Boulder Creek Building
Program Plan

COMMUNITY COLLEGE OF DENVER

16 JUNE 2016

Acknowledgements

Community College of Denver

Chris Arcarese
Judi Diaz Bonacquisti
Christopher Budden
Robert Browning
Kevin Dowell
Rhonda Epper
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Stephanie Harrison
Michael Kupcho
Mike Miller
Anthony Rubino
Kevin Seiler

Auraria Higher Education Center

Carl Meese
Jeff Stamper
Barb Weiske

RNL

Jordan Block
Fritz Gale
Josh Gould
Sydney Hamilton
Maggi Hattman
Ace Martin
Daniel Navarro-Gomez
Amy Tabor
Stephanie Wood

MK Think

Allan Donnelly

Shaffer Baucom Engineering and Consulting

Cody Johnson
Jason Ridl

Rimrock Group

John Worgan

Jones Lange Lasalle

Brad Boyle
Krista Trofka

the names of student participants have been kept anonymous

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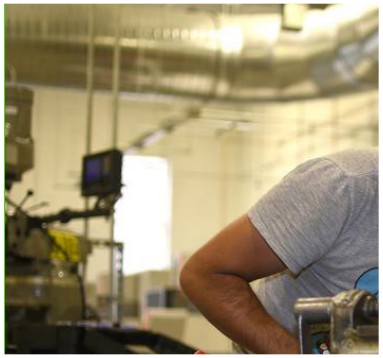


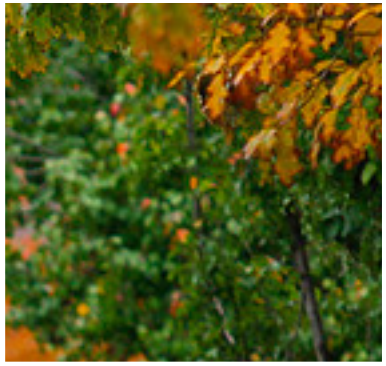
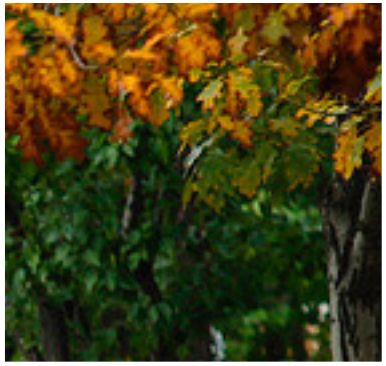
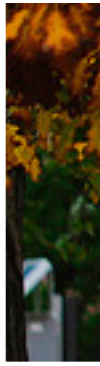


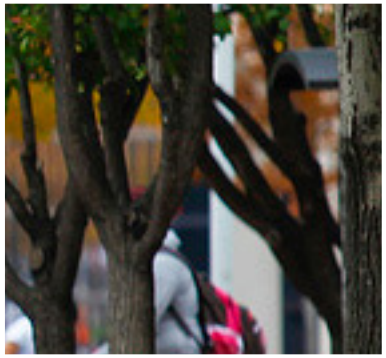

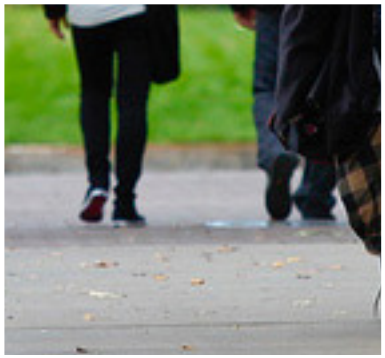

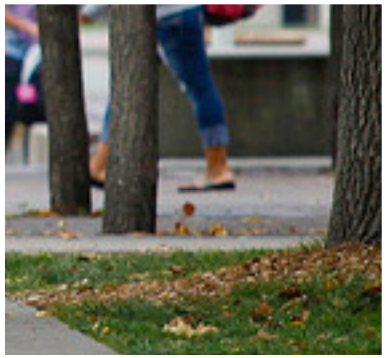
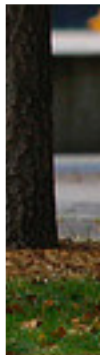

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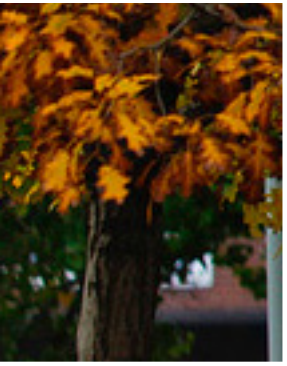
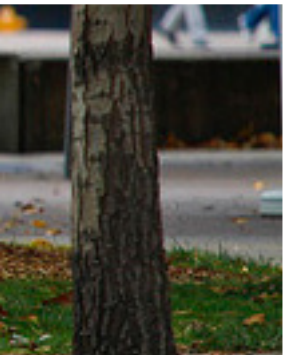






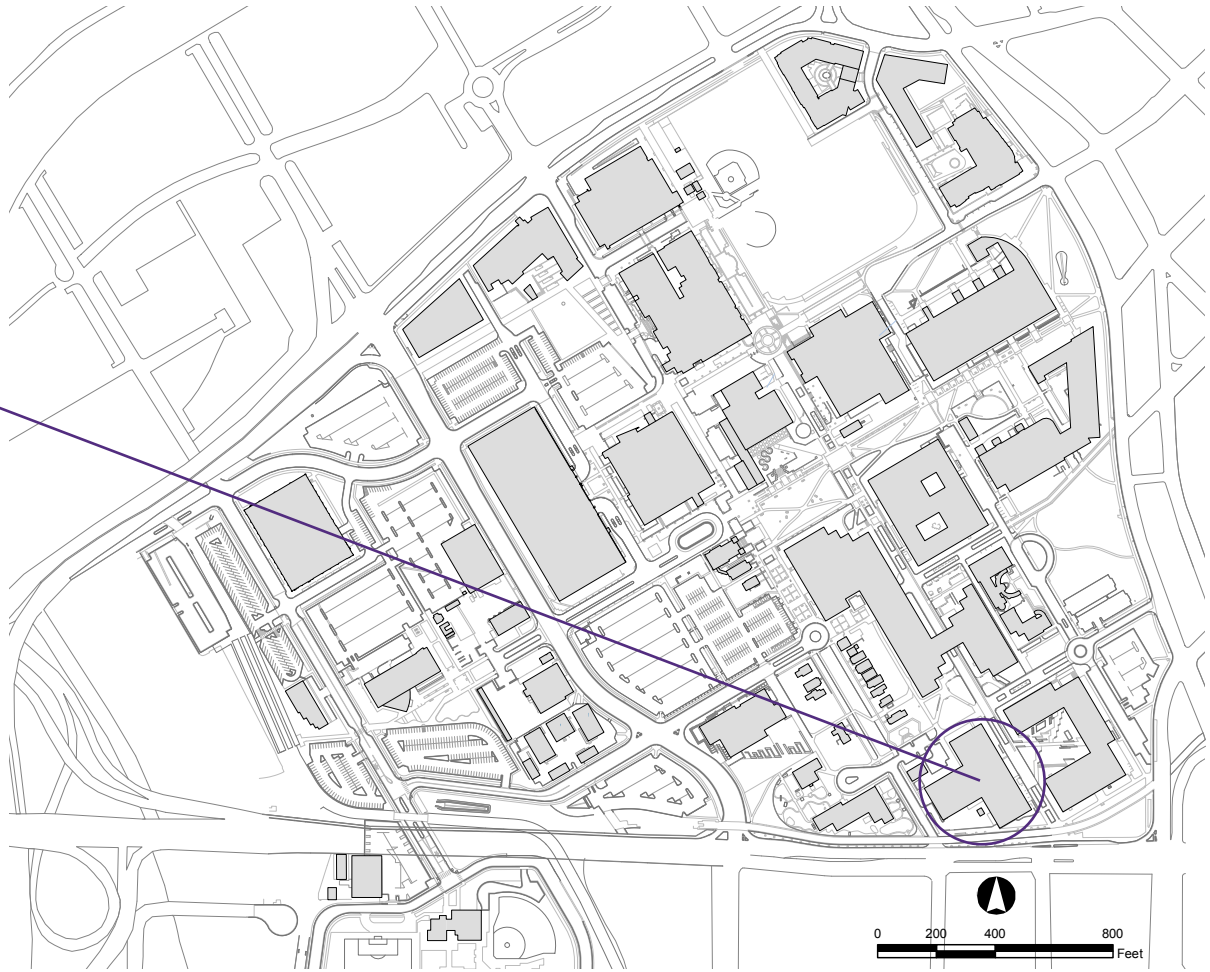

VERVIEW

Executive Summary

Boulder Creek is an important building in the Community College of Denver (CCD) neighborhood because of its prominent location on the Colfax Avenue edges of the Auraria campus. Positioned between 9th and 10th Streets in front of the light rail station, it has a unique opportunity to serve as a gateway into the institution's neighborhood and to further distinguish CCD as one of three important institutions sharing the campus.

Constructed in 1974, the Boulder Creek building is a single-story, tee-shaped brick building with a mixture of classrooms, teaching labs and computer labs, located on the Auraria Higher Education Center (AHEC) Campus. It is approximately 63,700 gross square feet (GSF).

Currently, Boulder Creek is shared among all of the three Auraria institutions - Metropolitan State University of Denver (MSU Denver), the University of Colorado Denver (CU Denver) and CCD. As part of a campus master plan that aims to better define neighborhoods for each of the three individual institutions, the Boulder Creek building is slated to be dedicated solely to CCD functions. As this transition takes place, it is critical that Boulder Creek take advantage of the opportunity to enhance its position as a gateway and a signature



building. It is also critical that the best inhabitants be selected to backfill the building in order to meet the institution's strategic goals.

This study proposes to enhance the building's position through a series of critical strategies:

- identify opportunities to enhance the building exterior in order to create inviting spaces for campus visitors and users
- place the most appropriate user groups in the building to satisfy affinity and space needs and use the building as efficiently as possible
- align with both the Neighborhood and Campus Master Plans

Through the course of this study, a variety of investigative strategies have been employed to arrive at the best solution for Boulder Creek. These have included interviews and surveys with user groups including students, faculty, staff, and Auraria representatives, workshops, visioning sessions, open houses, test fits, alternatives analyses and third party reviews. Through this iterative process, the study arrived at the solution described in the following pages.

It is proposed that the Health Sciences Center, currently located approximately 7 miles east of campus in a satellite location, be relocated to the main campus. This provides a number of important opportunities for both Health Sciences and CCD overall. Health Sciences is at a disadvantage in its current location because it does not have convenient public transportation options and is in competition with similar institutions offering similar programming, often at a lower cost. Locating it on the main campus would not only alleviate these disadvantages but would also provide the Center with increased revenue-generation opportunities through its Veterinary and Dental programs. This is further described in the following pages.

The Nutrition program currently borrows a kitchen from a working cafe located off-campus. This is not an ideal situation because of operational issues and because the kitchen is not appropriately sized for teaching, nor is it near other Health Science functions with which it needs to collaborate. It is recommended that this program be included in the Boulder Creek building along with a cafe that will be run by the program. By creating an on-campus cafe, the program's needs are satisfied, the program is enhanced and a neighborhood and campus hub is created that provides opportunities for revenue generation, identity enhancement and social engagement.

Human Resources (HR) and Finance, administrative groups currently housed in the Administration building across campus, are also slated for relocation to Boulder Creek. These two departments are required to relocate from their current location to a location within the CCD neighborhood as part of a space swap with MSU Denver that aligns with the Campus Master Plan. It is also preferred that they remain collocated because they work closely together. As such, Boulder Creek is an ideal location as it accommodates all of these needs.

In addition to relocating Health Sciences, HR and Finance to the building, it is proposed that an addition be constructed along the Colfax Avenue edge. This addition accomplishes several important things. It enhances the edge condition in front of the light rail station and it provides space for Health Sciences classrooms and faculty offices.

All of the CCD user groups that are currently housed in the building are slated to remain long term. It is recommended that the Computer Lab be downsized such that additional satellite locations be provided in new locations in the neighborhood. This addresses a request made by both students and faculty for dispersed computer lab services.

The proposed phasing plan is dependent upon available funding, cooperation between institutions for planning moves and final approval of the recommendations. Regardless of start dates, the phasing represents a sequence of events that will allow the various user groups to relocate to their long-term locations with few duplicate moves, thereby reducing cost and disruption. The most defined part of this plan is the short-term timeframe, which proposes that the initial remodels and relocations begin in 2018.

Time frames are defined as short-term (within the next 5 years), mid-term (within 6 to 8 years) and long-term (9 years or longer).

Based upon program information, phasing assumptions and preliminary renovation scope definitions, the total project budget is estimated to be **$23,590,783**. This includes an estimated renovation and new construction cost for Boulder Creek at $21,934,240, costs to renovate and disperse the computer lab at $521,131 and a project contingency. CCD is planning on contributing 6% of the total project cost. A final phase of remodel may not occur until the mid-term depending upon UC Denver's ability to relocate its lab space from the building.

The table below describes the space requirements of the departments slated to occupy space in Boulder Creek. The current assumption is that all of the non-CCD functions will be moving out of Boulder Creek.

BOULDER CREEK SPACE PROGRAM

Current Boulder Creek occupants to remain	Projected Need
Arch Tech	2,300 ASF
CCD general use computer lab (downsized)	2,292 ASF
CCD Engineering Graphics	1,733 ASF
CCD Math & Science Maker Space	950 ASF
CCD Visual Arts	1,796 ASF
CCD General Assignment Classrooms	3,953 ASF
CU Denver labs and studios (short-term)	10,757 ASF
Occupants to be relocated to Boulder Creek	
HR	2,213 ASF
Finance/CFO	3,007 ASF
Nutrition Teaching Kitchen	2,990 ASF
Health Sciences	27,752 ASF
TOTAL	59,742 ASF
Total available space in Boulder Creek	46,871 ASF

Description of Programs Being Affected

MSU Denver departments slated for relocation from Boulder Creek include Engineering Tech, Industrial Design and Nursing. CU Denver departments that will need to be relocated include Civil Engineering and Visual Arts.

The following CCD occupants are candidates for relocation to or consolidation in Boulder Creek.

Current CCD occupants to remain:
Architectural Technology class and lab space
CCD General Use Computer Lab
Engineering Graphics lab space
Math & Science Maker space
Visual Arts class and lab space

New CCD occupants:
Nutrition Teaching Kitchen and Cafe
Health Sciences
Human Resources
Finance/CFO

The Advanced Manufacturing Center (AMC) Machining and Welding programs were also considered for relocation to the Boulder Creek building but have been determined to be better suited elsewhere. A full description of the AMC is provided in the Appendix. Refer to the Neighborhood Master Plan for further information.

The following pages provide descripitons of each of these CCD occupants along with their current space needs. Detailed space needs assessments are included in the Appendix. Additional description of the methodologies used to project future space needs is provided in the Program Requirements and Projections section.

CENTER FOR CAREER AND TECHNICAL EDUCATION (CCTE)

Programs Being Affected

- Engineering Graphics-Mechanical
- Architectural Technology

Current Locations

- Class and Lab spaces for Engineering Graphics-Mechanical, and Architectural Tech are currently located in the Boulder Creek building. Faculty offices are located elsewhere on campus.

Existing Conditions

- The Architectural Technology program has no model shop, and would like to add this capability.

Emerging Issues

- Growth areas include the Architectural Technology program.
- It is not necessary to consolidate the Engineering Graphics-Mechanical and Arch Tech faculty offices with their class and lab spaces.

Engineering Graphics-Mechanical:
faculty: n/a (not slated for relocation to Boulder Creek)
existing ASF: 1,733*
current required ASF: 1,733*
2030 projected ASF: 1,733*

Architectural Technology:
faculty: n/a (not slated for relocation to Boulder Creek)
existing ASF: 1,142*
current required ASF: 2,320*
2030 projected ASF: 2,300*

*excluding faculty space

CENTER FOR HEALTH SCIENCES

Programs Being Affected

- Nurses Aid Program
- Medical Assistant Program
- Home Health Aid Testing (for PASCO)
- Radiation Therapy Program
- Mammography Program
- CT Scanning Program
- Veterinary Tech Program
- Emergency Medical Tech Program
- Dental Hygiene

Current Locations

- Lowry Campus – two buildings: one dedicated to the Dental Program and Clinic, the other for all other programs
- One newly created class/lab in the Cherry Creek Building for the Nurses Aid Program.

Existing Conditions

- This campus location does not include any of the amenities or student services that the main campus offers including student life, student support, advising, etc., nor food or public transportation options.
- The Dental Clinic could downsize if brought onto the main campus by redesigning exam space from individual rooms to a group exam layout and by sharing class/lab space with other programs.
- There is surplus space in the main Lowry Building. Much of the space was originally built to support the Nursing Program, which was eliminated. The classroom space could be reduced significantly. Some lab space could also be eliminated or downsized if relocated.
- There are special requirements for some of the labs including:
  - Radiology and Dental Hygiene need a lead lined room for X-ray equipment use.
  - The Vet Tech program requires a dark room and a dissection room. The latter is a full wet lab, with regular use of formaldehyde and other toxic substances.
  - Dental Hygiene and Vet Tech need a vacuum system an compressed air. Both of these programs also need secure storage for pharmaceuticals.
  - All labs require sinks, except for the VERT projection room/computer lab.
- The new class/lab in the Cherry Creek Building houses three simulation beds and can only accommodate one class at a time. It is fully booked.

Emerging Issues

- The creation of the simulation class/lab in the Cherry Creek building has resulted in a doubling of enrollment in the Nurses Aid program which supports the theory that Health Sciences could grow if relocated.
- This Center would like to offer continuing education courses that are not degree programs, which would be a way to expand nighttime use of spaces and could be fee generating.
- There is growing competition on the Lowry Campus and in the surrounding areas from other privately run institutions as well Aurora Community College.
- If the Dental Clinic were downtown, CU Denver is interested in using four dental exam chairs for their program which could be revenue generating for CCD.

Overview

- Ideally if Health Sciences moved from Lowry, the entire program would be under one roof.
- The Vet Tech program conducts spay/ neuter clinics that bring live animals into the building which may need special consideration. However, this too could be a revenue generator and reach a larger clientele base if located downtown.

Health Sciences:
faculty: 55
existing ASF: 31,166
current required ASF: 26,972
2030 projected ASF: 27,752

ADMINISTRATION

HUMAN RESOURCES

Programs
- Stand-alone Department

Current Locations
- Administration Building, third floor

Existing Conditions
- The existing CCD office space in the Administration Building is generally adequate, but inconveniently located.
- The primary deficiency for HR currently is lack of a conference/ training space that can accommodate up to 20 people and that is equipped with virtual meeting technology. Slightly more file storage space is needed.

Emerging Issues
- The need to locate administrative functions within the CCD Neighborhood is a key driver for changes in this Department.
- One location that has been discussed is a 9th Street House, being centrally located, but with some level of privacy for visitors.

FINANCE/CFO/PLANNING/FACILITIES/IT

Programs Being Affected
- Budget/Planning

Current Locations
- Administration Building, third floor

Existing Conditions
- The current space works well, however, the department is required to move from the Admin Building as part of the long-term Master Plan

Emerging Issues
- Budget, Planning, Accounting and Payroll should ideally be together, but do not necessarily need to be in the Cherry Creek Building.

Human Resources:
staff: 7
existing ASF: 1,477
current required ASF: 1,768
2030 projected ASF: 2,213

Finance/CFO:
staff: 16
existing ASF: 3,049
current required ASF: 2,503
2030 projected ASF: 3,007

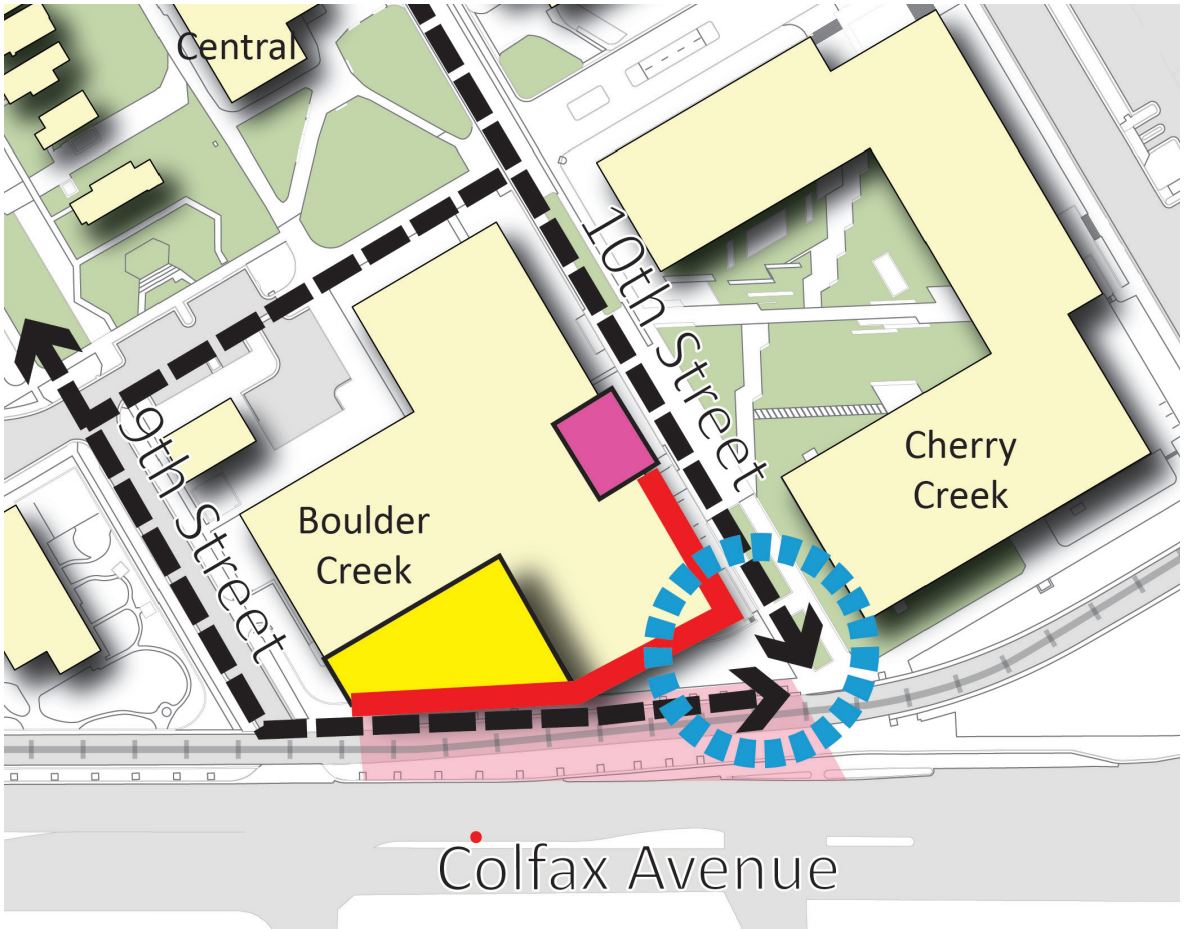
Relationship to the Facilities Master Plan

The idea of expanding the Boulder Creek building with a small addition along its Colfax Avenue edge has been considered in order to add additional capacity to the building as well as to enhance the pedestrian realm and provide identity improvements, such as signage and improved architecture, along this very important edge. Certain other structural and architectural improvements have been proposed in order to enhance the visibility of the entrances of the building, especially along 10th Street, and create an overall stronger presence for the building and its uses. This section describes the urban design goals of the building and its renovations and important considerations as the work develops over time. The importance of enhancing this campus edge was identified in the 2012 Auraria Master Plan and is critical to the success of the CCD Neighborhood Plan as well.

As a result of its presence along Colfax and its position as the point of entry for nearly all students, faculty and staff arriving by light rail at the Colfax at Auraria station, the Boulder Creek building has an opportunity improve its role as the gateway into campus. Currently, the building does not possess the qualities associated with a gateway structure. Gateways are defined by providing an interesting, safe and identifiable arrival to a place. Ideally, a gateway experience will help strengthen the identity of that place with signage, recognizable building forms and materials and other elements special to that place. In order to achieve this, the Boulder Creek building should maximize the structural changes described above in order to create a more interesting and pleasant arrival sequence to the campus. In particular, the definition of its entry way along the 10th Street edge will allow the building to act as a contributor to the overall placemaking and activation of 10th Street, a corridor that has recently been invested in as a more sustainable and comfortable connection.

The southeastern corner of Boulder Creek as it faces the light rail station should also be studied to find opportunities for gateway placemaking. In the short term, improved signage and identification at this primary corner can be applied to the existing structure. As a slightly longer term solution, the corner could see a renovation that would allow it to become more transparent and open up to the plaza adjacent to it. This renovation could look similar to the entryway tower proposed for the 10th Street doorway. The windows on this corner could expand along a larger portion of the façade – both vertically and horizontally – to make the building more inviting from this edge and provide greater visibility. The plaza surrounding this corner may also be reconfigured to improve Boulder Creek's presence and image. This reconfiguration of the plaza may see the wall surrounding this key corner removed and the sunken portion of the plaza peeled back to create a gradual transition from the higher transit plaza to the lower building area. The exact design of this plaza should be considered for a future design study.

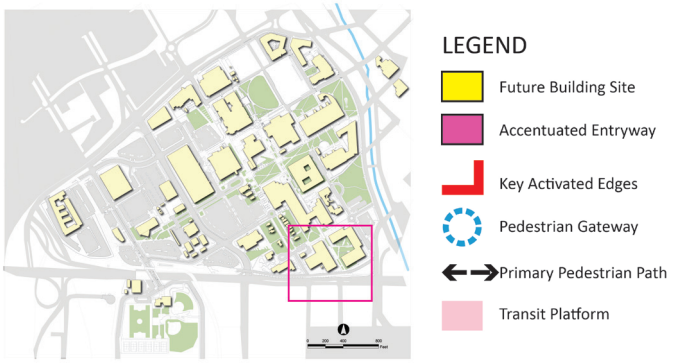
In the long-term, the edge along Colfax and the primary corner should be totally reconsidered. The proposed addition is a great start and will provide several years of usability and improvement over the existing condition. In the future, however, this edge and, potentially, the entire building should be reconsidered in order to provide a great experience along this edge. A taller building (up to five stories) was identified at this site in the 2012 Master Plan. A building of this stature can totally redefine the entry experience and the identity along Colfax – both from a pedestrian experience and from the large number of cars driving by the

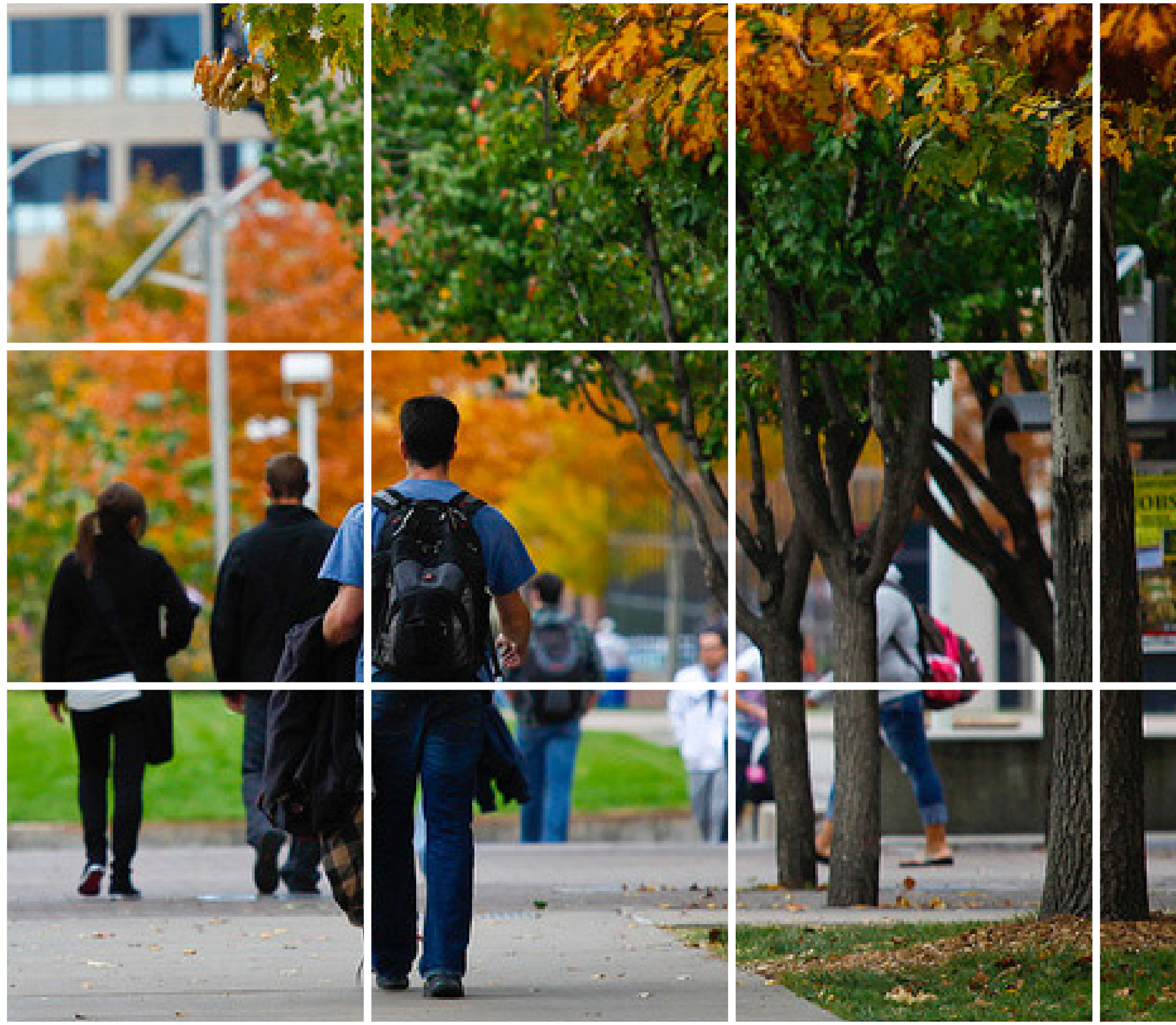


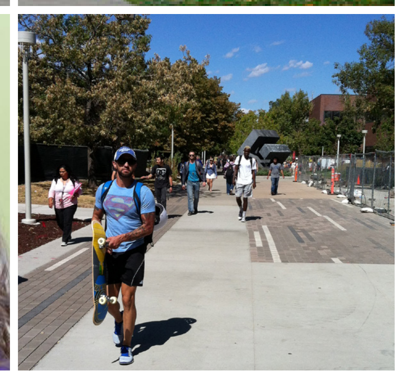
Important Relationships and Design Considerations

campus. This edge can feature prominent signage and identification advertising the Community College of Denver identity. This can include world-class architecture and strong ground floor activation to create a great gateway structure for both CCD and the Auraria Campus.

The primary pedestrian gateway experiences exist along 9th street on either end of the historic park. Coming from the light rail or a class in Cherry Creek, you would enter this new neighborhood center from 9th Street approaching from the extension of St. Francis Way. This experience can be improved over time by the removal of the small surface parking lot adjacent to Boulder Creek and an extension of the historic park's green space. The view of a new building on Site 1 would provide a strong visual endcap to this experience. These changes may happen as Boulder Creek gets redeveloped in the future.







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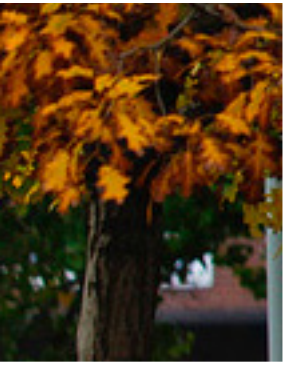
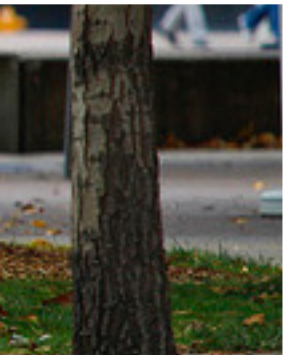











JUSTIFICATION

Justification

Vision

The mission and institutional vision of the Community College of Denver are the fundamental drivers of both the Neighborhood Master Plan and this Program Plan, each of which must support and reflect these overarching ideals.

CCD's MISSION STATEMENT

"CCD provides our diverse community an opportunity to gain quality higher education and achieve personal success in a supportive and inclusive environment." (College website)

The College's vision that "Every member of our community will attain the education he or she desires" is based on the following six key tenants and the inspirational statement

Start Here. Go Anywhere.

- Involvement
- Student-Focus
- Integrity
- Lifelong Learning
- Excellence
- Healthy Work Environment

To uphold the vision and mission, CCD has defined its foundation and goals as follows:

"Community College of Denver's educational programs are designed to enrich the social, civic, and economic fabric of our community, nation, and world. Through innovation, open exploration of ideas, and preparation of a well-trained workforce, CCD enriches our democracy and supports a vibrant local economy. Programs and strategies that promote access—as well as academic and personal success for underserved students—are the foundation of CCD operations."

Goals and Objectives

Specific criteria for success for this project were defined by the Steering Committee during the visioning session for the Neighborhood Master Plan. These criteria included the following six ideals:

- Create a plan that creates a sense of CCD identity and community
- Utilize a process and plan that is inclusive and reflective of all constituents whereby
  - » They see improved value and use
  - » There is consensus
- Create a plan that identifies potential issues with future solutions
- Create a realistic and workable plan that:
  - » Is not "pie in the sky"
  - » Is scaled appropriately for the best fit and highest value
- Create a plan that optimizes existing facilities by considering:
  - » Flexibility to expand/contract and adapt
  - » Increasing efficiencies and utilization
  - » System wide issues
- Create a plan that reflects Tri-Institutional goals and embraces campus planning to date

Priorities

The following four top priorities emerged from these criteria, along with specific objectives to support each priority. These were informed by input from student focus groups, user group interviews, and workshop discussions. They focus on optimizing efficiencies, flexibility, and adjacencies.

PRIORITY #1: Address current space needs issues

- Backfill Boulder Creek space with compelling program
- Backfill Clear Creek
- Find new home for HR, Finance, and IT from the Administration Building

PRIORITY #2: Optimize flexibility and use of current space

- Align adjacencies more effectively
- Optimize use of inefficient classroom and office space

PRIORITY #3: Identify the satellite program(s), if any, to relocate to the main campus

PRIORITY #4: Improve ability to find academic departments and support resources more easily

- Find home for all CCD Administrative functions within their neighborhood
- Consolidate admin/student support functions into one main location
- Bring most CCD faculty into CCD Neighborhood
- Consolidate all academic programs not in shared buildings in a single location

Goals and Objectives

Finally, a set of goals and objectives specific to placemaking were identified to further define the four top priorities:

CREATE A SENSE OF CCD IDENTITY

- Create student hub within the CCD neighborhood with more student activity space
- More food options and user friendly outdoor spaces
- Accessible student study lounge space (e.g. move one in Confluence or change perception)

ADHERE TO THE CAMPUS MASTER PLAN

- Create a clear gateway to the CCD Neighborhood
- Eliminate the Modular Buildings
- Create parking easily accessible from each neighborhood
- Identify near term vs. long term sites for new construction

STRENGTHEN THE CONNECTION TO THE REST OF THE CAMPUS

- Integrate neighborhood with rest of campus – Auraria identity as well as CCD identity
- Improve wayfinding (including signage) within and to/from the neighborhood

IMPROVE GENERAL FEELING OF SAFETY

- Improve access to safe parking at night/early AM
- Improve lighting

The solution proposed for Boulder Creek addresses all of the four defined priorities.

The proposal addresses priority #1 by backfilling Boulder Creek with a compelling program and finding a new home for HR and Finance/CFO.

The proposal addresses priority #2 by aligning the adjacencies of Health Sciences and the Nutrition Teaching Kitchen and Cafe. Bringing these functions to an on-campus location also improves their adjacency to more appropriate customers and improved opportunities for revenue generation. This priority optimizes classroom and office space inefficiency as well.

The proposal addresses priority #3 by identifying Health Sciences as the appropriate satellite program to relocate to campus.

Finally, the proposal addresses priority #4 by improving access to both Health Sciences and the Nutrition Teaching Kitchen and Cafe, by finding a home for administrative functions within the CCD neighborhood, and by bringing Health Sciences faculty into the CCD neighborhood.

The solution proposed for Boulder Creek also addresses all of the four defined goals.

The proposal strongly addresses the goal to create a sense of CCD identity by relocating the Nutrition Teaching Kitchen and Cafe to Boulder Creek. This creates a student hub with expanded food options and user friendly outdoor spaces.

The proposal addresses the goal of adhering to the Campus Master Plan by creating a clear gateway along the Colfax and 10th Street edges. It also identifies a near term site for new construction.

The proposal addresses the goal to strengthen the connection to the rest of the campus by improving wayfinding through the new gateway and by creating a student hub that will serve both CCD and non-CCD students, faculty and staff through the Nutrition Teaching Kitchen and Cafe.

Finally, the proposal strongly addresses the goal to improve the general feeling of safety by activating a plaza that is currently problematic. The new retail services of the cafe, veterinary and dental clinics create continuous activity around the building to improve safety.

Current Space Utilization

Boulder Creek is currently occupied by user groups from CCD, MSU Denver and CU Denver. Most of these spaces are labs and classlabs. The following table and diagram illustrate the building's current uses.

CURRENT SPACE UTILIZATION

Programs to Remain	AREA	Notes
CCD Arch Technology	1,142	rooms 117 and 126
CCD Engineering Graphics	1,733	room 113
CCD general assignment classrooms	2,006	4 total - rooms 104D, 106A, 106E, & 116
CCD general use computer lab	5,263	"Learning Success Services" - rooms 104, 104A, 104B, & 104C
CCD Math & Science Maker Space	950	Rooms 106D & 106D1
CCD Visual Arts	1,694	rooms 106B, 106C, & 108
Shared Classrooms (tri-institute)	1,947	3 total - rooms 112, 130B, & 130C
total currently occupied ASF	**14,735**	
Programs to Vacate		
MSU Denver Engineering Tech Labs	6,447	
MSU Denver Industrial Design class/lab	1,123	
MSU Denver Industrial Design faculty offices	1,459	
MSU Denver Industrial Design Machining Lab	3,200	
MSU Denver Industrial Design Plastics Lab	1,178	
MSU Denver Industrial Design Wood Shop	4,906	
MSU Denver Nursing	3,066	rooms 109 (and attached), 110, 114, & 130D
CU Denver Civil Engineering	7,744	to be relocated in the short-term, to vacate long-term
CU Denver Visual Arts	3,013	to be relocated in the short-term, to vacate long-term
total space becoming available ASF	**32,136**	
total building ASF	**46,871**	
Building Common NSF	9,779	includes corridors, lounges, restrooms, mechanical/electrical rooms, etc.
TOTAL BUILDING NSF	**56,650**	


Boulder Creek Current Occupancy
CCD - 12,788 ASF
MSU Denver - 21,378 ASF
CU Denver - 10,757 ASF
shared/common
circulation

Enrollment and Staffing Projections

Enrollment Projections

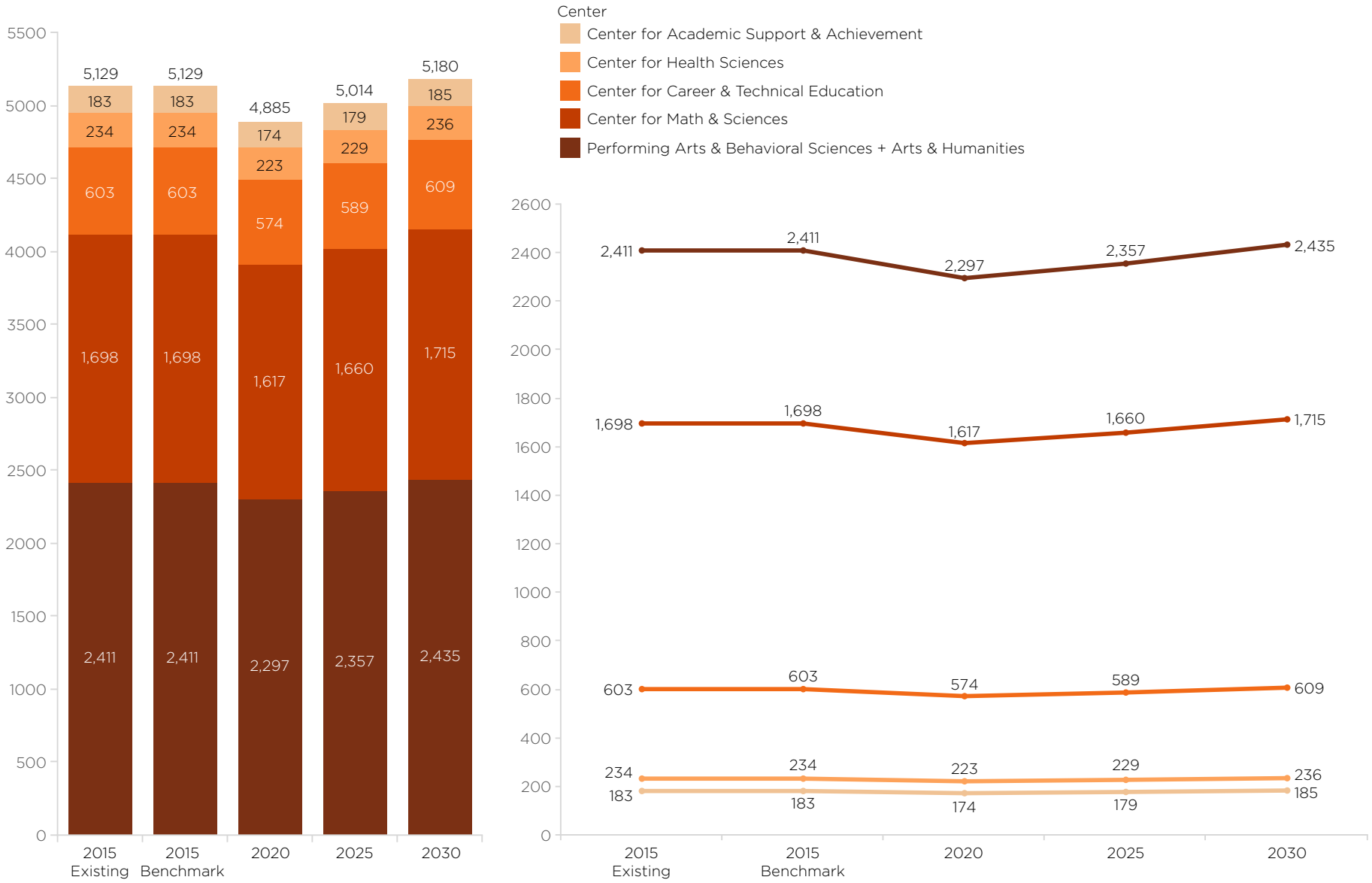
The space needs analysis relies in part on the enrollment trends and projections. Since school facilities can take years to build, projections must look ten to twenty years in advance to assess needs. Current enrollment data was provided by CCD's executive leadership team in the form of a report filed with the State of Colorado. The data used for the CCD enrollment projections came from enrollment growth figures stated by the CCD executive staff. Total full time equivalent enrollment projections were for 2017-2021. Enrollment projections out to 2030 were based on a linear growth rate equal to the average growth rate between 2017 and 2021 (0.652%). Enrollment for academic centers was calculated first by determining the relative proportion of the enrollment for each center to the over all enrollment of CCD, and then applying that proportion to future college-level enrollment projections.

Student FTE Enrollment Projections

DIVISION	2015	2020	2025	2030
Center for Career & Technical Education	603	574	589	609
Center for Health Sciences	234	223	229	236
Center for Math & Science	1,698	1,617	1,660	1,715
Arts & Humanities + Performing Arts and Behavioral Sciences	2,411	2,297	2,357	2,435
Center for Academic Support & Achievement	183	174	179	185
TOTAL	5,129	4,885	5,014	5,180

The projections indicate a 1% growth in enrollment over 15 years

Numbers shown are FTE. Current headcount is approximately 14.822 students.


Center
Center for Academic Support & Achievement
Center for Health Sciences
Center for Career & Technical Education
Center for Math & Sciences
Performing Arts & Behavioral Sciences + Arts & Humanities
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
5,129
183
234
603
1,698
2,411
5,129
183
234
603
1,698
2,411
4,885
174
223
574
1,617
2,297
5,014
179
229
589
1,660
2,357
5,180
185
236
609
1,715
2,435
2015 Existing
2015 Benchmark
2020
2025
2030
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
2,411
2,411
2,297
2,357
2,435
1,698
1,698
1,617
1,660
1,715
603
603
574
589
609
234
234
223
229
236
183
183
174
179
185
2015 Existing
2015 Benchmark
2020
2025
2030

Staffing Projections

CCD's Human Resource department provided employee data detailing the number of employee in each department. Employee projections were calculated in two different ways, depending on whether the employees were associated with an academic center or an administrative division. For academic centers, a student to faculty ratio was calculated for using FTE enrollment in each academic center. This ratio was then applied to Center enrollment projections to determine the number of employees in future years. For administrative divisions, staff projections were calculated in three steps. First, a student to administrative staff ratio was calculated. Next, a proportion was calculated determining the relative size of a given administrative division relative to the total number of administrative staff. If, for example, an administrative division consisted of 20 employees and there were 200 total administrative employees, then that division was 10% of the total administrative staff. Finally, the student to staff ratio and the divisional proportion were both applied to future university enrollment figures to determine future staff projections. The following table details the FTE employee projections used for the Neighborhood Master Plan.

FTE Staff and Faculty Projections

Division	2015	2020	2025	2030
Center for Career & Technical Education	45	43	44	45
Center for Health Sciences	33	31	32	33
Center for Math & Science	59	56	58	60
Arts & Humanities + Performing Arts and Behavioral Sciences	106	101	103	107
Presidents Office	13	12	15	15
Provost's Office	16	15	18	18
Student Life	15	14	17	17
Enrollment Services	49	44	55	56
Student Development and Retention	61	55	68	70
EASS + IR	7	6	8	8
Center for Academic Support and Achievement	11	10	12	13
CFO / Administrative Services	63	57	70	73
TOTAL	478	444	500	515

These projections indicate a 8% growth in faculty/staff by 2030.

Facility and Site Conditions

While the proposal for the Boulder Creek building is primarily program-driven, there are a number of health, safety and code issues that contriute to the need for building renovation as well. The building is over 40 years old and has physical deficiencies that should be addressed in the near term.

The Boulder Creek building requires a number of modifications – both cosmetic and functional - in order to achieve the proposed program. Major implications include upgrades to the roof and exterior skin as well as to the mechanical and electrical systems.

As outlined in the Implementation and Design Criteria Section, a new building entrance and renovations to 3 existing building entrances are proposed in order to improve wayfinding and create more welcoming and clearly defined building entrances. These proposed entrance modifications also create an opportunity for branding along the Colfax Street edge and along major pedestrian corridors into the main campus. The roof and all of the existing exterior glazing will need to be replaced.

Where possible, existing walls have been resused in order to minimize demolition and make the most efficient use of renovation resources.

Restroom capacities will need to be expanded in order to accommodate additional building occupants and to meet code requirements. This is described in further detail in the Implementation and Design Criteria section.

Additional student study amenities, which are currently lacking in the building, are included in the addition. This, too, is described in further detail in the Implementation and Design Criteria section.

Interior finishes such as flooring and drywall need varying degrees of maintenance and repair throughout the building.

A major consideration for the long-term viability of this building is the mechanical system, whcih is in need of an overhaul. Phased renovation is possible without disrupting the building's overall mechanical functions such that the building can remain in service during renovation.

Classroom and assembly space technology varies throughout the building. Upgrades to the A/V and other instructional and presentation technology are required throughout the building.

As different entrances in the proposed renovation will require different security levels (e.g. the Dental Clinic vs. the cafe), the building's security systems will need to be upgraded to manage these levels of access control.

An abatement specialist will need to be involved with the renovation to address contamination concerns. While no known abatement concerns exist at this time, it is likely - based on the age and history of use of the building - that some contamination will need to be addressed.

A full building conditions assessment is provided in the Appendix.

Program Requirements and Projections

Space Standards

Space standards have been developed through the use of CDHE guidelines, benchmark comparisons to comparable institutions, utilization analysis data and surveys and interviews with various user groups including faculty, staff, students and AHEC representatives. Standards used for planning purposes are detailed in the table below. A detailed description of the benchmarking methodology used for this project is included in the Neighborhood Master Plan, published separately. Note: standards have not been proposed for space not included in the Boulder Creek building.

Space Type	CDHE Standard	CCD Proposed Standard
OFFICE/SUPPORT SPACE		
President	300	n/a
Vice President	250	n/a
Dean	250	200
Department Chair/Manager	200	120
Faculty	120-160	120
Supervisor	120-160	120
Adjunct Faculty	n/a	48
Professional/Non-Faculty	120-160	120
Technical/Paraprofessional	100-140	100
Clerical/Secretarial	75-140	75
Standard Workstation	n/a	60
Shared Office	n/a	120

Adjunct faculty = 2 individuals per work station
Classrooms under 50 seats = 25 ASF per student
Classrooms over 50 seats = 20 ASF per student
Laboratories and specialized instructional spaces vary based on type
Office circulation = 30% of total ASF for private offices/50% of total ASF for open workstations

Methodology

The development of space needs is a multi-layered analysis that includes considering current space distribution and utilization, and future needs based on projected enrollment, staffing and academic/institutional growth or change. The bulk of the data used to assess existing space conditions was provided by CCD through existing AHEC or Facility Department records and/or specific information relayed to the consultant team by faculty/staff representatives. Data verification took place through in-person building and space tours of those programs being affected by this program plan.

Space need projections were based on two primary sets of data: First, enrollment projections provided by CCD and extrapolated by the consultant team to reflect growth beyond 2020; and second, benchmark data from a variety of sources that provides a means to compare CCD to other institutions and/or national higher education guidelines. In addition, compensation was given to the fact that a tri-institutional campus has a unique distribution of space as a result of sharing common amenities, support space, physical plant etc. This creates some challenges when comparing on an "apples to apples" basis. On the one hand this makes a more efficient campus. Relative to CCD, however, it actually provides some spaces, or more space in certain categories, than would typically be available on a community college campus (e.g. a full recreation center or large library). Overall, guidelines developed are on the conservative side of the available benchmark data to reflect the efficiencies and recognize the funding challenges of building new space in the higher education economic environment in the state.

The end result is a quantification of space needs for each individual user group. These space needs are defined at relative space category levels for planning purposes and do not negate the need for future detailed planning of individual spaces as the master plan phases are implemented.

Data Provided

The following data was provided by CCD:

- Room inventory by building and ownership status from AHEC
- Color coded block plans indicating current occupancy by owner from AHEC
- Class scheduling data from the Registrar's office and AHEC for a typical week in the fall semester of 2014
- Historical student enrollment figures from the institutional research office
- Projected student enrollment figures from the CFO's office for CCD
- Current staffing numbers from Human Resource records
- Anecdotal surpluses and deficits as communicated by departmental representatives during programming interviews
- Observations of existing conditions during building walk-throughs by the consultant team

It should be noted that the occupancy/ownership data and drawings provided were outdated in some cases. Where possible, RNL modified the data to reflect actual conditions based on available information.

Definitions and Acronyms

Assignable Square Feet (ASF):

In general, space models, standards and guidelines for institutions of higher education are analyzed in terms of "assignable square feet (ASF)". This refers to space that is directly assignable to a particular end user in a building. Typically this does not include primary building corridors, stairwells, elevators, mechanical space, bathrooms, and service spaces such as IT or janitor closets.

For new construction assignable square feet is translated to gross square feet (GSF) as an efficiency ratio, typically where the ASF is 55-70% of the GSF. Where a net square foot (NSF) number is needed for proposed interior remodels, the factor used to convert ASF to NSF is indicated.

Student and Faculty/Staff FTE:

Typically, space needs are based on full-time equivalents (FTE) for both students and employees. This is differentiated from "headcount" which accounts for the total number of people regardless of full time or part time status. For commuter schools that have a substantial number of part-time students and faculty, the difference between headcount and FTE counts can be significant.

Overall, the Program Plan for Boulder Creek supports the Neighborhood Master Plan through the following key means:

- The plan backfills the Boulder Creek Building with the most appropriate long-term occupants
- The plan helps activate the Colfax Avenue edge of the neighborhood
- The plan enhances an important gateway into the campus and creates identity opportunities for CCD
- The plan supports the long-term Campus Master Plan goals to strengthen the neighborhood identities of the individual institutions on campus

The space needs of the user groups included in the Program Plan are summarized on the following pages.

Health Sciences is a natural fit to backfill Boulder Creek for a wide variety of reasons, both practical and programmatic. First of all, since most of the available space is lab and workshop space with minimal finishes and exposed ceilings, the space is relatively easy to renovate for the proposed use, making efficient use of funding resources. The addition would house improved instructional space and more efficient faculty space. Aside from the practical reasons, however, are reasons related to the relationship Health Sciences has to other campus users and functions. The Center would benefit from being relocated to the main campus because this would eliminate competition it currently has with other institutions (public and private) offering similar degree programming nearby, often at lower costs and with newer facilities. It would also provide increased opportunities for revenue generation through the the Dental Clinic and Vet Tech programs because there is an increased client base in the downtown location.

According to the January 2016 Legislative Report on the Skills for Jobs Act by the Colorado Department of Higher Education (CDHE), the top sector for job openings is Healthcare. Providing Health Sciences with improved facilities in an appropriate location will contribute to filling these job openings.

While Arch Tech, Engineering Graphics, and Visual Arts are better suited in other locations with the rest of their instructional space, the recommendation to leave their current spaces in the building is based on a lack of availability in those locations without funding approval for other projects. If such funding is approved in the long-term, it is recommended that these functions be relocated and that their space be backfilled with growth space for other functions that will remain in the building, or with classroom space currently housed in modular structures.

The Nutrition Teaching Kitchen and Cafe will bring a new center of gravity to the CCD neighborhood, serving all CCD students, faculty and staff as well as attracting visitors from off-campus and from other on-campus institutions. This new attraction also provides a revenue stream for the College while simultaneously relieving it from having to borrow kitchen space from an off-campus organization for instructional purposes. Finally, the increased visibility and activity will help improve the perception of safety in and around the building.

The central computer lab is well used by students throughout the day and week. Students and faculty have expressed a desire for additional computer lab locations within the neighborhood. Resources do not currently permit the expansion

of computer lab services, however by downsizing the existing lab and redistributing the services to other strategic locations, this desire can be realized. Further discussion of this strategy is provided in the Neighborhood Master Plan, published separately.

HR and Finance/CFO are currently housed in the Administration Building, which is across campus and is slated to be dedicated to MSU Denver functions only. As such, the CCD functions in that building must vacate and find new locations within the CCD neighborhood. Because HR and Finance/CFO need to remain collocated for operational reasons, finding enough available contiguous existing space is difficult. It is recommended that they be temporarily housed in temporary office space on campus until CU Denver is able to vacate the space it occupies in Boulder Creek. Once that space becomes available, it is an ideal location to be renovated for administrative offices.

Finally, adding student study lounge space to Boulder Creek further contributes to the activation of the Colfax edge of the neighborhood and provides much needed space of this type in a prime location.

Appropriate occupants to backfill the Administration Building were determined through investigation of several metrics:

- comparison of current and projected space needs to available square footage in the building
- alignment of placement in the building with short- and long-term institutional goals - particularly those related to consolidating academic departments and to centralizing student-facing administrative functions
- phased sequencing of individual moves in order to minimize the need for temporary staging space such that department could be relocated once only if possible
- reuse of existing space type to minimize renovation costs; i.e. office space reused as office space and instructional space reused as instructional space

Detailed program requirements are provided in the Appendix.

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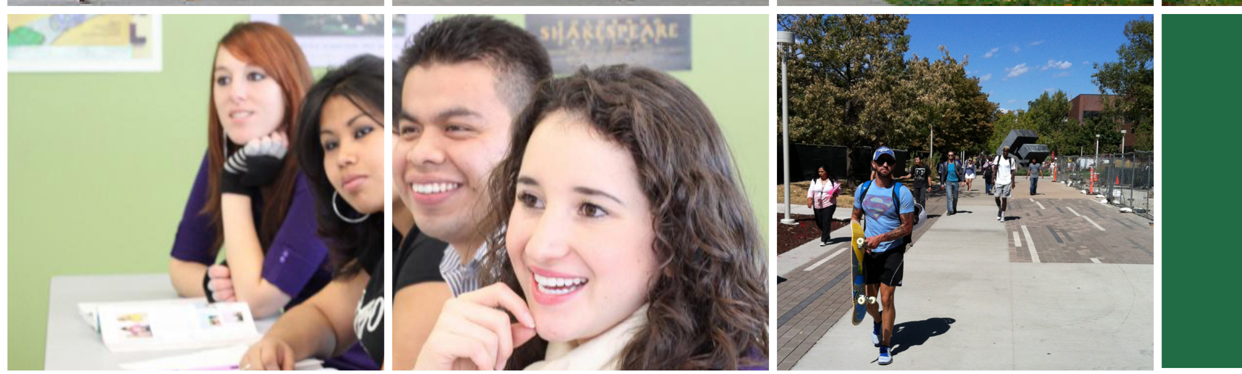
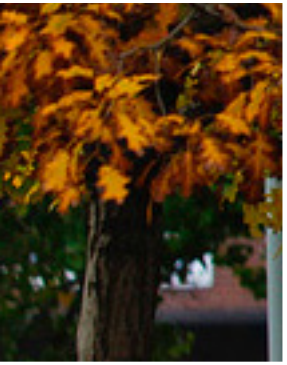
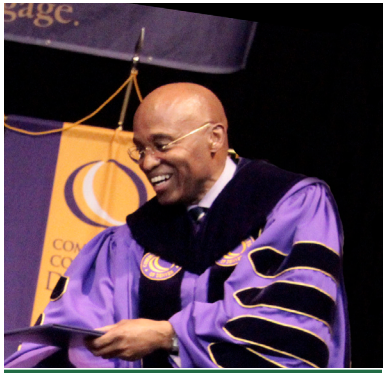


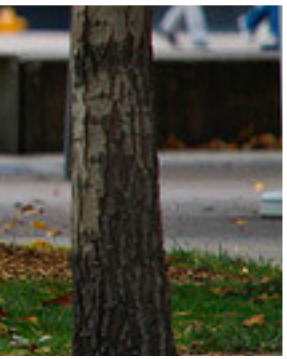
COMMUNITY
COLLEGE OF
DENVER












IMPLEMENTATION and DESIGN CRITERIA

Alternatives Analysis and Final Recommendation

Through workshops conducted with steering committee members, faculty, staff, and AHEC representatives, project goals were identified and prioritized. These goals and priorities are outlined in detail in the Justification section. The proposed solution for the Boulder Creek Building addresses these identified project goals and priorities, as described in the following pages.

Multiple options were discussed and explored in order to arrive at a final recommendation for the Boulder Creek building. These options took into consideration the established goals and priorities for both the building and for the Neighborhood Master Plan, as well as budget implications, site conditions, existing building conditions, and the needs of individual user groups being affected by each proposal.

The final recommendation, outlined and diagrammed in the following pages, places the Health Sciences Center in the Boulder Creek building along with all of its current CCD occupants (some shared classrooms, some instructional space for Visual Arts and CCTE, the Maker Space, and the central computer lab) and some of the administrative functions currently housed in the Administration Building across campus. The existing computer lab is downsized in order to provide decentralized distributed computer lab services in other neighborhood locations, as requested by CCD faculty and students. An addition to the building is also proposed that serves as a new CCD gateway to the neighborhood and addresses the plaza edge along Colfax Avenue at the light rail station. This addition houses instructional space and faculty offices for Health Sciences. Finally, the corner at 10th Street and Colfax Avenue will be activated by the addition of a Teaching Kitchen and Cafe for the Nutrition program. This amenity is currently located off campus in a facility that is borrowed from a private restaurant. By bringing the amenity onto campus, CCD gains opportunities for revenue generation, campus outreach, and improved affinities.

During the planning process, several critical priorities rose to the top that helped to shape the Neighborhood Master Plan and that represent the short term action items. These priorities also contributed to the Program Plan for Boulder Creek.

1. Complete the necessary and agreed upon swap of space between CCD and MSU Denver involving removing CCD's administrative functions from the Administration Building and MSU Denver's Nursing Program from the Boulder Creek Building.

2. Find a home within the CCD neighborhood for the administrative functions currently housed in the Administration Building.

3. Backfill the vacated space in the Boulder Creek building with one of the programs currently located off-campus.

Multiple alternatives were developed to explore how to best address these priorities. The following outlines the alternatives that were considered and highlights the recommended direction.

Priority: Relocate Finance/CFO, Human Resources, and IT (currently located in the Administration Building)

Recommendation: Move IT to Clear Creek and both HR and Finance/CFO functions into Boulder Creek.

This option makes use of space that will be vacated in Boulder Creek as well as space that would be created by decentralizing the computer lab. Clear Creek, once vacated by MSU Denver, can house the IT department. This solution provides reasonable long-term locations for all relocated administrative functions so that they do not need to be subdivided into separate locations. In addition, dispersing computer lab spaces to all of the primary buildings (Confluence, Cherry Creek, and Boulder Creek) is favored by both students and staff. Space can be created for this by reconfiguring office space in Confluence and Cherry Creek that is currently underutilized.

HR and Finance/CFO functions can move in once CU Denver's lab and studio functions relocate.

A temporary home for HR and Finance/CFO will need to be identified. Ultimately, HR and Finance/CFO will reside in CU Denver's temporary space in Boulder Creek.

Two other options were also considered and rejected in favor of the above preferred option. The first considered placing IT in Boulder Creek while placing HR in Cherry Creek and Finance/CFO in Clear Creek. The second considered placing IT in Bear Creek, HR in Cherry Creek, and Finance/CFO in Boulder Creek. These options were rejected because it is disadvantageous to separate HR from Finance/CFO and because long-term growth space for those functions is better accommodated in Boulder Creek.

Priority: Backfill the Boulder Creek Building

Recommendation: Relocate Health Sciences from the Lowry Campus into the Boulder Creek Building. Expand Boulder Creek to include additional functions in the building.

This option has a number of advantages, including the following:

- The Health Sciences building at Lowry is underutilized, costing CCD money for space it does not use effectively.
- CCD can save money by discontinuing the lease of space on the Lowry campus.
- Enrollment in this program is suffering from being in a remote location without good access to public transportation where it is also in competition with programs offered by other institutions that have newer facilities.
- The Dental and Veterinary Clinics could increase their clientele by being in a more urban and central location.
- Retrofitting Boulder Creek for this program is less costly than other explored retrofits.

The advantages of completing this option in the short term are:

- The Nutrition Program's Teaching Kitchen can be brought onto campus from their 10th and Osage location and be expanded to include a working café in the building, creating revenue generation opportunities, consolidating instructional space in a prime location, serving CCD students beyond those enrolled in the programs housed in Boulder Creek, and providing a hub for students, faculty and staff across campus that enhances CCD's image.
- A new front door, CCD amenity at the Neighborhood gateway and branding opportunity can be created through the design and construction of this addition as an infill of the courtyard facing Colfax Avenue.

note: depending on the timing of CU Denver's lab and studio relocations, the HR and Finance/ CFO relocation may not occur until the mid-term timeframe.

The Machining and Welding programs were also considered for relocation to Boulder Creek but were ultimately rejected based on the following factors (additional comparison is provided in the Neighborhood Master Plan, published seperately):

- A substantial investment was made recently in the leased facility specifically for this program and the lease term is for 10 years at which point lease extensions or ownership may be considered.
- There are benefits to co-locating industry based training facilities with the academic program in an off-campus location.
- Retrofitting Boulder Creek to accommodate this program and relocating the equipment are more costly.
- Truck access to the Boulder Creek Building, and noise control is substantially more difficult than at the current location or other potential sites on campus.

Design Requirements

The Boulder Creek building, along with most of its neighbor buildings on the campus, is a relatively simple structure with minimal ornamentation and variation on its exterior. Similarly, aside from a minimalistic transition from a consistent row of windows to small doorway areas, the building façade is very consistent around its entire perimeter. As a result, and due to the variety of uses within the building, multiple “main” entries into the building exist. The proposed changes include architectural treatments that help draw attention to two signature entrances - one along 10th Street and another along Colfax Avenue. These include new vertical elements with different but complementary materiality to help differentiate the front door. This vertical element can be glass and metal or other materials to give it a highlighted feel and can rise above the existing building roof line. This entry tower can have integrated signage to describe the use of the building as well display the identity of CCD. A clearer, more pronounced entryway along 10th Street can help activate that corridor and make a positive contribution to the life of the campus’ most important pedestrian spine.

The proposed new addition along Colfax Avenue has the opportunity to totally redefine the Boulder Creek building from an aesthetic and functional point of view. Because this addition will replace the existing frontage (or lack thereof) along Colfax, the addition should be designed to improve on the limitations of the existing building. One limitation of the existing building is its relative lack of transparency and visibility in and out of the building. The new addition aims to increase the transparency by providing increased glazing to allow users a view out of the building as well as provide much needed “eyes on the street” to help provide an added layer of safety along Colfax and at the adjacent light rail station. This addition can also be more generous in height. The addition can be a taller and more comfortable single story structure with greater floor-to-ceiling heights. The proposed solution calls for such a structure.

It should be noted that the 2012 Master Plan describes the possibility of a three to five story building at the Boulder Creek site. While it may be feasible to consider such a building in the long-term, and certainly should be considered, such a solution is not financially appropriate at this time.

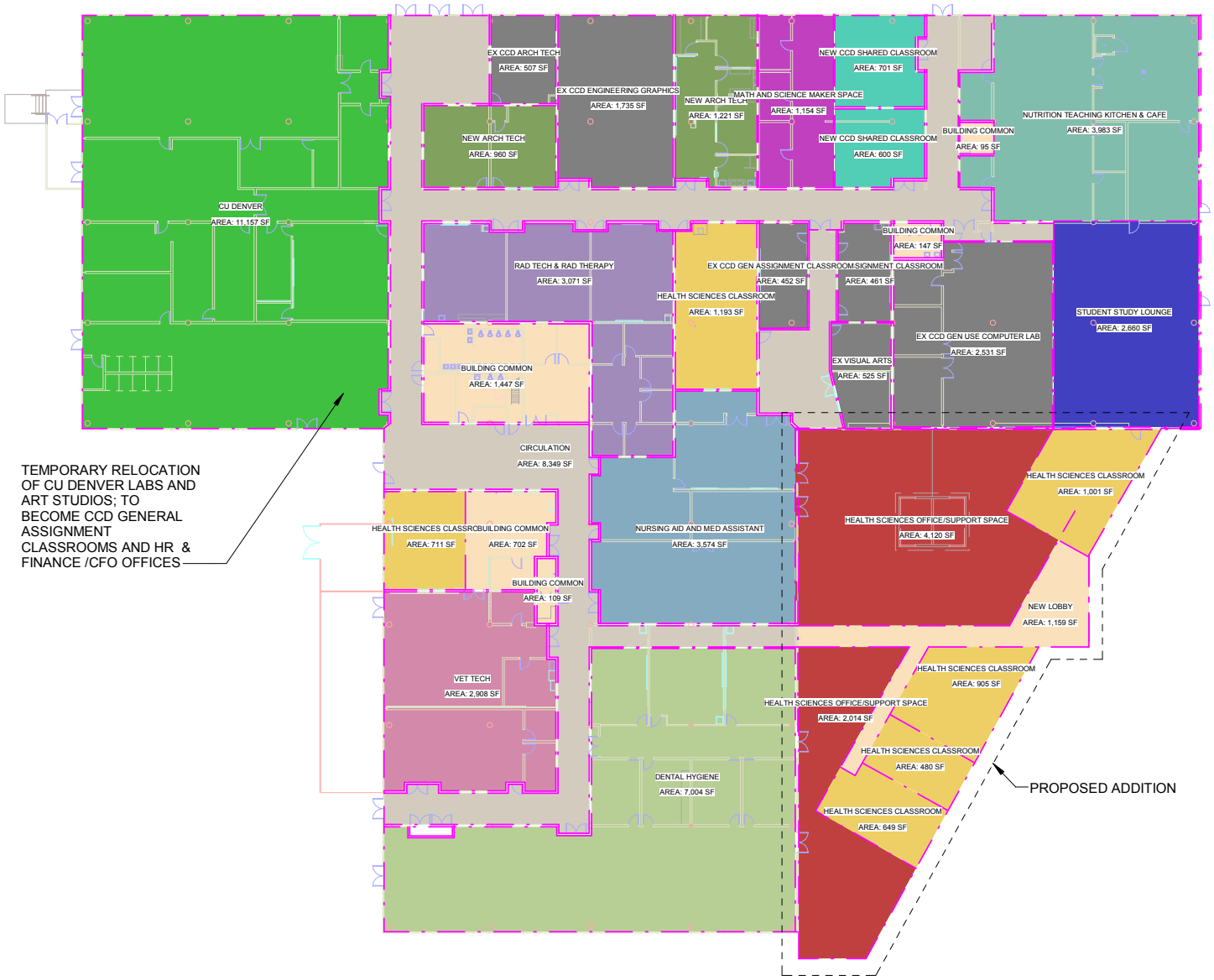
A preliminary LEED analisis indicates that the renovation and addition could achieve the state-required certification level of LEED Gold. Because funding for the project will be obtained after October of 2016, and because the existing mechanical system needs considerable modifications, the project is assumed to be registered under LEED v4 for BD+C: New Construction and Major Renovation.

Potential Future for the Boulder Creek Building Along10th Street

Potential Future for the Boulder Creek Building Along Colfax Avenue

CORNER CAFE SCHEME

- BUILDING COMMON
- CIRCULATION
- CU DENVER
- DENTAL HYGIENE
- EX CCD ARCH TECH
- EX CCD ENGINEERING GRAPHICS
- EX CCD GEN ASSIGNMENT CLASSROOM
- EX CCD GEN USE COMPUTER LAB
- EX VISUAL ARTS
- HEALTH SCIENCES CLASSROOM
- HEALTH SCIENCES OFFICE/SUPPORT SPACE
- MATH AND SCIENCE MAKER SPACE
- NEW ARCH TECH
- NEW CCD SHARED CLASSROOM
- NEW LOBBY
- NURSING AID AND MED ASSISTANT
- NUTRITION TEACHING KITCHEN & CAFE
- RAD TECH & RAD THERAPY
- STUDENT STUDY LOUNGE
- VET TECH



BOULDER CREEK WITH HEALTH SCIENCES DEPT.

Project Schedule, Cost Estimate and Financial Analysis

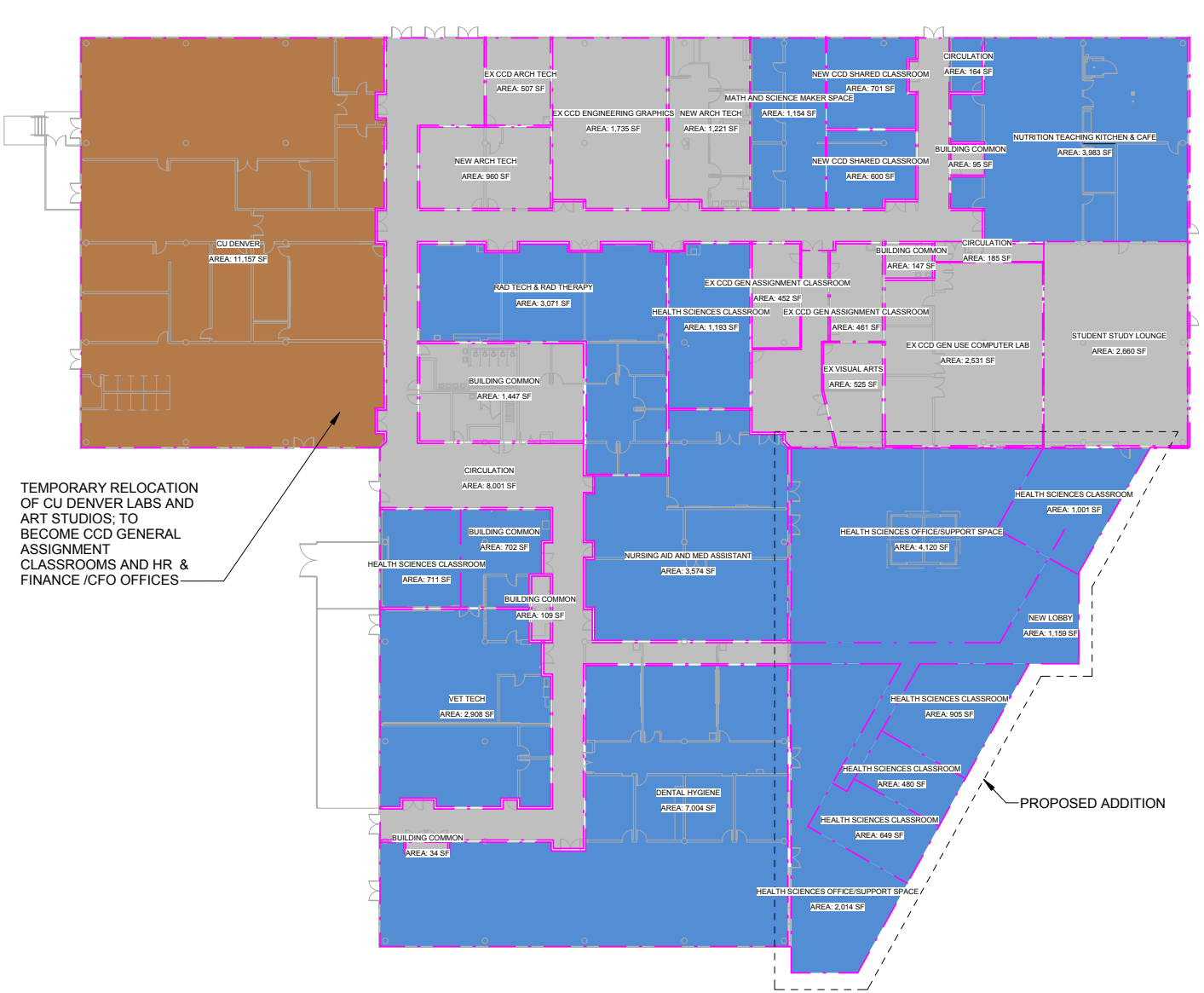
Project Schedule

The timing of implementing the most immediate, short-term priorities is dependent upon a) dollars available for an initial minimal remodel of several spaces, b) major funding for a complete remodel and addition for Boulder Creek, c) MSU Denver's ability to vacate space in Clear Creek and Boulder Creek currently occupied by Veteran's Upward Bound, Aerospace Engineering Science (AES) programs and Nursing, and d) CU Denver's ability to relocate their engineering labs and visual arts studios in the short-term.

In order for CCD to vacate administrative space in the Administration Building as part of a space swap with MSU Denver, it is recommended that HR and Finance/CFO move to temporary offices on campus. In addition, it will be necessary to downsize and decentralize the main computer lab that is currently in Boulder Creek. This change allows new academic programs to move into the building and is also an improvement that has been requested by both CCD students and faculty in order to make the computer labs more accessible. In order to accomplish this it will be necessary to reconfigure and minimally remodel space in both the Confluence and Cherry Creek Buildings to make room for smaller satellite computer labs. There is space that can be captured in these two buildings by reconfiguring currently underutilized/surplus space in office areas. Ideally all of this can occur in 2017.

Construction of MSU Denver's new AES Building is underway and slated for completion by fall of 2017. This will allow MSU Denver to vacate its AES space in Boulder Creek. MSU Denver's Nursing program will be able to vacate the building once several moves occur with MSU Denver's buildings that should be complete in 2018. Because timing is unknown for the relocation of CU Denver's labs and studios, these spaces will be consolidated into a single suite within the Boulder Creek building, at CCD's expense. Ultimately, this space will become office space for CCD's HR and Finance/CFO functions.

Once the Boulder Creek building has been cleared of all MSU Denver functions, the remodel can be completed to accommodate the relocation of the Health Sciences program from the Lowry campus into the building. This move is dependent upon the construction of a building addition. Therefore, it is recommended that the addition be constructed concurrently with the major remodel of the building to be more cost effective and shorten the timeframe for disruption of the building occupants who will need to remain in the building for the duration of the project. The addition will provide instructional and office space for Health Sciences. Space vacated by MSU Denver will become new space for the Nutrition Teaching Kitchen and Cafe that is currently located off-campus, and will provide additional student study space.



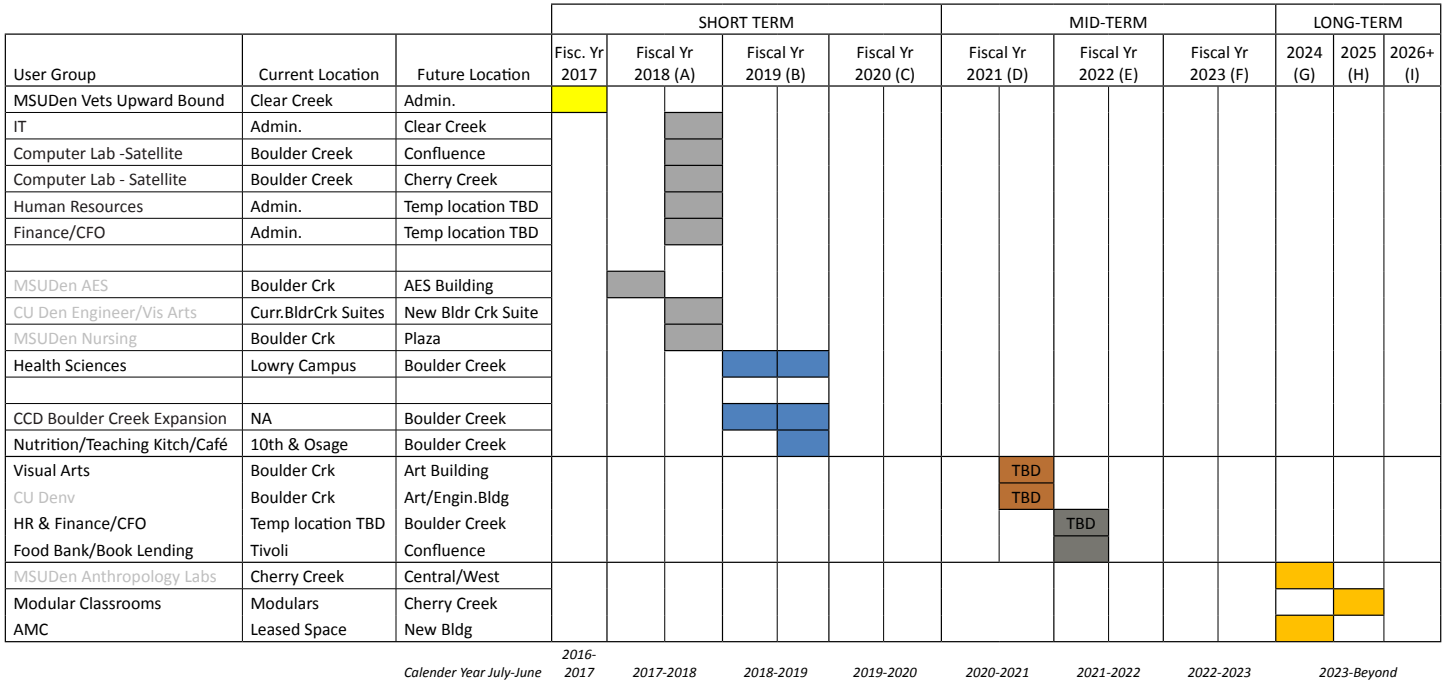
BOULDER CREEK - PHASING DIAGRAM

Cost Estimate and Financial Analysis

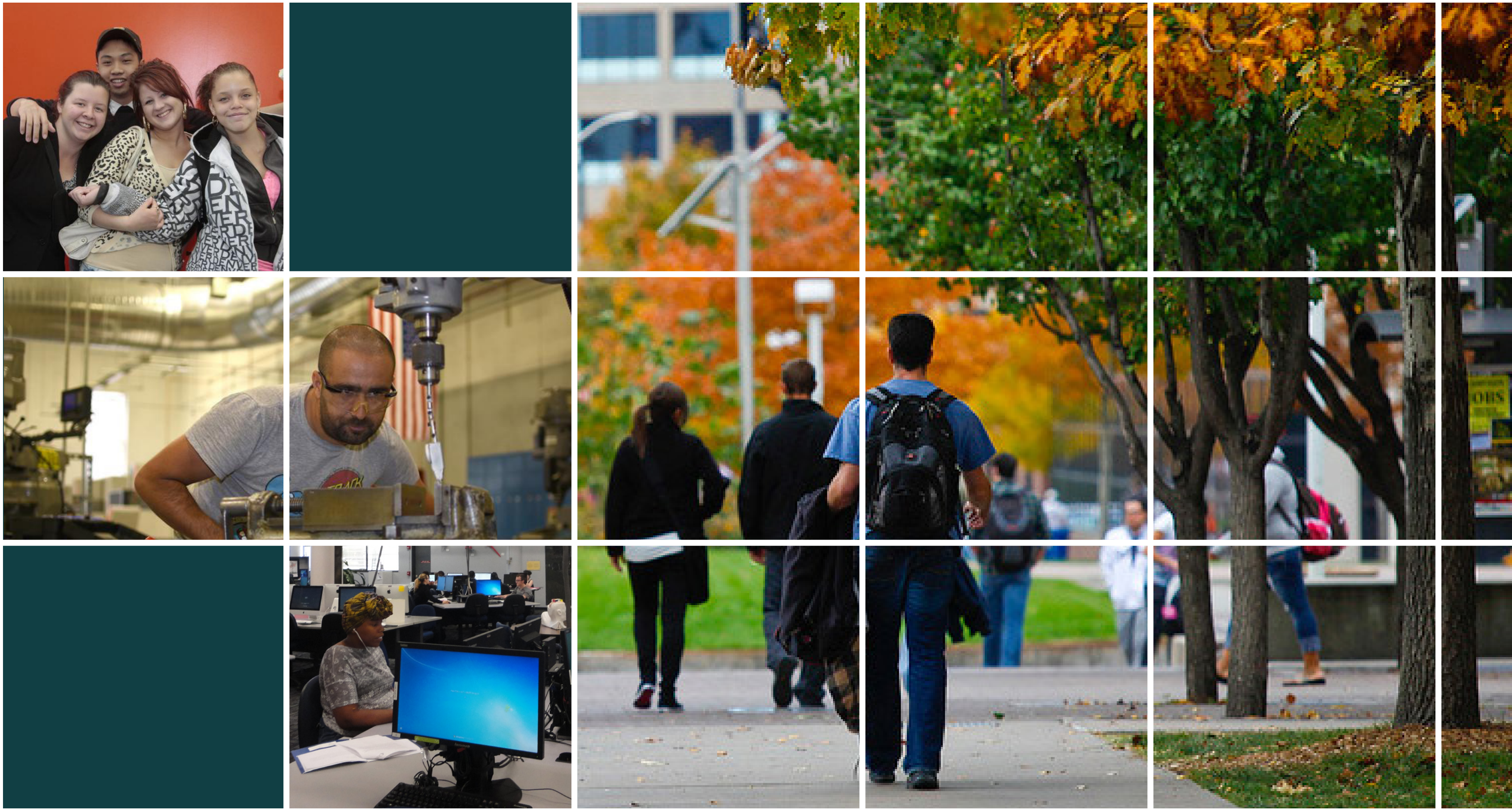
Budget approval is presumed for the following estimates. A standard CMGC project delivery method has been assumed for scheduling and pricing purposes.

Anticipated milestones are as follows:
Design - fall 2017/spring 2018
Phase A Construction start - spring 2018
Phase A Occupancy - fall 2018
Phase B Construction start - spring 2018
Phase B Occupancy - spring/fall 2019
Phase E Construction and Occupancy - fall 2021

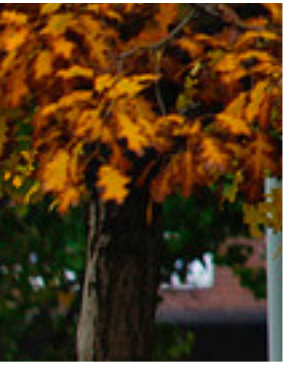
The total project budget is estimated to be **$23,590,783**. This includes an estimated renovation and new construction cost for Boulder Creek at $21,934,240, costs to renovate and disperse the computer lab at $521,131 and a project contingency. This estimate assumes an average annual construction inflation rate of 5%.



A detailed cost breakdown is included in the Appendix.

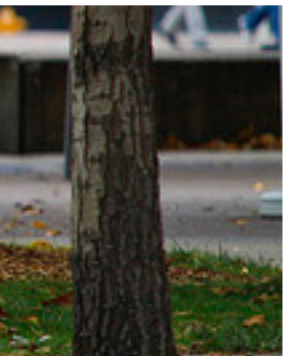


COMMUNITY COLLEGE OF DENVER








APPENDIX

Detailed Conditions Assessment - Exterior

This section describes the current physical condition of the Boulder Creek Building, including the interior and exterior finishes, the mechanical and electrical systems, and the building technology.

Recommendations to address concerns, if any, are provided following the description of each item.

Roof:

The existing built-up roof appears to be original to the building, and is therefore approximately 40 years old. There have been recurrent minor roof leaks. The original perimeter flashing is cracking and has been patched in several locations. The metal counterflashing riveted seams are separating in several locations. The sealant between the through-wall reglet and the counterflashing is peeling out. The light-weight stone aggregate is easily displaced by stormwater and has been scoured away in spots, and has washed up against the roof drains, completely covering some of them. Some of the roof drain strainers are broken, allowing larger debris through to the drain leader piping. The paint on the majority of the sheet metal hoods and ductwork is peeling to a significant extent; the sheet metal is galvanized and does not appear to be significantly rusted yet. The brick on the back side of the parapet is cracked and spalling in places, but this does not appear to be due to efflorescence. The metal parapet cap appears to be in good condition.

Recommendations – Replace roofing and flashing with single ply membrane. Cover with new heavier aggregate matching the existing color. Repair metal counterflashing. Replace damaged roof drain strainers. Paint sheet metal ducts and hoods. Repair or replace cracked brick.

Mechanical Penthouse:

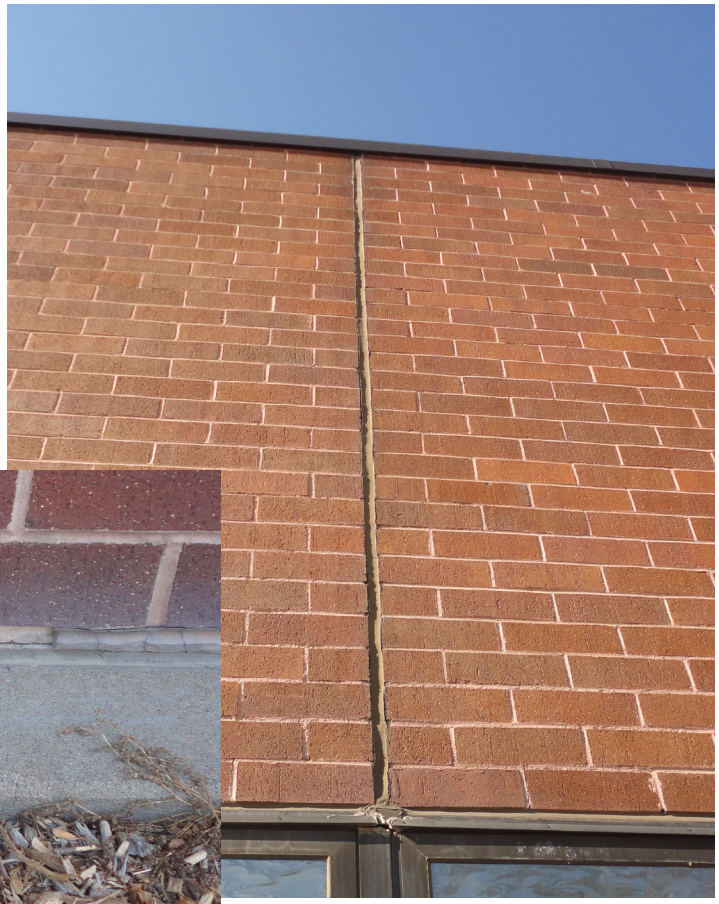
Refer to page 71 for mechanical and electrical systems assessments.

The concrete floor appears to have been originally painted, but the paint has largely chipped and worn away. Several areas of the floor have water and rust stains from leaking piping, and there is standing water in some areas.

Recommendations – Clean and repaint concrete floor. Repair or replace piping and equipment, as detailed in mechanical equipment assessment.

Walls:

The exterior walls appear to be solid brick masonry, without a cavity. Aside from a few areas of minor face shell cracking, the brick and mortar joints appear to be in generally good condition. In several locations the grout between the lowest brick course and the concrete grade beam is spalling and should be tuckpointed. The sealant at the masonry control joints is in good condition. The sealant at the building expansion joint on the 10th Street facade has separated from the brick.



Recommendations – Repair or replace cracked and broken bricks. Tuckpoint bed joint at base of wall. Remove and replace sealant at building expansion joint on 10th Street façade.

Windows:

The windows are original to the building. The frames appear to be bronze-anodized aluminum. The anodized finish has faded, particularly in areas most exposed to the sun. Many of the operable awning units are deformed and do not seal properly. The glazing is non-insulated tinted vision glass. Sun control film has been added in several areas, but is now blistered and peeling. The butt joint at one of the frameless corner windows has been resealed, but not in a workmanlike manner (see photo at left). The glazing in one of the corner windows is cracked (see photo at left). The window head flashing is bent in several locations, and some of the joints are separated. The sealant above the window head flashing is peeling out in places.

Recommendations – Replace windows with thermally-broken units with insulated high-performance glazing. Repair or replace flashing.

Storefront and Doors:

Storefronts are steel, probably without a thermal break, and with non-insulated glazing. Some rust is visible on the storefront frames. Exterior doors are hollow metal. Except for one door on the southeast side, all doors appear to be original. The paint on the doors is chalky and faded, and peeling in places. Some doors appear to have been repainted, but the color is not an exact match to that on the majority of the doors. Most of the door seals and bottom sweeps are damaged and should be replaced. Door hinges are rusted. The hollow metal sidelight panels on the service court sides are badly rusted due to peeled paint. The paint on the abandoned overhead doors is badly peeled.

Recommendations – Replace storefront with thermally-broken aluminum system with high-performance glazing to match new windows. Replace exterior doors and sidelights. Remove abandoned overhead doors and infill openings to match adjacent construction.

Equipment Enclosures and Retaining Wall:

The steel equipment screen on the northwest side has significant areas of rust (see phot at left). The masonry equipment enclosure on the northeast side appears to have been constructed at a later date, as the brick does not match the adjacent utility building (see photo at left). The sealant joint between this masonry enclosure and the adjacent building has failed, as have the mortar joints in the brick parapet cap. The brick at the drainage scuppers on the cooling tower enclosure has been stained by runoff, and the metal scuppers are damaged.

The brick retaining wall around the service yard has several areas of cracking. Several joints appear to have been tuckpointed in a non-workmanlike manner. Several mortar joints in the brick cap are in need of repointing. The sealant in the control joints has pulled away from the brick.

Recommendations – Replace steel equipment screen with new galvanized and painted screen. Remove and replace sealant at joint between brick mechanical enclosures and at control joints. Tuckpoint brick parapets. Grind out and tuckpoint sloppy bed joints at service yard screen wall. Repair or replace cracked and damaged brick. Clean soiled and stained brick at scupper. Repair or replace scupper.

Paved Areas:

The concrete sidewalk and curb on the southwest corner of the building are badly cracked. The vehicle guardrail in this area is out of plumb. The asphalt paving in the service yard is in very bad condition, and in some areas has eroded away. The steel bollards in the service court are badly rusted. Cracks in the concrete slabs have developed at the corners of the area drains in the northeast porch and the sunken southeast area. Weeds and small trees are growing in the joints between the building grade beam and the adjacent paved areas in the service court and the equipment enclosure on the northwest side. The northeast porch is settling independently of the main building and a gap has opened up between the porch wall and the building.

Recommendations – Replace damaged sidewalk and curb. Repair vehicle guardrail. Repave asphalt areas in service yard. Strip and repaint bollards. Remove weeds/trees and seal joints. Seal crack between building and porch and monitor for additional settlement.

Detailed Conditions Assessment - Interior

Signage:

Building and wayfinding signage are inadequate. Directional signage to the accessible entrances should be located at the 10th Street (main) entrance.

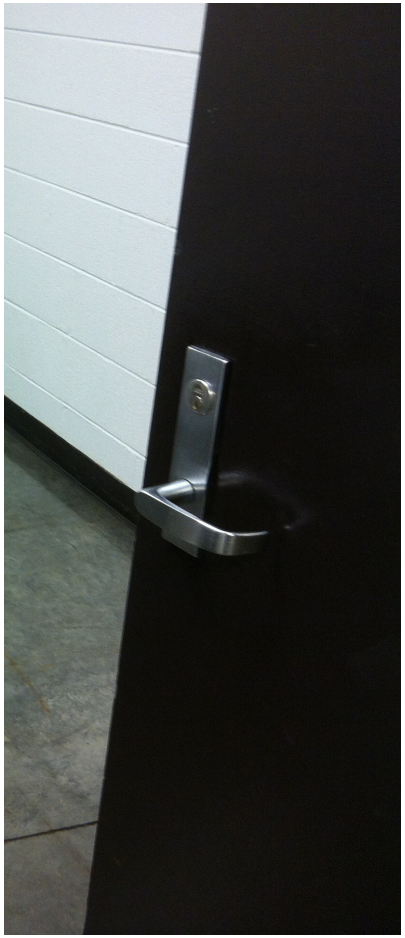
Recommendations – Install new building and directional signage.

The building is currently unsecured during class time, including after dark, and access by unauthorized persons is a simple matter. There are exterior security cameras, but they don't provide views of the entire building perimeter. There are no interior security cameras. See page 68 for additional information on building security.

Recommendations – Install card readers at entrances. Install additional exterior and interior security cameras.

Code and Accessibility:

The Women's Restroom fixture count is approximately 50% short. The main building entrance on 10th Street has steps and is not accessible. No directional signage to one of the accessible entrances is present at this location. Interior signage lacks Braille text. Primary circulation corridors and passage doors appear to be ANSI 117-compliant. Many doors (mostly storage and service areas) do not have compliant lever handles. Many classrooms, workshops and labs have aisles that are too narrow for a wheelchair. Built-in casework, counters, sinks, lab benches and lab and shop equipment are not accessible. The main Men's and Women's Restrooms appear to be largely in compliance with ASNI 117, however restroom lavatories are too deep, missing insulated covers on drain pipes, and have non-compliant faucets. The small Women's Restroom R100A is not compliant, lacking accessible stalls, fixtures and clearances.



Recommendations – Expand Restroom R100A or construct an additional Women's Restroom to add the required fixtures. Restroom R100C would be difficult to expand, as it is sandwiched between the main IT closet and the stair to the mechanical penthouse. Install new directional signage and ANSI 117-compliant interior signage. Replace doorknobs with levers. Rearrange furniture and equipment to provide accessible routes. Provide equivalent facilitation for built-in equipment. Replace sinks in accessible restrooms. Provide sign at R100A with directions to accessible restroom.

Finishes:

Drywall – There are few drywall partitions, and most are in good condition. A newly constructed storage area in the Civil Engineering Lab has unfinished drywall. The drywall furring at the exterior wall in the loading dock area has some small areas of damage. Where a new automatic door operator was installed at the northwest accessible entrance the drywall was left unfinished. The wingwall in the Men's Restroom has damaged corners. The walls at the urinals are drywall, and should be finished with a moisture-resistant and washable surface.

Recommendations – Repair damaged drywall and finish unfinished drywall. Provide ceramic tile wainscot at urinals.

Wall Base – Sections of resilient base are loose or missing in several areas. Many rooms with CMU partitions and concrete floors have unnecessary resilient base.

Recommendations – Repair resilient base. Any new base should be installed in the longest practical sections to minimize seams.

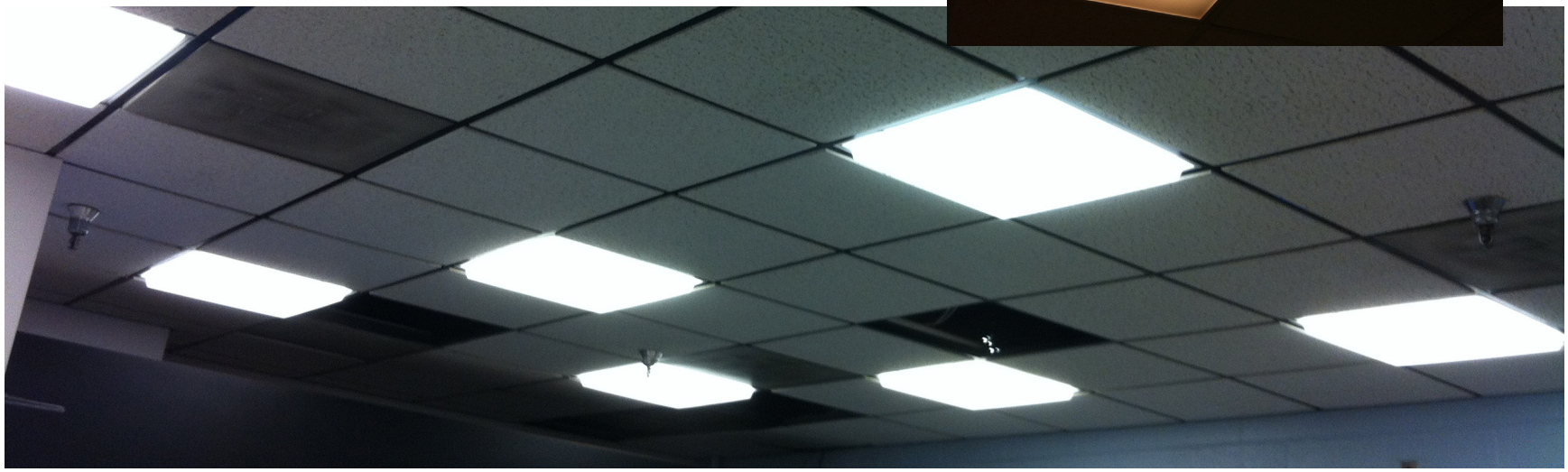
Flooring – Much of the resilient tile in primary circulation corridors is damaged. This tile and/or the mastic may be asbestos-containing. The tile at the drinking fountains in Corridor C100B is curling due to water damage. Several areas of tile have been replaced with new tile that doesn't match the existing. The broadloom carpet in the Industrial Design office area 124 and the Engineering Shops computer lab 119B are in poor condition. The carpet tile in the CCD computer center, classroom 104D and classroom 113 is fairly new and is in good condition. Most classrooms, studios, workshops and labs have sealed concrete floors. Most of these are in good condition, but limited areas are damaged or have been noticeably patched.

Recommendations – Test resilient tile and mastic for asbestos. Replace all original resilient tile with new. Replace broadloom carpet with carpet tile. Repair damaged concrete.

Ceiling Tile – With the exception of recently remodeled areas the acoustical ceiling tile is in poor condition with much water staining, and many tiles are missing. The suspended ceiling grid is in fairly good condition and will accommodate standard replacement ceiling tiles.

Recommendations – Replace all ACT, except at recently remodeled areas. Reuse existing ceiling grid.

Lighting – Light fixtures vary widely. Most appear adequate, but several areas have outdated and inefficient fixtures, some with cracked or yellowed lenses.



Recommendations – Replace old and damaged light fixtures.

Miscellaneous finishes –
The majority of the horizontal blinds are in good condition. A few units require repairs or should be replaced.
Sun control film should be applied to the glass sidelight in the Civil Engineering Lab 120D.
There are no urinal partitions.
The computer cabling in the CCD computer center runs wild (no cable tray) across the ceiling and dangles down to the individual workstations.

Recommendations – Repair or replace damaged blinds. Apply sun control film on glass sidelight in Lab 120D. Install urinal partitions. Install cable tray and vertical wire management devices in computer center.

Detailed Conditions Assessment - Technology

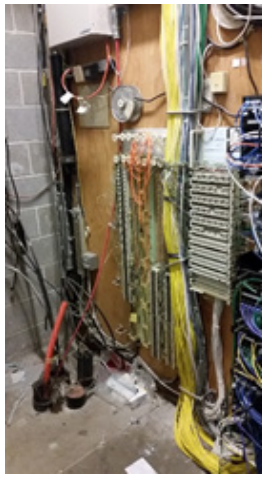
This section provides an overview of the technology systems assessed. Because 'technology' is such a broad term, for the purposes of this document the term 'technology' will be used to collectively refer to the systems below:

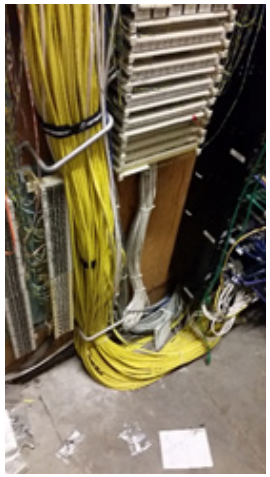
- Communications Infrastructure
- Audiovisual Systems
- Security Systems
- Other Low Voltage
- Networks
- Electrical Infrastructure

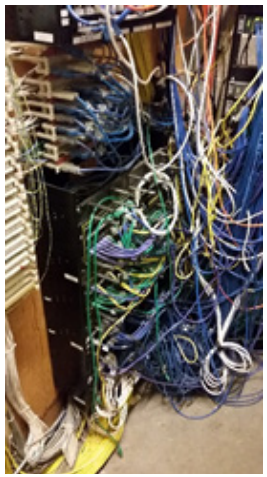
Communications Infrastructure:

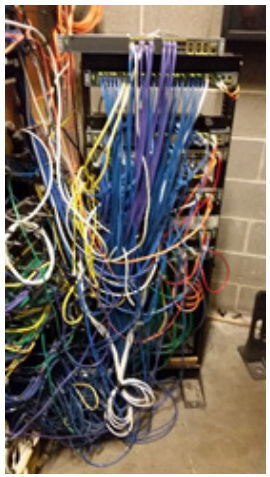
Telecommunications Entrance Facility (TEF) / Main Distribution Frame (MDF):

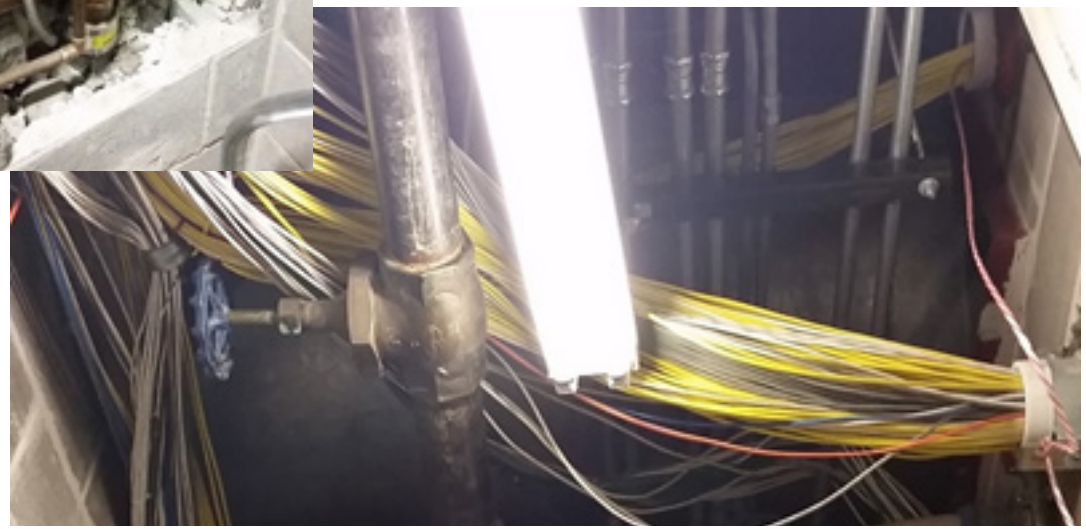
P100C. The existing TEF/MDF is located centrally in a very small room (approximately 4'-0" x 8'-6") with CMU walls and a door that opens into the room. One wall has plywood backer board, but does not appear to be fire-resistive treated. The Outside Plant (OSP) cabling, both copper and fiber come into the building here via (4) underground conduits and connect the Local Area Network within the building to the Campus Network and Telephone service provider. The phone field is mounted on one wall with a combination of 110-type and 66-type punch blocks on the adjacent wall with copper cabling to telephones located throughout the building. The Notifier Fire Alarm panel and Metasys Building Automation System panels are located on the wall; refer to electrical and mechanical narratives for more information about these low voltage systems. Honeywell and Jerrold panels are also mounted on the walls.





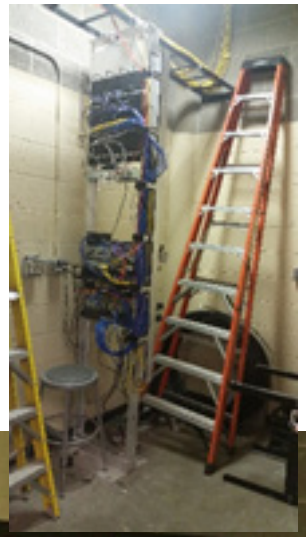






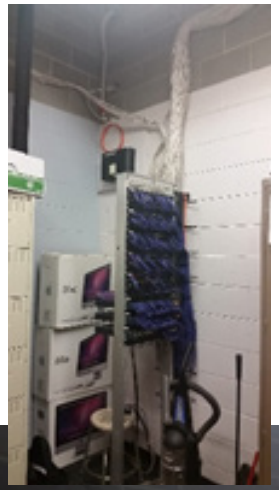
In addition, both Securitron and Millennium security access control panel and power supplies for the card readers are also mounted on the wall. The network switches are mounted in a combination of wall mounted and free-standing equipment racks. While cables are bundled and dressed carefully, there is little or no structural cable management system in the room. The network and cabling systems have overgrown the room and all of the sleeves penetrating walls are completely full. A portion of the CMU wall is open to the water piping serving the water fountain and water pipe risers with valves run through and overhead the equipment racks which is risk for potential damage should any leaks occur. HVAC ventilation ductwork runs through the room overhead as well. No fire sprinkler head or other fire protection system observed in the room. A telecommunications grounding system was not observed.

Recommendations – Since a new Women's restroom needs to be built in order to provide the code required plumbing fixtures for females, we recommend strong consideration be given to demolishing the small women's restroom R100C adjacent to the existing TEF/MDF P100C and use the space to create a properly sized TEF/MDF. The dimensions of the TEF/MDF room should be a minimum of 10' x 12' clear. The underground conduits and Outside Plant (OSP) cabling already enter the TEF/MDF, so the TEF/MDF room should remain where it is but be properly expanded to meet current BICSI TIA/EIA standards for communications rooms. Backer board, fire-resistive treated, should be attached to all walls. Two or three 2-post racks should be provided in the center of the room with vertical cable managers between the racks and overhead ladder rack running the perimeter of the wall and above the racks. Refer to the rendering on the following page for typical infrastructure provided for modern communications room. A telecommunications grounding system should be added to ground and bond all equipment, racks, and cable managers. If possible the water piping and valves running overhead should be relocated, or drip pans provided beneath them to protect the electronics equipment. HVAC ventilation ductwork should also be relocated out of the room if possible except for cooling to the room itself which should be provided by a dedicated HVAC system which operates 24/7 regardless of whether the building is occupied. A dry-pipe pre-action fire sprinkler system should be provided. The hole in the CMU wall should be repaired and strong consideration given to relocating the water fountain so there is no plumbing in any of the walls surrounding the TEF/MDF. A card reader should be added to record access.

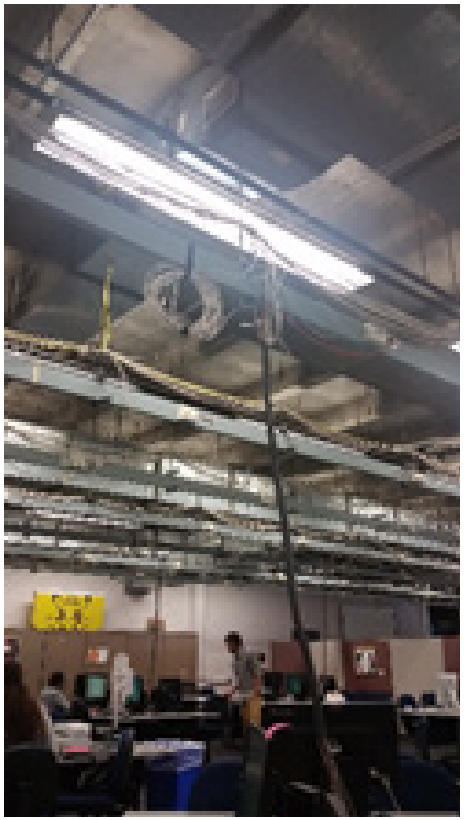


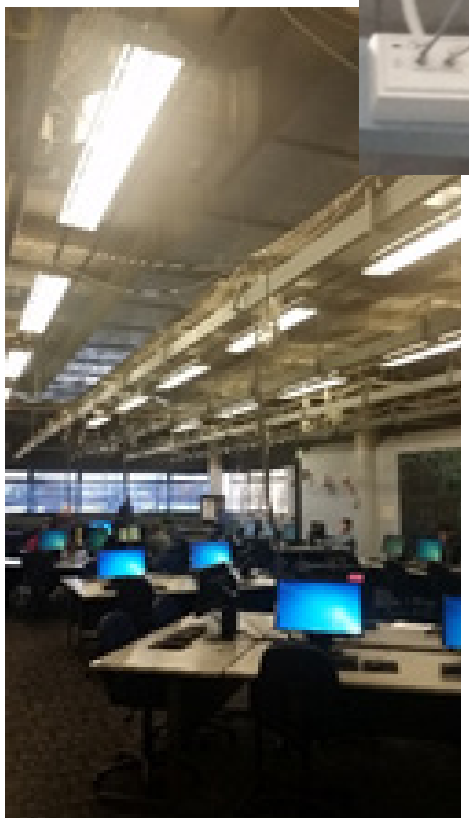
Telecommunications Room (TR) / Intermediate Distribution Frame (IDF):
P100H. In addition to the TEF/MDF there is an existing TR/ IDF measuring approximately 8'-6" x 8'-6" located in the southeast portion of the building. Three walls are CMU and one gypsum board. There is a single door that opens into the room. One wall has some plywood backer board, but does not appear to be fire-resistive treated. Fiber backbone cabling connects this TR/IDF to TEF/MDF. In addition a small phone field is mounted on the wall with punch blocks with copper cabling to telephones serving this area of the building.
The network switches are mounted in a two-post equipment rack which has room for some additional equipment. Most cables are attached to an overheard structural cable management system in the room while some are bundled and dressed neatly together. The sleeves penetrating walls are completely full. HVAC ventilation appears to be provided by a single sidewall ventilation fan mounted in the gypsum board partition. No fire sprinkler head or other fire protection system observed in the room. A telecommunications grounding system was not observed.
Recommendations – Backer board, fire-resistive treated, should be attached to all walls. Vertical cable managers should be added to the rack and up and down the walls as an extension of the existing overhead ladder rack system. A telecommunications grounding system should be added to ground and bond all equipment, racks, and cable managers. A dedicated HVAC system which operates 24/7 regardless of whether the building is occupied should be provided to the room; there may be minimal heat load now, but if additional equipment is added the load will grow. So the dedicated HVAC could be deferred until equipment is added. A dry-pipe pre-action fire sprinkler system should be provided. A card reader should be added to record access.

Computer Lab Equipment Room (ER):
104B. In addition to the TEF/MDF and TR/ IDF there is another small network ER that serves the Computer Lab and two adjoining rooms. The room is also being used and occupied for other purposes. One wall has a small piece of plywood backer board, but does not appear to be fire-resistive treated. Fiber backbone cabling connects this ER to the TR/IDF. There is no phone field or punch-down blocks. The network switches are mounted in a two-post equipment rack. While there is one vertical cable manager attached to the equipment rack and the cables are bundled and dressed carefully, there is little or no structural cable management system in the rest of the room. The sleeves penetrating walls are completely full. A telecommunications grounding system was not observed. Power for the rack-mounted equipment comes from a surge suppressor power strip which is supported on a stool.



Recommendations – If the computer lab remains we recommend the equipment be moved to the TR/IDF room since the cabling distance would not exceed 90 meters and there is sufficient space to add another rack in the TR/IDF or add equipment to the existing rack there now. However this will require re-cabling all of the workstations. See "Cabling" paragraph below for further discussion.



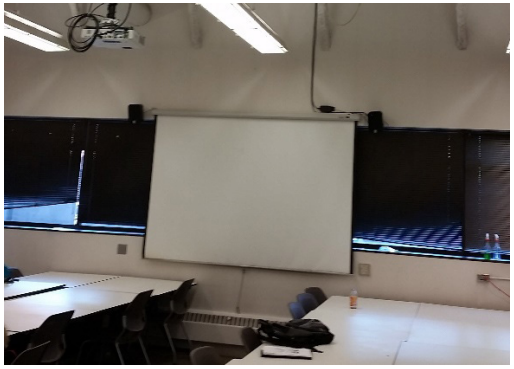


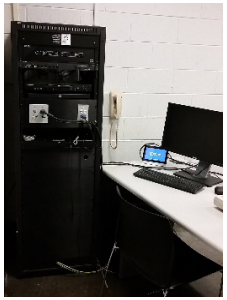
Computer Lab:
104. There is a large matrix of overhead raceway distributing power and some data to each workstation. However, there is a multitude of computer cabling attached to the outside of the raceway that is not properly supported and dangles down to the individual workstations.

Recommendations – If the computer lab remains, we recommend that as a minimum overhead cable tray be install next to the raceway to properly support the cabling. In addition, combination power-and-data poles should be provided down to each workstation. However, an alternate solution is to sawcut the floor and install underground conduit to floor feeds to the furniture. This would need to be coordinated with electrical for the same type of distribution from the floor rather than overhead. There are also some very low profile (as low as 2-1/2 inches) raised floors that can also be used.

Cabling -
The backbone fiber cabling appears to be in good condition. The existing horizontal station cabling appears to be Category 5e. Existing data outlets have a mix of faceplate styles and terminations, some angled and others flush, some recessed and others are surface mounted.

Recommendations – Replace all of the Category 5e cable with Category 6 to take advantage of higher throughput. Select one style of faceplate and replace those that do not match that style.





Audiovisual Systems:

Classrooms -

The existing classrooms use wall mounted, manual, 3x4 format, projection screens combined with ceiling mounted projectors. A pair of wall or ceiling mounted speakers are used to reinforce sound. And a rack-mounted amplifier and AMX control system to control input sources such as PCs, DVD, CD, Document Camera, or other Auxiliary AV input devices.

Recommendations – Replace the projection screens and projectors with large 80 or 90 inch, High Definition, flat panel displays whose format is 10:16. Update input interface plates to include HDMI.

Security Systems:

Currently there are both Millennium and Securitron Access Control panels mounted in the TEF/MDF. There are card readers installed on several classrooms inside the building. It appears only one exterior door has a card reader.

Video Surveillance System -

There is one exterior security camera mounted on the roof parapet on the southeast corner of the building. No security cameras were observed inside.

Intrusion Detection System -

There is an existing Honeywell intrusion detection system in the Computer Lab 104 which uses motion detectors.

Recommendations – Install card readers at all entrances. Add them at the TEF/MDF and TR/IDF. Install cameras to observe all entrances/exits. Auraria Campus Safety (Police) should be consulted to determine whether additional exterior cameras should be added.

Other Low Voltage:

In-building Wireless System / Distributed Antenna System (IWS/DAS):

It does not appear there is any type of radio or cell phone amplification system in the building.

Recommendations – A professional wireless subcontractor should conduct a physical signal strength survey within the existing building to determine which frequencies, if any require amplification. Until such survey is performed it should be assumed that at a minimum the Public Safety / First Responder radios will require an amplification system in order to comply with current fire code.

Networks:

Network Systems will be designed, procured, and installed by the Owner, and will make use of the Communications Infrastructure described previously in this narrative. These systems include:

- Data Network
- Wireless Network (including Wireless Survey to determine WAP locations)
- Power-over-Ethernet (part of the Data Network)
- Voice Network/PBX (including Intercom)
- Data (IT) Equipment (such as computers, notebooks, and servers)

Currently there is equipment to provide both wired and wireless data network service throughout the building. Some wireless access points were observed attached to the exposed structure overhead like the one shown below.

Recommendations – If any of the spaces are repurposed or reconfigured, especially where spaces become more densely occupied, a wireless survey should be performed again to check the existing WiFi coverage. In addition, information was provided by Chris Arcarese, Information Technology Services Director, identifying specific equipment that is being considered by the Owner to upgrade the network with the building. Refer to the Technology Appendix.

Electrical Infrastructure:

Cable Pathway and Supports -
Currently fiber cabling is contained in innerduct which runs overhead down some of the corridors attached to the wall, while bundles of copper cabling is suspended in many places by J-hooks. Some cabling passes from the corridor into the adjoining spaces through gaps at the tops of CMU walls, while other cabling passes through sleeves that are completely full.

Recommendations – Provide cable tray suspended overhead down all of the corridors wide enough to properly support all the fiber and copper communications cabling. Add additional conduit sleeves to enable cabling to penetrate walls where necessary to relieve already congested sleeves; consider use of such devices like EZ-Path where smoke and fire protection may be required.

Detailed Conditions Assessment - Mechanical and Electrical Systems

I. General

A. The purpose of this condition assessment for the Community College of Denver (CCD) master plan project is for Shaffer·Baucom Engineering & Consulting (SBEC) to assist CCD in the evaluation of the existing mechanical and electrical systems within the Boulder Creek (BC) Building. The results of this assessment will be utilized as a tool to prioritize a scope for master planning purposes.

B. The Boulder Creek Building is an approximately 63,700 square feet, single-story, tee-shaped building with a mixture of classrooms, teaching shop spaces, and computer labs, located on the Auraria Higher Education Center (AHEC) Campus. A mechanical penthouse located on the roof is approximately 3,800 square feet. Original construction date was approximately 1974. Subsequent renovations and modifications to the building appeared to have occurred; however, record documents of these revisions have not been available to the design team.

Within this narrative, the following system characteristics are addressed:

1. General
2. Applicable Codes and Standards
3. Summary of Existing Mechanical Systems

Appendix

Applicable Codes and Standards:

1. International Building Code (IBC), 2012
2. International Existing Building Code (IEBC), 2012
3. International Mechanical Code (IMC), 2012
4. International Energy Conservation Code (IECC), 2012
5. International Plumbing Code (IPC), 2012
6. International Fuel Gas Code (IFGC), 2012
7. National Electrical Code (NEC), 2014
8. National Fire Protection Association (NFPA) 13-2002, Standard for the Installation of Sprinkler Systems.
9. NFPA 69-2014, Standard on Explosion Prevention Systems
10. NFPA 654-2013, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids
11. NFPA 664-2012, Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities
12. ANSI A117.1, Accessibility requirements, 2009
13. ASHRAE Handbooks, Current Editions
14. ASHRAE Standard 62.1-2010, Ventilation for Acceptable Indoor Air Quality
15. ASHRAE Standard 90.1-2010, Energy Standard for Buildings Except Low-Rise Residential Buildings
16. ASHRAE Standard 55-2010, Thermal Environmental Conditions for Human Occupancy
17. NSF/ANSI 61: Drinking Water System Components – Health Effects.

Heating System:

1. Based on the existing Boulder Creek plans, the building is currently being served with one (1) 5" medium pressure steam (MPS), a 2" low pressure condensate return (LPR), and a 3/4" medium pressure condensate return (MPR) for a medium pressure end of main drip assembly that are original to the 1974 building. The steam service pipes enter the building on the east side of the BC building into a vault below room P100E. The 5" MPS and 2" LPR are then routed up to the north east corner of the mechanical roof penthouse. The 5" MPS is then routed through a steam pressure reducing station. The steam is reduced from approximately 40 pounds per square inch gauge (PSIG) to serve the building at 10 PSIG. The 5" reduced pressure steam then continues through the mechanical penthouse to the west from where two (2) shell and tube heat exchangers provide heating water. Additionally, a 2-1/2" reduced pressure steam branch continues to the north to provide steam to one (1) domestic hot water heat exchanger for domestic hot water; refer to "Domestic Hot Water" section below under "Summary of Existing Plumbing Systems" for additional information. The majority of the steam piping, valves, fittings, insulation, and equipment appears to be original to the 1974 building's construction with exception of a few occurrences of obvious valve and section replacements and the domestic hot water system; again refer to "Domestic Hot Water" section below under "Summary of Existing Plumbing Systems" for additional information.

Figure III-1. Main steam to heating water shell and tube heat exchangers.

Figure III-2. Main steam to heating water shell and tube heat exchangers.

2. On the building heating water side of the shell and tube heat exchangers, two base mounted end suction pumps circulate heating water to serve three (3) air handling units with pumped heating coils located in the penthouse. The remaining heating water piping is then typically routed along the perimeter of the building in a reverse return layout to serve the following ancillary heating terminals: perimeter fin tube and unit heaters. Additionally, there are four (4) heating-only, make-up air indoor suspended air handling units that have pumped hydronic heating coils and are located near teaching shop spaces.

Cooling System:

1. Based on the existing Boulder Creek plans, the building is currently being served with one (1) 5" chilled water supply (CH) and one (1) 5" chilled water return (CHR) that are original to the 1974 building. The chilled water service pipes enter the building on the east side of the BC building into a vault below room P100E. The 5" CH/CHR are then routed up to the north east corner of the mechanical roof penthouse. The 5" CH/CHR branches to provide chilled water to two (2) air handling units.

2. One (1) 4" CH/CHR is routed to AHU-1 via a pumped chilled water coil arrangement; refer to "Supply Air System" section below under "Summary of Existing Mechanical Systems" for additional information. Based on the existing BC plans, the main chilled water was brought into the mechanical penthouse with the intent of future cooling coil connections and based on existing plans and deducing information, the pump chilled water coil for AHU-1 was installed prior to 1992.

3. The second 4" CH/CHR branch is routed via a pumped chilled water loop to three (3) separate chilled water coils located downstream of AHU-3's supply air ducts; refer to "Supply Air System" section below under "Summary of Existing Mechanical Systems" for additional information. Based on the existing BC plans, the 4" CH/CHR piping was installed under a renovation project in 1992. The equipment and piping for this system appear to be original to that project. It was observed that the chilled water pump was experiencing a substantial leak at the pump seal as indicated with a large amount of water on the mechanical penthouse floor.

Figure III-4. AHU-1 direct evaporative cooler and main chilled water cooling coil.

4. Direct evaporative cooling for AHU-1 is also being utilized as the second stage of cooling. The evaporative cooler section appears to be original to the built-up air handling unit.

5. The remaining five (5) air handling units in the building, which provide 100% outside make-up air, do not have any means of cooling beyond economizer mode.

Supply Air System:

1. AHU-1: This unit is a custom, field built-up variable air volume (VAV), pumped heating water coil, direct evaporative cooling, pumped chilled water coil air handling unit. The original main supply and return air fans currently utilize variable frequency drives (VFD) but are still equipped with adjustable inlet vanes. Based on the existing BC plans, the air handling unit is designed to deliver approximately 80,000 cubic feet per minute (CFM). The air handling unit and its components appear to be original to the 1974 building.

   a) The supply air is distributed from a pressurized supply plenum on the air handling unit to distribute six (6) insulated, supply sub-mains ranging from 20"Ø to 28"Ø in size are routed to various points within the mechanical penthouse. Each of the six (6) supply sub-main ducts includes a round, extended casing, sound attenuators and are approximately 48"-60" in length. Each of the supply sub-main ducts are equipped with fire dampers located at each floor penetration. Additionally, fire dampers are also located at all main corridor penetrations. Medium pressure ductwork is typically routed above occupied spaces (i.e. classrooms, shops, etc.). The medium pressure ductwork provides supply air to pneumatic VAV terminal units without reheat coils. Each VAV terminal unit then supplies conditioned air via low pressure, 1-inch thick lined ductwork to ceiling air devices. With the exception of a few small renovations, the majority of the VAV terminal units, ductwork, and air devices are original to the 1974 building.

   b) The return air system is ducted and is typically routed tight to structure down the main corridor. Return air duct branches penetrate corridor walls with fire dampers and return air via side wall return grilles. Return air ductwork is then routed to two (2) centrally located 48"x48" return air ducts that are then routed up to the mechanical penthouse floor with fire dampers at the floor penetration. The main return air fan is then connected to the custom built-up air handling unit where air is either relieved through a louver located on the southeast side of the penthouse wall or returned and then mixed with fresh outside air intake louver on the southeast side of the penthouse before entering the filter section and pumped hot water coil.

Figure III-5. Existing AHU-1 custom field built-up air handling unit

Figure III-6. Existing pneumatic VAV terminal unit.

Figure III-7. Existing AHU-2 modular, multi-zone air handling unit.

2. AHU-2: This unit is a multi-zone, constant air volume, heating only, modular type air handling unit. Based on the existing BC plans, the air handling unit is designed to deliver approximately 16,730 CFM. The outside air is filtered and ducted through an intake louver at the southwest penthouse wall. A pumped heating water coil provides tempered air to three (3) zone supply ducts. The modular type air handling unit appears to be original to the 1974 building.

a) Each zone supply duct has been retrofitted with pumped chilled water coils to provide conditioned air to the following rooms: Laboratory room 102, Computer Lab room 104, Classroom Spaces room 106. Based on existing BC plans, the chilled water coils were added as part of 1992 mechanical remodel.

b) Return air ductwork is routed up though the mechanical penthouse floor without a fire damper. As part of the 1992 mechanical remodel an in-line return air fan was added to the system in addition to a relief louver located on the southeast side of the penthouse wall.

c) It was also observed that there are two (2) medium pressure supply ducts from AHU-1 that are connected to the outside air section of AHU-2. There does not appear to be any documentation or sequence of operation for these two (2) supply connections to the outside air plenum.

3. AHU-3: This unit is a multi-zone, constant air volume, heating only, 100% outside air, modular type air handling unit. Based on the existing BC plans, the air handling unit is designed to deliver approximately 17,565 CFM. The outside air is filtered and ducted through an intake louver at the northwest penthouse wall. A pumped heating water coil provides tempered air to distributed ductwork serving rooms 121. The modular type air handling unit appears to be original to the 1974 building.

4. AHU-4: This unit is a suspended, constant air volume, heating only, 100% outside air handling unit. Based on the existing BC plans, the air handling unit is designed to deliver approximately 3,800 CFM. The outside air is ducted through the roof to a roof intake hood. A pumped heating water coil provides tempered air to distributed ductwork serving room 123. The suspended air handling unit appears to be original to the 1974 building.

Figure III-8. Existing AHU-3 multi-zone 100& outside air handling unit.

Figure III-9. Existing AHU-5 suspended from structure with pump heating water coil.

5. AHU-5: This unit is a suspended, constant air volume, heating only, 100% outside air handling unit. Based on the existing BC plans, the air handling unit is designed to deliver approximately 2,800 CFM. The outside air is filtered and ducted through the roof to a roof intake hood. A pumped heating water coil provides tempered air to distributed ductwork serving Paint Spray Booth room 132A. The suspended air handling unit appears to be original to the 1974 building.

6. AHU-6: This unit is a suspended, constant air volume, heating only air handling unit. Based on the existing BC plans, the air handling unit is designed to deliver approximately 1,770 CFM. The outside air is filtered and ducted through the roof to a roof intake hood. A pumped heating water coil provides tempered air to distributed ductwork serving room 130. The suspended air handling unit appears to be original to the 1974 building.

7. AHU-7: This unit is a suspended, constant air volume, heating only air handling unit. Based on the existing BC plans, the air handling unit is designed to deliver approximately 3,805 CFM. The outside air is filtered and ducted through the roof to a roof intake hood. A pumped heating water coil provides tempered air to distributed ductwork serving the Woodshop - 132. The suspended air handling unit appears to be original to the 1974 building.

Exhaust Air Systems:

1. The building's existing exhaust systems range from general restroom exhaust to specialized exhaust systems (i.e. fume collection, dust collation, hazardous/ flammable exhaust). The exhaust fans are primarily located on the roof or just below the roof level with the exception of the dust collection systems which reside on grade located on the north side of the BC building within the screened utility enclosure.
2. EF-1-43, EF-2-43, & EF-3-43: There are two (2) main restroom groups, each with a dedicated roof mounted exhaust fan. The main Men's Restroom – R100B does not provide current code required ventilation rates. Both exhaust fan systems appear to be original to the 1974 building.
3. EF-8-43: Dust collector exhaust fan is located on north side of the BC building within the screened utility enclosure. SBEC was unable to verify if the equipment was operational at the time of the site survey. Based on existing plans, the dust collector has a 12"Ø exhaust main that serves room 128. The dust collector is original to the 1974 building construction and does not meet current codes and/ or NFPA requirements for dust collectors.
4. EF-9-43: Woodshop dust collector exhaust fan is located on north side of the BC building within the screened utility enclosure. The dust collection system is connected to several pieces of woodworking equipment located in the Woodshop - 132 and served by a 20"Ø exhaust main duct. The dust collector is original to the 1974 building construction and does not meet current codes and/or NFPA requirements for dust collectors.
5. EF-13-43 & EF-13-43: Welding shop exhaust fans provide dedicated exhaust for localized fume extraction. Utility set type fans located below the roof provide exhaust for two dedicated welding areas. Exhaust then terminates through the roof to sidewall hoods with a barometric damper.

Figure III-10. Existing wood shop dust collector EF-9-43 & existing dust collection EF-8-43 (beyond)

Figure III-11. Existing pneumatic temperature control air compressor.

Temperature Control System:

1. The building's temperature control system is a hybrid of predominantly pneumatic controls and localized direct digital controls (DDC) for some of the smaller remodel work.
2. The pneumatic temperature control compressor is located in the mechanical penthouse. The air tank appears to be original but the compressor and motor appear to have been replaced.
3. The pneumatic control air serves the following components throughout the building: control dampers, thermostats, control valves, pneumatically adjustable inlet vanes fans, etc.

Recommendations

Heating System:

1. *All hydronic and steam piping, original to the building, is in poor condition and is beyond its expected service life and was observed with degraded piping insulation. Due to the age of the piping, it is recommended that the entire heating hydronic piping be replaced to reduce number of leaks and reduce pumping energy brought on by mineral build up inside pipe. Insulation should also be replaced to meet current energy codes.*
2. *The main hydronic heating water pumps are in poor condition and should be replaced since they are beyond their expected service life. The hydronic heating water pumping strategy should be changed to incorporate a variable flow pumping system to increase potential energy savings.*

3. *Terminal boxes shall be replaced to incorporate reheat coils in order to maintain current ventilation rates; thereby requiring an increase in hydronic heating distribution.*

HVAC Air Conditioning System:

1. *All chilled water pumps are in poor condition and are beyond their expected service life and have already begun to fail. It is recommended that all chilled water pumps be replaced and each air handling unit with return air be provided with chilled water coils integrated into each unit.*
2. *It is recommended that direct evaporative cooling provides an energy efficient method of providing conditioned air to spaces that require 100% outside air and also utilized to provide a second stage of cooling beyond economizer mode that can optimize outside air conditions for air handling units and reduce chilled water usage.*

Supply Air System:

1. *All air handling equipment and components are in poor condition and are beyond their estimated service life. Equipment should be replaced and sized to meet current mechanical and energy codes and ventilation air requirements to maintain acceptable indoor air quality (IAQ).*
2. *Medium pressure ductwork appeared to be in good shape despite be beyond its estimate service life. It would be recommended that the medium pressure ductwork distribution remain and only be replaced and/or sized correctly in areas of significant heating/cooling/ noise issues.*
3. *All pneumatic VAV terminal units are beyond their estimated service life and should be replaced with DDC, VAV terminal units with reheat coils to maintain current required ventilation rates.*

Exhaust Air Systems:

1. *All exhaust equipment is in poor condition and is beyond their estimated service life. Equipment should be replaced and sized to meet current mechanical and energy codes and ventilation air requirements to maintain acceptable indoor air quality (IAQ).*
2. *The existing dust collection systems are not in compliance with current mechanical or NFPA requirements for dust collectors and explosion controls. Both dust collector systems are in poor condition and are beyond their estimated service life.*
3. *It is recommended that the welding exhaust booths be provided with new dedicated, properly sized exhaust fans located on the roof. New exhaust ductwork shall be connected to localized, articulating arm, welding snorkel exhaust hoods for each welding booth/ station.*

Temperature Control System:

The pneumatic control system is in poor condition and is limited in its capabilities by current sequence of operations required to meet energy codes and reduce overall energy consumption with air and hydronic systems. The entire building's pneumatic temperature control system should be replaced with DDC controls and revised sequence of operations should be provided for all equipment.

Figure IV-1. Existing domestic water piping. Cold water, hot water, hot water recirculation, compressed air, building heating water, and fire protection piping shown. Note the domestic water shut off valves for the branch piping.

Domestic Water System:

1. Based on the existing Boulder Creek plans, the building is currently being served with one (1) 4" domestic water service that is original to the 1974 building. The 4" service enters the building on the north side of the BC building into room 123B.
2. Original shut off valves on branch domestic cold water piping are gate type valves. Existing domestic cold water piping insulation was typically observed as being original to the building's construction. Some valves appeared to have been replaced with quarter-turn ball valves. The design team was unable to determine if the replaced ball valves meet the lead-free requirements of NSF-61G.

Domestic Hot Water System:

The domestic hot water is currently generated by a double wall steam to instantaneous hot water generator. Based on a conversation with the AHEC facilities staff, this was converted to a double wall heat exchanger in 2004 to protect the domestic water supply from the supply steam which utilizes an inhibiter chemical.

Building Sanitary Sewer System:

Based on the existing Boulder Creek plans, the building is currently being served with one (1) 5" sanitary sewer service that is original to the 1974 building. The sanitary sewer is 5" cast iron sewer that exits the building to the north side of BC below C100D entrance.

Building Storm Water System:

1. Based on the existing Boulder Creek building plans, the storm drainage is collected at the roof level and is then typically routed down near columns with vertical roof drain leaders to collect at one (1) 15" underground storm drain main that is original to the 1974 building. The main storm drain 15" exits the building to the south side of the BC building below room 102. The storm drainage piping insulation all appears to be original to the 1974 building.
2. The existing roof is a ballasted type roof with typical roof drain bodies with dome strainers. It was observed that some of the roof drain dome strainers have been either covered by ballast or have been damaged. It was also observed where vertical roof drain leaders came through the acoustical ceiling tiles and then exposed in the occupied space that some of the ceiling tiles appeared to have water damage. See photos in previous section.

Compressed Air System:

1. Based on the existing Boulder Creek building plans, the main 4" compressed air pipe is original to the 1974 building. The main compressed air pipe is typically routed in corridor space and then distributed throughout the building to compressed air drops.
2. The compressed air system is served by two (2) air compressors with one (1) refrigerated air dryer. The Ingersoll Rand refrigerated air dryer and one of the Ingersoll Rand air compressors appear to have been replaced; however the age of the remaining Quincy air compressor is unknown and appears to be original to the building. The compressed air plant is located in the mechanical penthouse within a room with sound absorptive wall treatments.

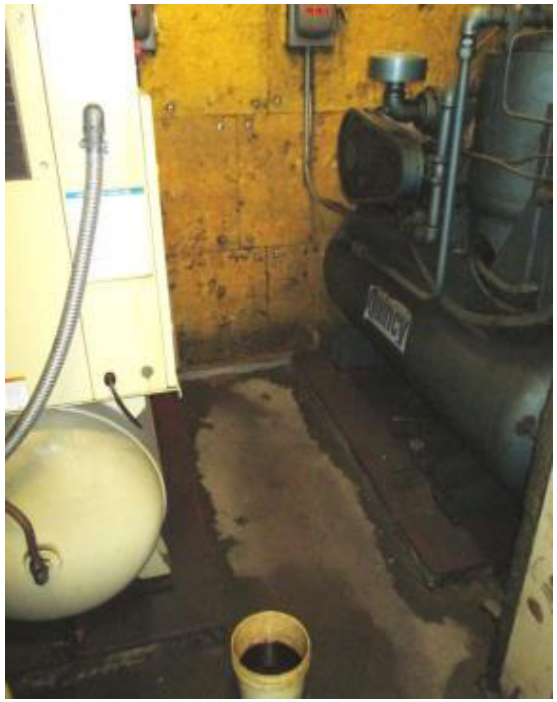


Figure IV-4. Existing compressed air plant.

Figure V-5. Existing natural gas piping routed on roof.

Natural Gas Service:

1. Based on the existing Boulder Creek building plans, the building is currently being served with one (1) 4" natural gas service and meter. The existing gas meter is located on the north side of the BC building within the screened utility enclosure. The natural gas piping has been rerouted to be located on the roof during a deferred maintenance project in 2014. Based on the existing BC building plans, the natural gas piping used to be located within the building; however, it was observed that generally the existing natural gas main routed through the building has been removed in the corridors.
2. Currently, the welded gas piping is routed on the roof and only provides natural gas service for laboratory space located in room 102. The natural gas piping in this laboratory room has been provided with an electric solenoid valve with an emergency shut-off keyed reset gas control switch located near the laboratory exit door.

Recommendations

Domestic Water System:

The building's domestic water system is typically original to the building including shut-off valves, insulation, and piping and is generally in poor fair to poor condition. It is recommended that the building's domestic water main and branch line isolation valves be replaced to lead free type valves complying with NSF-61G. Additionally, the piping insulation is beyond its expected service life and is recommended to be replaced with current code required thickness for condensation control.

Domestic Hot Water System:

The instantaneous steam domestic hot water generator is in good to fair condition and appears to be adequately sized for the buildings domestic hot water load. The piping insulation, which exception to the piping in the mechanical penthouse, appears to be original to the building and is beyond its expected service life and is recommended to be replaced with current energy code required thicknesses.

Building Sanitary Sewer System:

The main building's sanitary sewer system is original to the building. The design team is unable to determine the general condition of the sanitary sewer. It is recommended that a sewer scope of the main building's sanitary sewer be inspected via video camera to determine integrity of the system.

Building Storm Water System:

The storm water is in poor condition and has evidence of damaged components and localized water damage within the building space. Additionally, the storm water piping insulation is in poor condition and is beyond its expected service life.

Compressed Air System

The compressed air piping mains and isolation valves appear to be original to the building and are in poor condition. The existing compressed air plant is in fair to poor condition and is beyond its expected service life with exception to the newer air compressor and refrigerated air dryer. It is recommended to replace the Quincy air compressor and continue with regular maintenance of the remaining Ingersoll Rand equipment. Additionally, all plant and point of use compressed air filters should be replaced with new throughout the building.

Natural Gas Service:

There are no recommendations for the existing natural gas service or distribution. Existing system appears to be adequate size and good condition.

Figure V-1. Existing single interlock, pre-action fire suppression system in Room 104.

Fire Protection System:

1. Based on the existing Boulder Creek building plans, the building is currently being served with a 6" fire service with two main fire sprinkler zone valves. Zone 1 is indicated on the existing plans as serving the east half of the building and Zone 2 is indicated as serving the west half of the building.
2. The fire department connection is located on the north side of the building adjacent to main fire sprinkler service entry located in room 123B.

Dedicated Fire Protection System:

Room 104 is currently being served with a single interlock, pre-action type fire sprinkler system for the computer lab. Based on existing plans and deducing information, the pre-action system was installed prior to 2001.

Recommendations

Fire Protection System:

The existing fire protection system is generally in fair condition and appears to be adequately sized for the building size and usage. It is recommended that any modifications to the fire protection that could include removing, replacing and relocating sprinkler heads throughout the new spaces to accommodate new wall locations and new ceiling layouts shall comply with NFPA 13 requirements for usage and hazard type.

Dedicated Fire Protection System:

Room 104 is currently being served with a pre-action type fire sprinkler system for the computer lab and appears to be in good to fair condition and adequately sized for the current space served. There are no recommendations to this dedicated fire protection system.

Figure VI-1. Switchboard "MDC".

Main Electrical Service:

1. Based on existing plans and the site survey conducted the Boulder Creek building is presently served by a pad mounted campus primary 1000kVA, 13.2KV- 480Y/277 Volt, 3 Phase transformer. The transformer is located in the utility yard on the north side of the building, and feeds Switchboard MDC. MDC is located in the main electrical room and is 1,200 Amp, 480Y/277 Volt, 3 Phase, 4 Wire.
2. The Main Switchboard MDC is manufactured by General Electric with an AIC rating of 22,000 Amps.
3. A 40KW Diesel Generator is located in the utility yard on the north side of the building. The generator serves emergency and standby loads via Panelboard EGPD, located adjacent to the generator, via ATS #1 and ATS#2.

Figure VI-2. 40 KW Diesel Generator.

Appendix

Electrical Distribution System:

1. Switchboard MDC has a 1200 Amp 3 Pole Main Circuit Breaker and feeds panelboards HSL (200A3P), HPS (400A3P), HAA (225A3P), HSB (100A3P), HSI (175A3P), HSK (175A3P). MDC feeds motor control centers MCC-A (150A3P) and MCC-B (400A3P). MDC feeds 480-208Y/120 Volt transformers 150kVA (175A3P), 75kVA (110A3P), 75kVA (200A3P), 75kVA (60A3P) and 45kVA (70A3P). MDC provide normal side power to Automatic Transfer Switch #1 (30A3P) and Automatic Transfer Switch #2 (40A3P), MDC has TVSS (60A3P).
2. HSL is a 480Y/277 Volt, 3 Phase, 4 Wire, 225A3P Main Circuit Breaker panelboard.
3. HPS is a 480Y/277 Volt, 3 Phase, 4 Wire, 400 Amp rated MLO panelboard and feeds panelboard PS-1 (208Y/120 Volt, 3 Phase, 4 Wire) via a 75kVA stepdown transformer.
4. HAA is a 480Y/277 Volt, 3 Phase, 4 Wire, 225 Amp rated MLO panelboard and feeds Panelboard HB (480Y/277 Volt, 3 Phase, 4 Wire, 100A MLO).
5. HSB is a 480Y/277 Volt, 3 Phase, 4 Wire, 100A3P Main Circuit Breaker panelboard and feeds Panelboard SB (208Y/120 Volt, 3 Phase, 4 Wire, 100A MLO) via a 75kVA stepdown transformer. Panelboard SB feeds Panelboard SC (208Y/120 Volt, 3 Phase, 4 Wire, 30A3P MCB).
6. HSI is a 480Y/277 Volt, 3 Phase, 4 Wire, 175A3P Main Circuit Breaker panelboard. Panelboard HSI feeds Panelboard HSJ (480Y/277 Volt, 3 Phase, 4 Wire, 100A MLO), Panelboard HSI feeds Panelboard SI (208Y/120 Volt, 3 Phase, 4 Wire, 110A3P MCB) via a 45kVA stepdown transformer. Panelboard SI feeds Panelboard SJ (208Y/120 Volt, 3 Phase, 4 Wire, 100A MLO).
7. HSK is a 480Y/277 Volt, 3 Phase, 4 Wire, 175A3P Main Circuit Breaker panelboard and feeds Panelboard SK (208Y/120 Volt, 3 Phase, 4 Wire, 90A3P MCB) via a 30kVA stepdown transformer.
8. The 150kVA transformer fed via a 175A3P breaker feeds Panelboard SD (208Y/120 Volt, 3 Phase, 4 Wire, 125A3P MCB), Panelboard SP (208Y/120 Volt, 3 Phase, 4 Wire, 100A), Panelboard SA (208Y/120 Volt, 3 Phase, 4 Wire, 200A3P MCB) and Panelboard SDA (208Y/120 Volt, 3 Phase, 4 Wire, 90A3P MCB).
9. The 75kVA transformer fed via a 110A3P breaker feeds Panelboard SE#1 and SE#2 (208Y/120 Volt, 3 Phase, 4 Wire, 125A), via a 250A3P enclosed circuit breaker.

10. The 75kVA transformer fed via a 200A3P breaker feeds Panelboard SG (208Y/120 Volt, 3 Phase, 4 Wire, 100A3P MCB) and Panelboard SH (208Y/120 Volt, 3 Phase, 4 Wire, 60A3P MCB via a wireway on the transformer secondary with multiple taps.
11. The 75kVA transformer fed via a 60A3P breaker feeds Panelboard AA (208Y/120 Volt, 3 Phase, 4 Wire, 50A3P MCB) and Panelboard SM (208Y/120 Volt, 3 Phase, 4 Wire, 175A3P MCB), with two taps on the transformer secondary. Panelboard SM feeds thru to Panelboard SN.
12. The 45kVA transformer fed via a 70A3P breaker feeds Panelboard TE/CP1 (208Y/120 Volt, 3 Phase, 4 Wire, 150A3P MCB).
13. Panelboards and associated electrical equipment are manufactured by Square D.

Electrical Distribution System (Emergency and Stand-By):

1. Automatic Transfer Switch #1 (Emergency) is fed from Panelboard EGPD for emergency distribution and Switchboard MDC for normal distribution. ATS#1 feeds Panelboard HEM (480Y/277 Volt, 3 Phase, 4 Wire, 100A MLO).
2. Automatic Transfer Switch #2 (Standby) is fed from Panelboard EGPD for standby distribution and Switchboard MDC for normal distribution. ATS#2 feeds Panelboard HSB (480Y/277 Volt, 3 Phase, 4 Wire, 40A MCB). Panelboard HSB feeds Panelboard LSB (208Y/120 Volt, 3 Phase, 4 Wire, 50A MCB) via a15kVA stepdown transformer.

Figure VI-4. Automatic Transfer Switch #1

Figure VI-5. Automatic Transfer Switch #2

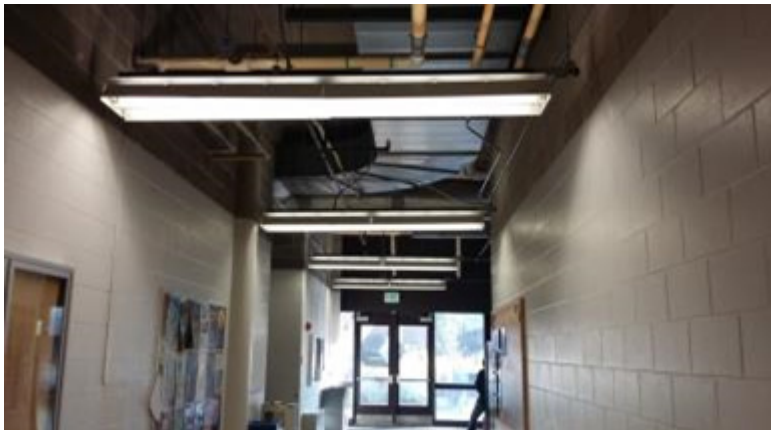


Figure VI-6. Typical Corridor Lighting

Figure VI-8. Typical Classroom Lighting

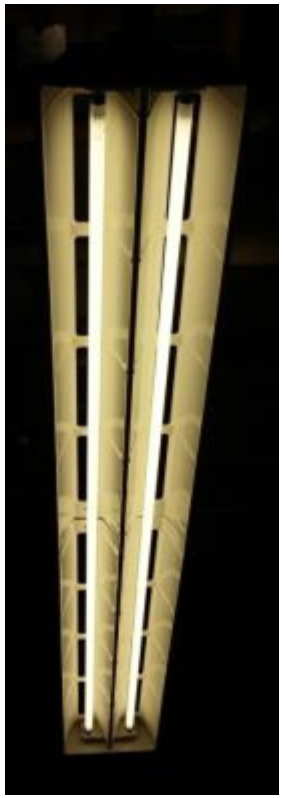


Figure VI-7. Typical 8' Strip Luminaire

Lighting System:

1. Labs and Corridors are illuminated with 4'-0" and 8'-0" fluorescent strip luminaires with (2) T-8 lamps per four-foot section, circuited at 277 volt. Strips have open reflectors and no lenses.
2. Classrooms are typically illuminated with 2'x2' and 2'x4' fluorescent recessed lay-in parabolic luminaires with (3) T-8 lamps, circuited at 277 volt.
3. Classrooms 130 B, C, D are illuminated with 1'x4' pendant mounted, fluorescent lensed luminaire with (2) T-8 lamps, mounted in continuous rows, circuited at 277 volt.
4. Offices are typically illuminated with 2'x4' fluorescent recessed lay-in lensed luminaires with (4) T-8 lamps, circuited at 277 volt.
5. Exit signs are LED.
6. Egress Lighting is connected to the EM branch from the generator.

Lighting Controls:

1. Corridors are controlled with single pole switches.
2. Labs are provided with dual level manual switching.
3. Classrooms are provided with dual level manual switching.
4. Offices are controlled with single pole switches.

Branch Power System:

1. Typical power in classrooms, offices, corridors is duplex and four-plex receptacles.
2. Labs have duplex receptacles at perimeter walls and cord drops at lab stations.
3. Room 104 Computer Lab has overhead buss gutter feeding computer stations.

Figure VI-9. Typical Lab Power Devices.

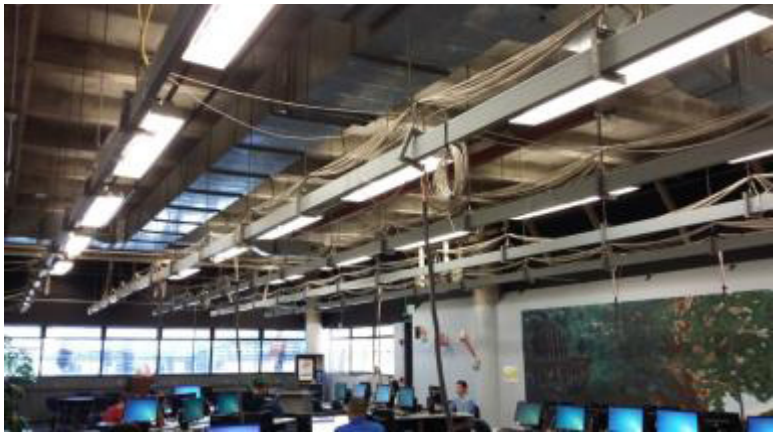


Figure VI-11. Computer Lab Overhead Buss Gutter.

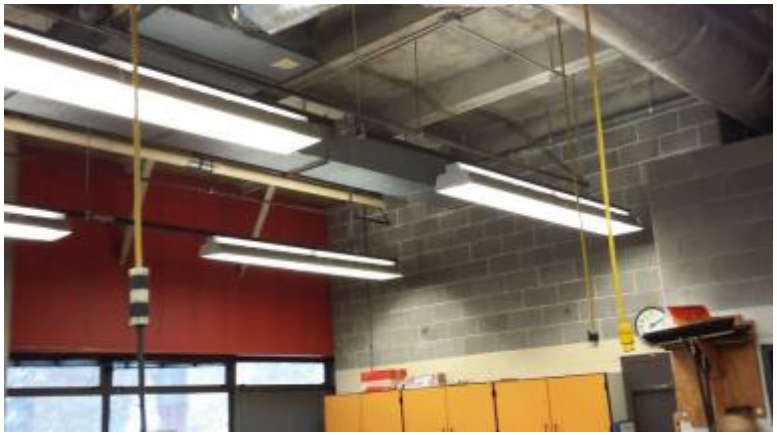


Figure VI-10. Typical Lab Cord Drop Receptacles.

Figure VI-12. Existing Fire Alarm Control Panelboard.

Fire Alarm System:

1. The building's Fire Alarm control panelboard is located in room P100D.
2. The building is provided with fire alarm notification and annunciation devices throughout.
3. The fire alarm system manufacturer is Simplex.

Recommendations

Electrical Distribution System:

1. The existing Main Switchboard MDC is in good condition. Based on information published in 2008, the peak demand on the electrical service is 539 Amps. However, MDC has no available spare or spaces to accommodate the addition of downstream distribution equipment to serve additional loads. Depending on the scope of recommended renovation and HVAC system upgrades, significant modifications to or replacement of the existing MDC may be required.

2. Branch panelboards located throughout the building to accommodate lighting, power, equipment are in good condition. However, the majority does not have available space or spare. Based on recommended renovation and HVAC system upgrades, additional branch circuit panelboards may be required.

3. The 480-208Y/120 Volt transformers located throughout the building are in fair condition. The existing transformers are not being used to full capability. The overcurrent protection feeding the transformers are undersized and will be required to match the rating of the transformer.

Electrical Distribution System (Emergency and Stand-By):

1. The existing 40KW generator and Automatic Transfer Switches #1 & #2 appear to be in good condition and should be adequate for any remodel.

2. Panelboards HEM (480Y/277V), HSB (480Y/277V), LSB (208Y/120V) are in good condition and have spare circuit breakers and spaces available for additional branch breakers.

3. Currently ATS #1 (Life Safety) and #2 (Stand-By) are fed from Switchboard MDC. Based on N.E.C. 2014 requirements Life Safety and Stand-By power are required to be fed separate. If modifications or Main Switchboard MDC is replaced ATS#1 and ATS#2 will be required to be fed from separate compartments.

Lighting System:

1. The current luminaires located throughout the building are in fair condition. If a building renovation is undertaken, it is recommended to consider upgrading the lighting to LED sources. LED luminaires would reduce the overall power consumption of the building, and significantly decrease maintenance.

2. Exit Signs appear to be in good condition. Based on new egress layout additional exit signs may be required.

Lighting Controls:

1. Currently the lighting controls are not code compliant.

2. Occupancy Sensors will be required for the remodel. Based on final building layout, wall and ceiling occupancy sensor will be required for lighting control.

3. Any modifications to the lighting will require the space to be compliant with current IECC recommendations.

Branch Power System:

Lab cord drop receptacles are in fair condition and out dated. During remodel new cord drop receptacles should be installed in appropriate locations.

Fire Alarm System:

The building's current Fire Alarm system appears to be fairly new and is in good working condition. Based on final building layout additional fire alarm equipment may be required.

Additional Program Descriptions

ADVANCED MANUFACTURING CENTER (AMC)

Programs

- Machining/Manufacturing
- Welding
- Potential future program: Additive Manufacturing
- Creating a corporate training center with funding from and in partnership with Burlington Northern Santa Fe (BNSF); other potential partnerships have been identified as well.

Current Location

- Advanced Manufacturing Center, which is a leased facility with a 10-year term, located approximately 4 miles north of the CCD central location on the Auraria campus

Existing Conditions

- Recently relocated to a newly-renovated facility that offers three times as much space as the previous facility
- Machining courses are offered in the mornings and afternoons; welding courses are offered in the mornings, afternoons, and evenings
- The nature of the equipment used at the AMC creates a number of environmental concerns, noise concerns, and loading concerns that are easily addressed at the current remote location
- Faculty use desks in open manufacturing areas rather than offices, though this is not preferred
- The facility has no break area or nearby good services
- There is currently no area for metal processing
- Classes are taught in a single open conference space that has noise issues

Emerging Issues

- The academic and certificate programs are under consideration for occupancy of the Boulder Creek Building, which would increase the visibility of those programs and might allow them to grow and tie in more effectively with other course offerings on campus.
- Non-credit certificate program enrollment is increasing and is expected to continue to increase significantly in the next few years; enrollment in machining is expected to double in the next year; enrollment in welding is expected to increase by 50% in the next year.
- BNSF prefers the off-campus location for liability reasons; the CCD staff and students prefer the autonomy of the off-campus location; non-credit certificate seekers prefer the off-campus location because they do not need on-campus services.
- The partnership with BNSF offers the use of equipment that would otherwise not be available to CCD students.

Detailed Space Needs Assessments

ARCH TECHNOLOGY

	Current Count	Existing Current ASF	Proposed Standard	Required Count	Required Current ASF	2020 Projection		2025 Projection		2030 Projection		Notes
						Count	ASF	Count	ASF	Count	ASF	
STAFFING												
FT (Tenure & Visiting) Faculty	n/a					n/a		n/a		n/a		office space not relocating to Boulder Creek
Adjunct/PT Faculty	n/a					n/a		n/a		n/a		
Staff	n/a					n/a		n/a		n/a		
Student Staff/Interns	n/a					n/a		n/a		n/a		
TOTAL HEADCOUNT	n/a					n/a		n/a		n/a		
OFFICE/SUPPORT SPACE												
Office & Office Support		n/a			n/a		n/a		n/a		n/a	office space not relocating to Boulder Creek
office circulation		n/a			n/a		n/a		n/a		n/a	
TOTAL OFFICE/SUPPORT		n/a			n/a		n/a		n/a		n/a	
DEDICATED CLASS/LAB SPACE												
Classroom		501			500							
Classrm/Lab and Lab		641			600							
Model Shop		0			1,000							based on existing Boulder Creek Suite 129
Model Shop Support		0			200							based on existing Boulder Creek Suite 129
TOTAL CLASS/LAB		**1,142**			**2,300**		**2,300**		**2,300**		**2,300**	
Total ASF		**1,142**			**2,300**		**2,300**		**2,300**		**2,300**	
NOTES												
Growth for office space, instructional space, and personnel head counts are based on overall projections by division as outlined in the Neighborhood Master Plan.												

HEALTH SCIENCES

	Current Count	Existing Current ASF	Proposed Standard	Required Count	Required Current ASF	2020 Projection		2025 Projection		2030 Projection		Notes
						Count	ASF	Count	ASF	Count	ASF	
STAFFING												
Full-Time Faculty	15					15		15		15		
Adjunct/PT Faculty	18					18		18		18		
Clinic Faculty (no office needs)	19					19		19		19		
Full-Time Staff	3					3		3		3		
Student Staff/Interns	0					0		0		0		
TOTAL HEADCOUNT	**55**					**55**		**55**		**55**		
OFFICE/SUPPORT SPACE												
Health Sciences Director		168			200		200		200		200	8 existing offices are vacant
Dental Director's Office		158			-		-		-		-	included in overall req'd staffing figures
Faculty Offices		3,341	see page 24		2,328		2,328		2,328		2,328	8 existing offices are vacant
Dental Faculty Offices (2 total)		235			-		-		-		-	included in overall req'd staffing figures
Faculty Conference Room		696			1,100		1,100		1,100		1,100	
Multipurpose Room		1,403			1,400		1,400		1,400		1,400	
Faculty Break Room		203			200		200		200		200	
Dental Conference		316			-		-		-		-	included in overall req'd faculty conf room
Dental Break Room		69			-		-		-		-	included in overall req' faculty break room
Storage		285			300		300		300		300	could be subdivided
office circulation		n/a	30%		1,658		1,658		1,658		1,658	existing circ factor = 32%
TOTAL OFFICE/SUPPORT		**6,874**			**5,528**		**7,186**		**7,186**		**7,186**	

Appendix

HEALTH SCIENCES

	Current Count	Existing Current ASF	Proposed Standard	Required Count	Required Current ASF	2020 Projection		2025 Projection		2030 Projection		Notes
						Count	ASF	Count	ASF	Count	ASF	
NON-INSTRUCTIONAL SPACE												
Food Bank		82			82							
Dental Waiting Room		700			700							
Dental Reception		372			372							
Dental Records File		250			250							
TOTAL NON-INSTRUCTIONAL		**1,404**			**1,404**							
DEDICATED CLASS/LAB SPACE												
Nursing Aid & Med Assistant												
Nurse Aid ClassLab		1,341			1,341							
Medical Assisting ClassLab		1,590			800							
CT & Mammography		225			225							
Medical Terminology Classroom		745			745							
Hospital Simulation Suite		1,531			0							
TOTAL		**5,934**			**3,361**							
Vet Tech												
Vet Dentistry Lab		473			473							
Spay/Neuter Lab		327			327							
Surgery		128			128							would be shared with surgical tech program
Diagnostic Lab		465			465							
Vet Anatomy & Physiology Lab		679			679							could be shared with Biology if colocated
Formaldehyde Storage												currently enclosed within the existing labs
Lab Staging Room		468			0							current room is used but is not needed

HEALTH SCIENCES

	Current Count	Existing Current ASF	Proposed Standard	Required Count	Required Current ASF	2020 Projection		2025 Projection		2030 Projection		Notes
						Count	ASF	Count	ASF	Count	ASF	
Laundry (Nurse & Vet shared)		0			0							shared - see Med Assis./Nurse Aid
Classroom		689			689							
TOTAL		**3,229**			**2,761**							
Rad Tech & Rad Therapy												
Classroom		931			931							
X-Ray		251			251							
X-Ray		251			251							
X-Ray		315			315							
Darkroom		87			87							
Storage		172			125							faculty indicated is currently oversized
V.E.R.T. Classroom		707			707							
Rad Therapy Classroom		735			735							currently used only 1ce/week
TOTAL		**3,449**			**3,402**							
Dental Hygiene												
Classroom		619			619							
ClassLab		1,113			1,113							contains 7 flip tables, seating 28
Exam Rooms (20 total)		2,382			2,382							average = 119
Group Exam Room		196			196							
X-Ray		403			403							
Supply Storage		329			329							
IPA		198			198							
Restoration Lab		142			142							
Restorative exam rooms (2)		0			240							

Appendix

HEALTH SCIENCES

	Current Count	Existing Current ASF	Proposed Standard	Required Count	Required Current ASF	2020 Projection		2025 Projection		2030 Projection		Notes
						Count	ASF	Count	ASF	Count	ASF	
TOTAL		**5,382**			**5,622**							
Shared												
Classroom		618			618							based on room 116
Classroom		751			751							underutilized - based on room 101
Classroom		928			928							based on room 103
Classroom		951			951							based on room 105
Laundry (Nurse & Vet shared)		90			90							
Teaching Computer Lab		955			955							could be shared w/ other colleges
Teaching Computer Lab		601			601							
TOTAL		**4,894**			**4,894**							
TOTAL CLASS/LAB		**22,888**			**20,040**							
Total ASF		**31,166**			**26,972**		**26,180**		**26,924**		**27,752**	
STUDENT SUPPORT												
Student Lounge		1,600			1,600							
Quiet Study Room		256			256							
TOTAL		**1,856**			**1,856**							
General/Common Factor		14,456			-							7160 1st floor, 7296 2nd floor
Dental General/Common Factor		4,317			-							
Total NSF		51,795			-							
NOTES												
Growth for office space, instructional space, and personnel head counts are based on overall projections by division as outlined in the Neighborhood Master Plan.												

LIFE SCIENCES (subset of Center for Math & Science)

note: only Teaching Kitchen & Café included in final recommendations

	Current Count	Existing Current ASF	Proposed Standard	Required Count	Required Current ASF	2020 Projection		2025 Projection		2030 Projection		Notes
						Count	ASF	Count	ASF	Count	ASF	
STAFFING												
FT (Tenure & Visiting) Faculty	n/a					n/a		n/a		n/a		office space not relocating to Boulder Creek
Adjunct/PT Faculty	n/a					n/a		n/a		n/a		
Lab coordinators (no office)	n/a					n/a		n/a		n/a		
Student Staff/Interns	n/a					n/a		n/a		n/a		
TOTAL HEADCOUNT	**n/a**					**n/a**		**n/a**		**n/a**		
OFFICE/SUPPORT SPACE												
Office & Office Support		n/a	n/a	n/a	n/a		n/a		n/a		n/a	office space not relocating to Boulder Creek
office circulation		n/a	n/a	n/a	n/a		n/a		n/a		n/a	
TOTAL OFFICE/SUPPORT		**n/a**	**n/a**	**n/a**	**n/a**		**n/a**		**n/a**		**n/a**	
DEDICATED CLASS/LAB SPACE												
Classroom		n/a			n/a		n/a		n/a		n/a	
Chemisty Labs		2,617			3,917		3,917		n/a		n/a	currently has 2 but needs 3
Biology Labs		9,690			12,490		12,490		n/a		n/a	currently has 6 but needs 8, includes fermentation lab
Lab Storage/Support		2,702			3,281		3,281		n/a		n/a	
TOTAL CLASS/LAB		**15,009**			**19,688**		**n/a**		**n/a**		**n/a**	
TEACHING KITCHEN & CAFÉ												
Teaching Kitchen		0			1,000		1,000		1,000		1,000	24 student capacity
Customer Seating for 30 people		0			450		450		450		450	
Counter Service		0			270		270		270		270	
Prep/Storage		0			920		920		920		920	
Manager's office		0			100		100		100		100	
Restrooms (1 M 1 W)		0			250		250		250		250	
TOTAL KITCHEN & CAFÉ		0			2,990		2,990		2,990		2,990	
Total ASF		**30,018**			**45,356**		**n/a**		**n/a**		**n/a**	
NOTES												
Teaching kitchen assumes 40 sf per student. Growth for office space, instructional space, and personnel head counts are based on overall projections by division as outlined in the Neighborhood Master Plan.												

VISUAL ARTS (Boulder Creek spaces only)

	Current Count	Existing Current ASF	Proposed Standard	Required Count	Required Current ASF	2020 Projection		2025 Projection		2030 Projection		Notes
						Count	ASF	Count	ASF	Count	ASF	
STAFFING												
FT (Tenure & Visiting) Faculty	n/a					n/a		n/a		n/a		office space not relocating to Boulder Creek
Adjunct/PT Faculty	n/a					n/a		n/a		n/a		
Staff	n/a					n/a		n/a		n/a		
Student Staff/Interns	n/a					n/a		n/a		n/a		
TOTAL HEADCOUNT	**n/a**					**n/a**		**n/a**		**n/a**		
OFFICE/SUPPORT SPACE												
Office & Office Support		n/a	n/a	n/a	n/a		n/a		n/a		n/a	office space not relocating to Boulder Creek
office circulation		n/a	n/a	n/a	n/a		n/a		n/a		n/a	
TOTAL OFFICE/SUPPORT		**n/a**	**n/a**	**n/a**	**n/a**		**n/a**		**n/a**		**n/a**	
DEDICATED CLASS/LAB SPACE												
Classroom		1,195		1	1,200							
Gallery		248		1	250							
Gallery prep/storage		251	see page 24	1	250							
TOTAL CLASS/LAB		**1,694**			**1,700**							
Total ASF		**1,694**			**1,700**		**1,700**		**1,745**		**1,796**	
NOTES												
All of the classroom and gallery space in Boulder Creek is addressed in the proposed renovation plans for the Arts Building. Growth for office space, instructional space, and personnel head counts are based on overall projections by division as outlined in the Neighborhood Master Plan.												

FINANCE/CFO

	Current Count	Existing Current ASF	Proposed Standard	Required Count	Required Current ASF	2020 Projection		2025 Projection		2030 Projection		Notes
						Count	ASF	Count	ASF	Count	ASF	
STAFFING												
Full-Time Staff	16					16		17		19		
Part-Time Staff	0					0		0		0		
Student Staff/Interns	0					0		0		0		
TOTAL HEADCOUNT	**16**					**16**		**17**		**19**		
OFFICE/SUPPORT SPACE												
CFO's Office		167	see page 24		200		200		200		200	
Offices & Workstations		613			1,140		1,140		1,200		1,260	
Storage		328			325		325		406		491	
Reception		64			60		60		60		60	shared w/ HR
Conference		166			200		200		250		302	shared w/ HR
office circulation		1,711	30%		578		578		635		694	
TOTAL OFFICE/SUPPORT		**3,049**			**2,503**		**2,503**		**2,751**		**3,007**	
DEDICATED CLASS/LAB SPACE												
Classroom		n/a										
Classrm/Lab and Lab		n/a										
Classrm and Lab Support		n/a										
TOTAL CLASS/LAB		n/a										
Total ASF		**3,049**			**2,503**		**2,503**		**2,751**		**3,007**	
NOTES												

HUMAN RESOURCES

	Current Count	Existing Current ASF	Proposed Standard	Required Count	Required Current ASF	2020 Projection		2025 Projection		2030 Projection		Notes
						Count	ASF	Count	ASF	Count	ASF	
STAFFING												
Full-Time Staff	7					9		10		10		
Part-Time Staff	0					0		0		0		
Student Staff/Interns	0					0		0		0		
TOTAL HEADCOUNT	**7**					**9**		**10**		**10**		
OFFICE/SUPPORT SPACE												
Director's Office		186	see page 24		120		120		120		120	
Offices & Workstations		484			540		720		780		780	
Storage		156			200		200		250		302	
Training Room		0			500		500		500		500	
office circulation		651	30%		408		462		495		511	
TOTAL OFFICE/SUPPORT		**1,477**			**1,768**		**2,002**		**2,145**		**2,213**	
DEDICATED CLASS/LAB SPACE												
Classroom		n/a										
Classrm/Lab and Lab		n/a										
Classrm and Lab Support		n/a										
TOTAL CLASS/LAB		n/a										
Total ASF		**1,477**			**1,768**		**2,002**		**2,145**		**2,213**	
NOTES												

Preliminary LEED Checklist

LEED v4 for BD+C: New Construction and Major Renovation
Project Checklist

Project Name: Boulder Creek Building, CCD
Date: 4/11/2014

Y	?	N			
			Credit	Integrative Process	

Y	?	N		Location and Transportation	16
		16	Credit	LEED for Neighborhood Development Location	16
1			Credit	Sensitive Land Protection	1
		2	Credit	High Priority Site	2
5			Credit	Surrounding Density and Diverse Uses	5
5			Credit	Access to Quality Transit	5
	1		Credit	Bicycle Facilities	1
1			Credit	Reduced Parking Footprint	1
	1		Credit	Green Vehicles	1

Y	?	N		Sustainable Sites	10
Y			Prereq	Construction Activity Pollution Prevention	Required
		1	Credit	Site Assessment	1
		2	Credit	Site Development - Protect or Restore Habitat	2
		1	Credit	Open Space	1
		3	Credit	Rainwater Management	3
	2		Credit	Heat Island Reduction	2
1			Credit	Light Pollution Reduction	1

Y	?	N		Water Efficiency	11
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
2			Credit	Outdoor Water Use Reduction	2
2	2		Credit	Indoor Water Use Reduction	6
		2	Credit	Cooling Tower Water Use	2
	1		Credit	Water Metering	1

Y	?	N		Energy and Atmosphere	33
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
	6		Credit	Enhanced Commissioning	6
12			Credit	Optimize Energy Performance	18
	1		Credit	Advanced Energy Metering	1
		2	Credit	Demand Response	2
		3	Credit	Renewable Energy Production	3
1			Credit	Enhanced Refrigerant Management	1
	2		Credit	Green Power and Carbon Offsets	2

Y	?	N		Materials and Resources	13
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
		5	Credit	Building Life-Cycle Impact Reduction	5
2			Credit	Building Product Disclosure and Optimization - Environmental Product	2
		2	Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
		2	Credit	Building Product Disclosure and Optimization - Material Ingredients	2
2			Credit	Construction and Demolition Waste Management	2

Y	?	N		Indoor Environmental Quality	16
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
2			Credit	Enhanced Indoor Air Quality Strategies	2
3			Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
1	1		Credit	Indoor Air Quality Assessment	2
1			Credit	Thermal Comfort	1
2			Credit	Interior Lighting	2
		3	Credit	Daylight	3
		1	Credit	Quality Views	1
	1		Credit	Acoustic Performance	1

Y	?	N		Innovation	6
	1	4	Credit	Innovation	5
1			Credit	LEED Accredited Professional	1

Y	?	N		Regional Priority	4
1			Credit	Regional Priority: Specific Credit	1
1			Credit	Regional Priority: Specific Credit	1
	1		Credit	Regional Priority: Specific Credit	1
	1		Credit	Regional Priority: Specific Credit	1

47	21	50	TOTALS	Possible Points:	110

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

Code Review Draft

PLUMBING FIXTURES						DRINKING FOUN-TAIN (DF) 1 PER 500 OLF		FIXTURE COUNT TOTAL (A)	WC	LAV	DF REQ.
	A-3	OLF =20	345	MEN WC	MEN LAV	WC MALE	LAV MALE				2
				0	0	1 PER 125	1 PER 200	MEN	0	0	
				WOMEN		WC					
ENG GRAPHICS	1735	87	345	WC	WOMEN LAV	FEMALE	LAV FEMALE	WOMEN	0	0	
ARCH TECH 3	1221	61		0	0	1 PER 65	1 PER 200				
M & SCIENCE	1154	58									
COMP LAB	1832	92									
VISUAL ARTS	1193	60									
RAD TECH 1,2,3,4	3071	154									
NURSING 1	1787	89									
NURSING 2	1787	89									
TOTAL	13780	689						FIXTURE COUNT TOTAL (B)	WC	LAV	DF REQ.
											0
	A-3	OLF =15	140	MEN WC	MEN LAV	WC MALE	LAV MALE	MEN	0	0	
				0	0	1 PER 75	1 PER 200	WOMEN	0	0	
STUDENT LOUNGE	4200	280	140	WOMEN WC	WOMEN LAV	WC FEMALE	LAV FEMALE				
				0	0	1 PER 75	1 PER 200	FIXTURE COUNT TOTAL (A) AND (B) REQUIRED			
	0	0									
TOTAL	4200	280						MEN	0	0	
								WOMEN	0	0	
	A-3	OLF =5	53	MEN WC	MEN LAV	WC MALE	LAV MALE	FIXTURE COUNT PRO-VIDED			
				0	0	1 PER 75	1 PER 200				
VISUAL ARTS	525	105	53	WOMEN WC	WOMEN LAV	WC FEMALE	LAV FEMALE	MEN	12	6	
	0	0		0	0	1 PER 75	1 PER 200	WOMEN	5	3	
TOTAL	525	105						(COM-BINED TO-GETHER FOR W)			
TOTAL (A) OCCU-PANCY		1074									

B OCC

	OFFICE	OLF 100
	11900	119

	STORAGE	OLF 300
	0	0
	0	0
	0	0
	0	0
	0	0
	0	0
	0	0

	TRAIN	OLF 20
HSC 1	988	49
HSC 2	515	26
HSC 3	585	29
HSC 4	654	33
HSC 5	900	45
HSC 6	940	47
ARCH TECH 1	507	25
ARCH TECH 2	960	48
SHARED CL. 1	701	35
SHARED CL. 2	600	30
SHARED CL. 3	907	45
SHARED CL. 4	650	33
SHARED CL. 5	461	23
SHARED CL. 6	452	23
	9820	491

TOTAL B OCC LOAD 610

305	MEN WC	MEN LAV
	0	0
305	WOMEN WC	WOMEN LAV
	0	0

WC MALE	LAV MALE
1 PER 25	1 PER 40
FOR FIRST 50	FOR FIRST 80,
THEN 1 PER 50	THEN 1 PER 80

WC FE MALE	LAV FEMALE
1 PER 25	1 PER 40
FOR FIRST 50	FOR FIRST 80,
THEN 1 PER 50	THEN 1 PER 80

NOTES: 0 WATER FOUN-TAINS PRO-VIDED, NEED ?

TOTAL A & B OCC LOAD

OCCUPANTS

1684

2012 IBC

	FACTOR	NEED	EXIST-ING
STAIR	0	505	FIRST 0 FLOOR
EXIT DOOR	0	253	966

Cost Estimate and Financial Analysis

Basis of Cost Estimate

Estimate has been prepared at the request of RNL Design and is to provide a programmatic estimate of construction cost the for Community College of Denver Neighborhood Master Plans.

The estimates are based upon program information, phasing and renovation scope as provided by RNL Design.

Estimate assumes the full cost of the project is bought and funds allocated at construction start date regardless if the project spans more than one fiscal year.

Information at this time is conceptual. Estimates for the Boulder Creek Renovation are highly dependent on the scope renovation definitions of Minor, Moderate and Extensive as defined on the following page.

Mid-term and long term new construction estimates are based entirely on historical cost data for similar projects and benchmark data. These estimates do not include material site preperation and site improvement, abatement, contingency, or design costs. These costs should be evaluated as design and program scope evolve.

Pricing is based on April 2016 costs and escalation allowances, equal to 5% per annum, are assumed. An estimating contingency of 10% has been included.

Cost Estimates for Community College of Denver Boulder Creek Building, Clear Creek Building, Bear Creek Building, Cherry Creek Building and Confluence Building are presented in the form of the Capital Construction Request document with further detail
attached.

Exclusions include the following elements:

- Hazardous materials abatement
- Excavation, unless otherwise noted
- Work to structural components within renovation scope, unless otherwise noted
- Out of hours work
- Construction management costs unless otherwise noted
- Utility upgrades tap fees and charges
- Permits & plan review fees
- Owner's contingnecy
- Land and legal costs
- Environmental and remediation expenses, including but not limited to asbestos and subsurface conditions
- Geotechnical, environmental, surveys, traffic and all other studies

The following definitions were used to determine the renvoation levels required to meet the program outlined by RNL. Cost per square foot assumptions were utilized for Finishes, Electrical and Mechanical depending on the renovation level.

MINOR RENOVATION
- Up to 20% remodel
- Reconfigured partitions
- Same use
- Patch/repair flooring/base/paint
- Selective replacement of ACT
- Repair casework as needed

Cost per Square Foot Assumptions

Finishes	$ 12.50
Electrical	$ 6.00
Mechanical	$ 10.00

MODERATE RENOVATION
- 20- 50% remodel
- Reconfigured partitions
- Similar or new use
- New flooring/base/paint
- 50% new ACT and grid
- 50% new light fixtures
- 50% new casework

Cost per Square Foot Assumptions

Finishes	$ 31.00
Electrical	$ 12.00
Mechanical	$ 15.00

MAJOR RENOVATION
- 50-90% remodel
- New partitions/doors/borrowed lights
- New use
- New flooring/base/paint New ACT and grid
- New light fixtures
- New casework

Cost per Square Foot Assumptions

Finishes	$ 50.00
Electrical	$ 15.00
Mechanical	$ 25.00

CC-C: CAPITAL CONSTRUCTION REQUEST FOR FY 2017-18

Agency :	**Community College of Denver**	State Controller Project No. (if applicable):	
Project Title:	Short Term Master Plan Projects	Agency Signature Approval:	Date
Project Year(s):	FY 2018 - 18	OSA Signature Approval:	Date
Agency Priority Number:		OSPB Signature Approval:	Date:
Name and E-mail of Preparer:			

	Revision? Yes No If yes, last submission date:	**Total Project Costs**	**Total Prior Year Appropriation(s)**	**Current Year Request FY 17-18**	**Year 2 Request**	**Year 3 Request**	**Year 4 Request**	**Year 5 Request**
A.	***Land /Building Acquisition***							
(1)	Land /Building Acquisition	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
B.	***Professional Services***							
(1)	Master Plan/FPP	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(2)	Site Surveys, Investigations, Reports	$ -	$ -		$ -	$ -	$ -	$ -
(3)	Architectural/Engineering/ Basic Services	$ 1,791,313	$ -	**$ 1,791,313**	$ -	$ -	$ -	$ -
(4)	Code Review/Inspection	$ 179,131	$ -	**$ 179,131**	$ -	$ -	$ -	$ -
(5)	Construction Management	$ 612,180	$ -	**$ 612,180**	$ -	$ -	$ -	$ -
(6)	Advertisements	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(7a)	Inflation for Professional Services	$ 213,156	$ -	**$ 213,156**	$ -	$ -	$ -	$ -
(7b)	Inflation Percentage Applied		0.00%	**5.00%**	0.00%	0.00%	0.00%	0.00%
(8)	Other	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(9)	*Total Professional Services*	$ 2,795,781	$ -	**$ 2,795,781**	$ -	$ -	$ -	$ -
C.	***Construction or Improvement***							
(1)	Infrastructure	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
	(a) Service/Utilities	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
	(b) Site Improvements	$ 313,775	$ -	**$ 313,775**	$ -	$ -	$ -	$ -
(2)	Structure/Systems/ Components							
	(a) New (GSF): 10,327	$ 3,407,910	$ -	**$ 3,407,910**	$ -	$ -	$ -	$ -
	New $282 /GSF							
	(b) Renovate GSF: 65,593	$ 9,672,781	$ -	**$ 9,672,781**	$ -	$ -	$ -	$ -
	Renovate $133 /GSF							
(3)	Other (Contractor Indirects)	$ 2,072,108	$ -	**$ 2,072,108**	$ -	$ -	$ -	
(4)	High Performance Certification Program	$ 100,037	$ -	**$ 100,037**	$ -	$ -	$ -	$ -
(5a)	Inflation for Construction	$ 1,213,716	$ -	**$ 1,213,716**	$ -	$ -	$ -	$ -
(5b)	Inflation Percentage Applied		0.00%	**5.00%**	0.00%	0.00%	0.00%	0.00%
(6)	*Total Construction Costs*	$ 16,780,326	$ -	**$ 16,780,326**	$ -	$ -	$ -	$ -
D.	***Equipment and Furnishings***							
(1)	Equipment	$ 22,000	$ -	**$ 22,000**	$ -	$ -	$ -	$ -
(2)	Furnishings	$ 2,525,985	$ -	**$ 2,525,985**	$ -	$ -	$ -	$ -
(3)	Communications	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(4a)	Inflation on Equipment and Furnishings	$ 171,282	$ -	**$ 171,282**	$ -	$ -	$ -	$ -
(4b)	Inflation Percentage Applied		0.00%	**5.00%**	0.00%	0.00%	0.00%	0.00%
(5)	*Total Equipment and Furnishings Cost*	$ 2,719,267	$ -	**$ 2,719,267**	$ -	$ -	$ -	$ -
E.	***Miscellaneous***							
(1)	Art in Public Places=1% of State Total Construction Costs (see SB 10-94)	$ -	$ -	**$ 157,735**	$ -	$ -	$ -	$ -
(2)	Annual Payment for Certificates of Participation	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(3)	Relocation Costs	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(4)	Other Costs [specify]	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(5)	Other Costs [specify]	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(6)	Other Costs [specify]	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(7)	Other Costs [specify]	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(8)	*Total Misc. Costs*	$ 157,735	$ -	**$ 157,735**	$ -	$ -	$ -	$ -
F.	**Total Project Costs**	$ 22,453,110	$ -	**$ 22,453,110**	$ -	$ -	$ -	$ -
G.	***Project Contingency***							
(1)	5% for New	$ 170,396	$ -	**$ 170,396**	$ -	$ -	$ -	$ -
(2)	10% for Renovation	$ 967,278	$ -	**$ 967,278**	$ -	$ -	$ -	$ -
(3)	*Total Contingency*	$ 1,137,674	$ -	**$ 1,137,674**	$ -	$ -	$ -	$ -
H.	**Total Budget Request [F+G(3)]**	**$ 23,590,783**	**$ -**	$ 23,590,783	**$ -**	**$ -**	**$ -**	**$ -**
I.	***Source of Funds***							
1	CCF	$ 22,175,336	$ -	**$ 22,175,336**	$ -	$ -	$ -	$ -
2	CF	$ 1,415,447	$ -	**$ 1,415,447**	$ -	$ -	$ -	$ -
3	RF	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
4	FF	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -

Community College of Denver **6/16/2016**
Renovation: Boulder Creek Building

Boulder Creek Renovation - Cost Estimate Summary

		Renovation Scope (SF)		55,283
Item No.	**Description**	**$/SF**		**Total**
A10	Foundations	Excluded		
A20	Basement	Excluded		
B10	Superstructure	Excluded		
B20	Exterior Closure[1]	$ 13.19	$	729,000
B30	Roofing[2]	$ 14.25	$	787,783
C10	Interior Construction	Included in finishes		
C20	Staircases	Excluded		
C30	Interior Finishes[3]	$ 42.15	$	2,330,017
D10	Conveying Systems	Excluded		
D20	Plumbing[4]	$ 8.75	$	483,750
D30	HVAC[5]	$ 53.69	$	2,968,140
D50	Electrical[6]	$ 21.00	$	1,160,943
E10	Equipment[7]	$ 0.36	$	20,000
E20	Furnishings[8]	$ 35.00	$	1,934,905
F10	Special Construction & Equipment	Excluded		
F10	Selective Building Demolition	Included in finishes		
G10	Site Preperation	Excluded		
G20	Site Improvements[9]	$ 0.64	$	35,250
H10	General Conditions / Requirements (15%)[10]	$ 23.10	$	1,277,232
	Subtotal Direct Construction Costs	$ 212.13	$	11,727,020
	Estimators Contingency (10%)		$	1,172,702
	Total Direct Construction Costs	$ 233.34	$	12,899,722
	Escalation Cost Through Construction Start Date of January 2018 (FY 2018)	$ 17.72 (5%)	$	979,474
	Estimated Construction Cost of Boulder Creek Renovation:	$ 251.06	$	13,879,195
	Architectural and Engineering Design Fee (10% of Escalated Construction Cost)	$ 25.11	$	1,387,920
	Construction Management Cost (3.5% of Escalated Construction Cost)	$ 8.79	$	485,772
	Materials Testing and Special Inspections (1% of Escalated Construction Cost)	$ 2.51	$	138,792
	LEED Building System Commissioning Fee	$ 0.65	$	35,934
	LEED Credit Management / Oversight	$ 1.00		55,283
	Art in Public Places (1% of State Total Costs)[11]	$ 1.98	$	109,713
	Total Cost (Art, Construction, Design, Management, Escalation, FFE)	**$ 291.10**	**$**	**16,092,608**

Comments:

(1) Exterior closure consists of tuckpointing allowance of $35,000; full replacement of all windows to insulated high-performance glazing allowance of $650,000 including storefront window system at one location; storefront replacement and masonry infill allowance of $44,000.

(2) Roofing and flashing to be replaced with single ply membrane and covered with aggregate at estimated cost of $4.25 per square foot.

(3) Finish renovation levels per Minor, Moderate, and Extensive renovation levels as outlined by RNL program and cost to renovate space into Nutrition Teaching Kitchen and Cafe. Additional costs include painting of mechanical penthouse (500sf) at a cost of $5 per square foot.

(4) Assumes full restroom replacement and expansion of 1,935 square feet.

(5) HVAC cost represents a complete demolition and replacement of the building's existing mechancial system. HVAC systems upgrade should be sized to accommodate new construction addition at time of Boulder Creek renovation.

(6) Electrical renovation levels per Minor, Moderate, and Extensive renovation levels as outlined by RNL program.

(7) Equipment consists of $20,000 allowance for signage. Security upgrades are not included.

(8) Furnishings includes $20 allowance for FF&E psf and $15 allowance psf for AV/IT upgrades.

(9) Site Imporvements consists of allowance for paved areas ($25,250) and equipment enclosure ($10,000).

(10) General Conditions / Requirements does not include Furnishings cost. This cost to be assumed by owner and outside of General Contractor scope.

(11) Assumes State funding for 94% of total project cost of including architectural and engineering design fee, construction management fee, materials testing, LEED costs, furnishings, and construction cost.

(12) See cover sheet for full list of exclusions and basis for estimate.

Community College of Denver **6/16/2016**
New Construction: Boulder Creek Building

Boulder Creek New Construction - Cost Estimate Summary

		New Construction Scope (SF)			10,327
Item No.	**Description**	**$/SF**			**Total**
A10	Foundations	Excluded			
A20	Basement	Excluded			
B10	Superstructure	$	250.00	$	2,581,750
B20	Exterior Closure[1]	Included in Superstructure			
B30	Roofing[2]	Included in Superstructure			
C10	Interior Construction[3]	$	50.00	$	516,350
C20	Staircases	Excluded			
C30	Interior Finishes[4]	Included in Interior Construction			
D10	Conveying Systems	Excluded			
D20	Plumbing	Included in Superstructure			
D30	HVAC[5]	Included in Superstructure			
D50	Electrical	Included in Superstructure			
E10	Equipment	Included in Superstructure			
E20	Furnishings[6]	$	35.00	$	361,445
F10	Special Construction & Equipment	Excluded			
F10	Selective Building Demolition	Included in finishes			
G10	Site Preperation	Excluded			
G20	Site Improvements[7]	$	24.21	$	250,000
H10	General Conditions / Requirements (15%)[8]	$	53.88	$	556,432
	Subtotal Direct Construction Costs	$	413	$	4,265,977
	Estimators Contingency (10%)	$	41.31	$	426,598
	Total Direct Construction Costs	$	454	$	4,692,574
	Escalation Cost Through Construction Start Date of January 2018 (FY 2018)	$	34.50	$	356,306
		5%			
	Estimated Construction Cost of Boulder Creek NC:	$	488.90	$	5,048,881
	Architectural and Engineering Design Fee (10% of Escalated Construction Cost)	$	48.89	$	504,888
	Construction Management Cost (3.5% of Escalated Construction Cost)	$	17.11	$	176,711
	Materials Testing and Special Inspections (1% of Escalated Construction Cost)	$	4.89	$	50,489
	LEED Building System Commissioning Fee	$	0.65	$	6,713
	LEED Credit Management / Oversight	$	1.00		10,327
	Art in Public Places (1% of State Total Costs)[9]	$	4.22	$	43,624
	Total Cost (Art, Construction, Design, Management, Escalation, FFE)	**$**	**565.67**	**$**	**5,841,632**

Comments:

(1) Exterior closure consists of core and shell construction costs @ $250psf for 10,327 gross square feet.

(2) Roofing cost is included in core and shell construction cost @ $250psf for 10,327 gross square feet.

(3) Interior Construction includes 3,110 square feet of classroom, 6,043 of office, and 1,174 square feet of circulation per RNL space diagram dated 5/16/2016.

(4) Interior Finish cost included in Interior Construction cost.

(5) HVAC upgrades as part of Boulder Creek Renovation should be sized appropriately to accommodate new addition.

(6) Furnishings include $20 psf FFE allowance and $15 psf IT/AV allowance.

(7) Site Improvement allowance of $250,000 assumes $155,000 plaza cost plus additional amenities and site improvements.

(8) General Conditions / Requirements does not include Furnishings cost. This cost to be assumed by owner and outside of General Contractor scope.

(9) Assumes State funding for 94% of total project cost of including architectural and engineering design fee, construction management fee, materials testing, LEED costs, furnishings, and construction cost.

(10) See cover sheet for full list of exclusions and basis for estimate.

Additional Renovation Costs per Institution and Building [1]

Institution	Building	Total GSF	Est. NSF by Level of Renovation: Minimal	Moderate	Extensive	Renovation Cost (April 2016)	Hard Cost PSF (April 2016)	Estimators Contingency 10%	Indirects 15%	Total Cost (April 2016)	Construction Start Date	Escalation Allowance[2] 5% per annum	Total Cost with Escalation	Escalated Cost PSF
Community College of Denver	Short Term Projects													
	Clear Creek Building	7,410	5,500	1,910	-	$ 222,655	$ 30.05	$ 22,266	$ 36,738	$ 281,659	Jan-18	$ 28,870	$ 310,529	$ 41.91
	Cherry Creek Building	2,340	2,340	-	-	$ 66,690	$ 28.50	$ 6,669	$ 11,004	$ 84,363	Jan-18	$ 11,004	$ 93,010	$ 39.75
	Confluence Building	1,560	1,560	-	-	$ 44,460	$ 28.50	$ 4,446	$ 7,336	$ 56,242	Jan-18	$ 5,765	$ 62,007	$ 39.75
	Subtotal:	11,310				$ 333,805				$ 422,263			$ 465,545	$ 41.16
	Subtotal A&E Costs (10%)									$ 42,226			$ 46,555	
	Subtotal Materials Testing (1%)									$ 4,223			$ 4,655	
	Subtotal State Art Requirement (1%)[5]									$ 4,687			$ 4,376	
	Total Short Term Projects:	**11,310**								**$ 473,399**			**$ 521,131**	**$ 46.08**

Institution	Building	Total GSF	Est. NSF by Level of Renovation: Minimal	Moderate	Extensive	Renovation Cost (April 2016)	Hard Cost PSF (April 2016)	Estimators Contingency 10%	Indirects 15%	Total Cost (April 2016)	Construction Start Date	Escalation Allowance[2] 5% per annum	Total Cost with Escalation	Escalated Cost PSF
Community College of Denver	Mid Term Projects													
	Boulder Creek Building[4]	11,157	-	1,002	6,043	$ 985,767	$ 62,124	$ 98,577	$ 162,652	$ 1,246,995	Jan-21	$ 306,166	$ 1,553,162	$ 139.21
	Grand Total All CCD Projects:	**22,467**				**$ 1,319,572**				**$ 1,720,395**			**2,074,293**	**$ 92.33**

(1) Renovation levels per Minor, Moderate, and Extensive defination provided by RNL.

(2) Escalation allowance is based on 5% escalation rate compounded annually through construction start date per RNL program dated 5/16/2016.

(3) Furniture, Fixtures, and Equipment not included in costs. Construction Management costs not included.

(4) Boulder Creek renvoation from UCD to CCD anticipated to occur January 2021. This is a mid-term project; not reflected on Capital Construction Request form.

(5) Assumes State funding for 94% of total project cost of including architectural and engineering design fee, construction management fee,

(6) See cover sheet for full list of exclusions and basis of estimate.