b>3,500</b>				<b>Multi-Purpose Production Area (Preferred/Optional)</b>			<b>1,500</b>		<b>2,000</b>
Historic Community Theater		1	11,000	11,000		Y	a	Theater (500 seat)	1	5,000	5,000		6,000
Stage		1	1,700	1,700		Y	a	Stage	1	3,500	3,500		(1,800)
Laundry		1	150	150		Y		Laundry	1	150	150		0
Control Room		1	190	190		Y		Control Room	1	200	200		(10)
Sound Room		1	100	100		Y		Sound Room	1	100	100		0
Office		1	70	70		Y		Office	1	70	70		0
Box Office		1	78	78		Y	a	Box Office	1	100	100		(22)
Concessions		1	61	61		Y	a	Concessions	1	100	100		(39)
Equipment Storage		1	120	120		Y		Equipment Storage	1	120	120		0
Lighting Storage		1	100	100		Y		Lighting Storage	1	100	100		0
Costume Storage		1	400	400		Y		Costume Storage	1	400	400		0
Make-Up		1	400	400		Y		Make-Up	1	400	400		0
Boy's Dressing & Toilet		1	380	380		Y		Boy's Dressing & Toilet	1	380	380		0
Girl's Dressing & Toilet		1	380	380		Y		Girl's Dressing & Toilet	1	380	380		0
Orchestra Pit	(Not provided at current facility)							Orchestra Pit	1	500	500		(500)
Drama Classroom/Black Box	(Not provided at current facility)							Drama Classroom/Black Box	1	1,600	1,600	1	(1,600)
Scenery Construction/Production Storage	(Not provided at current facility)							Scenery Construction/Production Storage	1	1,500	1,500		(1,500)
<b>Theater &amp; Support</b>				<b>15,129</b>				<b>Theater/Dance</b>			<b>14,600</b>	<b>1</b>	<b>529</b>
<b>Wellness Center</b>				<b>1,635</b>				<b>Health Clinic</b>			<b>1,600</b>		<b>35</b>
Lobby/Waiting		1	400	400		Y							
Office - Social Worker		1	80	80		Y							

Benson Tech Opening Day Area Program									PPS Comprehensive High School Ed Spec					Comparison
Program Components	CTE Suite Type	Quantity	Area (SF)	Total (SF)	Teaching Stations	Refer to PPS Comp. Ed Spec for Room Data	Notes	Program Components	Quantity	Area (SF)	Total (SF)	Teaching Stations	Delta (+/-)	
Office - OHSU Family Medicine		1	150	150		Y								
Exam Room		3	130	390		Y								
Mental Health/Therapy Room		1	130	130		Y								
Laboratory (Clean/Dirty)		1	65	65		Y								
Restroom		1	60	60		Y								
Nurse Office		1	80	80		Y								
Sick Room		1	120	120		Y								
Sick Toilet		1	60	60		Y								
Storage		1	100	100		Y								
<b>Teen Parent</b>				<b>2,280</b>				<b>Teen Parent</b>			<b>2,150</b>		<b>130</b>	
Infant Room		1	500	500		Y		Infant Room	1	500	500		0	
Breastfeeding Room		1	60	60		Y		<i>Breastfeeding Room (Preferred/Optional)</i>	1	50	50		10	
Toddler Room		1	500	500		Y		Toddler Room	1	500	500		0	
Crawler Room		1	500	500		Y		Crawler Room	1	500	500		0	
Restroom		1	60	60		Y		Restroom	1	50	50		10	
Children's Restroom		1	60	60		Y		<i>Children's Restroom</i>	0	-	-		60	
Changing Area	(Not included, additional restroom provided)							Changing Area	1	50	50		(50)	
Nap Area		1	200	200		Y		Nap Area	1	200	200		0	
Office		1	100	100		Y		Office	0	-	-		100	
Storage/Kitchen		1	300	300		Y		Storage/Kitchen	1	300	300		0	
Outdoor Play Area			approx.	1,500			g	<i>Outdoor Play Area</i>						
<b>Other</b>				<b>1,400</b>				<b>Other</b>			<b>1,400</b>		<b>0</b>	
Food Pantry		1	200	200		Y		<i>Pantry (Preferred/Optional)</i>	1	200	200		0	
Food/Clothes Closet		1	1,200	1,200		Y		Food/Clothes Closet	1	1,200	1,200		0	
<b>Wrap-Around Services</b>				<b>5,315</b>				<b>Wrap-Around Services</b>			<b>5,150</b>		<b>165</b>	
								<b>Preferred/Optional Total</b>			<b>29,230</b>			
<b>Net Program Area total</b>			<b>280,018</b>	<b>283,518</b>				<b>Required Comprehensive Total</b>			<b>183,890</b>			
<b>Circulation &amp; Walls (Net to Gross Range of 29%-36%)</b>			<b>81,205</b>	<b>102,066</b>				<b>Net to gross ratio of 36%</b>			<b>76,723</b>			
<b>GRAND TOTAL</b>			<b>361,223</b>	<b>385,584</b>	<b>93</b>		<b>c</b>	<b>GRAND TOTAL</b>			<b>289,843</b>	<b>74</b>	<b>95,741</b>	
<b>Athletic Fields</b>								<b>Athletic Fields</b>						
Baseball Field with Dug-Outs	(Provided, but not compliant at current facility)							<i>Baseball Field with Dug-Outs</i>						
Softball Field with Dug-Outs	(Provided, but not compliant at current facility)							<i>Softball Field with Dug-Outs</i>						
Soccer Field								Soccer Field						
400 meter Track and Field	(Provided, but not compliant at current facility)							<i>400 meter Track and Field</i>						
Football Field	(Provided, but not compliant at current facility)							<i>Football Field</i>						
Spectator Bleachers	(Not adequate at current facility)							<i>Spectator Bleachers</i>						
Concessions & Restroom Facilities	(Not provided at current facility)							<i>Concessions &amp; Restroom Facilities</i>						
Notes:								Notes:						
a. Existing location and general size to remain.								1. Italics denote program areas labeled differently or included in the Comprehensive Ed spec that differ from the Benson Tech program.						
b. Assumes double lockers will be used, so total locker count will be double the area total, which equals one locker per student.								2. Red italics denote preferred/optional program areas from the Comprehensive HS Ed spec that are relevant to Benson Tech program.						
c. Area total provided is a target based on information gathered from Benson Tech staff, administration and equipment surveys. Final building area to be determined in design, and may vary based on extent of work and existing conditions.														
d. Additional space for this core academic program accounted for in CTE Suites														
e. Shared space within adjacent general classrooms														
f. To support team collaboration, provide a set of two rooms in each learning cluster, separated by an operable partition to allow flexible adaptations in the programs.														
g. Outdoor areas not included in building area calculation.														



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## 5.2 PROGRAM SPECIFIC REQUIREMENTS

### DESIGN AND APPLIED ARTS

#### 2D ART LAB

MEDIUM LAB @ 1,350 SF

##### ROOM SPECIFIC USE

- + Drawing and painting through charcoal, ink, colored pencil, oil pastel, watercolor, gouache, tempera, collage, and mixed media
- + Digital design, including 3D printing
- + Display and review of instructional materials and student work

##### ROOM SPECIFIC TECHNICAL DATA

- + Furniture: Large format (42 in x 36 in) flat paper storage, cabinets with doors and drawers of various sizes, cabinets with open shelves

#### 3D ART LAB

MEDIUM LAB @ 1,800 SF

##### ROOM SPECIFIC USE

- + 3D art – ceramics, sculpture
- + Digital AV Instruction
- + Wax cooking
- + Display of instructional materials and student work

##### ROOM SPECIFIC TECHNICAL DATA

- + Direct/Indirect LED lighting with multiple switching options for energy conservation and note taking during screen viewing
- + Display lighting
- + Power requirement for Pug Mill
- + Utility sinks with clay traps
- + Exhaust for wax cooking
- + Floor drains with plaster traps

#### SUPPORT

SMALL SUPPORT @ 450 SF

##### ROOM SPECIFIC USE

- + Kiln room + art storage room
- + Ceramic firing
- + Clay preparation
- + Art storage room
- + Storage of materials, art supplies, and projects

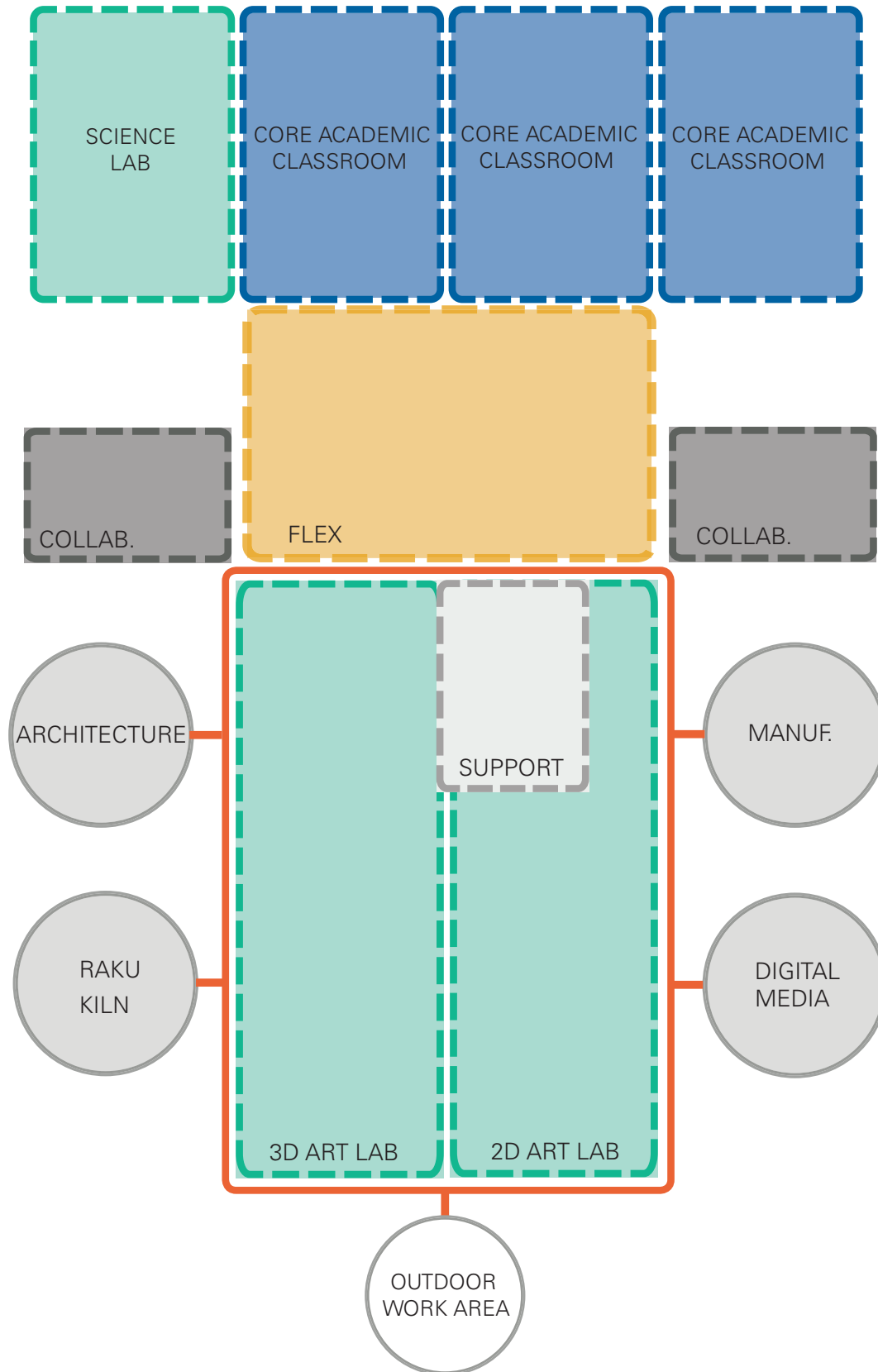
##### ROOM SPECIFIC TECHNICAL DATA

- + Power requirement for kiln
- + Power outlets spaced sufficiently around the perimeter of the room
- + Stainless steel counter tops
- + Deep open shelving (18 in)

##### ADJACENT SPACES

Outdoor work area access for Raku firing

### CTE SUITE TYPE A : DESIGN AND APPLIED ARTS





## DESIGN AND APPLIED ARTS EQUIPMENT LIST

Room Name	Item	Quantity	Manufacturer	Item/Model Number	Footprint	Working space footprint	Technical Requirements
<b>2D ART LAB</b>							
	Teaching Station	1			30 x 54		
	Teaching Chair	1					
	Work Table	16			30 x 54		
	Chairs/Stools	32			18" tall		
	Paint Sink	2			10 x 30		
	Regular Sink	2			18 x 20		
	Book Shelvs	3			18 x 42		
	Large Format flat paper storage	1			Paper size 36 x 42		
<b>3D ART LAB</b>							
	Teaching Station	1			30 x 54		
	Teaching Chair	1					
	Storage cabinet	1			24 x 46		
	Work Table	16			30 x 54		
	Chairs/Stools	32			18" tall		
	Ceramic Wheel	12			28 32	36 x 36	
	Pug Mill	1			24 x 84	30 x 96	Needs electrical plug like one needed for a washer and dryer
	Mini Kiln	3			24 x 30		
	Clay sink	2			18 x 20		Clay Trap required
	Book Shelvs	3			18 x 42		
<b>SUPPORT</b>							
	Kiln	1					Exhaust and power required for Kiln
	Art Supply Shelving	2			120 x 24 x 72		
	Ceramic Storage Shelves	4			24 x 36		
	Work-in-Progress Shelves	6			12 x 36		
	Glaze storage	1			24 x 36		

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## ARCHITECTURE

### DRAFTING TECH LAB

MEDIUM LAB @ 1,350 SF

#### ROOM SPECIFIC USE

- + Small and medium group instruction
- + Display of material such as student work
- + Storing books, learning materials
- + Hand Drafting: Instruction in drafting basics using drafting boards
- + Computers for research and exploration of AutoCAD and SketchUp

#### ROOM SPECIFIC TECHNICAL DATA

- + Magnetic whiteboard (28-36 LF), tackboards (16-24 LF)

### ARCHITECTURE LAB

MEDIUM LAB @ 1,800 SF

#### ROOM SPECIFIC USE

- + Small and medium group instruction
- + Display of material such as student work
- + Storing books and learning materials
- + 3D printing
- + Instruction in various computer programs including Revit, AutoCAD and SketchUp
- + Residential design and construction
- + Development of graphic presentations and construction documents
- + Class pin-up and presentations
- + Model making
- + Small break out space for pin-ups/presentations
  - Presentations and pin-ups by teachers and students, individually and in groups
  - Model and presentational poster making
  - Class presentations
  - Group work
- + Adjacent to plot/print/layout room or area in suite

#### ROOM SPECIFIC TECHNICAL DATA

- + Small break out space for pin ups/presentations
  - Magnetic whiteboards around perimeter of room for pin up

### SUPPORT

SMALL SUPPORT @ 450 SF

#### ROOM SPECIFIC USE

- + Small and large format printing, plotting, scanning, and copying
- + Layout and mounting of boards
- + 3D printing
- + Large format scanning
- + Paper cutting
- + Material, supply, and equipment storage
- + Adjacency to medium lab is preferred

#### ROOM SPECIFIC TECHNICAL DATA

- + 180° door open
- + Operable relites into adjacent labs/ classrooms
- + Provide work countertop

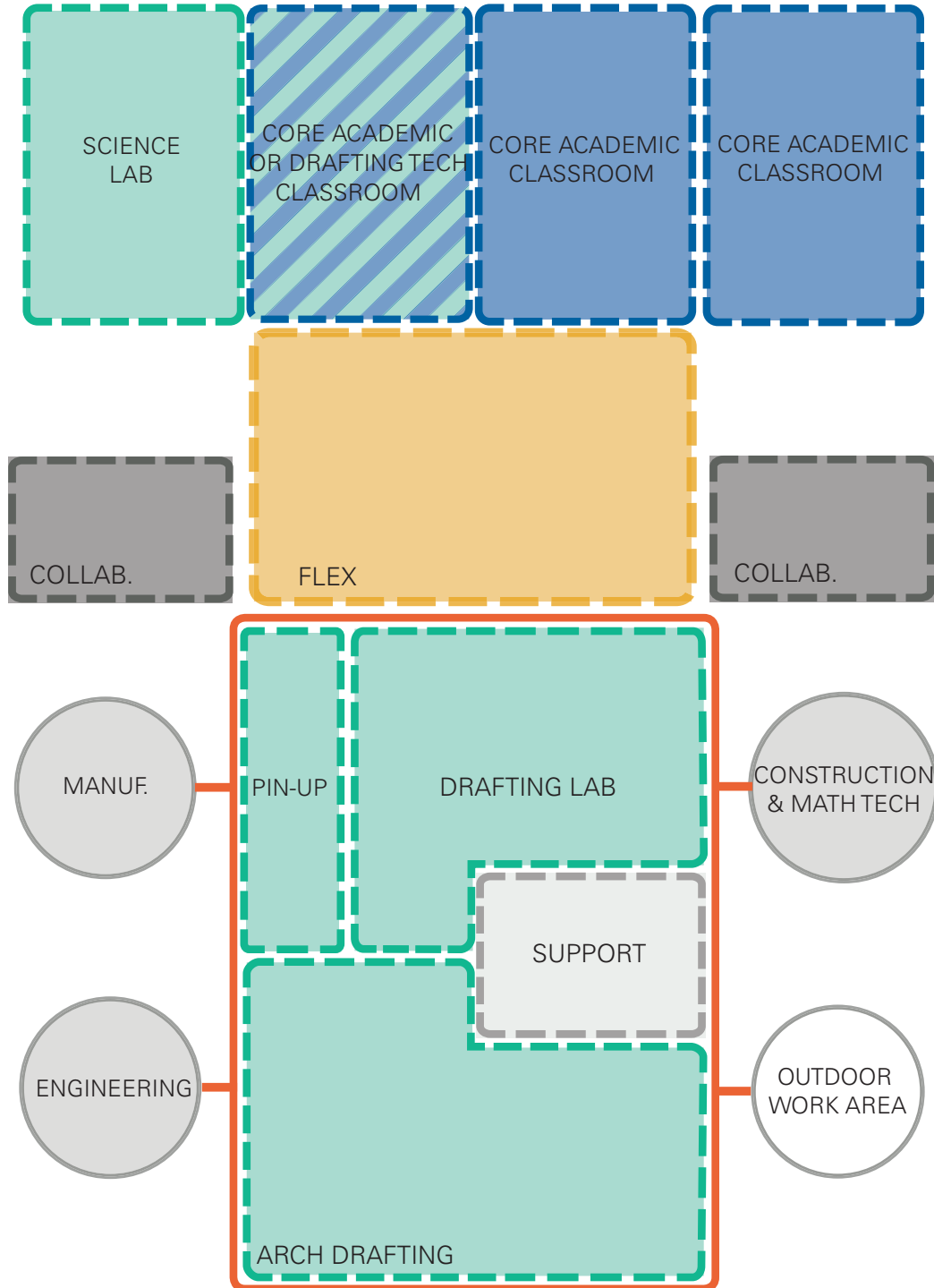
### ADJACENT SPACES

Drafting Tech Classroom

Outdoor work area access for daylighting studies



### CTE SUITE TYPE A : ARCHITECTURE



## ARCHITECTURE EQUIPMENT LIST

Room Name	Item	Quantity	Manufacturer	Item/Model Number	Footprint	Working space footprint	Technical Requirements / Comments
DRAFTING TECH LAB							
	Teaching Desk	1			30 x 80		Includes desk and storage cabinet
	Teaching Chair	1					
	Work Tables	12			24 x 30		2 student stations / work table
	Stools	30			18" height		
	Computer Tables	2			24 x 30		2 computers / table
	Drafting Board Storage - Mobile Carts	2			30 x 24 x 36 tall		
	Staging Table	2			24 x 72		
	Flat File Storage Small	1			28 x 28		
	Flat File Storage Large	1			34 x 46		
	File Cabinets - 4 drawer	2			18 x 28		
	Large Cabinet Storage	3			18 x 38		
	Book Storage	1			12 x 34		
	Laser Printer	1			24 x 24		For 8.5 x 11 paper
ARCHITECTURE LAB							
	Teaching Station	1			30x80		Includes desk and storage cabinet
	Teaching Chair	1					
	Flat File Storage Cabinet	1			36 x 48		
	Staging Table	2			24 x 72		
	Work Tables	26			30 x 48		CPU hangs under worktop
	Stools	26			18" height		
	Supply Cabinet - Orange	1			20 x 30		Existing to be re-used
	Tall Flat Lay Shelving	1			22 x 34 x 72 tall		For student work. Existing to be re-used
	Student binder bookshelf	1			12 x 28		Existing to be re-used
	Drafting Board Storage - Mobile Carts	3			30 x 24 x 36 tall		
	Blue Storage Cabinet	2			24 x 48		On wheels. Existing to be re-used
	Book Storage	3			12 x 34		
	Bizhub 223 printer	1	Konica Minolta	F3156	24 x 26	26 x 40	Connected to power
	Light Table	1			32 x 42		Connected to power
	Sink	1					Standard Size. Provide lower cabinets
	Water Fountain	1					Standard Size
SUPPORT							
	Storage	1			60 x 18 x 72		
	HP DesignJet T790 Plotter	1	HP		42 x 48	48 x 48	Connected to power, existing to be re-used
	HP DesignJet 800 ps Plotter	1	HP		32 x 66	36 x 66	Connected to power, existing to be re-used
	Graphtec Large Format Scanner	1	Graphtec		24 x 42	48 x 48	Connected to power, existing to be re-used
	Rotary Paper Cutter	1			22 x 46	36 x 48 table	Existing to be re-used
	3D printing Stations	3	MasterBot	Replicator	22 x 24	24 x 48 table	Working area includes computer station to operate printer

*DRAFT DOCUMENT*  
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## ENGINEERING

### DESIGN LAB

MEDIUM LAB @ 1,350 SF

#### ROOM SPECIFIC USE

- + Classroom Instruction
- + 3D Modeling
- + 3D Printing
- + Drafting
- + Vinyl Cutting
- + Operable Partition to split room into two teaching spaces

#### ROOM SPECIFIC TECHNICAL DATA

- + High visibility into Fabrication Labs

### WOOD FABRICATION LAB

SMALL LAB @ 900 SF

#### ROOM SPECIFIC USE

- + Skateboard component development and production
- + MasterCAM CNC toolpathing
- + Plastics machinery
- + Sanding

#### ROOM SPECIFIC TECHNICAL DATA

- + STC 65-70
- + General exhaust and dedicated local exhaust systems as needed

### METAL FABRICATION LAB

SMALL LAB @ 900 SF

#### ROOM SPECIFIC USE

- + Injection molding
- + Lost wax casting

#### ROOM SPECIFIC TECHNICAL DATA

- + STC 65-70
- + General exhaust and dedicated local exhaust systems as needed

### SUPPORT

SMALL SUPPORT @ 450 SF

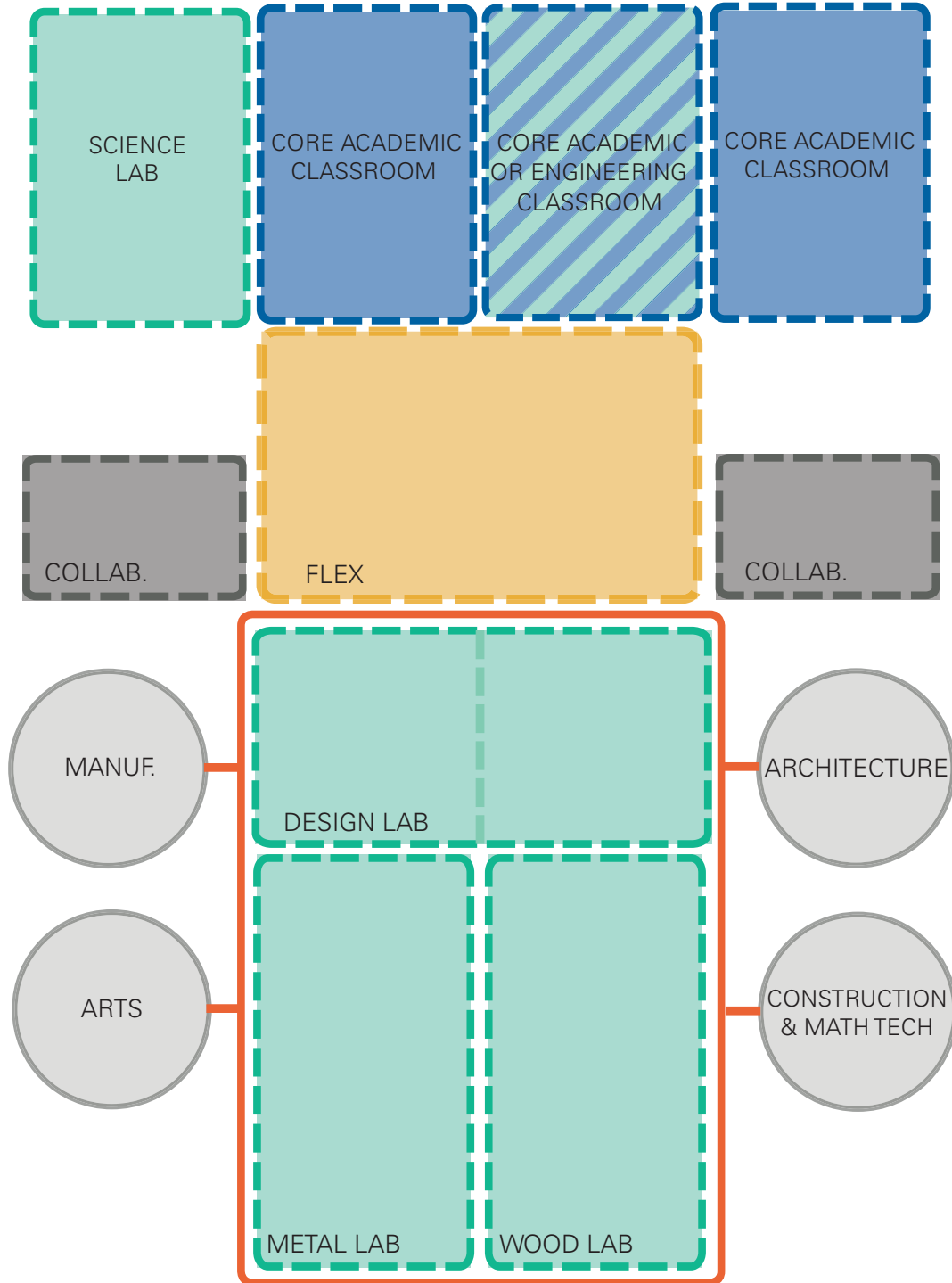
#### ROOM SPECIFIC USE

- + No specific requirements

#### ROOM SPECIFIC TECHNICAL DATA

- + No specific requirements, match general technical requirements

### CTE SUITETYPE A : ENGINEERING



## ENGINEERING EQUIPMENT LIST

Room Name	Item	Quantity	Manufacturer	Item/Model Number	Footprint	Working Space Footprint	Technical Requirements / Comments
<b>DESIGN LAB</b>							
	Work Table	6			48 x 96		24 small lockers under each table, 12 on each side
	Stools	24					
	3D printers	5	Mod-t, MakerBot		12 x 15	24 x 36 desk with computer	Connects to power
	Sign Maker	1	Roland		30 x 48	36 x 38	Standalone on wheels
	Drafting table	1			32 x 48	48 x 48	
	Laptop Carts	4					
<b>WOOD FABRICATION LAB</b>							
	Work Tables	4			48 x 96		Vise grips connect to these tables
	Stools	24					
	Vise Grip	4	Morgan Chicago		12 x 12		
	Angle Sander	1			20 x 22	24 x 36	Connected to power and exaughst
	Baldor Sander	1	Baldor		12 x 18	24 x 24	115/208-230 V, 7.4/3.9-3.7 Amps, 60 Hz. Connects to power
	Band Saw	1	Rockwell/ Delta	28-200	24 x 26	48 x 36	Connected to power
	Burr King Sander	1	Burr-King	562	18 x 18	24 x 24	Connects to power
	Circular Sander	1	Chawn		24 x 30	36 x 36	Connected to power and exhaust
	Double Angle Cut	1	Polymer machinery Corp		30 x 42		On wheels, Baldor motor, Connects to power
	Drill press	2	Powermatic Houdaille	1150A, 1100	15 x 36		203 V, connected to power
	Miter Saw	1	Bosch		36 x 36	36 x 60	Connected to power, on rolling machine table
	Rockwell Model 20 Vertical Ba	1	Rockwell	28-3X5	32 x 42	48 x 60	Connected to power and exhaust
	Table saw	1	Saw stop		48 x 84	84 x 96	Connected to power and exhaust
<b>METAL FABRICATION LAB</b>							
	Arburg Allrounder	1	Arburg	221-55-250	60 x 108	144 x 96	230 V, 60 Hz, 10 kW, Connected to power and exhaust, other connections see pictures
	Compression molder	2	DAKE	44250	28 x 34	48 x 60	240 V, 4800 W. Power and other connections,see pics, small work table between 2 machines
	Frejoth Mill	1	Frejoth	980273	72 x 66	84 x 84	Doesn't appear to be in use, connects to power
	Grinder sander	3	Baldor		12 x 24	36 x 36	220/440 V, 1.3/0.65 Amps
	Pexto Sheet Metal Stomp She:	1	Peck, stow, & Wilcox co	137-L	30 x 48	48 x 48	Bolted to wood on ground
	Rotational Molder	1	EM Co		24 x 36	24 x 36	115 V, 20 Amps,On counter connected to power
	Rotational Molder-Large	1	EM Co		36 x 46 x 60 tall	36 x 46 x 60 tall	110 V, 25 Amps
	Small Furnace	1	K.H. Huppert co	D.0v	16 x 24	16 x 24	110 V, 10 Amps, On counter connected to Power
	Thermoformer	3	AAA Plastics Equipment Co.	MB 5	36 x 72	96 x 48	220 V, 45 Amps, connected to power
	Electric Aluminum Smelting Fu	1			60 x 60		
	Injection Molder	1	Elite Plastics Donation		48 x 96		Dimensions not exact-please verify
	Dayton 18" Metal Cutting						
	Band Saw	1	Dayton	6Y952	20 x 36	26 x 60	Connected to power

*DRAFT DOCUMENT*  
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# COMPUTER ENGINEERING

## TECHNOLOGY LAB

MEDIUM LAB @ 1,800 SF

### ROOM SPECIFIC USE

- + Computer fundamentals for computer engineering, microprocessors, mathematics, and programming
- + Introduction to theoretical concepts using C++, C#, and other programming languages in Windows and Linux
- + Design and implementation of projects using embedded micro controllers
- + Computer “tear-downs” – individual stations for each student around the perimeter of the room with storage space to keep their projects
- + Object-oriented Programming
- + Polymorphism
- + Peripheral Networking
- + Hardware and Software Troubleshooting
- + Database Management

### ROOM SPECIFIC TECHNICAL DATA

- + Task lighting: around room perimeter at tear-down stations
- + Short throw projector access to both the network and HDMI-equipped instructional computers
- + Tear-down stations should have a clear acrylic top that can be pulled down over works in progress and locked so that the student work spaces become a display to other students without risking the safety of their work

## TECHNOLOGY LAB

MEDIUM LAB @ 1,350 SF

### ROOM SPECIFIC USE

- + Introductory programming techniques
- + Fundamental computer hardware operations
- + Basic skills in MS office.
- + Fundamentals for exploring computer engineering, programming, and creative problem solving
- + Write code in C++
- + Introduction to computer hardware architecture

### ROOM SPECIFIC TECHNICAL DATA

- + No other specific requirements, match general technical requirements

## SUPPORT

SMALL SUPPORT @ 450 SF

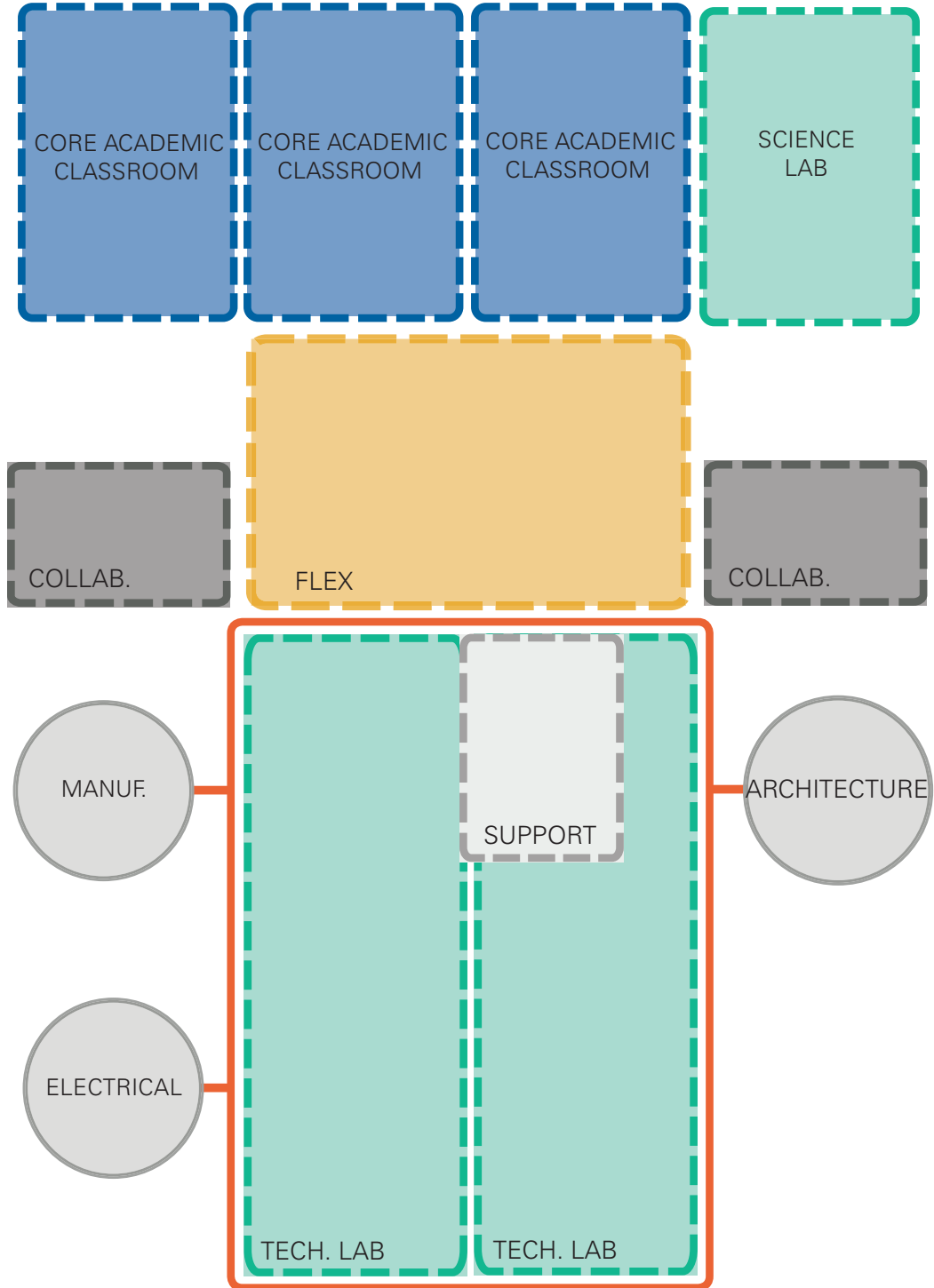
### ROOM SPECIFIC USE

- + Server storage for program
- + Server maintenance and reconfiguration
- + Storage

### ROOM SPECIFIC TECHNICAL DATA

- + Power will be available around perimeter of closet
- + Communication cabling to support technology interconnectivity

### CTE SUITE TYPE A : COMPUTER ENGINEERING



### COMPUTER ENGINEERING EQUIPMENT LIST

Room Name	Item	Quantity	Footprint	Technical Requirements
TECHNOLOGY LAB				
	Teaching Desk	1	40 x 48	
	Teaching Chair	1		
	Computer Stations	12	40 x 48	2 computers / table
	Stools	24	24" tall	
	Lockable Perimeter Work Stations	12	38 x 72	2 duplex outlets and task lighting / work station
TECHNOLOGY LAB				
	Teaching Desk	1	40 x 48	
	Teaching Chair	1		
	Computer Stations	16	40 x 48	2 computers / table
	Stools	32	24" tall	

DRAFT DOCUMENT

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## DIGITAL MEDIA

### VIDEO & GRAPHIC DESIGN LAB

MEDIUM LAB @ 1,350 SF

#### ROOM SPECIFIC USE

- + Film history and genres
- + Script writing
- + Camcorder operation
- + Video and audio shooting techniques
- + Lighting techniques
- + Video editing
- + Adobe suite
- + Graphic design
- + Animation

#### ROOM SPECIFIC TECHNICAL DATA

- + No specific requirements, match general technical requirements

### WEB DESIGN LAB

MEDIUM LAB @ 1,350 SF

#### ROOM SPECIFIC USE

- + Graphic design
- + Page layout software
- + Digital photo manipulation
- + HTML and web page design
- + Digital video editing

#### ROOM SPECIFIC TECHNICAL DATA

- + No specific requirements, match general technical requirements

### PHOTOGRAPHY LAB

MEDIUM LAB @ 1,350 SF

#### ROOM SPECIFIC USE

- + Film scanning
- + Photography techniques
- + Photography design
- + Photoshop
- + Web mockups
- + Website creation
- + Using Cascading Style Sheets (CSS)
- + Web basics – xHTML structure.
- + Adjacent: Photo prep studio, film dark rooms, pin-up flex space

#### ROOM SPECIFIC TECHNICAL DATA

- + No specific requirements, match general technical requirements

### VIDEO & SOUND PRODUCTION STUDIOS

SMALL LAB @ 450 SF

#### ROOM SPECIFIC USE

- + Green screen/white screen photo and video backdrop
- + Sound booth
- + Videography
- + Photography

#### ROOM SPECIFIC TECHNICAL DATA

- + No specific requirements, match general technical requirements

### PRINT/LAYOUT/PRODUCTION

SMALL LAB @ 900 SF

#### ROOM SPECIFIC USE

- + Photo processing
- + Photo printing, matting, and framing

#### ROOM SPECIFIC TECHNICAL DATA

- + Blackout casework to store chemicals
- + Two 4 x 8 tables for mounting presses and photo matting

### DIGITAL MEDIA CLASSROOM

LARGE CLASSROOM @ 900 SF

#### ROOM SPECIFIC USE

- + Computer work

#### ROOM SPECIFIC TECHNICAL DATA

- + No specific requirements, match general technical requirements

### SUPPORT

SMALL SUPPORT @ 450 SF

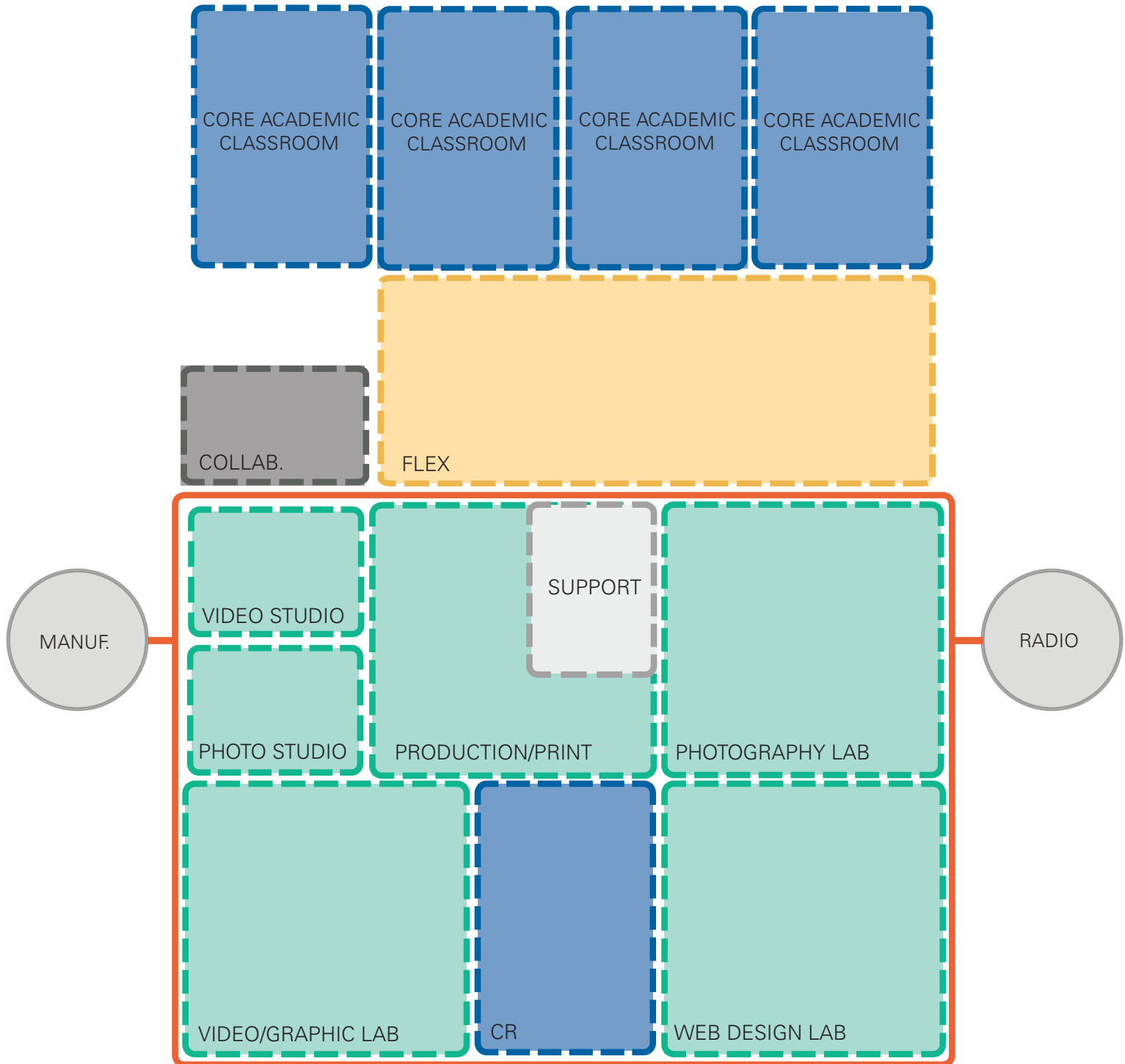
#### ROOM SPECIFIC USE

- + Storage and check out of digital media equipment

#### ROOM SPECIFIC TECHNICAL DATA

- + 4 large lockable storage cabinets on wheels

### CTE SUITE TYPE C : DIGITAL MEDIA



### DIGITAL MEDIA EQUIPMENT LIST

Room Name	Item	Quantity	Manufacturer	Item/Model Number	Footprint	Working space footprint	Technical Requirements / Comments
<b>VIDEO &amp; GRAPHIC DESIGN LAB</b>							
	Teaching Station	1			36 x 48		
	Teaching Chair	1					
	Computer stations (Mac)	24			32 x 38		Connected to power
	Computer Chairs	24					
	Storage cabinets	3			28 x 18		
	Storage cabinets around 2 walls of room	30			12 x 36		
<b>VIDEO &amp; SOUND PRODUCTION STUDIOS</b>							
	Sound Proof Booth	1			48 x 60 x 84 x 84 x 60	Pentagon	Connected to power
	Green Screen Area	1			12 x 108	108 x 108	
	White Screen Area	1			12 x 108	108 x 108	
	Photo Reflector	4			36 x 60	33" round stand	various sizes
	Projector Screen on Stand	1			40 x 40 x 40	triangular stand	
<b>WEB DESIGN LAB</b>							
	Teaching Station	1			36 x 48		
	Teaching Chair	1					
	Computer Tables	24			30 x 72	2 computers / table	Connected to power
	Computer Chairs	24					
	Small film viewing computer stations	1			32 x 62		Connected to power. Station has two computers, two film viewers
	Bookcase	3			11 x 36		
	Flat lay storage	1	Lyon		34 x 45		
	Lockers	60	Lyon		10 x 14	12' x 3' block of lockers total	
	Storage cabinet	1			24 x 144		
	Materials storage cabinet	1			18 x 36		
<b>DIGITAL MEDIA CLASSROOM</b>							
	Teaching Station	1			36 x 48		
	Teaching Chair	1					
	Computer workstations	24			32 x 38		Connected to power
	Computer Chairs	24					
<b>PHOTOGRAPHY LAB</b>							
	Photo Processing Sinks	2			18 x 30	30 x 180	On counter with large storage space and black out cabinetry
	Light Table	1	Gradco		28 x 40		Connected to power
	Design Jet 1050C Plotter	1	Hp	Design Jet 1050C	30 x 60		Connected to power
	Lockers	70			10 x 24	Around perimeter of room	
	Paper Cutter	1	Challenge	HA	46 x 60	48 x 78	Connected to power
	Paper Drilling Machine	1	Challenge	JF 33193	20 x 40	40 x 48	Connected to power
	Laminator	1	GBC	Heat Seal Ultima 65	20 x 36		Connected to power
	Aficio MP 5002 Printer	1	Ricoh	Aficio MP 5002	28 x 54	36 x 60	Connected to power
	Button Press	1			16 x 18	24 x 24	

*DRAFT DOCUMENT*  
The information presented in the equipment list are based on existing equipment surveys and preliminary feedback from CTE program department leads. Further development will occur in the design phases along with coordination of FF&E.



### DIGITAL MEDIA EQUIPMENT LIST

Room Name	Item	Quantity	Manufacturer	Item/Model Number	Footprint	Working space footprint	Technical Requirements / Comments
<b>PRINT / LAYOUT / PRODUCTION</b>							
	Paper Cutter (sliding)	1	Rotatrim	Mastercut II	15 x 36	50 x 96 table	In the cutting, matting photo prep table area
	Paper Cutter (chop)	1	Premier		24 x 36	50 x 96 table	
	Paper Cutter Small (chop)	1	Premier		14 x 18	50 x 96 table	
	Hot Mounting Press	1	Seal	Commercial 210 M	26 x 26	50 x 96 table	Connected to power
	Cold Mounting Press	1			18 x 28	36 x 36	
	Scanner	1	Epson	Expression 11000XL	18 x 26		Connected to power
	SureColor P800 Printer	1	Epson	SureColor P800	20 x 36	32 x 38 table	Connected to power
	Stylus Pro 3800 Printer	1	Epsom	Pro 3800	15 x 28	32 x 38 table	Connected to power
	Laser Jet 4250n Printer	1	Hp	laser jet 4250n	16 x 18	24 x 36 table	Connected to power
	Laser Jet 4250n Printer	1	Hp	Laser Jet 4250n	16 x 16		Connected to power
	Hp Color Laser Jet 4700dn Printer	1	Hp	Laser Jet 4700dn	20 x 26		Connected to power
	Hp DesignJet T1120ps Plotter	1	Hp	DesignJet T1120ps	36 x 48	48 x 48	Connected to power
	Paper and Misc. Storage	1			24 x 52		
	Orange and Blue Storage Cabinet	2			22 x 48		
<b>SUPPORT</b>							
	Secure storage for digital media equipment						

## RADIO

### AM RADIO PRODUCTION STUDIO

LAB @ 146 SF

#### ROOM SPECIFIC USE

- + Radio production
- + Reading of news and commercials
- + Completing assignments

#### ROOM SPECIFIC TECHNICAL DATA

- + Room is hooked up to go on-air if needed
- + Interior relites to AM Air Booth and AM Studio and Digital work stations
- + Provide carpet flooring per PPS Design Standards

### AM RADIO AIR BOOTH

SMALL LAB @ 115 SF

#### ROOM SPECIFIC USE

- + Radio broadcasting
- + Reading of news and commercials

#### ROOM SPECIFIC TECHNICAL DATA

- + Provide carpet flooring per PPS Design Standards

### AM STUDIO/DIGITAL STATION

SMALL LAB @ 254 SF

#### ROOM SPECIFIC USE

- + Music production
- + Music recording

#### ROOM SPECIFIC TECHNICAL DATA

- + Potential to connect power/communications to both adjacent control rooms
- + Provide carpet flooring per PPS Design Standards

### COMMTECHTV/DIGITAL MEDIA STUDIO

SMALL LAB @ 850 SF

#### ROOM SPECIFIC USE

- + Tech news production and recording

#### ROOM SPECIFIC TECHNICAL DATA

- + Heavy sound proof doors required
- + Provide carpet flooring per PPS Design Standards

### COMMTECH OFFICE/STREAMING STATION

SMALL LAB @ 165 SF

#### ROOM SPECIFIC USE

- + On-air broadcasting on KBPS.AM Internet Stream

#### ROOM SPECIFIC TECHNICAL DATA

- + Provide carpet flooring per PPS Design Standards

### COMMTECH CONTROL ROOM

SMALL LAB @ 264 SF

#### ROOM SPECIFIC USE

- + On-air broadcasting on KBPS.AM Internet Stream

#### ROOM SPECIFIC TECHNICAL DATA

- + Provide carpet flooring per PPS Design Standards

### PRACTICE STUDIO

SMALL LAB @ 60 SF X 4

#### ROOM SPECIFIC USE

- + Group computer work
- + Watching videos and listening to music for assignments

#### ROOM SPECIFIC TECHNICAL DATA

- + Provide carpet flooring per PPS Design Standards

### ENGINEERING OFFICE

SMALL SUPPORT @ 90 SF

#### ROOM SPECIFIC USE

- + Fixing radio equipment
- + Preparing radio equipment for use

#### ROOM SPECIFIC TECHNICAL DATA

- + Provide carpet flooring per PPS Design Standards
- + Wire shelving with 6 in. height separation on 2 walls
- + Shelving with 12 in. height separation on 1 wall

### IT OFFICE

SMALL SUPPORT @ 72 SF

#### ROOM SPECIFIC USE

- + IT support
- + Storage

#### ROOM SPECIFIC TECHNICAL DATA

- + Provide carpet flooring per PPS Design Standards

### CLASSROOMS

SMALL CLASSROOM @ 550 SF

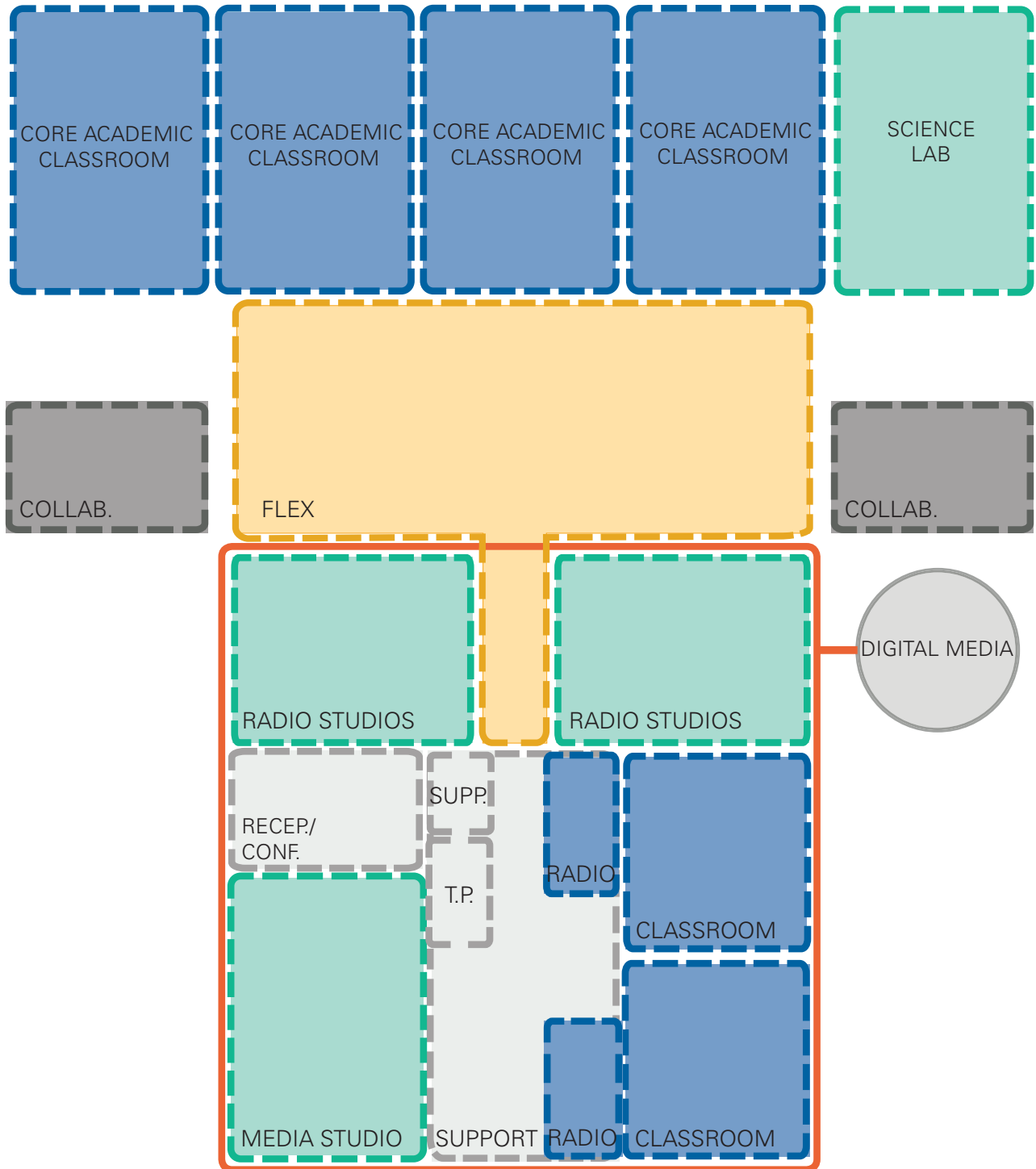
- + No specific requirements, match general technical requirements

### SUPPORT

VARIES

- + No specific requirements, match general technical requirements

### CTE SUITETYPE B : RADIO



## RADIO EQUIPMENT LIST

Room Name	Item	Quantity	Manufacturer	Item/Model Number	Footprint	space footprint	Technical Requirements / Comments
<b>Comm Tech TV Studio</b>							
	Reporting Desk	1			48 x 90	60 x 96	
	Video Camera	1			12 x 12		
	Video Camera Stand	1			30 x 30	40 x 40	
	Chairs	5					
<b>Comm Tech Control Room</b>							
	Control Board	1	Wheatstone	Audioarts Engineering IP-16 Digital	24 x 24	24 x 36	
	Monitors	2					
	Keyboards	2					
	Microphones	2					
	Chairs	2					
	CD Player	3					
	Headphones	2					
	Clock and timer	1					
	Desk	1			48 x 96		
<b>Comm Tech Office/Streaming Work Station</b>							
	Control Board	1	Wheatstone	Audioarts Engineering IP-16 Digital	24 x 24	24 x 36	
	Computer Monitor	1					
	Programming Monitor	1					
	Keyboards	2					
	Microphones	2					
	Chairs	2					
	CD Player	3			18 x 18		
	DAT Player	1					
	Headphones	2					
	Clock and timer	1					
	Desk (wide u shape)	1			48 x 96		
<b>AM Studio and Digital Work Stations</b>							
	iMac Computers	14	Apple	iMac	12 x 24		
	Musical Keyboards	14					
	Computer Keyboards	14	Apple		6 x 18		
	Tables	7					2 stations / table
	Chairs	14					
<b>AM Production</b>							
	AM Control Board	1			30 x 36		
	Programming Monitor	1					
	Computer Monitor	2					
	Keyboard and mouse	3					
	Computers	2					

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### RADIO EQUIPMENT LIST

Room Name	Item	Quantity	Manufacturer	Item/Model Number	Footprint	space footprint	Technical Requirements / Comments
	Microphones	3					
	Turn Table	1					Locked in cabinet
	Reel to Reel Tape Machine	1			24 x 24		
	CD Players	3			24 x 24		
	Cart Players	2					
	Compact Disc Platers	1			24 x 24		
	Caset players	2					
AM Air Booth							
	AM Control Board	1				24 x 30	
	Programming Monitor	1					
	Computer Monitor	1					
	Keyboard and mouse	2					
	Computers	1					
	Microphones	2					
	CD Players	2					
	Clock and timer	1					
	Storage shelf for CDs	1			48 x 72		
	Storage shelf for books	1			10 x 24		
IT Office							
	Workstation	1					
	Storage shelves around room						
Engeneering Office							
	Workstation	1					
	Storage shelves around room						
	Work Counter						
Practice Rooms							
	Mini Control Board	1					
	Computer	1					
	Microphone	1					
	Table	1					
	Chairs	3					

## HEALTH OCCUPATIONS

### NURSING LAB

MEDIUM LAB @ 1,350 SF

#### ROOM SPECIFIC USE

- + Presentations by teachers and students, individually and in groups
- + Small and medium group instruction
- + Display of material such as student work
- + Watching DVDs
- + Patient health records
- + Lab instruction at nursing beds

#### ROOM SPECIFIC TECHNICAL DATA

- + Fume hood exhaust
- + 5 Sinks

### DENTAL LAB

MEDIUM LAB @ 1,350 SF

#### ROOM SPECIFIC USE

- + Presentations by teachers and students, individually and in groups
- + Small and medium group instruction
- + Display of material such as student work
- + Watching DVDs
- + Patient health records
- + Lab instruction and practice at dental chairs
- + Mobile x-ray stations

#### ROOM SPECIFIC TECHNICAL DATA

- + 4 sinks (1 per every 2 dental chairs)
- + Fume hood exhaust
- + Air suction at every dental chair
- + 8 student dental chairs, 1 instructor dental chair

### MEDICAL LAB

MEDIUM LAB @ 1,350 SF

#### ROOM SPECIFIC USE

- + Presentations by teachers and students, individually and in groups
- + Small and medium group instruction
- + Display of material such as student work
- + Watching DVDs
- + Patient health records
- + Lab instruction at medical beds

#### ROOM SPECIFIC TECHNICAL DATA

- + Deep sinks for surgical scrub instruction
- + 2-4 standard sinks
- + Additional doors to adjacent spaces

### MEDICAL SCENARIO CLINIC

SMALL LAB @ 450 SF

#### ROOM SPECIFIC USE

- + Medical appointments
- + General checkups

#### ROOM SPECIFIC TECHNICAL DATA

- + Per Checkup room: 1 door, 1 sink with upper and lower casework, 1 exam bed, 2 patient chairs, 1 doctor stool, 1 wall-mounted computer, 1 wall-mounted vitals machine
- + Tall storage cabinetry along hallway opposite checkup rooms
- + Doors to adjacent spaces

### SIMULATION LAB

SMALL LAB @ 450 SF

#### ROOM SPECIFIC USE

- + Medical simulation lab with one hospital bed and adjacent control room with one-way glass observation window

#### ROOM SPECIFIC TECHNICAL DATA

- + 1 sink

### SUPPORT

SMALL SUPPORT @ 450 SF

#### ROOM SPECIFIC USE AND ROOM SPECIFIC TECHNICAL DATA

- + No specific requirements, match general technical requirements

### HEALTH OCCUPATIONS CLASSROOM

LARGE CLASSROOM @ 900 SF

#### ROOM SPECIFIC USE AND ROOM SPECIFIC TECHNICAL DATA

- + No specific requirements, match general technical requirements

### FIRST RESPONDER CLASSROOM

LARGE CLASSROOM @ 900 SF

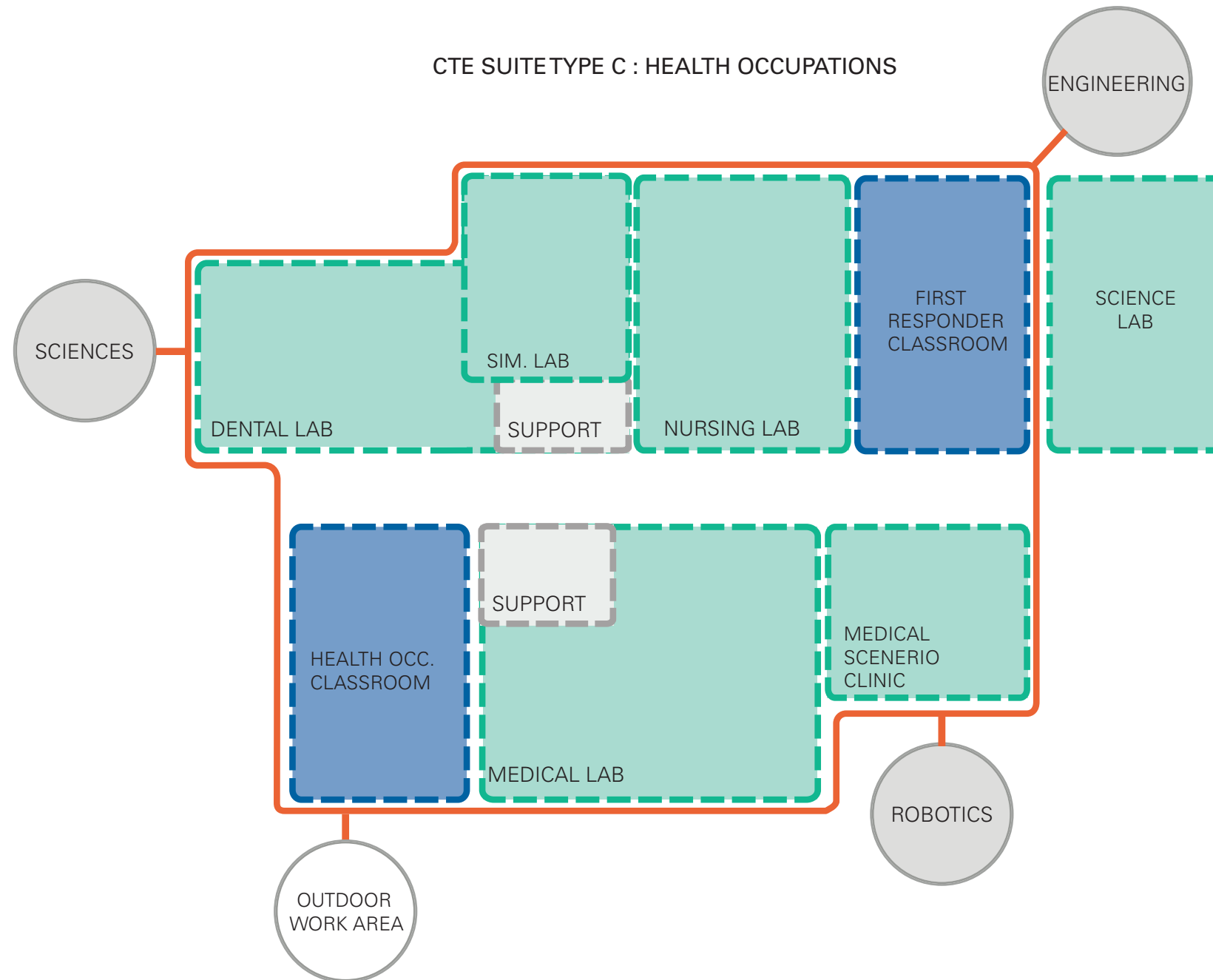
#### ROOM SPECIFIC USE AND ROOM SPECIFIC TECHNICAL DATA

- + No specific requirements, match general technical requirements

### ADJACENT SPACES

Anatomy Lab

Outdoor work area access for medicinal gardens



### HEALTH OCCUPATIONS EQUIPMENT LIST

Room Name	Item	Quantity	Manufacturer	Item/Model Number	Footprint	Working space footprint	Technical Requirements / Comments
<b>NURSING LAB</b>							
	Teaching Station	1			24 x 48		
	Teaching Chair	1					
	Desks	12			24 x 48		2 Students / Desk
	Chairs	24					
	Nursing Bed	5			38 x 88	96 x 108	Connected to power, on wheels, working area includes curtain track
	Rolling Food Table	5			15 x 30		On wheels
	Bedside Table	5			18 x 22		Some on wheels, not all
	IV Stand	3			18 x 18		On wheels
	Vitals Stand	1	WelchAllyn	Spot Vital Signs LXi	22 round		On wheels
	Folding Curtain Stands	2			20 x 32	20 x 80	On wheels, folds out to working area
	Toilet Seat	2	Drive,Lumex		18 x 21		
	Baby Carriers	5	Costco		16 x 28		
	Baby Bed Rolling Cart	2			16 x 30		On wheels
	Wheel Chairs	4			24 x 32		
	Counter-top Scale	1	Health-o-Meter		16 x 18		
	Laundry Baskets	3			18 x 18		On wheels
	Sinks	5			22 x 22		On west wall counter
	Linen Storage Cabinet	1			22 x 48		Stores: towels, bibs, washcloths, blankets, bath towels, draws, bed linens, fitted sheets, bath blankets, sheets, pillow cases
	Printer	1	HP	Laser jet p3005dn	18 x 18		
	Computers	4	HP	L1710	18 x 30		
<b>Nursing Lab Kitchenette</b>							
	Double Sink	1			22 x 32		
	Double hot plate	1			12 x 18		
	Washing machine	1			24 x 24		
	Fridge	1	Kenmore		30 x 30		
	Sterilizing unit	1	Porter	SES 2000E	16 x 18		
	Oven	1			24 x 30		
	Cabinetry	Various					
	Standing Scale	1	Detecto	Detecto	18 x 22		
	Skillet	1			12 x 24		
<b>DENTAL LAB</b>							
	Teaching Station	1			24 x 48		
	Teaching Chair	1					
	Desks	12			24 x 48		2 Students / Desk
	Chairs	24					
	Dental patient chairs	9	Various		36 x 72	72 x 96	Connected to power, and air suction. 1 chair is a teaching chair
	Dental dentist chair	17	Various		20 x 24		On wheels, 2 per dental chair, 1 for teaching chair
	Dental Trimmer Grinder	2	Torit by Chayes Virginia		12 x 16	36 x 48	On counter top
	Station tool set	9	Plastic cabinet		12 x 14		

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### HEALTH OCCUPATIONS EQUIPMENT LIST

Room Name	Item	Quantity	Manufacturer	Item/Model Number	Footprint	Working space footprint	Technical Requirements / Comments
X-Ray Room (2)	Cabinetry	Various					above and below counters with sinks where possible
	Sinks	5			22 x 22		sinks to be located in counters inbetween dental chairs
	Dental patient chairs	2	Various		36 x 72	72 x 96	Connected to power, and air suction
	Dental dentist chair	4	Various		20 x 24		On wheels
<b>SUPPORT</b>							
	Automatic sterilizer	1	Midmark	M9 UltraClave	16 x 20		
	Sink	1			24 x 24		
<b>MEDICAL LAB</b>							
	Teaching Station	1			24 x 48		
	Teaching Chair	1					
	Desks	12			24 x 48		2 Students / Desk
	Charis	24					
	Computer stations	6			24 x 24		
	Medical bed	4			28 x 54	3.5' x 5.5'	Connected to power
	Folding Curtain stands	4			20 x 32	6'8" x 1'8"	On wheels, folds out to working area
	Mini laptop station	1			22 x 24		
	Metal rolling cart	4			14 x 20		
	IV stand	4			18 x 18		On wheels
	Sinks	5			22 x 22		4 regular sinks, 1 large "scrub in" sink
	Props. Skeleton, muscles, etc						
	Cabinetry						Above and below counters with sinks where possible
	Scale	1	Detecto	Detecto	18 x 22		
<b>MEDICAL SCENARIO CLINIC</b>							
	Exam bed with stirrups	4					1 / Room
	Wall mounted vital signs machine	4					1/ Room. Includes EKG monitoring and pulse oximeter.
	Small cabinet or wall mounted shelves with 3-5 drawers for supplies.	4					1/ Room
	Computer station	4					1/ Room
	Sink	4					1/ Room
	EKG machine on a rolling cart with shelves.	4					1/ Room. The cart must raise to waist height with room underneath for gowns and EKG supplies.
	Mayo stand or rolling table	4					1/ Room
	Autoclave machine	1					At sterilization area in clinic
	Tall storage closet for cleaning supplies, models & brooms	2					In central hallway outside of exam rooms
<b>SIMULAITON LAB</b>							
	Exam bed	1					1 / Room
	Teaching Monitor	1					
	Simulation Equipment	1					

## ELECTRIC

### AUTOMATION SHOP

MEDIUM SHOP @ 1,800 SF

#### ROOM SPECIFIC USE

- + Semiconductor technology
- + Three-phase electrical systems
- + Motor control
- + Programmable controllers
- + Robotics
- + Variable frequency drives
- + Industrial automation

#### ROOM SPECIFIC TECHNICAL DATA

- + Provide dedicated power supply with excess capacity for fluctuations in power requirements of program
- + Provide connection to alternative energy systems – PV and wind, for example, to allow incorporation into projects
- + General exhaust and dedicated local exhaust systems as needed; provide shaft space at regular intervals for future flexibility

### ELECTRIC SHOP

MEDIUM SHOP @ 1,800 SF

#### ROOM SPECIFIC USE

- + Electric safety
- + Industry tools and equipment
- + Mechanical systems
- + Commercial wiring methods
- + Codes and regulations
- + Mirco house wiring
- + Fire alarm and security system installation

#### ROOM SPECIFIC TECHNICAL DATA

- + Provide dedicated power supply with excess capacity for fluctuations in power requirements of program
- + Provide connection to alternative energy systems – PV and wind, for example, to allow incorporation into projects
- + General exhaust and dedicated local exhaust systems as needed; provide shaft space at regular intervals for future flexibility

### ELECTRIC SHOP

MEDIUM SHOP @ 1,800 SF

#### ROOM SPECIFIC USE

- + Electrical house wiring power supplies
- + Amplifier and alarm projects
- + Circuit board assembly

#### ROOM SPECIFIC TECHNICAL DATA

- + Provide dedicated power supply with excess capacity for fluctuations in power requirements of program
- + Provide connection to alternative energy systems – PV and wind, for example, to allow incorporation into projects
- + General exhaust and dedicated local exhaust systems as needed; provide shaft space at regular intervals for future flexibility
- + Provide compressed air spigot
- + Provide exhaust hoods for soldering

### CLASSROOM

MEDIUM CLASSROOM @ 675 SF

#### ROOM SPECIFIC USE

- + No specific requirements, match general technical requirements

#### ROOM SPECIFIC TECHNICAL DATA

- + No specific requirements, match general technical requirements

### SUPPORT

SMALL SUPPORT @ 450 SF

#### ROOM SPECIFIC USE

- + No specific requirements, match general technical requirements

#### ROOM SPECIFIC TECHNICAL DATA

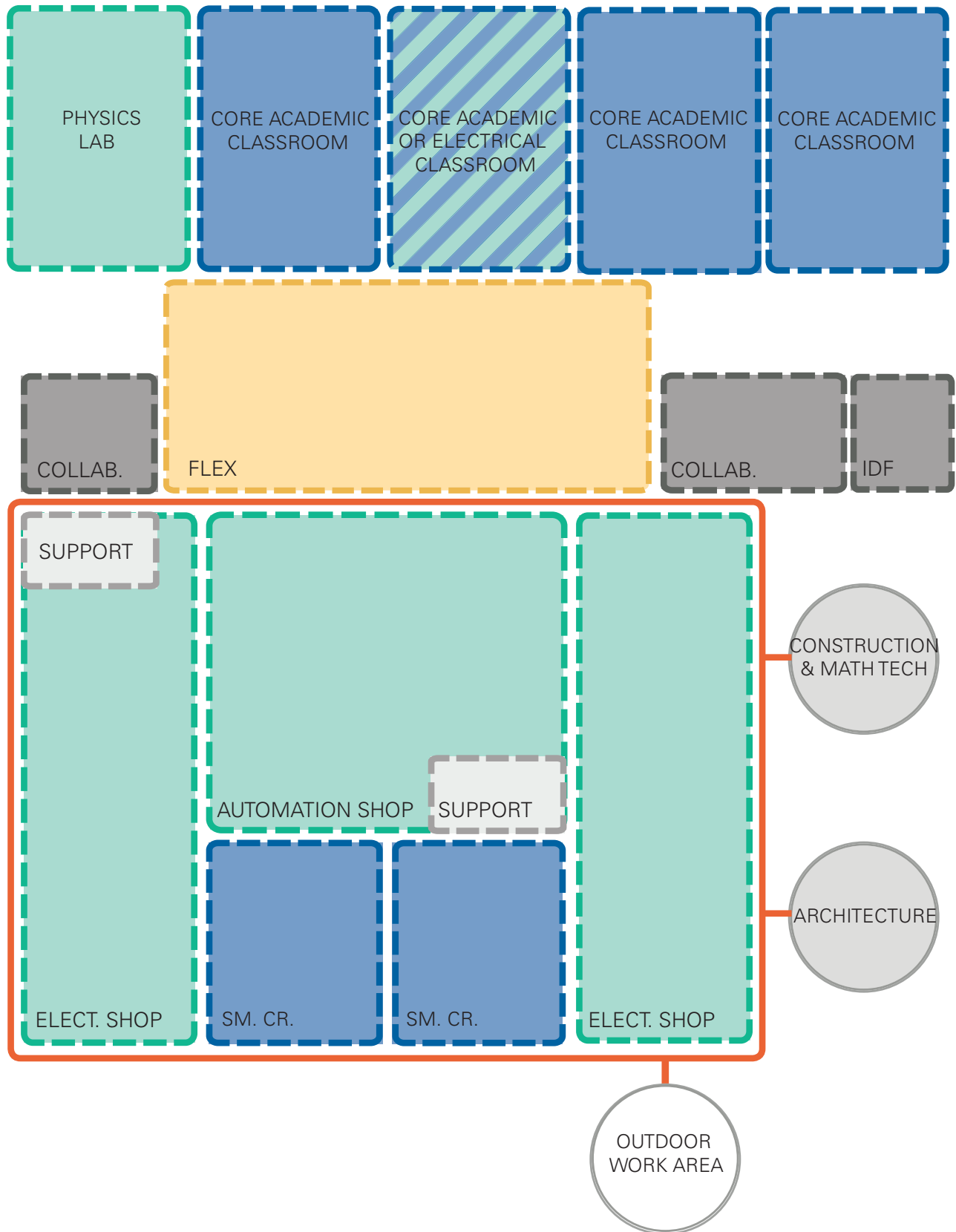
- + No specific requirements, match general technical requirements

### ADJACENT SPACES

Electric Classroom

Outdoor work area access for solar panel projects

### CTE SUITE TYPE C : ELECTRICAL



### ELECTRIC EQUIPMENT LIST

Room Name	Item	Quantity	Manufacturer	Item/Model Number	Footprint	Working space footprint	Technical Requirements / Comments
AUTOMATION SHOP							
	Robotic Arm Workstation	1			180 x 192		
	Work Isle Area	2			120 x 288		
	Mill	1	Bridgeport				
	Work table	1			60 x 192		
	Foot shear	1	Pexto	137-L	30 x 44	48 x 48	No power
	PLC (Programmable Logic Controller)	1			36 x 36	36 x 36	Small computer workstation
	Motor Control Lab	1			60" wall space		Logic controller system installed on the wall
ELECTRIC SHOP							
	Mini House Workstations	23			48 x 84 x 100 tall		
	Countertop Workstations	12			30 x 32		
	10" Bandsaw	1	Jet		18 x 24	24 x 36	120 V, 3.4 Amps, 60hz. Connected to Power
	14" 16 Speed Floor Drill Press	1	Tradesman	8100S	12 x 26	18 x 36	Connected to power
			Target machinery				
	5 Speed Drill Press	3	industry co	813B	8 x 15	12 x 24	Connected to power
	8" Keyless Drill Press	1	Central Machinery	44595	8 x 15	12 x 24	110 V, 3.6 Amps,60 ha. Connected to Power
	1" Belt 5" Disc Sander	1	Delta	P2001	12 x 15	12 x 24	120 V, 2.6 Amps, 60 Hz. Connected to Power
	Lockers	60	Lyons		10 x 14		
ELECTRIC SHOP							
	Teaching Station	1			36 x 48		
	Teaching Stair	1					
	Perimeter counter work stations	14			40 x 72	6' x5'	2 students/ station. 4 outlets, 2 upper cabinets, 1 shelf
	Desks	14			24 x 48		2 Students / Desk
	Chairs	28					at desks
	Stools	28					at perimeter work stations
	Work Table 8' x 4'	1			48 x 96		
	Foot shear	1	Pexto	138-k	30 x 44	48 x 48	No power
	5 Speed Drill Press	1		ZJ4113	8 x 15	18 x 36	Connected to power
			Roper Whitney inc,				
	Square Punch	1	pexto	218	8 x 22	18 x 53	No power
	Hand Brake	1	Berkroy	B 924	10 x 34	34 x 46	No power
	Rotex Punch	2	Thor	1210	9 x 22	18 x 46	
			Roper Whitney co,				
	Notcher	2	pexto	100	12 x 18	24 x 36	
	13 mm Drill Press	1	Target machinery	TT-6P	1 x 20	18 x 36	



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## CONSTRUCTION

### CONSTRUCTION SHOP

LARGE SHOP @ 7,200 SF

#### ROOM SPECIFIC USE

- + Woodworking
- + Cabinetry construction
- + Finishing
- + Group construction / woodworking projects
- + Individual construction / woodworking projects

#### ROOM SPECIFIC TECHNICAL DATA

- + Provide dedicated power supply with excess capacity
- + Dedicated local exhaust system with increased air exchange rate
- + Compressed air

### CONSTRUCTION SHOP - TECH GEOMETRY

LARGE SHOP @ 3,600 SF

#### ROOM SPECIFIC USE

- + Truss construction
- + Module wall construction for tiny homes and trailer homes

#### ROOM SPECIFIC TECHNICAL DATA

- + Provide dedicated power supply with excess capacity
- + Dedicated local exhaust system with increased air exchange rate
- + Compressed air

### DESIGN LAB & TECH ALGEBRA

MEDIUM LAB @ 1,350 SF

#### ROOM SPECIFIC USE

- + Heat press printing
- + Screen printing
- + Digital design production

#### ROOM SPECIFIC TECHNICAL DATA

- + Lockable merchandise storage cabinets around the perimeter of the room and/or under work counters

### CNC SHOP

SMALL SHOP @ 450 SF

#### ROOM SPECIFIC USE

- + CNC machining
- + Computer lab work

#### ROOM SPECIFIC TECHNICAL DATA

- + Provide dedicated power supply with excess capacity

- + Dedicated local exhaust system with increased air exchange rate
- + Compressed air

### CONSTRUCTION CLASSROOM

LARGE CLASSROOM @ 900 SF

#### ROOM SPECIFIC USE

- + No specific requirements, match general technical requirements

#### ROOM SPECIFIC TECHNICAL DATA

- + No specific requirements, match general technical requirements

### SUPPORT

LARGE SUPPORT @ 900 SF

#### ROOM SPECIFIC USE

- + Storage of hand tools and materials

#### ROOM SPECIFIC TECHNICAL DATA

- + No specific requirements, match general technical requirements

### SUPPORT

SMALL SUPPORT @ 450 SF

#### ROOM SPECIFIC USE

- + Spray painting
- + Varnishing

#### ROOM SPECIFIC TECHNICAL DATA

- + No specific requirements, match general technical requirements

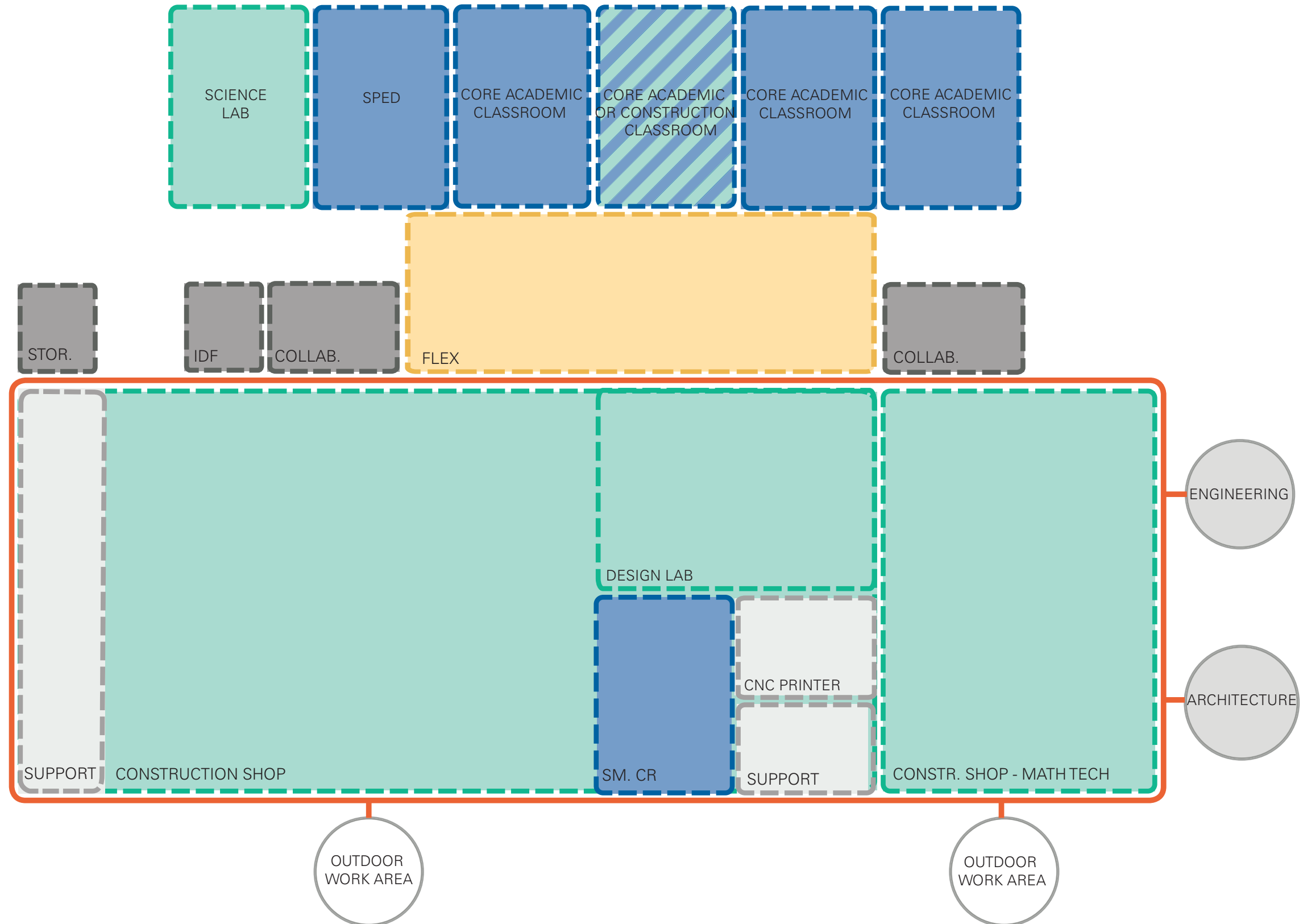
### ADJACENT SPACES

Math Tech Classroom

Outdoor work area access

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CTE SUITE TYPE D : CONSTRUCTION AND MATHTECH





## CONSTRUCTION EQUIPMENT LIST

Room Name	Item	Quantity	Manufacturer	Item/Model Number	Footprint	Working space footprint	Technical Requirements / Comments
CONSTRUCTION SHOP							All items require power and exhaust
Junior/Senior	Work Tables with Lockers Below	6			96 x 96		
	Stools	24					
	14" Band Saw	2	Powermatic	PWBS-14	24 x 30	36 x 48	115/230 V (Prewired for 115 V)
	14" Band Saw	1	Rockwell	28-200	24 x 30	48 x 48	Connected to power and exhaust
	20" Band Saw	1	Delta		24 x 36	60 x 48	230 V, 15 Amps, 60 Hz
	Bandsaw - General International	1	General international	90-360M2	30 x 36	60 x 48	220 V, 5.4 Amps, 60 Hz
	Drill press - Small Tabletop	1	General international	75-075MI	24 x 24	48 x 36	110/220 V, 10/5Amps
	Drill Press - General International	1	General international	75-200M1NC	18 x 24	24 x 48	110/220 V, 12/6 Amps, 60 Hz
	Drill Press - Powermatic	1	Powermatic	1100	14 x 24	24 x 48	220/240 V, 2.3/1.4 Amps, 60 Hz
	Mini Drill	1	Blum	2002	30 x 36	36 x 48	3 x 220 V, 5 Amps, 60 Hz
	24' Planer	1			36 x 42	42 x 60	
	13" Three Knife, Two Speed Thickness Planer	1	DeWalt	DW735	24 x 30	36 x 24 cart	120 V, 14 Amps, 60 Hz
	Kingwood Drum Sander	1	Kingwood		42 x 60	42 x 84	
	Jointer	2	Powermatic	1285-3HD	36 x 84	60 x 120	230/460 V, 8.4/4.2 Amps
	16" Disc Sander	1	Reuland Electric	ML	24 x 36	48 x 60	208/220/416/440 V, 5.08/4.8/2.54/2.4 Amps
	Belt and Disc Sander	2	General international	15-035DCM1	24 x 36	48 x 60	110/220 V, 16/8 Amps. 60 Hz
	Edge Belt Sander	1	Ritter	R7C1	34 x 66	72 x 48	115/230
	Oscillating Spindle Sander	1	JET	JOVS-10	24 x 24	48 x 48	115 V
	Downdraft Table	2	Denray Machine	2872 B	28 x 72	48 x 84	115 & 220 V, 1 PH -OR- 230,460, & 575 V, 3 PH
	Clamp Table	2	Ritter	R-1475	36 x 72	36 x 72	
	7" Grinder	1	Rockwell/Delta	23-200	14 x 24	36 x 48	115/230 V, 6.6/3.3 amps
	Grinder Buffer	1	Baldor		18 x 24	36 x 48	115/230 V, 3.8/1.9 Amps
	Grinder-Super Grind 2000	1	Tormek	SE-711 23	12 x 12	12 x 36	115 v, 60 ha, 200 watts
	Lathe	1	Delta	88C18103	18 x 60	36 x 60	Unknown
	Mini Lathe	2	Jet	JML - 1014	8 x 24	16 x 42	115 volts 5 Amps, 60 Hz
	Miter Saw0714	1	Makita	LS0714	36 x 36	52 x 72 table	120 V, 10 Amps, 50-60 Hz
	Miter Saw1013	3	Makita	LS1013	24 x 42	28 x 136 table	120 V, 13 Amps, 50-60 Hz
	Miter Saw1016	1	Makita	LS1016L	24 x 36	36 x 102 table	
	Miter Saw1212	1	Makita	LS1212	24 x 40	60 z 192 table	120 V, 15 Amps, 50-60 Hz
	Panel Saw - Large	1	Grigio		84 x 216	120 x 240	
	Panel Router - Small	1	Her-Saf	145	48 x 120	144 x 72	
	Single Row Line Drill	1	Ritter and Barbo Machinery		30 x 72	48 x 96	115 V, 208-230 Amps, 60 ha
	Single Row Line Drill-Spindle	1	Ritter and Barbo Manufacturing inc		36 x 60	60 x 96	
	Table saw "10" industrial cabinet saw"	3	Saw stop		42 x 68	60 x 84	
	Unisaw routers	2	Delta		48 x 60	72 x 84	2 routers on either side of main saw
	12-14" Tilting Arbor Saw	1	Rockwell/Delta		42 x 78	96 x 72	
	Pocket Screw Machine	1			24 x 48		
	Scroll Saw	1			11 x 13	18 x 18	

### CONSTRUCTION EQUIPMENT LIST

Room Name	Item	Quantity	Manufacturer	Item/Model Number	Footprint	Working space footprint	Technical Requirements / Comments
Sophomore	Sink	1			18 x 24		
	Spray Booth	1			450 SF		In support space
	Work Tables with Lockers Below	4			96 x 96		
	Stools	16					
	15" Planer with Helical Head	1	JET	JWP-15HH	48 x 36	48 x 78	230 V
	20" Planer	1			48 x 36	48 x 78	230 V
	8" Jointer	2	Powermatic	60/60 B	30 x 72	48 x 84	230 V, 8.4 Amps
	18" Band Saw	1	Jet	JWBS-18	34 x 24	42 x 48	115 Volts
				Walker Turner Div., Kearney &			
	Billy Band Saw	1	Trecker Corp.		36 x 52	60 x 72	
	14" Band Saw	3	Rockwell	28-200	24 x 30	48 x 48	
	Drill Press	1	Powermatic	1100	14 x 24	24 x 48	115/230 V, 15/7.5 Amps
	Drill Press	1	Rockwell		24 x 24	24 x 48	115/230 V, 15/7.5 Amps
	Drill Press	1	General		24 x 24	24 x 48	115/230 V, 15/7.5 Amps
	Miter Saw0815	1	Makita	LS0815F	18 x 38	40 x 60	120 V, 10.5 Amps, 50-60 Hz
	Miter Saw1016	1	Makita	LS1016L	30 x 42	48 x 60	120 V, 15 Amps, 50-60 Hz
	Miter Saw1040	1	Makita	LS1040	20 x 32	40 x 60	120 V, 15 Amps, 50-60 Hz
	Lathe	1	Rockwell/Delta		12 x 60		
	Multi-router	2	JDS Company	101L	24 x 30		10 Amps
	Table Saw (10" industrial cabinet saw)	2	Saw Stop		42 x 84	84 x 84	230 V, 12 Amps, 60 Hz
	Table Saw Unisaw	1	Delta		42 x 60	60 x 84	Converted with two Jess 'em lift routers
				Denray Downdraft Tables,			
	Downdraft Table	1	Barbo Machinery	2872	28 x 72	36 x 84	115 V, 20/10 Amp, 60 Hz
Belt and Disc Sander	3	Rockwell/Delta		32 x24	48 x 60	230 V	
Drum Sander	1	Seco	SK-A724WP	38 x 42	48x x72	220/440V, 10/20 Amp, 60 Hz	
Oscillating Spindle Sander	2	JET	JOVS-10	24 x 24	48 x 48	115 V	
Sander	1	Apex		36 x 36	48 x 72	208/220/426/440 V, 5/4.8/2.54/2.4 amps	
<b>CONSTRUCTION SHOP - TECH GEOMETRY</b>							
	Truss Construction Zone				360 x 360		
	Saws Work Counter				48 x 144		
	Work Bench				36 x 420		
<b>DESIGN LAB &amp; TECH ALGEBRA</b>							
	Heat Press	3	UsCutter	IT9100	18 x 24	36 x 40	110 V, 13 A, 1.5 kW, 50/60 Hz
	Power Heat Press (small)	1	Power Heat Press		18 x 18	30 x 42	
	Printer - Aficio SG 7100 DN	2	RICOH	7100 DN	22 x 24	36 x 42	
	Computer Stations	2	HP	L1710	30 x 36	30 x 60	Footprint includes tower
	Vinyl Cutter/sign maker	1	Roland	Versa Studio Sign Ma	24 x 36	42 x 48	100-240 V, 50/60 Hz
	Heat Press	2	GEO Knight & Co Inc.	16 x 20 K20S	18 x 32	52 x 72	120 V, 1800 W, 60 Hz, 15 Amps
	Paper Cutter - Chop	2			22 x 30	30 x 48	
	Paper Roll	2			12 x 48	30 x 48	

*DRAFT DOCUMENT*  
The information presented in the equipment list are based on existing equipment surveys and preliminary feedback from CTE program department leads. Further development will occur in the design phases along with coordination of FF&E.

### CONSTRUCTION EQUIPMENT LIST

Room Name	Item	Quantity	Manufacturer	Item/Model Number	Footprint	Working space footprint	Technical Requirements / Comments
	Light Tables	2	GRADCO		22 x 26	30 x 36	
	Screen Printing Press	1	Hopkins	MR D-5 200	84 x 84	108 x 108	
	Heat Press Stand	1	Ryonet	EF1600	40 x 48	60 x 60	120 VAC, 1575 W, 13.3 A 50/60 Hz
	Exposure Unit	1	silkscreeningsupplies.com	RXP exposure unit 20	22 x 24	36 x 48	120 W, 60 Hz, 1.9 A
	Flat File Cabinet	1			24 x 30		
	Scanner - HP ScanJet 5590	2	HP	Scan Jet 5590	12 x 24	24 x 36	
	Printer - HP LaserJet P2055dn	1	HP	LaserJet P2055dr	16 x 16		
	Computer Lab	1	HP	Compaq LE1711	24 x 30	30 x 48	3 computers in the computer area
<b>CNC SHOP</b>							
	CNC	1	Forest Scientific		72 x 84		
	Computer Station	1			36 x 48		

## TRANSPORTATION - AUTO

### AUTOMOTIVE SHOP

LARGE SHOP @ 1,800 SF

#### ROOM SPECIFIC USE

- + Diesel engine / equipment repair

#### ROOM SPECIFIC TECHNICAL DATA

- + Specialized air exhaust system

### AUTOMOTIVE SHOP

LARGE SHOP @ 7,200

#### ROOM SPECIFIC USE

- + Engine deconstruction and reconstruction
- + Brakes and suspension
- + Engine systems
- + Motorcycle repair
- + Fuel and electrical systems

#### ROOM SPECIFIC TECHNICAL DATA

- + Specialized air exhaust system

### AUTOMOTIVE CLASSROOM

SMALL LAB @ 900 SF

#### ROOM SPECIFIC USE

- + Vehicle maintenance
- + Engine evaluation

#### ROOM SPECIFIC TECHNICAL DATA

- + Specialized air exhaust system

### AUTOMOTIVE CLASSROOM

SMALL LAB @ 900 SF

#### ROOM SPECIFIC USE

- + Classroom instruction
- + Small gas engine repair

#### ROOM SPECIFIC TECHNICAL DATA

- + Shelving, countertops, and lockers around perimeter

### AUTOMOTIVE CLASSROOM

SMALL LAB @ 900 SF

#### ROOM SPECIFIC USE

- + No specific requirements, match general technical requirements

#### ROOM SPECIFIC TECHNICAL DATA

- + No specific requirements, match general technical requirements

### SUPPORT

LARGE SUPPORT @ 900 SF

#### ROOM SPECIFIC USE

- + Storage of tools and materials

#### ROOM SPECIFIC TECHNICAL DATA

- + No specific requirements, match general technical requirements

### SUPPORT

LARGE SUPPORT @ 900 SF

#### ROOM SPECIFIC USE

- + No specific requirements, match general technical requirements

#### ROOM SPECIFIC TECHNICAL DATA

- + No specific requirements, match general technical requirements

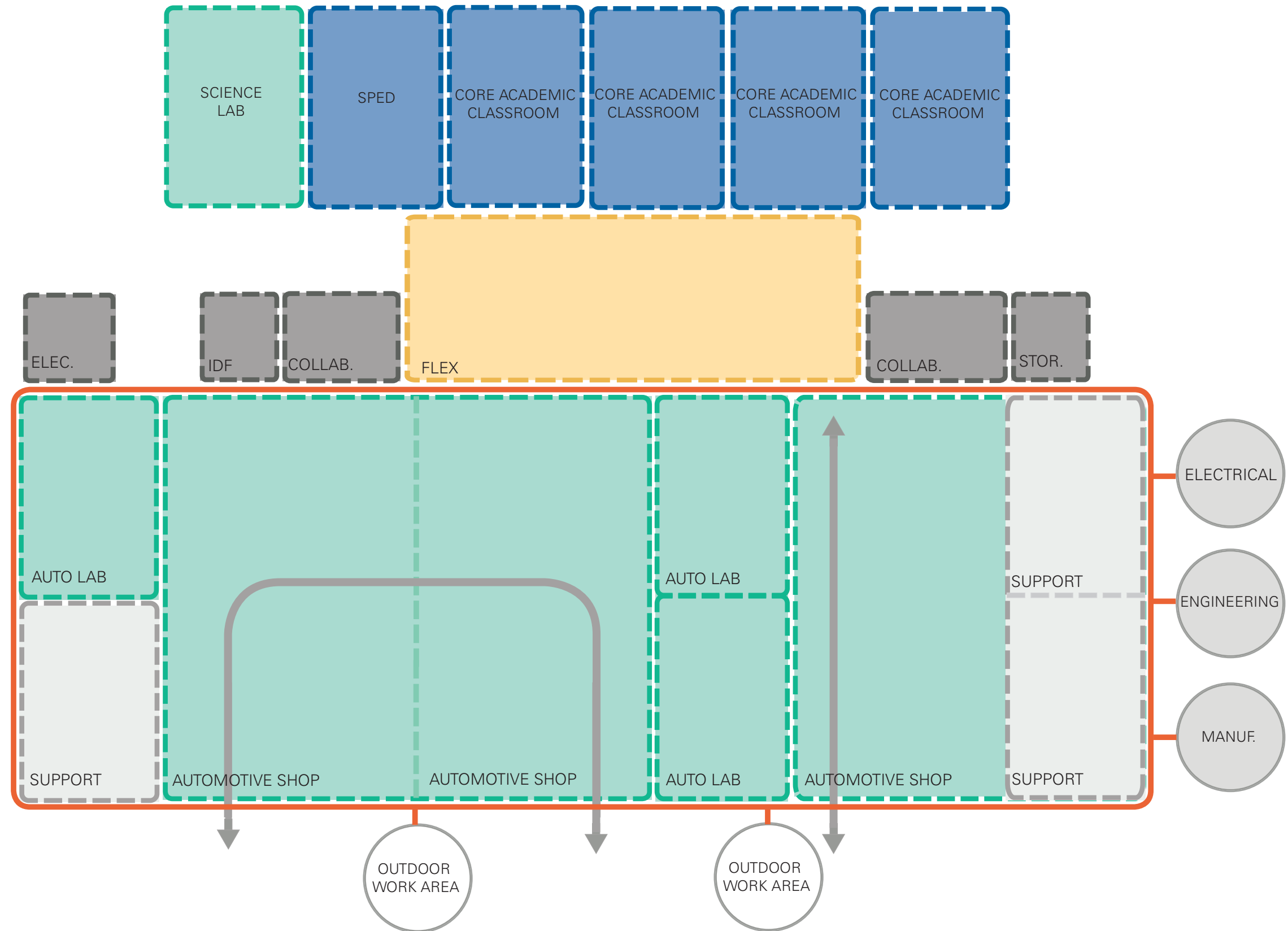
### ADJACENT SPACES

Outdoor work area access



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CTE SUITE TYPE D : TRANSPORTATION - AUTO



### AUTOMOTIVE EQUIPMENT LIST

Room Name	Item	Quantity	Manufacturer	Item/Model Number	Footprint	space footprint	Technical Requirements / Comments
AUTOMOTIVE SHOP							
	Antique Ford	1	Ford		72 x 168		
	Automatic Temperature Control Board	1	Chrysler-ATech		24 x 36	36 x 52	
	Bacharach Fuel Injection Replacement	1		Model 10 specialist st	30 x 52		
	Battery Charger	3	Super charge	BC5500	12 x 12		Input: 120 VAC, 14.5 Amps, 60 Hz. Output: 7.9/14.5 VDC, 100/70 Amps
	Battery Charger	2	Schumacher	She series	12 x 12		
	Buffer - standalone	1	Baldor		24 x 30	36 x 548	208-220/440 V, 3.6-3.4/1.7 Amps
	Caterpillar Engine	1	Caterpillar	3126	36 x 52	60 x 72	
	Caterpillar Engine - small	1	Caterpillar	30240	28 x 30		
	Cummins B Series Engine	1	Cummins	B series	40 x 48	72 x 78	
	Cummins Blue and Yellow Engine	1	Cummins	N11220IF	42 x 72	72 x 104	
	Cummins Engine	1	Cummins	NTC-444	36 x 78	72 x 106	
	David Kieth Tan engine	1			40 x 66	71 x 96	
	Series 900 Diesel Engine	1	Detroit Diesel	900	42 x 72		
	Demonstration Cut-Away	1			18 x 22		
	Diesel Truck - Large	1		Business class M2	96 x 360		
	Drill press	1	Boice Crane		12 x 32	24 x 42	Connected to power
	Ford Diesel Truck	1	Ford	7000	108 x 219		
	Ford pickup Truck	1	Ford	F350 XLT	114 x 264		
	Fork Lift	1	Hyster	60	48 x 144		
	General Motors Diesel Engine	1	General Motors	5115791	36 x 76	72 x 104	
	Grinder - standalone	1			24 x 24		Connected to power
	Grinder - table top	1	Sioux	2017	12 x 18	36 x 52	115 V, 8 Amps, 60 Hz
	Lockers	40					
	Mercedes Benz Engine	3	Mercedes Benz		36 x 48	60 x 72	
	Navistar Engine	1	Navistar		40 x 70	72 x 84	
	Perkins Engine	1	Perkins		30 x 40	72 x 78	
	Port Fuel Injection	1	ATech		24 x 42	40 x 52	
	Series 60 Diesel Engine	3	Detroit Diesel	60	30 x 52	72 x 48	
	Series 900 Diesel engine	5	Detroit Diesel	900	42 x 72	56 x 96	On wheels
	Snap-on Tool Cabinets	11	Snap on		6 x 25 x 34		
	Tool Cabinet Black	1	Craftsman		18 x 28		On wheels
	Tool Cabinet Red	1	Mac		24 x 50		On wheels
	Vise grip	4			6 x 18		
	Vise grip -standalone	1	Wilton		28" diameter		
	CoolTech 3488	1	Robin air	34288	18 x 36		On wheels
	Demonstration Board	1			24 x 96		On wheels

### AUTOMOTIVE EQUIPMENT LIST

Room Name	Item	Quantity	Manufacturer	Item/Model Number	Footprint	space footprint	Technical Requirements / Comments
	Mercedes Benz Engine	1	Mercedes Benz		36 x 48		
	Motorcycle	1	Yamaha	250	24 x 72		
	Oil Jugs	3			28" diameter		
	Series 60 Diesel Engine	1	Detroit Diesel	60	30 x 52	48 x 72	
	Tractor	1	John Deer	4100	36 x 96		
	Tractor - small	1	McCormick Farmall	Cub	48 x 60		
AUTOMOTIVE SHOP							
	4 column Auto lift (black)	1	4 column	PP9PY11BK	120 x 264		
	Auto Lift-Forward (blue)	1	Forward	DP 10A	72 x 144	168 x 180	
	DuoLift (blue)	1	Hofmann		108 x 156	156 x 180	
	Rotary lift (blue)	1	Rotary	SM7N000	108 x 192	144 x 192	
	2 1/2 Ton Hydraulic Floor Jack	1			14 x 28		
	Hydraulic Service Jack	5	Napa	91-655	18 x 60		
	3 ton vehicle stands	multiple	Varies		8 x 8		
	Circular sink	1			60" round		
	Computer wheel balancer	1	Snap-on	WB250	18 x 32		Connects to power
	Drill press -Tabletop	1	Delta Milwaukee		12 x 30		
	Engines on counters	3			30 x 30		
	Engines on Rolling Stands	20			36 x 36		
	Engines on Stationary Stands	4			28 x 60		
	Grinder - Tabletop	1	Driver		12 x 24		
	Hand operated press	1	F.A. Nugier Co.	H60-7	42 x 66		
	Investigator Gas/Diesel Analyzer	1	Sun		28 x 48		Connects to power
	Lawn Mower	1	Cub Cadet		24 x 60		
	Lockers	96	Lyon		10 x 13		
	Oil jugs	4			30 x 96		Oil area needed
	Powermate P1582019	1	Power mate		18 x 18		120v, 15a, 60 hz
	Snap-on Tool Cabinets	18	Snap on		6 x 25 x 34		
	Tire changer	1		FMC 8600	30 x 60		Connects to power
	Tire inflators	1	Coats		18 x 52		Connects to power
	Tool cabinet	1	Home tool storage		20 x 28		On wheels
	Transmission jack (hydraulic)	1	Wudel		42 x 42	711	On wheels
	Vise grip	4	Wilton		12 x 12		
	Work table with axel setup	4			32 x 60		
	Boat Motor	1	Johnson Seahorse		18 x 18		
	Car stalls	8			108 x 300		
	Circular sink	1			48" diameter		
	DuoLift	1	Duo lift		108 x 156		



### AUTOMOTIVE EQUIPMENT LIST

Room Name	Item	Quantity	Manufacturer	Item/Model Number	Footprint	space footprint	Technical Requirements / Comments
	Hunter PA 130	1	Hunter	PA130	30 x 120		On wheels, connected to power
	Ignition Simulator	2	Snap on		20 x 26		
	Lockers	66					
	Motorcycles	4	Honda, kawasaki		24 x 84		
	Rolling cart	12			24 x 40		
	Tractor	1	Kubota	B2100	48 x 108		
	Valve Face Grinding Machine	1	Sioux	645 LC	20 x 30		115 V, 7.8 Amps
	VBM Automotive Lift	1	VBM corporations		26,000 144 x 300		230 V, 11Amps, 60 hz
	Ball Bearing Grinder	1	Albertson & co		18 x 24		Connected to power
	Boring machine	1	Kwik-way		30 x 48		Connected to power
	Circular sink	1			60" round		
	Demagnetixing Unit	1	Magnaflux	SB 1416	28 x 36		440 V, 45 Amps, 60 hz, Connects to Power
	Drill press - standalone	1	Rockwell	15-665	22 x 28	24 x 48	Connects to power
	Engine stand	9	Banner		36 x 36		None
	Grinder - standalone	1	Rockwell	438-02-314-0186	24 x 24	30x 48	115/230 V, 6.6/3.3 Amps, connects to power
	Hand operated press	1	F.A. Nugier co.	H60-7	36 x 64	60 x 72	None
	Head and Block Grinder	1	DCM TECH. Inc.	Scledum RT 17 PA	48 x 96	72 x 120	220/380 v, 16,9/9.8 amps, connects to power
	Heavy Duty Cap and Rod Grinder	2	Sunnen	CRG-300 and CRG-77	12 x 24	24 x 48	116 V, 6.3 amps, 60 hz, connects to power
	Heavy Duty Precision Honing Machine	2	Sunnen	LBB-1699	32 x 42	48 x 60	115/230 V, 7.0/3.5 Amps, connects to power
	Honing Machine	1	Axe equipment	CH-A2	48 x 60		Connects to power
	Lathe	1	Star machines		24 x 72	48 x 72	Connects to power
	Lockers	30	Lyon		10 x 22		
	Magnetic Particle Machine	1	Magnaflux corpora	ANQ.484.5	36 x 72		440 V, 75,Amps, 60 hz, connects to power
	Mill/Drill Press	1	DCM TECH. Inc.		36 x 56	60 x 60	208-230/460 V, 60 Hz. OR 190/380 V, 50 Hz, connects to power
	Moped	1	Milano	TN'G	22 x 60		
	Parts cleaner	2	Sioux	710	20 x 30		Connects to power
	Perfect Circle Nurilizer	1	Perfect circle Corp	2807- serial number	24 x 36	36 x 48	
	Sand Blaster- Blast-N-Peen	1	Zero		36 x 44	48 x 60	connects to power and exhaust
	Storm power cleaning machine	1	Storm Vulcan	SP-125	48 x 96		230 V, 18.2 Amps,60 hz, connects to power and water
	Valve face grinder	2	Sioux		2001 24 x 36		115 V, 6 Amps, 60 hz, connects to power
	1/2 HP Grinder	1	Sears	397.19591	18 x 18	24 x 42	115/230 V, 5.2/2.6 Amps, 60 Hz, CONNECTS TO POWER
	2 1/2 Ton Hydraulic Floor Jack	1			14 x 28	24 x 60	
	2 Ton Folding Engine Crane	1	Titan	21008	24 x 36	24 x 60	
	3 Ton Car Stand	multiple	Car quest		8 x8		
	Battery charger	2	Snap-on		12 x 12		Continuous Duty Charge Ratings: 120 VAC, 60 Hz, 12.2 Amp; 70 Amps 7.2 Volts, 60 Amps 14.6 Volts

*DRAFT DOCUMENT*  
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### AUTOMOTIVE EQUIPMENT LIST

Room Name	Item	Quantity	Manufacturer	Item/Model Number	Footprint	space footprint	Technical Requirements / Comments
	Cars	8					
	Circular sink	1					
	Drill Press	1	Rockwell delta	15-660	18 x 24	24 x 42	Connects to Power
	Engines on ground and counter	7					
	Engines on stand	2			36 x 36		
	Lawnmower	2	Excello (1), Goodall (1)		24 x 60		
	Lockers	90	Lyon		10 x 22		
	Motercycle	1	Honda		36 x 84		
	Rotary Lift	1	Rotary	SM7N000	108 x 192	144 x 192	
	Tool cabinet	1	Craftsmen		18 x 28		
	Vise grips	6	Columbine		12 x 12	36 x 36	
AUTOMOTIVE CLASSROOM							
	Teaching Station	1			36 x 72		
	Teaching Chair	1					
	Desks and chairs	24			24 x 36		
	Work tables	12			30 x 60		
	Drill press	1			18 x 24		
	Lockers	120					
	Snap-on Tool Cabinets	2	Snap on		6 x 25 x 34		
	Under cabinet lockers	40			13 x 20		
	Circular sink	1			72" diameter		

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# MANUFACTURING

## MANUFACTURING SHOP

LARGE SHOP @ 7,200 SF

### ROOM SPECIFIC USE

- + Manufacturing
- + Shop work
- + CNC milling
- + Lathe
- + Mill
- + EDM
- + 3-D printing
- + Laser printing

### ROOM SPECIFIC TECHNICAL DATA

- + Oil waste piping
- + Metal dust collection
- + Furnace exhaust
- + Welding exhaust

## PATTERN MAKING SHOP

SMALL SHOP @ 900 SF

### ROOM SPECIFIC USE

- + Wood and metal work
- + Lost wax casting
- + Wood lathe

### ROOM SPECIFIC TECHNICAL DATA

- + Provide dedicated power supply with excess capacity
- + Dedicated local exhaust system with increased air exchange rate
- + Compressed air

## FOUNDRY

SMALL SHOP @ 900 SF

### ROOM SPECIFIC USE

- + Metal pouring and casting
- + Green sand casting
- + Furnace

### ROOM SPECIFIC TECHNICAL DATA

- + Metal dust collection
- + Furnace exhaust

## FABRICATION AND WELDING LAB

LARGE SHOP @ 3,600 SF

### ROOM SPECIFIC USE

- + Design layout
- + Forming

- + Joining
- + Welding (TIG, Gas, MIG, Arc)
- + CNC plasma
- + Soldering
- + Oxygen acetylene cutting

### ROOM SPECIFIC TECHNICAL DATA

- + Oil waste piping
- + Welding exhaust
- + Metal dust collection
- + Furnace exhaust

## DESIGN LAB

SMALL LAB @ 900 SF

### ROOM SPECIFIC USE

- + Flammable storage

### ROOM SPECIFIC TECHNICAL DATA

- + No specific requirements, match general technical requirements

## CNC SHOP

SMALL SHOP @ 450 SF

### ROOM SPECIFIC USE

- + Flammable storage

### ROOM SPECIFIC TECHNICAL DATA

- + Provide dedicated power supply with excess capacity
- + Dedicated local exhaust system with increased air exchange rate
- + Compressed air

## SUPPORT

SMALL SUPPORT @ 450 SF

### ROOM SPECIFIC USE

- + Flammable storage

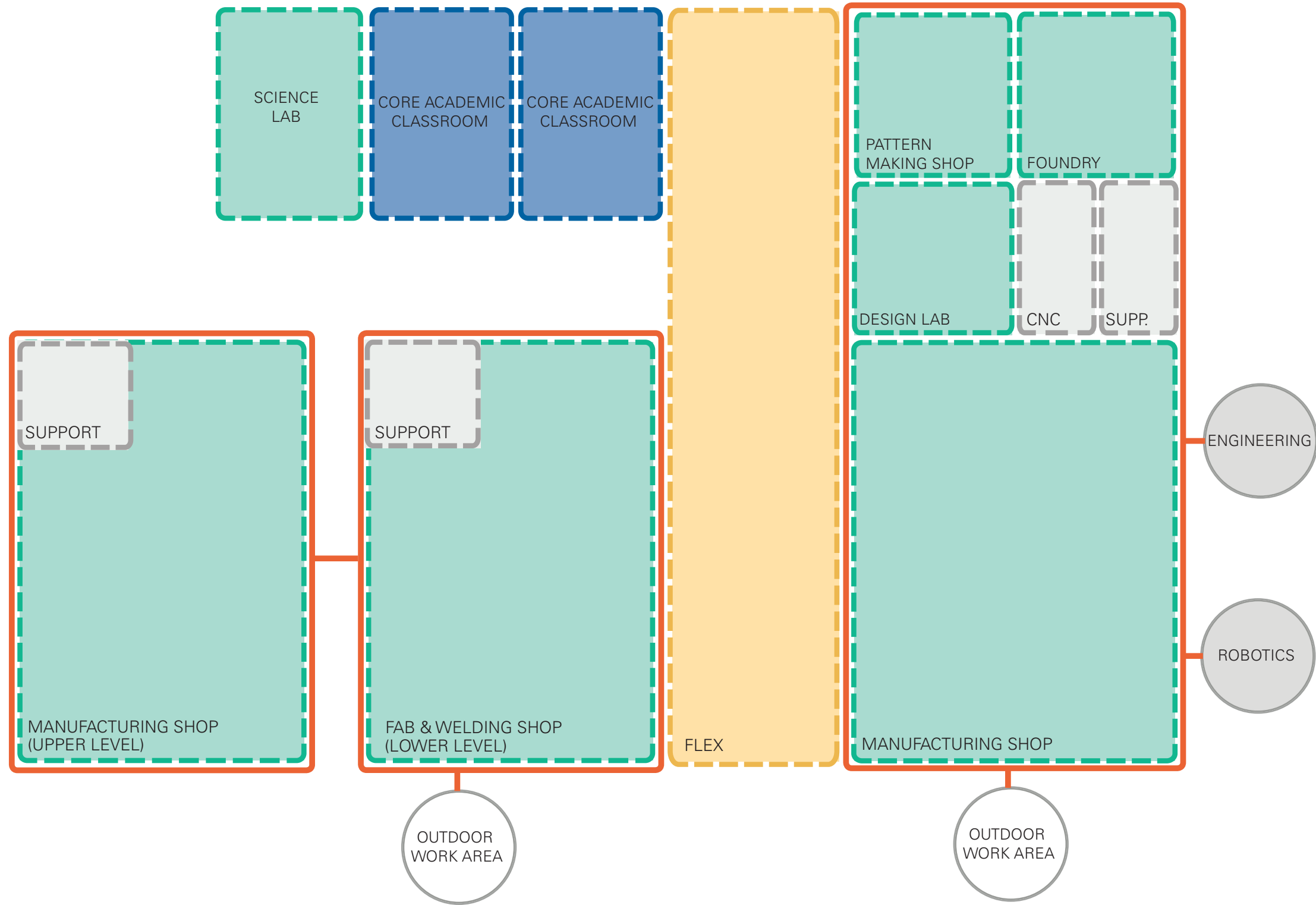
### ROOM SPECIFIC TECHNICAL DATA

- + No specific requirements, match general technical requirements



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CTE SUITETYPE D : MANUFACTURING



### MANUFACTURING EQUIPMENT LIST

Room Name	Item	Quantity	Manufacturer	Item/Model Number	Footprint	Working space footprint	Technical Requirements / Comments
MANUFACTURING SHOP							
	12"x36" Tabletop Lathe /Cylindrical Grinder	1	Unknown	95871	30 x 66	48 x 66	
	12x30 Lathe	1	Hendey machine co.	44091A	36 x 96	54 x 96	600 V Connects to Power
	14" Lathe	1	Lodge & Shipley		42 x 144	60 x 144	Connects to power
	16" Lathe	1	Lodge & Shipley		60 x 120	66 x 120	Connects to power
	16x54 American Pacemaker Lathe	1	The Chase A Strelinger Machinery, Supplies, Tools, & The American Toolworks Co		42 x 132	60 x 132	Connects to power
	16x78 American Pacemaker Lathe	1	The American Tool Works Co.		36 x 144	54 x 144	Connects to power
	24x12 Laser cutter	1	Epilogue mini		24 x 36	24 x 36	30 , Connects to Power
	6"x12"Surface Grinder	1	Central Machinery	33732	36 x 36	36 x 60	110 V, 60 Hz, Connects to Power
	612 Micromaster Surface Grinder	1	Brown and Sharpe	612	48 x 42	48 x 72	Connects to Power
	Acra Turn 15.5x40 Lathe	1	Blount Inc.	28572	36 x 96	54 x 96	220 V, 3.22 KW, 4.8 P, Connects to Power
	Anvil on a stand	2	Unknown		12 x 24 x 32		None
	Arbor press	1	Dake	2 1/2	12 x 24 x 32	24 x 48	None
	Bandsaw	1	Wellsaw	613	24 x 60	48 x 72	
	Bandsaw - Large	1	Coal Metalmaster		42 x 72	60 x 96	
	Beverly Shear	1	Beverly	B-2A	9 x 12 x 36		None
	Box & Pan Brake	2	Jet	HB-2248 and BP- 2248	13 x 52	36 x 54	None
	Carbide Grinder	1	Hammond	WD-10-C	30 x 48	36 x 96	208/ 350 V, Connects to Power
	Carlton Radial Drill Press	1	Carlton		132 x 36 x 180	132 x 132 x 180	Connects to Power
	Cincinnati Large Milling Machine No.3 & 4	2	Cincinnati	3 and 4	96 x 96	120 x120	Connects to Power
	Clark Hardness Tester	1	Clark Instrument area	US 12	18 x 24	18 x 42	Connects to Power
	Coolant mixer	1	Dema		8 x 8		
	Dimension bst 768- 3-d Printer	1	StrataSYS	Dimension bst768	30 x 36	30 x 36	100-240 V, 12-6 Amps, 50-60 Hz, Connects to Power
	Drill press - Standalone	2	Boice Crane		36 x 36	48 x 60	208 V, 5.6/4.6 Amps, Connects to Power
	Drill press - Tabletop	2	(1) Jet (2) Rockwell/Delta	(1) OR-1758 (2) 15- 655	18 x 30	24 x 60	(1) 115 V, Connects to Power
	Dynamyte 1007 CNC Mill	1	Dynamyte	1007	48 x 48	60 x 72	Connects to Power
	Dynamyte 2400 CNC Mill	1	Dynamite	2400	30 x 36	36 x 60	Connects to Power
	Electric Metal Saw	1	Everett Industries Inc	12A	24 x 30	36 x 48	Connects to Power
	Electrical Discharge Machine (EDM)	1	XLO Lectra-Form		48 x 60	60 x 84	Connects to Power
	Emco Concept CNC Mill 55	1	Emco	Concept Mill 55	42 x 46	48 x 72	110/230 V, 50/60 Hz, Connects to Power
	Emco Concept Turn 55 Tabletop CNC Lathe	1	Emco	Concept Turn 55	36 x 36	35 x 72	110/230 V, 50/60 Hz, Connects to Power
	Endmill Sharpener	1	Darex	E-85/90	18 x 18	24 x 48	115 V, 3.2 Amps, 50/60 Hz, Connects to Power
	Gas forge	1	Johnson Gas Appliance co	142-5	30 x 60	36 x 84	Connects to Power and Exhaust

## MANUFACTURING EQUIPMENT LIST

Room Name	Item	Quantity	Manufacturer	Item/Model Number	Footprint	Working space footprint	Technical Requirements / Comments
	Grinder	2	(1)Unknown (1) Baldor		24 x 36	36 x 48	208-220/440 V, 3-2.8/1.4 Amps, Connects to Power
	Grinder Buffer-Tabletop	6	(2) Baldor, (1) Stanley (1) Darex (1) Central Machinery (1) unknown		12 x 22	36 x 36	115 V, 60 Hz, 6.3 Amps, Connects to Power
	Hydraulic Press	1	Jet	HP-70	30 x 30	48 x 48	
	Junior Lathe	1	Menziken Machine Works LTD.		36 x 120	54 x 120	Connects to Power
	Precision Lathe	5	South Bend	14602 TKX	34 x 72	48 x 72	206 V, 60 Hz, Connects to Power
	Lift	1	Walker	J-816 E	24 x 84		Connects to Power
	Lockers	126, 3 types, see notes	Various, see notes				90 small under counter lockers, LYON (10"x12"), 6 under counter lockers,LYON (3'x3'), 30 wall lockers, double height, Republic steel Corp. Berger Division (10"x3')
	Logan 14" Lathe	1	Logan Engineering Co	6561H	36 x 84	54 x 84	Connects to Power
	Magnifying Glass-Optical Comparator	1	MicroVu	400	18 x 30	18 x 48	117 V, 3 Amps, 50-60 CPS, Connects to Power
	Milling machine- Series I-2HP	8	Bridgeport		48 x 60	72 x 96	
	Model H Milling Machine	1	Milwaukee	H	60 x 60	84 x 84	Connects to Power
	Monarch Lathe	1	Monarch Machine Tool co	14" C	42 x 132	60 x 132	Connects to Power
	Orac CNC Lathe	1	Orac		24 x 42	48 x 42	Connects to Power
	Pexto Bar Folder	1	Peck, Stow & Wilcox co.	63F	24 x 42	36 x 42	None
	Pexto Corner Notcher	1	Peck, Stow & Wilcox co.	PS-66	18 x 20 x 36	20 x 36	None
	Pexto Foot Shear	1	Peck, Stow & Wilcox co.	137-L	44 x 48	48 x 72	None
	Sander - Tabletop	1	Burr King		22 x 30	36 x 36	115/230 V, , 13.4/ 8.4 Amps, Connects to Power
	Screw machine	1	Brown & Sharpe Manufacturing. Co		38 x 216	60 x 216	440 V, Connects to Power
	Shop Vacuums	5	Various				
	Sink	1	unknown		60 x 60	96 x 96	
	Slip roller	1	Berkroy	R-624	10 x 36	34 x 36	None
	SO Tool and Cutter Grinder	1	Feinme Chanik Michael Deckel	87-23367	15 x 18	24 x 24	Connects to Power
	ST/8 CNC Slant Bed Lathe	1	Rhino		32 x 72	42 x 72	Connects to Power and Air
	Sterling Drill Bit Grinder	1	McDonough		18 x 36	24 x 60	Connects to Power
	Storage/miscellaneous		ictures and notes				
	Stryco Welder	1	Stryco		20 x 20	36 x 36	320 V, 18 Amps
	Tool and Cutter Grinder	1	K.O. Lee Co.	B2062BB	36 x 48	48 x 60	Connects to Power
	Turret Lathe	1	Colcord-Wright Machinery & Supply co.		48 x 216	66 x 216	440 V, Connects to Power
	Victor -1640B Precision Lathe	1	Victor	1640B	36 x 84	54 x 84	Connects to Power
	Vise grips	8	Wilton		12 x 12	12 x 36	None

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### MANUFACTURING EQUIPMENT LIST

Room Name	Item	Quantity	Manufacturer	Item/Model Number	Footprint	Working space footprint	Technical Requirements / Comments
<b>PATTERN MAKING SHOP</b>							
	20" disc sander and grinder	1	MAX		28 x 50	54 x 60	230/460 V, 8.5/4.3 Amps, Connects to Power
	7" grinder	2	Chawn		18 x 24	24 x 36	115/230 V, 6.6/3.3 Amps , Connects to Power
	Apex grinder	1	Apex	16-SDD	24 x 42	42 x 60	220/440 V, 4.8/2.4 Amps , Connects to Power
	Ball Bearing Grinder	2	Stanly (1), Blue Point (1)	677 (s) , BG333(bp)	22 x 24	24 x 42	11 V, 5 Amps (s), 115 V, 4 Amps (bp), Connects to Power
	Bandsaw	2	Northfield foundry and machine do	34B7	24 x 56	36 x 72	208 V, 60 ha, Connects to Power
	Bandsaw 36	1	Crescent	7694	32 x 60	42 x 84	Connected to power
	Buffer-small	2	Delta (1), baldor(1)	438-02-314-0204	14 x 26	36 x 36	115/230 V, 6.6/3.3 Amps, Connects to Power
	Drill press- tabletop	1	Rockwell delta	15-665	14 x 24	24 x 48	115/230 V, 11.2/5.6 Amps, Connects to Power
	Drill press-standalone	1	Powermatic	1100	14 x 30	36 x 54	Connected to power
	Furnace -small	1	Neycraft pro		15 x 15		Connected to power
	Glider Trim Saw	1	Hammond	G 100	20 x 36	24 x 54	208-220/440 V, 4.3-42/2.1 Amps, Connects to Power
	Hydraulic Ram	1	DAKE		24 x 24	24 x 42	44-251, Connects to Power
	ITE Switchboard	1			24 x 38	24 x 38	120/208 V, Connects to Power
	Jointer	1	Powermatic	60	28 x 66	42 x 84	Connected to power and exhaust
	Lathe	8	Rockwell Delta (7), Yates American (1)		25 x 60	48 x 60	Connected to power
	Lockers	1	LYON		10 x 14 x 22		
	Mill	1	Lagun-Republic	3620	60 x 84	108 x 72	Connected tompower
	Mitre Saw	1	Makita	LS1011	20 x 30	24 x 48	
	Orange cylinder	1			32" diameter		
	Oscillating Spindle Sander	2	MAX (1), Master (1)		24 x 24	48 x 48	115 V, Connects to Power and Exhaust
	Painting station	1	N/a		56 x 66		One table separated into 4 sections
	Planer	1	Powermatic	160	42 x 48	48 x 60	Connected to power and exhaust
	Precision Lathe	1	South bend	Model A	22 x 63	36 x 66	
	Radial Arm Saw	1	Dewalt- black and decker		32 x 38	36 x 40	Connected to power and exhaust
	Radial Sander	1	Rockwell delta		18 x 20 x 36	24 x 36	Connected to power
	Table saw	1	Unknown		42 x 56	60 x 60	Connected to power and exhaust
	Unidentifiable	1	Grob inc	RW-A	14 x 14		230 V, 20'Amps
	Vacuum sealer-CentraCaster	1	Vaniman		15 x 24		
	Work tables	7	N/a		54 x 65		
	Work tables large	2			36 x 116		
<b>FOUNDRY</b>							
	Abrasive Belt Grinder	2	MAX		24 x 36	48 x 60	208-220/440 V, 6/3 Amps, connects to power
	Bandsaw	1	Rockwell		30 x 42	48 x 48	
	Bucket Loader	1	National engineering		84 x 108		Lots of connections. See pics

### MANUFACTURING EQUIPMENT LIST

Room Name	Item	Quantity	Manufacturer	Item/Model Number	Footprint	Working space footprint	Technical Requirements / Comments
	Buffer	1	Clark		30 x 66	48 x 72	Connected to power
	Combination Abrasive Cut Off	1	MAX	CAC-16	42 x 66	48 x 84	
	Conveyer Belt	1	Rapistan	351-20-1816-3/4	24 x 528	72 x 600	Working dimension includes wheel conveyer
	Furnace-large	1	Inducto inductotherm co.		36 x 72	36 x 72	
	Furnace-small	1	Inducto		24 x 30	30 x 60	See pics
	Furnace-small round	1	Speedy-melt		32" round	32 x 72	See pics
	Grinder	1	Unknown		30 x 36	36 x 48	
	Half circle sink	1			36 x 54		
	ITE Switchboard	1	Unknown	FC-1	24 x 38	24 x 38	
	Mix Muller	1	Simpson		48 x 60	48 x 72	Connected to power
	Sand barrel	2	None		50 x 38		Rolling cart-moveable
	Sand blaster	1	Unknown		48 x 66	66 x 72	
	Sand Press	1	Osborn	213-PJ	42 x 42	42 x 60	No visible connections
	Sand Sifter	1	Foundry supplies fg co.- universal	12 1 66	24 x 24		Handing from ceiling beam and connected to table
	Workstations	16	None		30 x 48	42 x 48	
FABRICATION AND WELDING LAB							
	Anvil on a stand	1	Unknown		12 x 26	Unknown	None
	Bar Folder	2	(1) Niagara no.4 (2) Peck, stow, & Wilcox	(1) 358 (2) 63 F	24 x 48	48 x 48	None
	Bending Brake-Large	1	W. Whitney Stueck inc	422	18 x 54	36 x 60	None
	Bending Brake-Small	2	Unknown		12 x 48	2/ 168 x 42 table	None
	Beverly shear	2	Chicago 55 and hand nib model 4		8 x 34	12 x 36	None
	Buffer / Grinder-Small	1	Baldor		20 x 32	36 x 36	208-220/440, Connects to Power
	Cutting Torch	1	Victor	2400	24 x 24	On a 4' x8' table (table top is a metal rack)	115 V, Connects to Power
	Delco Sander	1	Delco		24 x 30	24 x 48	Connects to Power
	Dialarc 250 AC /DC	13	Miller		20 x 28		AC: 225 Amps at 29 V, DC: 175 Amps at 27 V, Connects to Power
	Drill Press	1	Rockwell / Delta	15-655	17 x 32	36 x 48	Connects to Power
	Dvorak Hydraulic Iron Worker	1	Little Scotchman Industries	314	20 x 42	36 x 48	Connects to Power
	Furnace-Small	2	Johnson		9 x18	24 x 30	Connects to Power, small exhaust hood
	Grinder-Large	1	Unknown		24 x 34	30 x 36	Connects to Power
	Grinder-Small	1	Rockwell/Delta		18 x 24	30 x 36	Connects to Power
	Hand Brake-Large	1	Chicago	416	42 x 76	48 x 84	None

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Room Name	Item	Quantity	Manufacturer	Item/Model Number	Footprint	Working space footprint	Technical Requirements / Comments
	Hand Press Brake	1	Di-Acro Houdaille	J-1788	26 x 28	36 x 48	None
	Hinge Type	1	W. F. Wells and Sons Inc		24 x 48		Connects to Power
	Lockers	See notes	N/a		See notes		112 small under counter lockers, 1 long lock per 28 lockers, LYON ( 10"x12"), 5 under counter lockers,LYON (3'x3'), 30 wall lockers, double height, Republic steel Corp. Berger Division (10"x3')
	Notcher	1	Di-Acro Houdaille	A-3805	18 x 18	24 x 36	None
	Pexto Parts Holder	1	Pexto		24 x 38		None
	Pexto Sheet Metal Stomp Shear-Small	1	Peck, stow, & Wilcox	137-L	46 x 58	48 x 72	None
	Rotex Punch	1	Rotex	18-A	24 x 44	30 x 60	None
	Sander-Tabletop-Small	1	Kalamazoo industries		10 x 16	22 x 26 work table	115/208-230, Connects to Power
	Sheet Metal Jump Shear-Large	1	Peck, stow, & Wilcox	152-J	60 x 78	60 x 96	None
	Slip Roll	1	Peck, stow, & Wilcox	381-D	12 x 54	36 x 60	None
	Spot Welder	1	ACME	2-24-30	32 x 54	36 x 72	208 V, Connects to Power
	Unknown Circular Standing Tool	1	Unknown		24 x 36	36" radius	None
	Vise grip-Standalone	2	Wilton		12 x 18	24 x 24	None
	Vise grip-Tabletop	1	Wilton		12 x 18	24 x 24	None
	Welding station-Cubicle	14	N/a		36 x 84	84 x 102	
	Welding Stations-Open	6	N/a		One station: 36 x 48	Entire module: 96 x 144	Connects to Power
	Work tables	3	N/a		48 x 96		None
	6' x 10 Gauge Metal Shear	1	Pexto	10-U-6A	114 x 138	120 x 168	Connected to power
	Air/gas cylinders	5	Unknown		24 x 42		
	Anvil on a stand	1	Unknown		12 x 24		
	Bar Folder	1	Pexto	63-G	30 x 42	48 x 54	None
	Bar Folder-Small	1	Niacara		24 x 32	38 x 48	None
	Bending Brake	2	Connecticut	U422	24 x 60	48 x 60	None
	Beverly Shear	1	Beverly Shear		11 x 44	48 x 48	None
	Drill press	1	Wilton	20600	24 x 30	36 x 48	220 V, 3.8/3.1 Amp, Connected to power
	Gas forge	1	Johnson gas co	133-B NAT	24 x 42	36 x 48	Connected to gas
	Grinder/buffer	1	The standard electric tool co		24 x 38	36 x 42	Connected to power
	Grinder/Sander	1	Cutler hammer		24 x 28	36 x 36	
	Hand Brake	2	Chicago Dreis & Krump	BP0.412-6	48 x 96	60 x 108	None
	Hand Brake 2	1	Whitney Jensen	414	48 x 80	60 x 84	None
	Hand Brake-Extra Large	1	Chicago	S-816	48 x 144	72 x 144	None
	Hand Nib	1	Heinrich		12 x 36	26 x 48	None
	Hand Slip Roll-Large	1	Pexto		24 x 72	42 x 78	None
	Hand Slip Roll-Small	1	Roper whitkey	381 D	14 x 54	36 x 60	None

### MANUFACTURING EQUIPMENT LIST

Room Name	Item	Quantity	Manufacturer	Item/Model Number	Footprint	Working space footprint	Technical Requirements / Comments
	Hossfeld Bender	1	Hossfeld		12 x 60	48 x 60	None
	Hydraulic Press Brakes and Shears	1	Pacific	40-6	42 x 72		Connected to power
	Lennox Tru-Edge Metlmaster	1	Lennox Metlmaster-Portland machinery co	TE-100	24 x 528	36 x 72	Connected to power
	Lockers	28/24	Unknown		See Notes		28 double stacked lockers (10"x3') – 24 small under table lockers (10"x12")
	vise grip	6	Wilton/1 Reed		12 x 24	24 x 36	None
	Miller Dialarc 250 AC/DC	5	Miller	250	24 x 36		200/230/460 V, 103,90,45 Amps, 60 Hz, connected to large breaker boxes
	Miller Diversion 130	1	Miller	130	15 x 39		Connects to Power
	Miller Sidekick	3	Miller		12 x 36		115 V, 26 Amps, 2.17 KW, 60 Hz, connects to air and power
	Miller Syncrowave 250	1	Miller	250	20 x 42		200/230/460 V, 110.4/96/48 Amps, 60 Hz, connects to power
	Miller Syncrowave 350 LX	1	Miller	350	30 x 42		Connects to Power
	Miller Thunderbolt XL	1	Miller		12 x 18		25 V, 225 Amps, connects to power
	Millermatic 200,200,35,252	4	Miller		12 x 44		200/230 V, 46/40 Amps, 8.3 KW, 60 Hz, connects to air and power
	Nichols-Unidentifiable	1	Nichols		18 x 30	36 x 48	None
	Notcher	1	Whitney metal tool co		18 x 24	24 x 36	None
	Pexto Foot Shear	1	Pexto	152	60 x 72	66 x 96	None
	Piranha	1	Piranha		24 x 72	48 x 96	
	Right Angle Tool Div	1	Unknown		18 x 40	30 x 60	None
	Roll Formers on a Circular Stand	rollers, one st	Pexto	5.44-A	36 x 36	60 x 60	None
	Rotex punch	1	Unknown		24 x 42	30 x 54	None
	Sander	1	Westinghouse electric co		24 x 30	20 x 48	208-220/440 V, 3.4-4/1.7 Amps
	Storage and misc						
	Stryco Spot Welder	1	Stryco	D24-30 FT	30 x 60	42 x 78	208 V, 144 Amps
	Work tables	7	Unknown		48 x 96		
	Yellow Sheet Storage racks	2	Unknown		54 x 120 and 42 x 54		
<b>CNC SHOP</b>							
	CNC Plasma Cutter	1			48 x 96		
	CNC Mill	1	Bridgeport	J29203	60 x 96	96 x 96	Connects to Power
	Comet CNC	1	Comet		96 x 108	120 x 120	Connects to Power
	Computer lab area	19 comp	PC				
	CNC	1	Dyna	EM 3116	72 x 90	108 x 84	Connected to power
	CNC techno 1 and 2	2	Isle-automation	242525 0001	30 x 32	42 x 78	Working area includes computer station

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