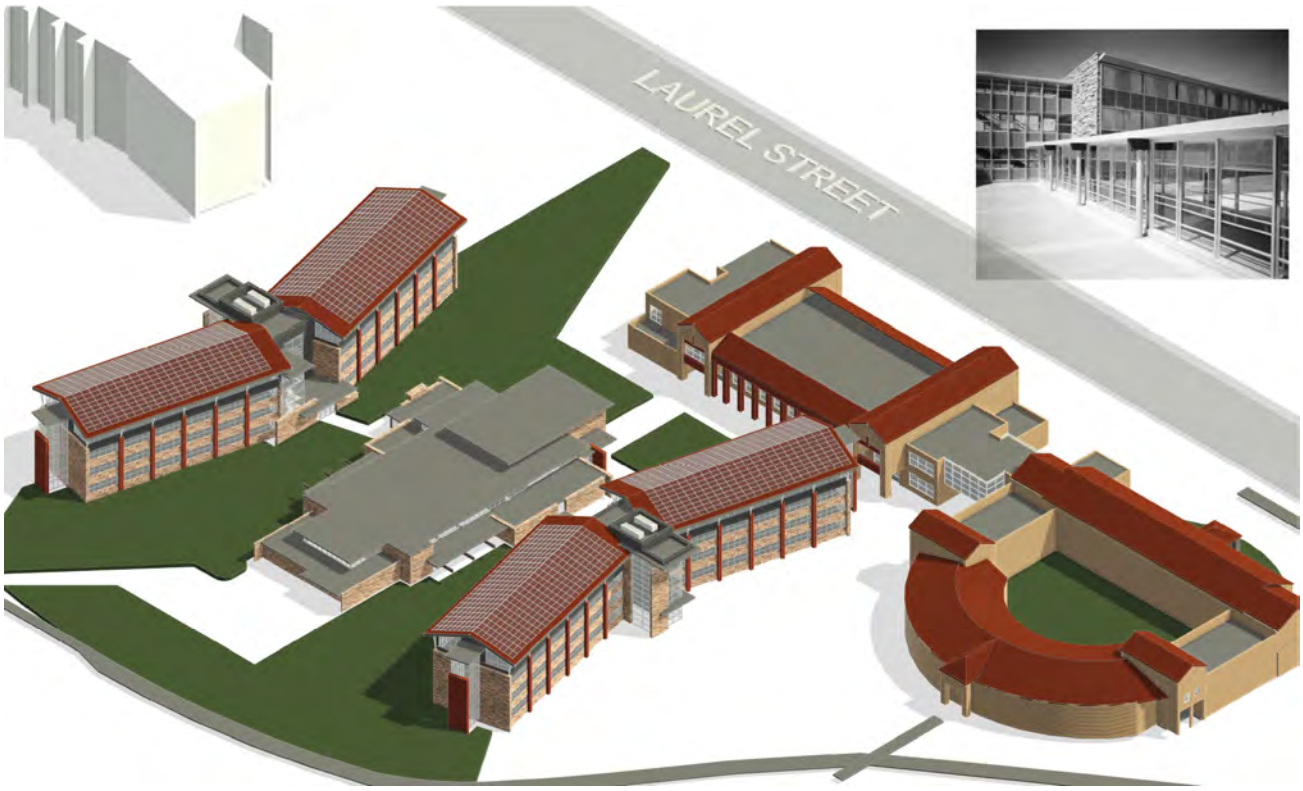

Additions and Renovations to Allison Hall

August 2023

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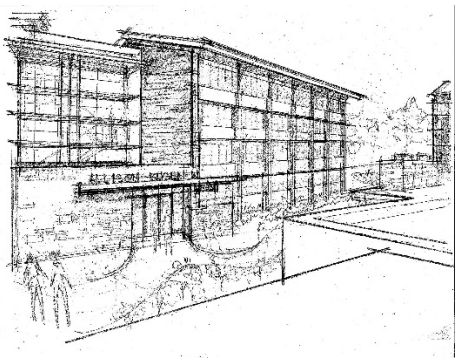
Executive Summary

The project will include an addition and renovation of the existing approximately 91,600 gsf Allison Hall. Allison Hall is located on the north side of main campus, directly adjacent to the College of Business. It houses approximately 400 students in double occupancy, community-style rooms (residents in each corridor share a community bathroom). The hall and its surrounding landscape sit on 3.67 acres. Allison Hall has served our students and supported the CSU mission since 1958. Except for minor improvements and bathroom renovations completed several years ago, Allison Hall remains mostly original.



New space will include approximately 225 new beds for a total of approximately 625 beds to accommodate anticipated future enrollment growth. Housing & Dining Services intends to fully renovate the existing building to address all deferred maintenance and to bring Allison Hall in alignment with our standards for quality, healthy, inclusive and functional spaces that are critical to student success. As part of the renovation, HDS anticipates incorporating an exciting option to partner with the Colleges of Business and Engineering to create space for an entrepreneurship and innovation academic program and associated living/learning community.

Prior to the pandemic, the University was in design on the Meridian Village project. This project was proposed as new construction for approximately 1,400 beds along with new dining space. Post pandemic, realities of escalating construction costs, escalating bond rates, competing priorities to address critical deferred maintenance in other HDS buildings, less than desirable structural frame and building materials required to maintain budget, and difficulty in predicting future enrollment for a project of this size necessitated that this project be cancelled. Since then, HDS has focused on revitalizing existing housing stock to address on-campus housing needs.

The existing 1950 - 1960 era buildings at CSU are cast -in -place concrete and are durable and structurally sound, so it is both sustainable and cost effective to invest in them. Retaining Allison and accommodating vertical and perhaps horizontal additions allows for adaptive and sustainable reuse of a structurally sound

existing building that can inform future projects. Between 2011 and 2015 CSU developed additions and renovations to both Braiden and Parmelee halls. Cost metrics for the projects were slightly less than new ground-up construction and the completed projects were more durable than new ground-up construction. Future College of Business (COB) expansion on both the east and west sides of existing facilities remains viable with the proposed Allison Project and allows for COB program expansion within the Allison footprint with renovation and perhaps a one-story vertical addition at the center section.

Project Description

The specified and constructed reinforced cast-in-place concrete structural section at Allison Hall can accommodate up to two additional stories at the residential wings and another storyat the center section. The anticipated structural framework for the additions will include braced steel post and beam construction with light gage infill and exterior enclosure framing. The entire building will be revitalized with the potential for the center section to be repurposed to meet the programmatic needs of HDS and the University in accommodating a new Institute for Entrepreneurship in partnership with the COB. This concept to create additional space is similar to the successful Braiden and Parmelee Hall projects developed between 2011-2015 (photos below).

Braiden and Parmelee Representational Images.

Anticipated base project scope included in the program:

- Renovation of the existing building to address all deferred maintenance including all new mechanical (including air conditioning), plumbing, electrical, and IT systems.
- Necessary site utility upgrades and replacements.

- Space to add approximately 225 new beds and retain the existing 400 beds for a total occupant capacity of approximately 625.
- Renovations to accommodate all-gender bathrooms in the resident wings.
- Reception space.
- Building services and operational support space.
- Office and living space for HDS staff.
- Small dining facility/retail food service space.
- Renovation of the existing building center section, to include multi-purpose/flexible space to meet the programmatic needs of HDS, the Entrepreneurship Living Learning community, and the Center for Entrepreneurship.

As an outcome of the project, Allison Hall will be a more efficient and sustainable facility with manageable maintenance and operational costs for HDS. This program plan includes conceptual studies of several potential options and alternates for further development with the project team. The project design and final scope inclusions will be determined through further program verification and design phases of the project. CSU anticipates a Design-Build with GMP project delivery with an estimated total development cost budget of $82.1M. Once approvals are in place the entire project is expected to take 42 months (about 3 and a half years) to complete. While Allison Hall is off-line Summer 2025 through Summer 2027, Housing & Dining Services will be able to accommodate all first-year students through full occupation of current spaces, by managing the number of transfer students that are encouraged to live on campus, by managing the number of returning students that are encouraged to live on campus, and adding additional beds in current facilities, if needed.

2. JUSTIFICATION

2.1 HISTORY, ROLE and MISSION

COLORADO STATE UNIVERSITY – WHO WE ARE
Founded in 1870 as the Colorado Agricultural College, Colorado State University is now among the nation's leading research universities.

Colorado State University Mission: Inspired by its land-grant heritage, Colorado State University is committed to excellence, setting the standard for public research universities in teaching, service, and extension for the benefit of the citizens of Colorado, the United States, and the world.

HOUSING & DINING SERVICES – WHO WE ARE
A member of the Division of Student Affairs, Housing & Dining Services (HDS) is a multifaceted auxiliary organization responsible for management, finance, administration, and program development of all on-campus housing facilities, including residence halls, university apartments, and residential dining. The HDS department also includes the Ram Card Office and Conference & Event Services providing support and services to guests and visitors to campus all year-round. HDS, with support from other campus partners, is also responsible for operations and maintenance of the CSU Mountain Campus.

Housing & Dining Services Mission: We create dynamic housing and dining experiences that enhance personal growth and global engagement.

Housing & Dining Services Vision: To create the best living and learning experience in higher education, support active learners, successful graduates, and engaged global citizens. Our priority is providing our residents and guests with safe living environments, quality dining, and exceptional out of classroom experiences. We accomplish this through sound fiscal and operational management strategies, and an emphasis on the development of programs and services that are designed to enhance personal growth and global engagement.

INSTITUTE FOR ENTREPRENEURSHIP-WHO WE ARE

The Institute is housed in, and financially supported by, the College of Business, however it is designed to be a support service organization providing free entrepreneurial programming and resources to the entire university and greater Front Range. We're focused on building entrepreneurial mindsets and skillsets that will make our students successful in their future careers.

ENTREPRENURESHIP LIVING LEARNING COMMUNITY. Residential Learning Communities (RLC) are programs that integrate academic and social learning in residence hall settings through faculty involvement. The hope is that all of Allison Hall will eventually become an entrepreneurship living/learning community.

2.2 PROGRAM NEEDS and TRENDS / FUTURE OPPORTUNITIES

To support the University's goals around recruitment, retention and sustainability, HDS is focused on revitalizing existing housing inventory and alleviating our deferred maintenance backlog, while addressing:

- Cross-disciplinary academic integration within the residential experience beyond program specific opportunities. To this end we are incorporating a partnership with the College of Business, located directly adjacent to Allison Hall. The College of Business Institute for Entrepreneurship supports undergraduate and graduate students from all 8 colleges, building a culture of entrepreneurship across CSU.
- Cultivate student learning, provide student support, and develop student leaders and student employees to meet the university strategic goals, diversity and inclusion plans, and overall mission and vision of CSU. These efforts have culminated in residence hall students obtaining higher grade point averages across all undergraduate class groups when compared to their off-campus counterparts. Recent data shows that students who live on campus have higher GPA's and are more likely to graduate than students who live off campus. In addition, residence hall students persist in their work towards a degree at a higher rate than those who live off campus and are more likely to graduate in four years.
- Ensure adequate supply for the live-on requirement and to enhance the second-year student experience.
- Provide a deliberate and differentiated sophomore experience.

WHY STUDENTS CHOOSE TO STAY ON CAMPUS

Students have indicated that cost, location, and where friends choose to live are primary drivers for why they choose to live on campus beyond their first year. Data also indicates that location, access to parking, amenities, and quality property management are important to students. By paying attention to these factors HDS has been successful in attracting more students to live on campus. Being able to accommodate returning students with a year-by-year analysis helps alleviate the reliance on enrollment projections and allows HDS to keep existing and future residence hall space filled**.**

2.3 EXISTING PROGRAMMATIC / OPERATIONAL DEFICIENCIES

Allison Hall was built in 1958 and has not received major renovations/upgrades since that time.It currently houses approximately 400 residents and is in need of renovation to include modernized resident rooms and bathrooms,upgraded student and staff support space, upgraded envelope and improved and or new mechanical (including air conditioning), plumbing, electrical, and IT systems as well as site utility considerations. Renovation of Allison Hall will alleviate a large deferred-maintenance backlog. Deferred maintenance was estimated at $22M from a facilities condition assessment completed in 2018.

2.6 CURRENT ENROLLMENT / CASELOAD

FIRST-YEAR LIVE-ON REQUIREMENT

CSU requires that all newly admitted first-year students and transfer students with fewer than 15 post-high school credits, who are single, under 21 years of age, and not living with their parents in the Fort Collins area, live in university residence halls for the first two consecutive terms of their attendance.

To fulfill the HDS vision of creating “the best living and learning experience in higher education” it is imperative that we understand the ways that residence halls support these students who are required to live on campus. In addition, we have an obligation to support the university’s student success initiatives beyond their first year, and as such it is critical that we also understand what we can do to provide the facilities and supports that are most impactful for returning students. To this end, regular assessments are conducted to gauge student satisfaction with our on-campus living facilities, to understand the factors that contribute to their satisfaction (as well as to their dissatisfaction) with living on campus, what can be done to improve satisfaction, and to better understand why students choose to return to campus.

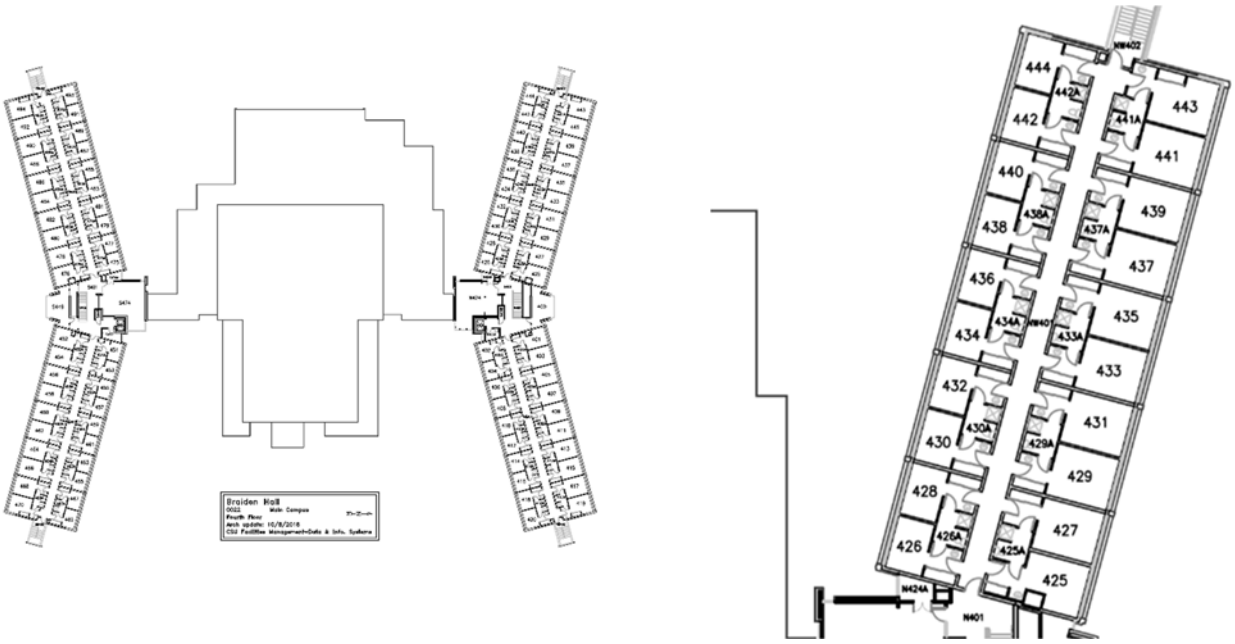
New Space Analysis

With the addition of resident rooms in the base scope and potentially other programmatic space in the center section, new space will be required to accommodate circulation and accessibility through the building. A preliminary spatial analysis is included in the Appendix and includes to an opportunity to add approximately 17,000 gsf of new ground-up additions similar to the “knuckle” additions at Braiden and Parmelee that provided space for elevators, student kitchens, lounges, and study space as well as building circulation. This could provide an opportunity to provide this functional space outside of the center section at Allison and also create defined entries to the east and west wings with the potential for office and reception space.

The two-story wing additions equate to approximately 44,000 gsf with a total base scope of approximately 61,000 gsf. New space may also include additive scope alternates, not currently in the project budget, for additional revenue generating beds of various configurations. There will be an opportunity to develop alternates that may also include new space within the center section as office, College of Business resident instruction classrooms, and for a small dining and/or grab and go retail food service. Further opportunity exists in redeveloping outdoor spaces that will provide opportunities for residents, staff, and academic programs to engage, collaborate and learn. With the full build out of the additional floor, the additive scope alternates at the center section total approximately 15,000 gsf of additional space.The extent and quality of interior finish items associated with the renovation scope can also be developed as alternates during the program verification and design process.

SPATIAL ANALYSIS						
LEVEL	ONE	TWO	THREE	FOUR	FIVE	TOTAL BASE
STUDENT STUDY/ LOUNGE NEW KNUCKLE WEST	2200	2200	2200	2000		8600
STUDENT STUDY/ LOUNGE NEW KNUCKLE EAST	2200	2200	2200	2000		8600
NEW SUITES				22000	22000	44000

The plans for Braiden and Parmelee included 120 beds in the 4th floor addition. The beds were distributed suite style with 20 beds in double occupancy suites on ½ of the wing and 10 beds in singles on the other side of the wing – total 30 beds per wing x 4 wings = 120 beds per additional floor. The program plan and initial conceptual design studies anticipate the 5th floor may step back from the end of the building mass and thus looking at a range of new beds using 225 as the planning metric. The floor plate for each wing is approximately 5,500 gsf.



Furniture Allocation

The total development cost budget includes a $2.5M allowance for new furnishings throughout all HDS spaces and any living/learning community space including resident and staff living spaces, offices, lounges and common spaces, HDS staff support spaces, the dining area, and outdoor seating areas. This budget shall also include other items necessary to outfit the building for occupancy, such as window coverings, mattresses, AV equipment, cleaning equipment, etc . It is anticipated that funds will be raised and provided to the project to outfit the spaces in support of the COB and COE Entrepreneurship and academic programs. This is anticipated to be codified in the MOU referenced later in this document.

Alternative Analysis The project costs can be reduced by excluding the renovation scope, similar to Braden and Parmelee but that option would not address the critical deferred maintenance for the sixty-five year-old building and would not solve ongoing energy and operational cost challenges due to mechanical, plumbing, electrical and IT systems that are beyond their useful life.

Another alternative is to build a portion of Meridian Village. This alternative is not viable due to the undesirable type of construction (light wood frame), the low-quality mechanical system specification, and poor material qualities required to make the proforma viable with current construction and borrowing costs. The resulting project would not help to address existing critical deferred maintenance, it would not be aligned with current campus aesthetics, and is less desirable than the adaptive use of an existing structurally sound facility built with more durable materials.

Similar project metrics and design concepts can be applied to Ingersoll, Edwards and/or Newsom Hall. Ingersoll and Edwards have been reclad with exterior envelope enhancements including new windows, insulation and a durable, attractive thin brick masonry application. Newsom is the same today as it was when originally occupied in 1956 with little improvement having been made beyond exterior painting, similar to Allison Hall. If Allison were to remain in its current state, and the project scope applied at another location, the potential for shared space and the entrepreneurial center would have to be developed in the future COB additions to the east and/or west of the current COB facilities and the University would not be able to capitalize on the potential for a living learning community with the College of Engineering and the College of Business.

Benefits of the Project

The conception of this project has been strategic to provide numerous benefits to HDS, campus partners, and the University.

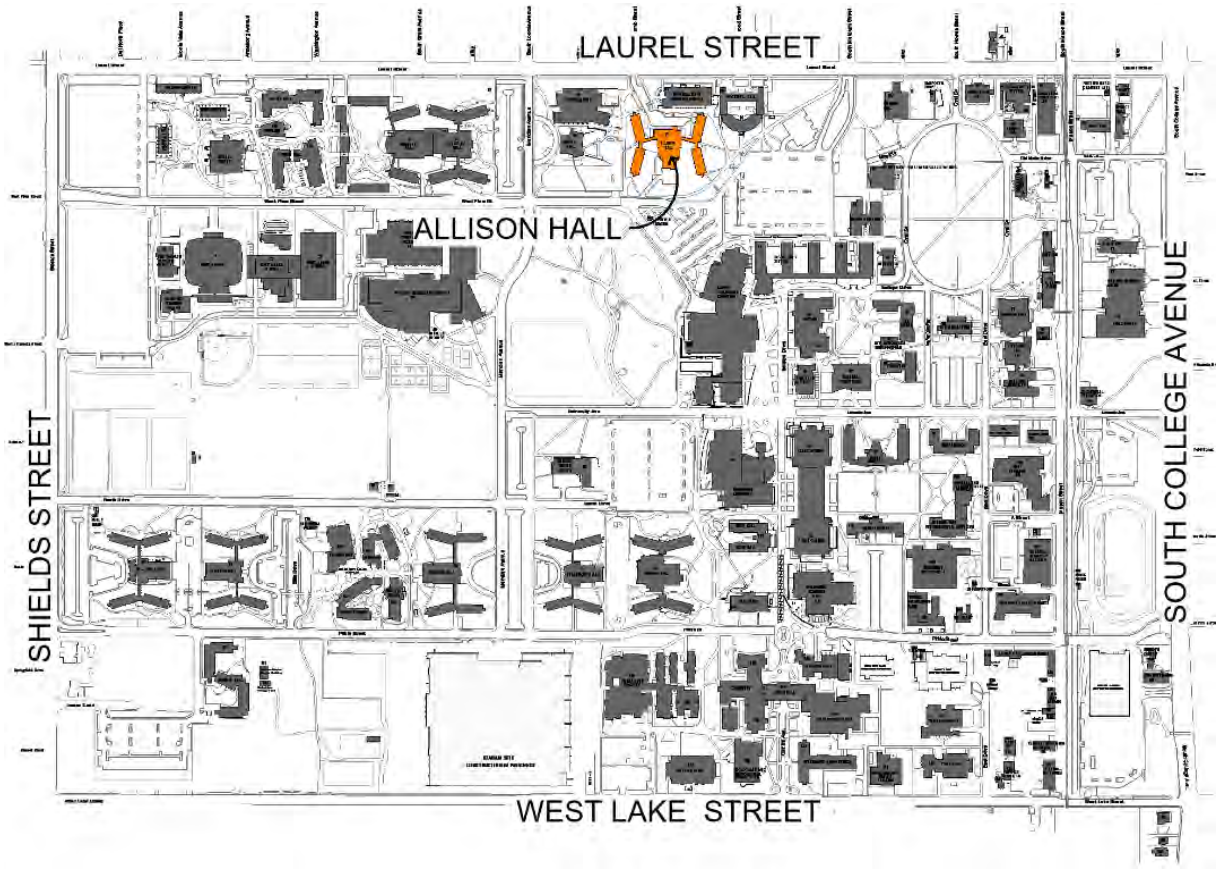
1. Increase housing capacity in support of our mission to provide on-campus housing for all first-year students as well as the desire to provide on-campus housing for all students who wish to live on campus. This will allow HDS to incrementally add housing capacity while enrollment projections continue to evolve.
2. A significant amount of critical deferred maintenance backlog will be addressed. Without addressing critical deferred maintenance, HDS would be facing added risk in failed building systems and resulting unoccupiable space.
3. Promotes an adaptive reuse of an existing, structurally sound building with vertical and ground up building additions to make the facility viable for the next century. The reuse and capital renewal of an existing building is one of the most sustainable and environmentally sound project types and aligns with the Universities approach to environmental sustainability.
4. More efficiently performing building equating to lower utility costs and energy consumption. The revitalized building will have a thermal envelope four times better than the existing enclosure. The exterior walls are projected to average around R16 by including thermally separated aluminum window frames and multi-pane low-e glass. Energy use to heat and cool the building will be significantly reduced even with consideration of the new space additions.
5. Maintain campus sites for other development needs - Developing new residence hall bed space on existing sites through additions and renovations helps maintain existing main campus sites for new campus parks as well as future academic, athletic, support and/or research buildings.
6. More value realized through the added housing capacity. While the cost per bed is comparable to new light wood frame construction, the quality and maintainability of the facility will be far better.
7. Opportunity to collaborate with campus partners in the creation of community and academic shared spaces. The College of Business is experiencing tremendous growth in their academic programs and with the proximity of their college to Allison and the timing of this revitalization project, there is an opportunity to alleviate some of that pressure by building out academic space and other

programmatic space within the Allison footprint. There is also an opportunity to create a living/learning community with the College of Engineering.

8. Alignment of Master Planning efforts – There is also an opportunity to align new directions being developed for the HDS Master Plan, starting with the Allison Hall site, with the College of Business' Master Plan and address some of those overlapping needs within this project.

3. Design Criteria

3.1 SITE AND SITE CONSTRAINTS



University Master Plan and HDS Master Plan

The most recent HDS Master Plan was developed in January 2009 in conjunction with Anderson Mason Dale Architects and incorporated into the 2014 University Master Plan. This plan showed the construction of numerous new villages on the current sites of Laurel Village, Allison Hall, the former site of Aylesworth Hall (which was deconstructed for Meridian Village), Newsom Hall, and Aggie Family.

Since the development of the 2009 HDS Master Plan the following capital projects have occurred:

- 2012 – a fourth floor was added to Parmelee Hall, increasing occupancy in the building by 120 beds
- 2013 – a fourth floor was added to Braiden Hall, increasing occupancy in the building by 120 beds
- 2013 – The Durrell Center reopened with an all new dining center layout and renovated meeting spaces.
- 2014 - Laurel Village was opened on the site of the former Lory Apartments, adding 541 residence hall rooms
- 2016 – Aggie Village (Lodgepole, Walnut & Cottonwood) was opened on the former site of Aggie Village North, providing 937 beds. These are the first on-campus apartments available for undergraduate students who have completed their one-year live-on requirement.
- 2018 – The Foundry dining center was completed, connecting the former Corbett and Parmelee Hall dining centers

Meridian Village (MV) Project

The Meridian Village project was approved by the Board of Governors (BOG) in January 2019 but put on hold shortly thereafter due to the COVID Pandemic. Post-pandemic, the project was evaluated and cancelled due to continued construction cost escalation, interest rate volatility with significant increases and other COVID impacts which dramatically reduced HDS reserve and fund balances. In consideration of long-term maintenance and operational costs, the University was unable to continue to reduce the project scope and quality to a point at which the revised proforma, incorporating the revised costs and interest rates would be viable. HDS was also facing significant challenges in balancing competing needs to address critical deferred maintenance across our building inventory. At the time of cancellation, the total development budget estimate for phase one of the project was over $200M and considered untenable with post-pandemic pressures.

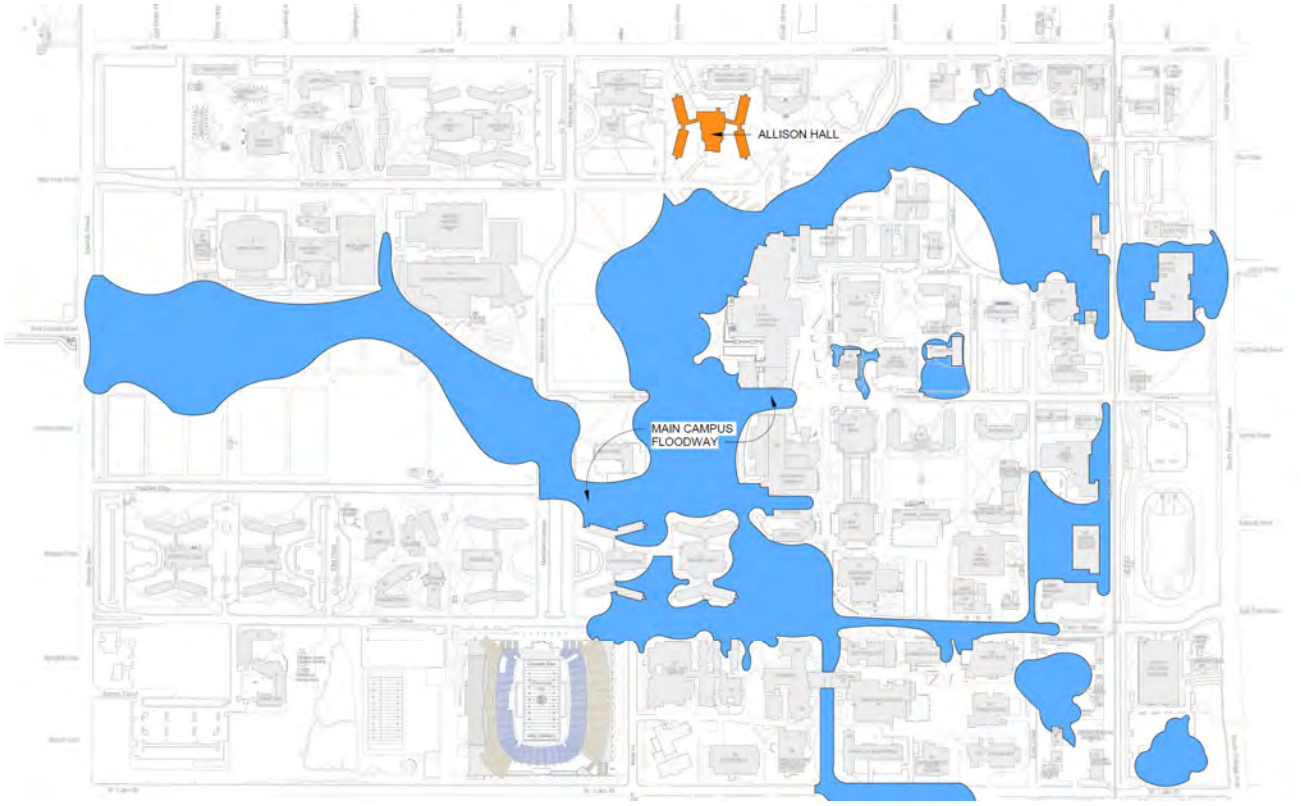
Allison Hall

Additions and renovations to Allison Hall are proposed as a viable alternative to the previously planned Meridian Village project. The project will provide additional residence hall bed space while renovating existing residence hall space. The site between the main entrance to the College of Business, Rockwell West Building and the northeast wing of the existing Allison Hall building is constrained. Optional additive alternates have been coordinated to relieve this condition either within this project or at some point in the future when funding becomes available.

Master Plan Committee Approval

The retention, revitalization and additions to Allison Hall project was presented and approved by the University Master Plan committee at the September 25, 2023 meeting. The approval will prompt updates to the 2014 University master plan to incorporate Additions and Renovations to Allison Hall as a living, learning community.

3.2 FLOOD MITIGATION ANALYSIS



Schematic graphic of the campus floodway in relation to Allison Hall

Allison Hall is adjacent to but outside of the existing campus floodway. Building Additions that increase the impervious area will need to accommodate on or off-site storm water management - retention as part of the development project. On going recommendations around storm water quality should be parsed out between project and ongoing university obligations.

3.3 SUSTAINABILITY AND THE HPCP

Senate Bill 07-051 directs that state buildings undergoing substantial renovation or new construction conform to the High-Performance Certification Program (HPCP) https://dlg.colorado.gov/high-performance-certification-program-hpcp. The Office of the State Architect has stated that the United States Green Building Counsel (USGBC) Leadership in Energy and Environmental Design (LEED)-NC Gold is the targeted standard of this program, or at a minimum, the highest obtainable LEED standard. The most current LEED publication at the time of design will be used. The inclusion of high-performance standards is an integral part of the project, beginning at the program planning stage. The building roofs should be designed as solar ready to accept solar panels that may be part of future power purchase agreements. The solar array is not currently estimated in the base scope of work for the project.

The project will meet the 2021 International Energy Conservation Code (IECC) and may be subject to the Buy Clean Colorado Act. Enhanced Thermal Envelope to support HVAC powered by renewable energy sources, space identified on site for renewable energy sources and the adaptive reuse of an existing building promotes the long-term sustainability goals of the University. Conformance with the 2021 IECC is generally

thought to be equitable to a LEED Silver rating. HDS anticipates the target for this project will be LEED Gold certification.

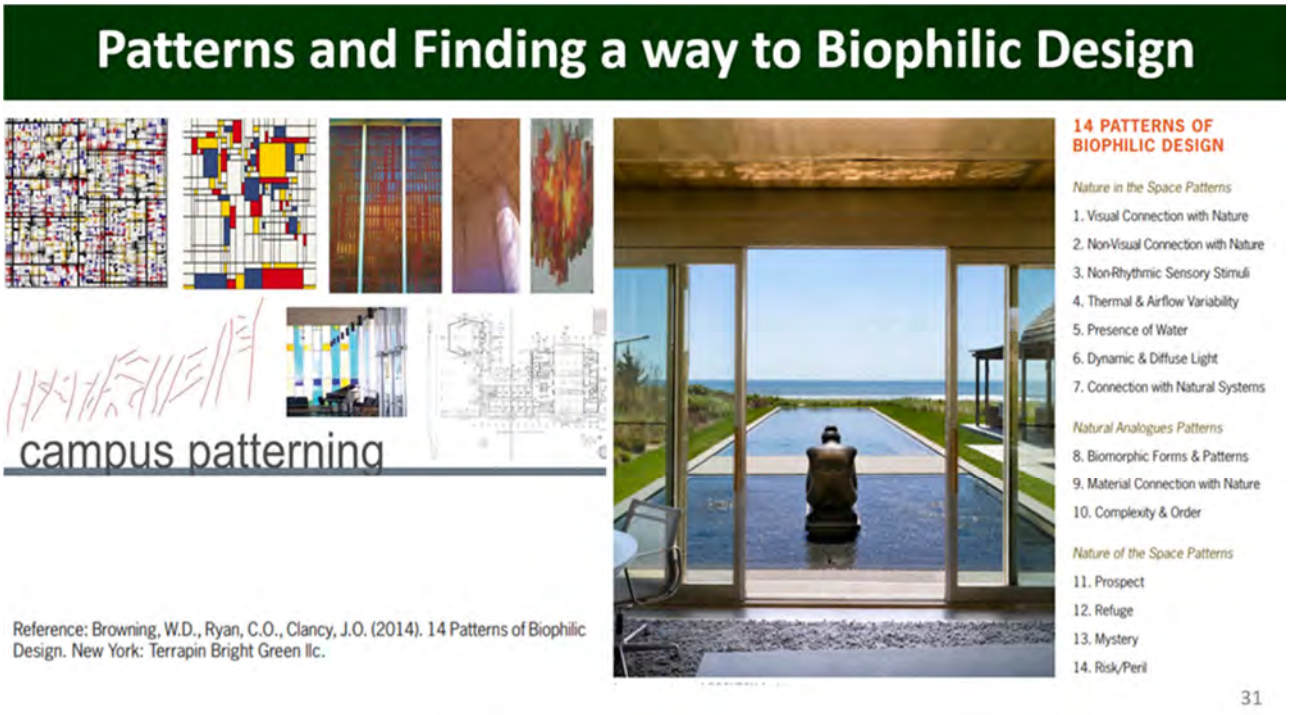
3.4 ARCHITECTURAL NARRATIVE AND INTEGRATING THE COLLEGE OF BUSINESS FUTURE GROWTH PLANNING

Architectural Narrative

Concept sketch indicating a four-story massing, proportional and material studies with existing arcades removed and in context with surrounding buildings.

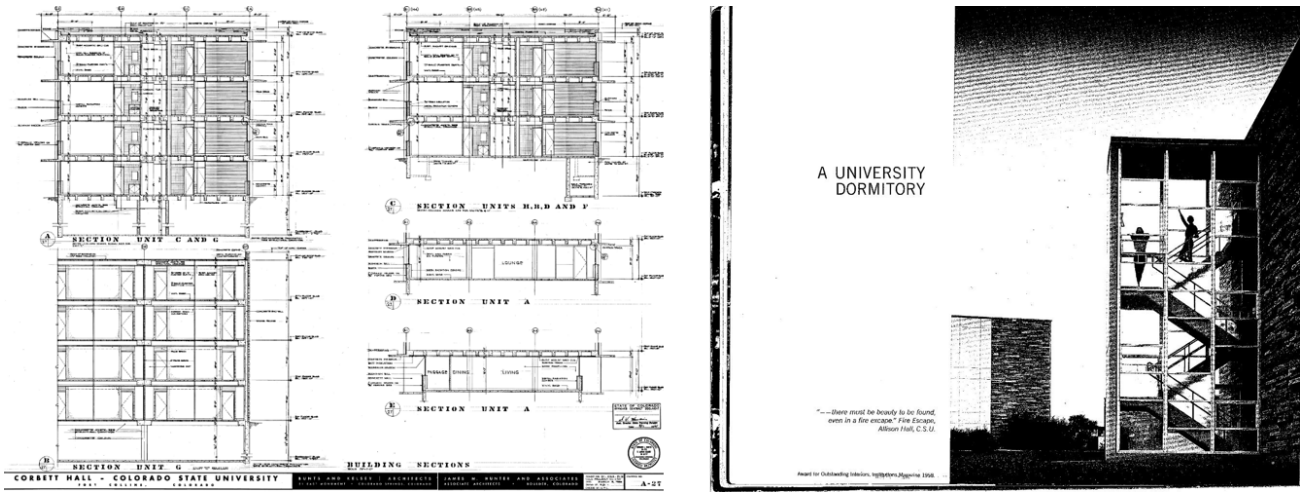
The existing building remains compelling and was elegant for its time; the facility's architectural roots are in the Mid-Century Modern International Style of architecture. Carefully considered detailing around opposing material qualities, pragmatic massing and modulation, low-pitched roofs with extended eaves and overhangs, post and beam construction and innovation in the use of concrete are all tenants of the style.

Like many facilities completed over the last couple of decades on the CSU campus, there is opportunity for the Allison Hall project to promote biophilic design considerations including robust daylighting, building layout to promote views at the end of hallways, circulation patterns that frame nature and connect occupants to the outside environment. Where appropriate, interior walls in the common spaces should promote transparency to allow the building itself to function as a teaching tool (displaying the recreational functions of adventure and discovery) and allowing exterior daylighting to reach deep into interior spaces. Biophilic Design elements defined by Browning, et al., have been promoted through the early conceptual design and programming efforts for several successful campus buildings. As an inherent and sustainable goal for building development, the Biophilic Design patterns promote optimized occupant energy, health, wellness and result in enhanced productivity and quality of residence hall life.



The Mid-Century Modern International Style design criteria informed by the existing Allison Hall and other similar buildings of the era at CSU, promote local materials, stone, and glass, (not to slather but to concentrate) and the use of the local materials both inside and outside the building enclosure. The building, or portions of the building should be apparent as a lantern to promote campus way finding and continuity of elegance with other buildings on campus during the evening hours. The reincorporation of the style allows the proposed building revitalization to be readily identifiable, of this time and place. We should promote stone and/or brick wall planes that extend from the inside out and the outside in. Integrate building entries

with extended roof planes, exterior plazas, and seat walls of native stone materials. Horizontal canopies should extend out in generous proportion from the building to promote a sense of horizontality. As in sketching, allow the line to extend all the way off the page. As such, we can promote a visual reduction in vertical scale while defining exterior space and promoting sun control. The end of hallways can be defined with a view to the outside, intersecting circulation is often used for student study. Introduce interior glass, storefront walls to allow the exterior light and views to extend deep into the internal space. Promote elegance in the details, carefully considered and documented as an integral part of the completed project.



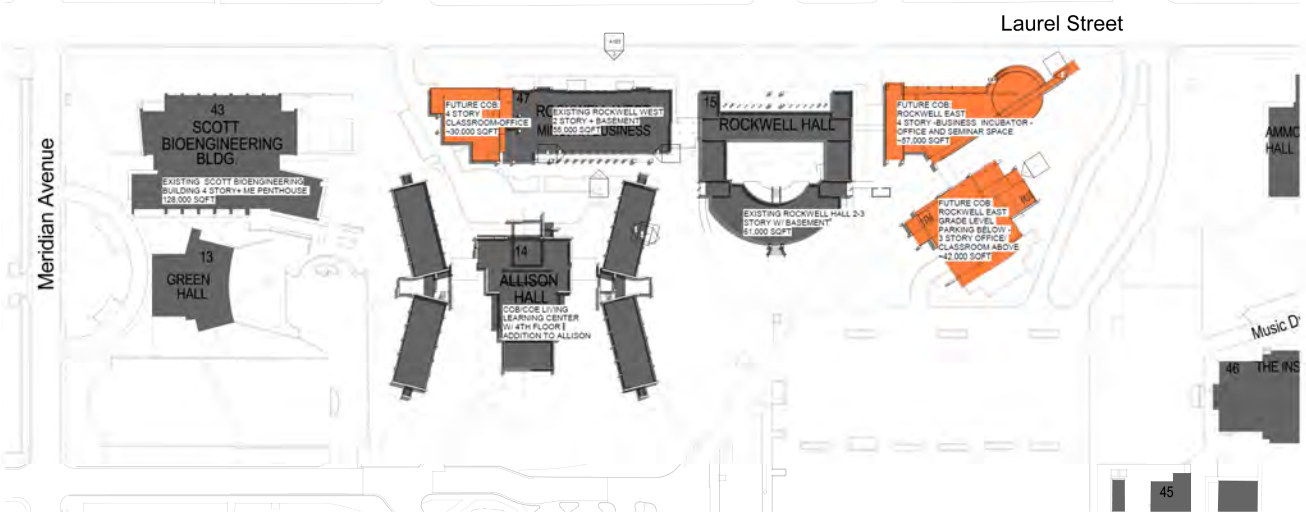
"There must be beauty to be found, even in a fire escape." -James Hunter, Architect Allison Hall.

Integrating Future College of Business Planning and Future Development Sites

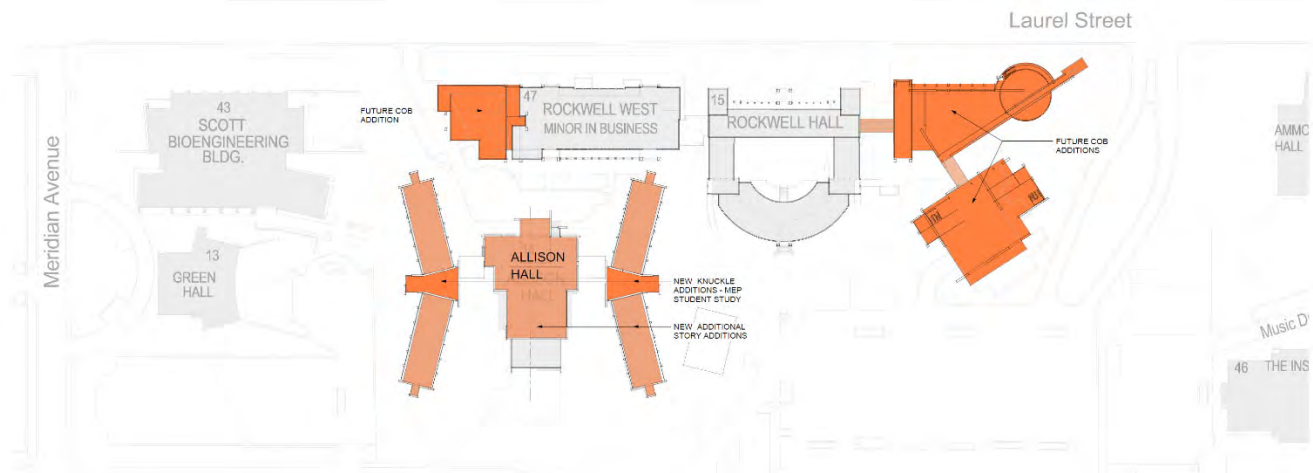
The current CSU master plan includes College of Business planning that is contingent on the deconstruction of Allison Hall once additional housing, such as the successful completion of Meridian Village or other housing development projects on campus, comes online. The Meridian Village project was approved by the BOG in January 2019 but put on hold shortly thereafter due to the COVID Pandemic. Post-pandemic, the project was evaluated and cancelled due to continued construction cost escalation, interest rates volatility with significant increases and COVID impacts which dramatically reduced HDS reserve and fund balances. In consideration of long-term maintenance and operational costs, the university was unable to continue to reduce the project scope and quality to a point at which the revised proforma, incorporating the revised costs and interest rates would be viable. The University determined to cancel the Meridian Village project and instead concentrate on revitalizing existing buildings to gain ground on deferred maintenance and integrating new beds in existing structurally sound facilities. Allison Hall was identified as the first candidate for such revitalization due to proximity to the College of Business and College of Engineering with a found opportunity for a entrepreneurship center and living/learning community.

In initial discussions, revitalizing Allison Hall and opportunities for accommodating multistory additions has been coordinated around the potential for an option to truncate the NE wing of Allison Hall to lessen the constrained impact on the entrance to the COB Rockwell West Building as well as the potential for future

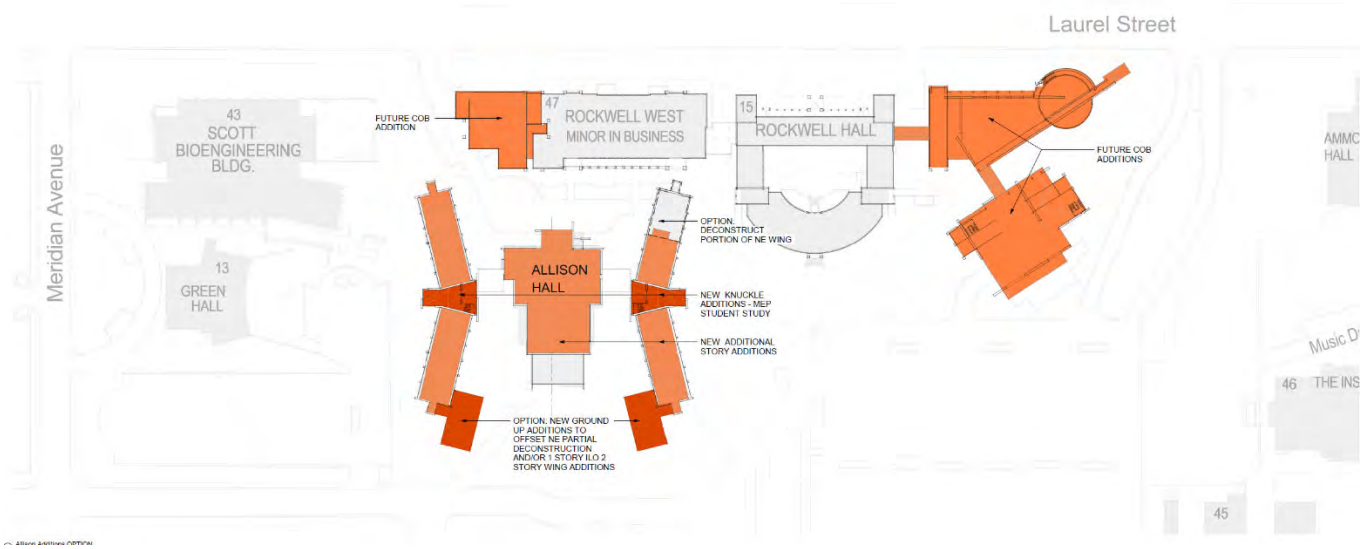
expansion of the College of Business facilities. Sites that can accommodate future growth are indicated on the east and west side of the existing College of Business classroom and office facilities.



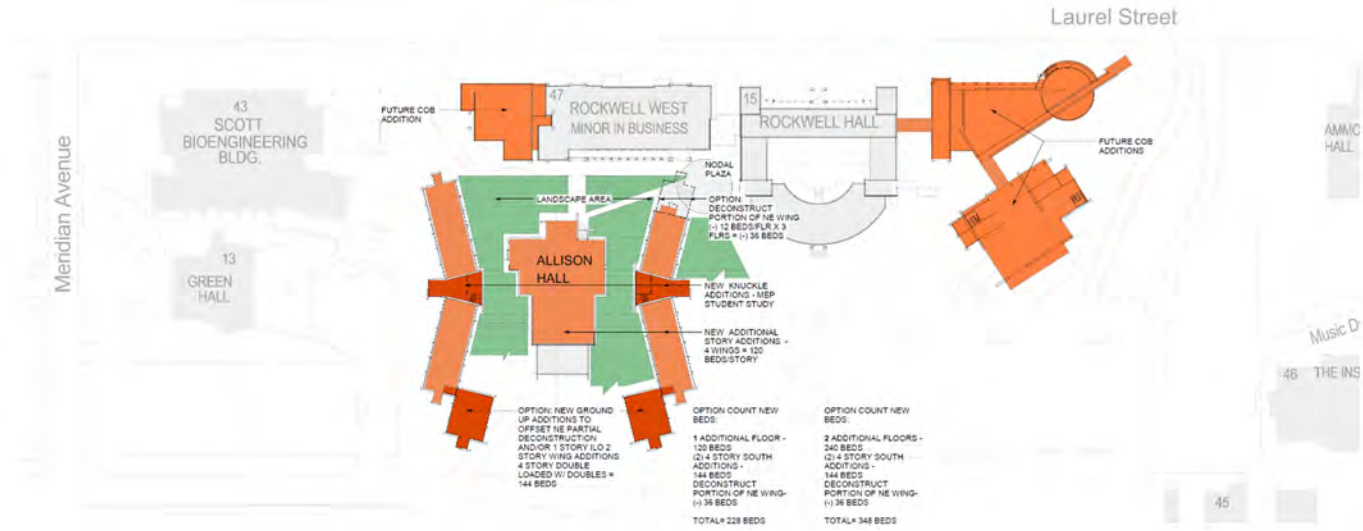
College of Business future growth on the west and east side of existing Rockwell Hall and Rockwell West. Multistory Additions with 130,000 GSF +/- growth potential in addition to the existing 115,000 GSF.



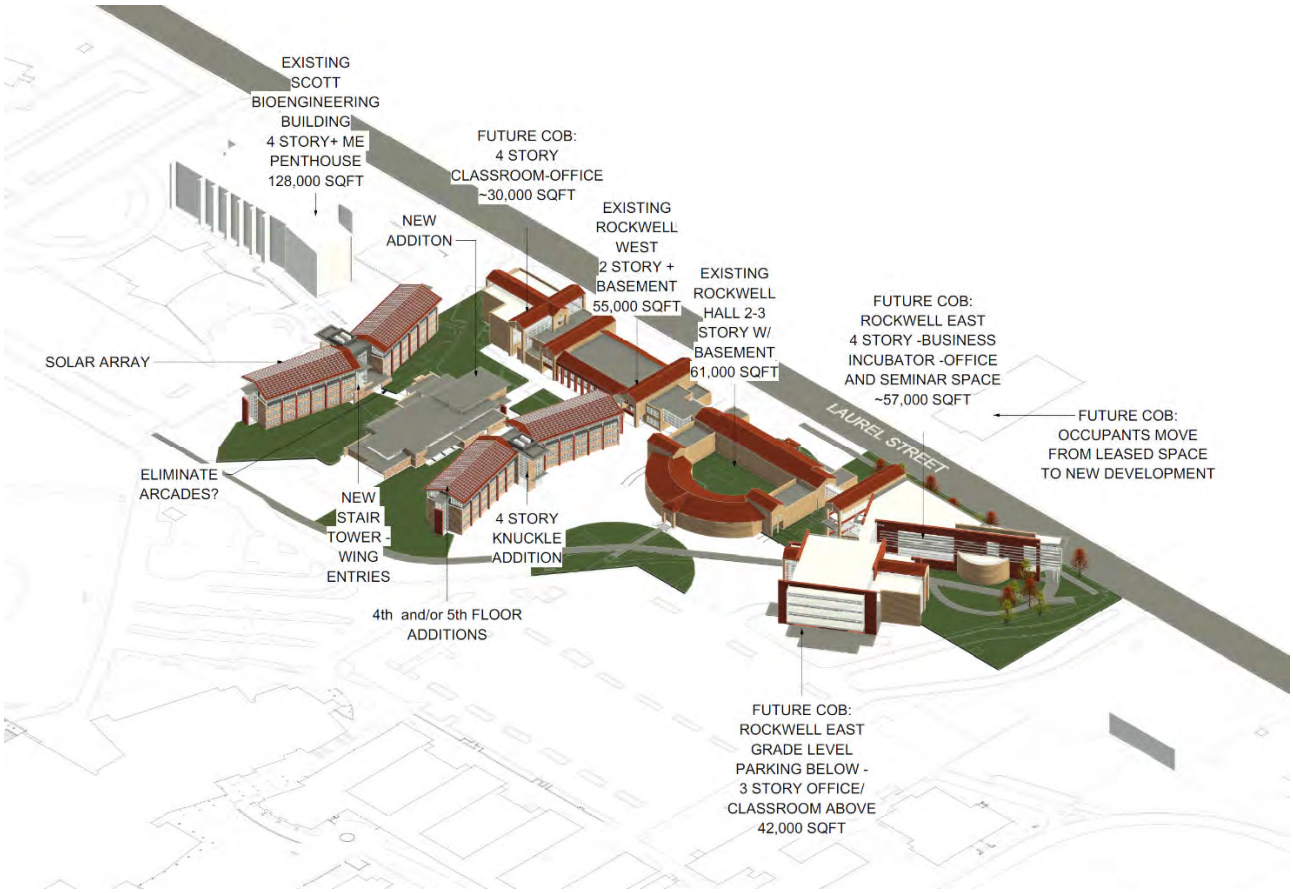
Allison Hall with Future College of Business Additions – One story addition at center section, two additional floors at the existing wings = 240 new beds matching the layout used at Braiden and Parmelee



Allison Hall with Future College of Business Additions – One Story addition at Center section, 1 or 2 additional floors at the existing wings, Option for partial deconstruction of the northeast wing with new ground up additions on the south side of the existing site.



College of Business future growth with potential design options for Allison Hall.



Conceptual aerial rendering of Allison and College of Business indicating future growth potential, existing Allison floor plan configuration with one additional floor over the wings, student study additions and one additional floor over the center section. Additional conceptual design, programming and the eventual program plan for the College of Business additions along Laurel Street are not part of this document but can be explored separately as a parallel effort as the Allison Hall project moves into design.

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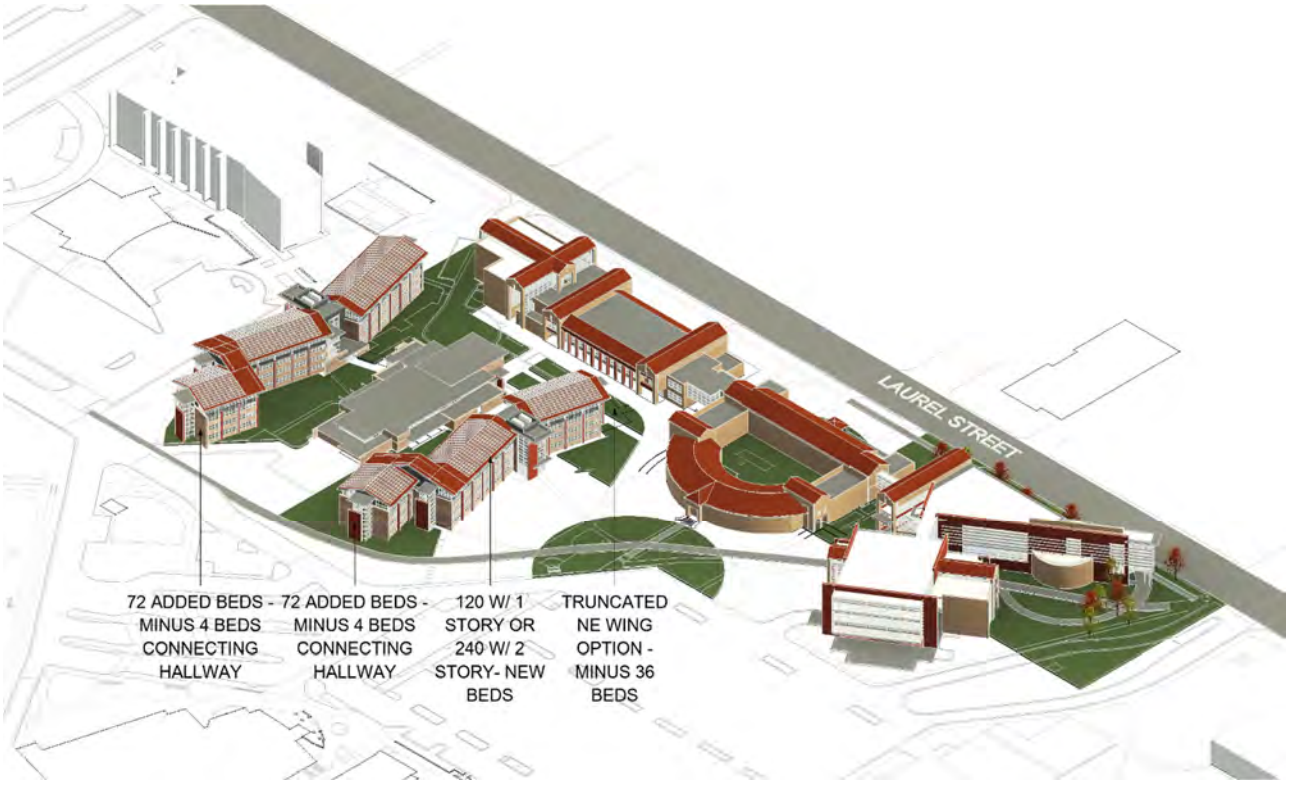
Deconstructing one or two bays of the northeast wing of Allison Hall is being carried in the program plan as a project option and alternate with additional discussion needed around the final project proforma and the ability to fund. The truncated NE wing option provides a less constrained impact on Rockwell West and allows for a landscaped area between the buildings with an (already in place) formal colonnade to promote functional program adjacencies to the available outdoor space. At it's narrowest point, the NE wing of Allison Hall is separated from the entrance of the Rockwell West building entrance by approximately 22 feet. If the adjacencies are maintained and the existing floor plate remains at this point, the fourth and at minimum the fifth floor should step back a bay or two so as to not exacerbate this existing condition.



With the truncated option and if the program evolves towards a one-story addition in lieu of two, additional ground-up space may be explored.. The addition would accommodate 72 additional beds each for a total of 144 beds in the new additions coupled with 120 beds in the one-story wing additions = 264 beds – 40 beds deconstructed for a total of 224 new beds. With two story wing additions the total new bed count increases to 344. If the design build team finds the ground-up additions more cost effective than the 5th floor addition, the site appears to accommodate this option.

Additional study and eventual program plans can be developed for proposed College of Business additions to the east and west side of the existing facilities. These proposed additions are indicated here for planning coordination with the additions and renovations within the Allison Hall project but are not a part of this program plan, associated budget and /or schedule.

The conceptual planning and design studies included herein are intended to be reviewed as initial programming and design criteria documents and should not limit exploration of additional concepts during the program verification process.

Project Scope Alternate for College of Business Renovations and Additions to the Center Section.

The total development budget base scope currently includes renovation of the center section for HDS reception, office, staff support, meeting, and dining/food service space which may be shared as part of a living-learning community. With additional funding from the College of Business, the renovation of the center section may also include an innovation and entrepreneurial center with a proposed 15,000 gsf second floor addition consisting of COB resident instruction classrooms in addition to HDS programmed space.

Allison Hall is envisioned as *an innovation and entrepreneurship* centered living-learning community that welcomes students from all eight CSU Colleges who have an interest in creating solutions to a very wide assortment of problems (e.g., water, energy, food, health, music & creative arts). Given the unique qualities of this facility, we expect it to attract a disproportionate number of second and third-year students relative to all other residence halls on campus. College of Business desired spaces include perimeter student venture offices and meeting spaces, a large conference/ board room, flexible student collaboration/ common space/ event space, faculty staff enclosed and shared office space, and a small café as informed by the HDS Dining Operations masterplan study. To the extent funding can be identified to support the alternate scope, additional new square footage can be explored to accommodate resident instruction classroom use with multiple 50-100 seat flexible classrooms to support the COB projected growth and the living-learning community.

3.5 STRUCTURAL, MECHANICAL, ELECTRICAL AND PLUMBING NARRATIVES

Structural

In 2022 a geotechnical analysis of the Allison Hall site and foundations was conducted to provide geotechnical engineering recommendations regarding subsurface conditions, groundwater conditions and existing foundation design. PEC (Professional Engineering Consultants) was then engaged to perform a structural analysis to determine the viability/feasibility of adding a 4th and 5th floor to Allison Hall as well as an additional floor to the center section. The existing 1950's and 1960's era buildings are cast-in-place concrete and are structurally durable, structurally sound. It is both sustainable and cost effective to invest in them. The structural section at Allison Hall can accommodate an additional two stories at the residential wings and another story added to the central wing. The anticipated structural framework for the additions will include High Strength Steel (HSS) braced steel post and beam construction with light gage infill and

Parmelee Hall 4th floor additions- steel roof structure construction – Braiden similar

The 4th and 5th floor addition to Allison Hall Resident wings will be accommodated with the installation of additional steel gravity columns to support the load of the two additional floors and roof including all mechanical equipment. Lateral bracing will be accommodated by addition of moment frame and braced frame members located on the 3rd, 4th, and 5th floors. Floor construction will consist of composite beams and girders topped with a 5" composite slab. The roof structure will consist of cold formed steel structural studs spaced at 16" on center with steel girders. The existing cold formed joists will be replaced with new steel beams at the column lines with a 1" steel deck.

The 4th and 5th floor addition to the Knuckles between each of the resident wings will be supported by steel gravity columns to support the load of the two additional floors and roof including mechanical equipment. New steel lateral brace framing will be installed at all floors excluding basement. The new floor structure will consist of a 9" reinforced concrete slab over concrete beams and girders. The roof structure will consist of a 9" reinforced concrete slab over concrete beams and girders. It is assumed that mechanical units will be located on the roof and will require additional floor reinforcement in these areas. The additional floors added to the knuckles will also require foundation work entailing installation of exterior and interior grade beams spanning screw piles or piers and 5" reinforced slab on grade. The stairs will be continuous from the existing 3rd floor up to the additional 4th and 5th floors, however the addition of any combination of 4th floor or 4th +5th floors to Allison Hall will also require the installation of new elevators for accessibility. Through the design process, If the 5th floor is determined to be of higher cost than ground-up additions, the site appears to support modest ground up additions on the south side of existing resident hall wings and this option may also promote a better density for the site, where four floors may be visually preferred over five.

Mechanical

We anticipate a four-pipe fan coil system or other terminal unit system with heating and cooling capacity. The terminal units are preferred in each room or in paired rooms if necessary. Hot and cold-water supply to the systems can be either tied into the University central steam and chilled water loop or planned with on-site ground mounted boilers and roof mounted chillers. Thermal storage, making and storing ice in the evening off peak electrical load and rate hours as part of the chiller configuration may be a viable and highly sustainable system addition as long as the chiller is sized to accommodate building loads without the thermal storage. The desire is to have high quality, simple and easy to maintain heating and cooling systems. With the intent to utilize existing infrastructure if possible and without extraneous investment while meeting the 2021 International Energy Conservation Code with tenable first and long-term operational costs. Mechanical system alternates may be required during the design phase if other project scope or scope additions are determined to be of higher priority.

Electrical

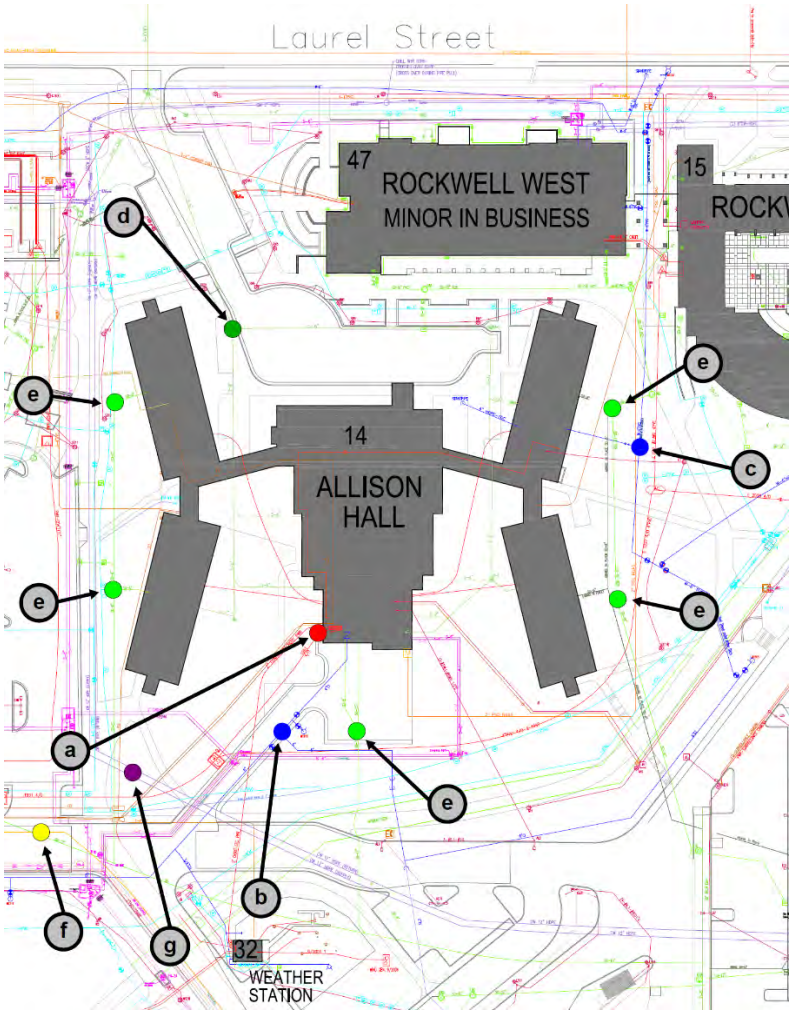
The electrical primary and main electrical distribution system in the building can be maintained with potential upgrades to service panels and subpanels as well as new fixtures and outlets where existing building renovations are anticipated.

Plumbing

New plumbing risers, fixtures, supply distribution and waste and vent are anticipated with existing restroom renovations.

Utilities

The following impacts of the proposed site redevelopment to existing utilities are based on site location and available capacity.



General

- Letters in parentheses ( ) are map references.

Electrical

- (a) - Existing connection point to switch at A7-2 will be reused.
- The building transformer will need to be sized for the design load of the renovated and added space. Due to the long lead times for a new transformer (up to 4 years) or a rebuilt transformer (over one year) this item must be purchased very early to be ready for the project.

Water

- (b) - Existing building service for domestic water is 4". Size needed for the renovated and additional fixture count needs to be assessed.
- (c) - Existing fire service. Fire flow for the renovated and additional space will need to be assessed.

Sanitary Sewer

- (d) - Connection point.
- Existing sanitary service is original to the building and very shallow. Must be evaluated for slope, condition, and capacity of the renovated and additional fixture count. Replacement or rehabilitation is recommended.
- If the renovated building has any planned kitchen service a grease trap shall be added.

Stormwater

- (e) - connection points.
- Existing stormwater service lines are original to the building and very shallow. Must be evaluated for slope, condition, and capacity. Replacement or rehabilitation is recommended.
- Roof leaders on the interior side of the wings will need to be piped. Existing slopes are too flat for surface flow.

- Local detention shall be installed to accommodate any increase to existing runoff volume of the site, both piped and surface flows.
- This project triggers stormwater treatment regulation for the site. Existing site runoff is currently untreated. If the site or land use is too constrained by local treatment structures, a similar runoff volume may be treated elsewhere on Main Campus, at an agreed-upon location.

Natural Gas

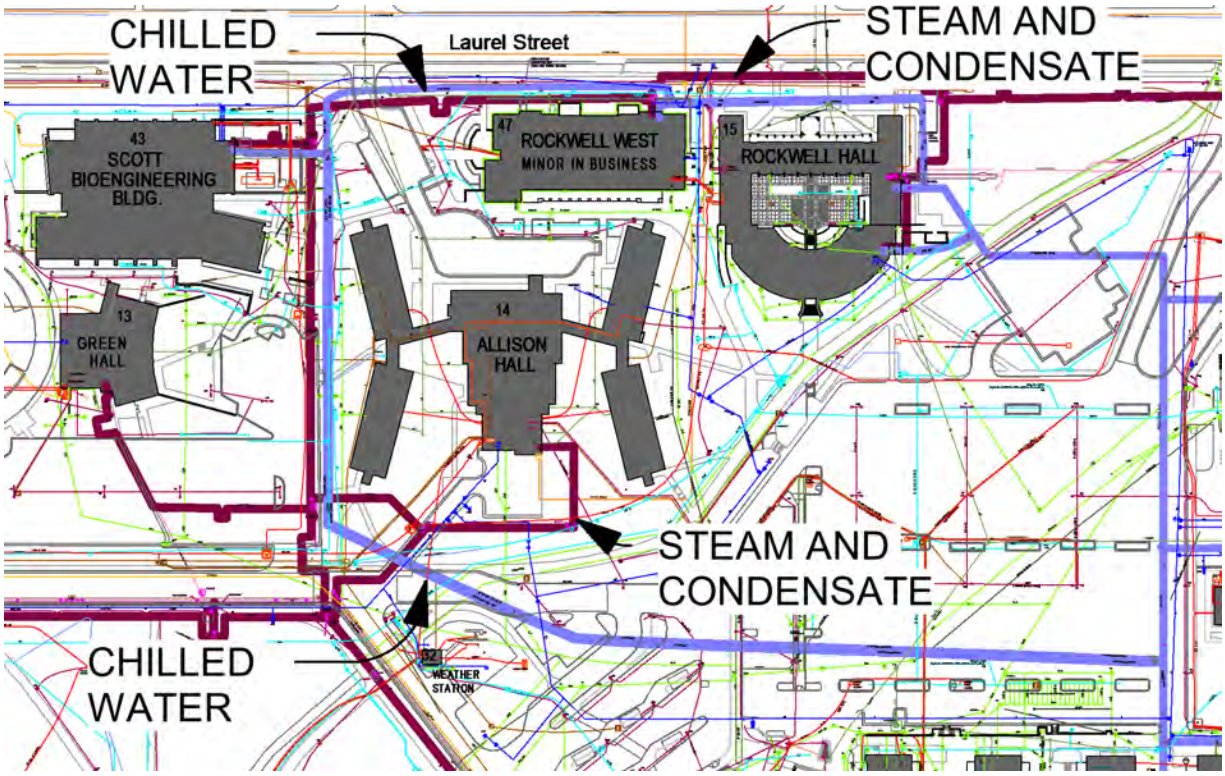
- (f) - If natural gas continues to be used on the site, recommendation is to remove existing Xcel Energy service and connect to the CSU-owned system. This would include disconnection by Xcel Energy in Laurel Street.

District Heating

- This building site is currently served by the central steam utility. If the site continues to be served by the central steam utility, it can also be served by the future hot water utility. Provision shall be made for future hot water supply and return entry to the building. Building heating and domestic hot water systems shall be designed to accommodate the supply hot water temperature of the new utility. Design details are found in Division 23 and Division 33 of the CSU standards.

District Cooling

- This building site is not currently served by the central chilled water utility. If the site is to be served by the future hot water utility, it shall also be connected to the chilled water utility. The reason for this is that the chilled water utility will be part of a future combined heating and cooling system that produces both chilled and hot water. Design details are found in Division 23 and Division 33 of the CSU standards.
- (g) - Connection point for new chilled water service.



Information technology and audio visual scope will be coordinated during the design process with team members from HDS.

3.6 CSU Facilities Planning, Design and Construction Standards

HDS has adopted amendments to the CSU Facilities Planning, Design and Construction Standards. These documents are meant to serve as supplemental standards for HDS-specific buildings and should be referenced in tandem to the full versions maintained by CSU Facilities Management; both of which will be incorporated into this project. Building standards may require adjustment based on scope and budgetary pressures and these issues will be addressed as the project is designed.

3.7 CSU INCLUSIVITY STANDARDS

Colorado State University requires all capital construction projects to provide inclusive facilities. These facilities are consistent with CSU Strategic Plan, Climate Action Plan (CAP) and Principles of Community that "create and nurture inclusive environments," and "welcome, value and affirm members of our community, including their various identities, skills, ideas, talents, and contributions." Standards for each room type are located at: https://www.fm.colostate.edu/wp-dev/wp-content/uploads/Chapter-06-Requirements-by-Space-Type-and-Use.pdf

CSU Accessibility Standards outline additional accessibility requirements. In addition, Lactation rooms, Commuter Showers and Reflection spaces can be considered. Seminar and meeting space can double as a reflection room.

3.8 BUILDING CODES

List of applicable codes –

Approved building codes and standards have been adopted by the Office of the State Architect (herein referred to as State Buildings Program (SBP)) and other state authorities, and are identified below as the minimum requirements to be applied to all construction projects at state agencies and institutions of higher education owned facilities.

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The 2021 edition of the International Building Code (IBC)

(As adopted by the Colorado State Buildings Program as follows: Chapter 1 as amended, Chapters 2-35 and Appendices C and I).

The 2021 edition of the International Existing Building Code (IEBC)

(As adopted by the Colorado State Buildings Program as follows: Chapters 2-16, Appendices A-C and Resource A) Effective December 2020.

The 2021 edition of the International Residential Code (IRC)

(As applicable)

The 2021 edition of the International Mechanical Code (IMC)

(As adopted by the Colorado State Buildings Program as follows: Chapters 2-15 and Appendix A)

The 2021 edition of the International Energy Conservation Code (IECC)

(As adopted by the Colorado State Buildings Program and Colorado Energy Office)

Colorado Model Electric Ready and Solar Ready Code

(Published by the Colorado Energy Office) Effective July 1, 2023

The 2023 edition of the National Electrical Code (NEC) (NFPA 70®)

(As adopted by the Colorado State Electrical Board) Effective July 1, 2023

The 2021 edition of the International Plumbing Code (IPC), first printing (March 2020) (As adopted by the Colorado Examining Board of Plumbers)

The 2021 edition of the International Fuel Gas Code (IFGC) first printing (August 2020) (As adopted by the Colorado Examining Board of Plumbers)

The National Fire Protection Association Standards (NFPA)

(As adopted by the Department of Public Safety/Division of Fire Prevention and Control)

The 2021 edition of the International Fire Code (IFC)

(As adopted by the Department of Public Safety/Division of Fire Prevention and Control (DFPC). Projects requiring DFPC review should be designed with the most restrictive requirements)

The 2015 edition of the ASME Boiler and Pressure Vessel Code

(As adopted by the Department of Labor and Employment/Boiler Inspection Section) Effective July 1, 2017.

The 2017 edition of the National Boiler Inspection Code (NBIC)

(As adopted by the Department of Labor and Employment/Boiler Inspection Section) Effective July 1, 2017.

The 2015 edition of the Controls and Safety Devices for Automatically Fired Boilers CSD-1

(As adopted by the Department of Labor and Employment/Boiler Inspection Section) Effective July 1, 2017.

The 2015 edition of the Boiler and Combustion Systems Hazards Code, NFPA 85

(As adopted by the Department of Labor and Employment/Boiler Inspection Section) Effective July 1, 2017.

The 2019 edition of ASME A17.1 Safety Code for Elevators and Escalators

(As adopted by the Department of Labor and Employment/Conveyance Section) Effective January 1, 2021.

The 2005 edition of ASME A17.3 Safety Code for Existing Elevators and Escalators

(As adopted by the Department of Labor and Employment/Conveyance Section Effective January 1, 2021.

The 2017 edition of ASME A18.1 Safety Standard for Platform Lifts and Stairway Chairlifts

(As adopted by the Department of Labor and Employment/Conveyance

The current edition of the Retail Food Establishment Rules and Regulations

(As adopted by the Department of Public Health and Environment/Division of Environmental Health and Sustainability)

The Current edition of ICC/ANSI A117.1, Accessible and Usable Buildings and Facilities

As referenced in the adopted edition of the International Building Code.

The Secretary of the Interior's Standards for Rehabilitation

(As required by the Colorado State Historic Preservation Office for designated historic properties)

Note: Additional codes, standards and appendices may be adopted by the state agencies and institutions in addition to the minimum codes and standards herein adopted by State Buildings Programs.

1. The 2021 edition of the IBC became effective on July 1, 2022. Consult the state electrical and plumbing boards and the state boiler inspector and conveyance administrator and the Division of Fire Prevention and Control for adoption of current editions and amendments to their codes.
2. Projects should be designed and plans and specifications should be reviewed based upon the approved codes at the time of A/E contract execution. If an agency prefers to design to a different code such as a newer edition of a code that State Buildings Programs has not yet adopted, the

agency must contact SBP for approval and then amend the A/E contract with a revised Exhibit C, Approved State Building Codes. Please note that the state plumbing and electrical boards enforce the editions of their codes that are in effect at the time of permitting not design.

3. The state's code review agents, or the State Buildings Programs approved agency building official, shall review all documents for compliance with the codes stipulated herein. Note: The Department of Public Health and Environment, Division of Consumer Protection will review drawings for food service related projects.
4. This policy does not prohibit the application of various life safety codes as established by each agency for specific building types and funding requirements. NFPA 101 and other standards notwithstanding, approved codes will supersede where their minimum requirements are the most restrictive in specific situations. If a conflict arises, contact State Buildings Programs for resolution.
5. It is anticipated that compliance with the federal Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG) and Colorado Revised Statutes Section 9-5-101 will be met by compliance with the 2015 International Building Code and ICC/ANSI A117.1. However, each project may have unique aspects that may require individual attention to these legislated mandates.
6. The 2018 edition of the International Building Code (IBC) is to be applied to factory-built nonresidential structures as established by the Division of Housing within the Department of Local Affairs.

A. Appendices

Appendices are provided to supplement the basic provisions of the codes. Approved IBC Appendices are as follows:

1. Mandatory

   IBC Appendix Chapter C - Agricultural Buildings IBC Appendix Chapter I - Patio Covers
2. Optional

   Any non-mandatory appendix published in the International Building Code may be utilized at the discretion of the agency. Use of an appendix shall be indicated in the project code approach.

B. Amendments

1. International Building Code, Chapter 1 as amended
2. International Building Code Chapter 29 as amended

URL for project team reference

https://osa.colorado.gov/state-buildings/building-codes

No insurmountable code issues are anticipated with the proposed project scope but a detailed code analysis

should be performed early in the program verification process. Early analysis should include exterior envelope requirements as well as allowable area calculations based on the specified options for existing and new construction types with an egress analysis with travel distance studies to determine if fire barriers are required to accommodate the proposed additions.

4.0 PROJECT SCHEDULE, COST ESTIMATING AND FINANCING

4.1 PROJECT SCHEDULE, PHASING AND SWING SPACE.

Project Schedule

Develop Program Plan	August 2023
CSU review and post program plan for BOG Review	September 2023
BOG Review Program Plan and Plan of Finance	October 2023
Publish RFP DBGMP	October 2023
Selection Announced	December 2023
Negotiation of D/B Contract	December 2023
Contract Approval (Anticipated)	January 2024
Anticipated Programming Verification	January-May 2024
Anticipated Design Start	June 2024
Anticipated Construction Start	June 2025
Substantial Completion and Furniture Stocking	May 2027
Occupancy by End-Users and Final Acceptance	August 2027

Phasing and Swing Space

While Allison Hall is off-line for the construction process (Summer 2025 through Summer 2027) Housing & Dining Services will be able to accommodate all first-year students through full occupation of current spaces, managing the number of transfer students that are encouraged to live on campus, managing the number of returning students that are encouraged to live on campus, and adding additional beds in current facilities, if needed.

- FY24 – 587 unoccupied beds
- FY25 – *Anticipated Program capacity of 6,058*
  - Durward Hall off-line for windows replacements and building code-related upgrades (495 beds)
- FY26 - *Anticipated Program capacity of 6,153*
  - Durward Hall back on-line (495 beds)
  - Allison Hall off-line for renovation and expansion (400 beds)
- FY27 - *Anticipated Program capacity of 6,153*
  - Allison Hall off-line
- FY28 - *Anticipated Program capacity of 6,143*
  - Allison Hall back on-line (~ 625 - 650 total)

4.2 FINANCING

Housing & Dining Services has run a pro forma on this project assuming an $82.1M 30-year bond at a 4.5% interest rate. Other assumptions include the addition of 225 beds (for a total capacity of 625 when the building reopens) with revenue budgeted at 92% - 93% of occupancy with an average room and board increase of 4% until FY32 and average increases of 3% after that. Expenses are estimated to escalate by 3% annually. Payments on the bond are scheduled to begin in FY28, when the project will be completed and new revenues will be realized. The debt service ratios vary between 1.00 – 1.15 when R&R is included, and vary from 1.28 – 1.79 if R&R is not included.

4.3 CONCEPTUAL COST ESTIMATING AND METHODOLOGY

Industry standards for conceptual cost estimating include considerations of limited scope documentation and Owners should generally expect a 20% range of projected estimated costs and/or projected scope. On housing projects that include significant renovation components, pushing and pulling the desired renovation scope and level of quality is often required to maintain budget as more is known about the as the overall project including the number of required new beds to make the financial analysis and project proforma viable.

For the purposes of this program plan, we used the Braiden and Parmelee projects for benchmarking cost analysis with compounded escalation from 2014 to estimated project buyout late in 2025 and then checked that against anticipated total development costs per sqft for new construction. This analysis included the escalated costs for one additional floor (~120- 130new beds) with a new exterior envelope and new 4:12

pitched roof system as well as new lounges and new student study areas. The escalated cost per bed was used to determine the estimated cost of new construction for a total of two additional floors with some setbacks for the top floor for a total of 225 new beds. This new construction and new envelope cost was then coupled with renovation estimate target range for approximately 91,600 gsf anticipating a target renovation cost of between $300/gsf and $340/gsf where the existing building would retain the existing interior wall layout but be revitalized with updated finishes in existing rooms, and include new bathrooms, new stair and elevator cores as well as a proposed new MEP and IT systems in the existing facility. Options are carried to accommodate various bed count configurations and scenarios, but the cost estimate is based on 225 new beds for a total of 625 beds in the completed project achieved within a total development cost of approximately $131,000 per bed. The total development cost estimate includes 10% contingency on the fixed limit of design and construction which equates to approximately $7M.

Project alternates have been identified for an additional 25 beds – total 250 new beds,650 total beds respectively. Due to uncertainty around projected cost estimates, lingering limited subcontractor coverage, and ongoing supply chain issues, we have identified the following scope alternates and predict that this scope is currently outside the $82.1M total development cost budget. Should conditions improve and embedded contingency dollars remain as the project is dried-in, some of the identified additional scope items may be possible w/in the estimated budget. The total development cost budget includes a $2.5 M allowance for new furnishings for HDS spaces, with the expectation that additional funding would be provided to furnish and outfit any COB spaces.

The current additive alternates include:

- Stone exterior enclosure and wall panels in lieu of brick.
- Additional revenue generating beds, 25 – 100. Total new beds in the range of 325 seems viable on the site based on initial studies and with additional funding.
- A “pop-top” vertical office and classroom addition at the center section of approximately 7,000 gsf estimated at approximately $5M.
- Incremental cost to increase the size of the center section addition from 7,000 gsf to 15,000 gsf with an incremental increase of $5.5M, total for 15,000 gsf = $10.5M for 15,000 gsf.
- An option alternate for removing/deconstructing a portion of the existing northeast wing with potential for associated ground-up resident wing additions to accommodate the lost beds. This truncation option will allow for better site aspect and new more generous and less constrained plaza at the College of Business main entrance to Rockwell West. Estimated costs to be developed during the program verification and schematic design phase of the project.
- Enhanced renovation of a portion of the center section of the building for the college of business program.
- Mechanical system specifications and configurations including the prioritization of air conditioning over other renovation scope can be used to further dial in the final scope and budget inclusions.

Due to uncertainty around future projected cost estimates, lingering limited subcontractor coverage, and ongoing supply chain issues, we have identified the scope alternates above and currently predict that this scope is outside the $82.1M Total Development Cost Budget (TDCB). The TDCB was estimated in Q3, 2023

with program plan approval anticipated early in Q4 2023. If the project is delayed, we currently anticipate 6% - 8% escalation per year. In Q3 of 2024, the estimated Total Development Cost should be increased to $88.7M and the university should anticipate continued cost escalation compounded annually until project initiation although (hopefully) at a lower rate of escalation.

Identifying financial resources and available funding from the College of Business is needed to prioritize and include the alternates described above within the project and a codified Memorandum of Understanding (MOU) is recommended early in the program verification phase of the project to help limit the options being carried through the design process and to maintain the project schedule and commitment to reoccupy Allison Hall Fall 2027.

The fixed limit of design and construction (FLDC) for the project is estimated at approximately $70M with a total development cost estimate including all project contingencies totaling $82.1M for the base scope of work. The construction cost/sqft is estimated at $664/sqft (new construction target =$39.8M) and the renovation construction cost, quality and scope limited is estimated at approximately $317/sqft (renovated construction target =$28. 2M). The target total development cost is estimated at $82.1M and equates to approximately $545/gsf with blended renovation and new addition scope but including all anticipated hard and soft costs.

The cost model indicated the estimated costs for new construction to be higher than anticipated from research and the renovation construction costs lower than anticipated. With the new construction and renovation costs combined however, the estimate is within a range prescribed and anticipated and seems reasonable. Current market conditions and market volatility may require scope prioritization towards revenue generating space. The proforma requires adherence to the total development cost budget and changes in new construction project scope can be accommodated by adjusting the amount of or extent of the proposed renovation, the quality metrics of the renovation itself and identifying additional alternates to be carried though the design process. The detailed budgetary analysis to date is included in the Appendix

Appendices

- **A.** Site and Utility map
- **B.** College of Business and Allison Hall - Immediate Area Growth Planning
- **C.** Existing Building Drawings – Allison
- **D.** Existing Building Drawings - Braiden
- **E.** Conceptual Budget Estimate Worksheets and Spatial Analysis
- **F.** USGBC – Projected LEED Checklist
- **G.** Campus Planning & Design Philosophy- Aesthetic Guidelines
- **H.** Existing structural analysis
- **I.** Geotechnical Report
- **J.** 9/25/2023 -Master Plan Committee – Slide Deck

Appendix A – Site and Utility Map

Laurel Street
8" CITY WATER MAIN
47
ROCKWELL WEST
MINOR IN BUSINESS
15
ROCKW
14
ALLISON
HALL
32
WEATHER
STATION
a
b
c
d
e
e
e
e
e
f
g
CHILL WTR RTRN
CROSSES OVER SUPP
(CROSS OVER DURING PIPE PULL)
6" PSC NGAS
2" PSC NGAS
STANDPIPE
LIGHTING
CONTACTOR
4" HDPE-FDC
CW 12" HDPE (RETURN)
CW 12" HDPE (SUPPLY)
ARTHUR DITCH
WIND GEN. 9/2006
1991 4/0
E 2000 4/0
4"PVC 4/0 E 1997
SCORPIO 71
60" ARCH CMP
Aband. in Place
T-4" CONDUIT (09)
Pwr to crosswalk light-City

Allison Hall renovation and Addition
Program Plan Utility Assessment
9/6/2023

The following impacts of the proposed site redevelopment to existing utilities are based on site location and available capacity. Note, this assessment does not include any regulatory discussion relevant to groundwater, permanent dewatering, or the floodplain. That information is to be collected elsewhere.

General

- Letters in parentheses ( ) are map references.

Electrical

- (a) - Existing connection point to switch at A7-2 will be reused.
- The building transformer will need to be sized for the design load of the renovated and added space. Due to the long lead times for a new transformer (up to 4 years) or a rebuilt transformer (over one year) this item must be purchased very early to be ready for the project.

Water

- (b) - Existing building service for domestic water is 4". Size needed for the renovated and additional fixture count needs to be assessed.
- (c) - Existing fire service. Fire flow for the renovated and additional space will need to be assessed.

Sanitary Sewer

- (d) - Connection point.
- Existing sanitary service is original to the building and very shallow. Must be evaluated for slope, condition, and capacity of the renovated and additional fixture count. Replacement or rehabilitation is recommended.
- If the renovated building has any planned kitchen service a grease trap shall be added.

Stormwater

- (e) - connection points.
- Existing stormwater service lines are original to the building and very shallow. Must be evaluated for slope, condition, and capacity. Replacement or rehabilitation is recommended.
- Roof leaders on the interior side of the wings will need to be piped. Existing slopes are too flat for surface flow.
- Local detention shall be installed to accommodate any increase to existing runoff volume of the site, both piped and surface flows.
- This project triggers stormwater treatment regulation for the site. Existing site runoff is currently untreated. If the site or land use is too constrained by local treatment structures, a similar runoff volume may be treated elsewhere on Main Campus, at an agreed-upon location.

Natural Gas

- (f) - If natural gas continues to be used on the site, recommendation is to remove existing Xcel Energy service and connect to the CSU-owned system. This would include disconnection by Xcel Energy in Laurel Street.

District Heating

- This building site is currently served by the central steam utility. If the site continues to be served by the central steam utility, it can also be served by the future hot water utility. Provision shall be made for future hot water supply and return entry to the building. Building heating and domestic hot water systems shall be designed to accommodate the supply hot water temperature of the new utility. Design details are found in Division 23 and Division 33 of the CSU standards.

District Cooling

- This building site is not currently served by the central chilled water utility. If the site is to be served by the future hot water utility, it shall also be connected to the chilled water utility. The reason for this is that the chilled water utility will be part of a future combined heating and cooling system that produces both chilled and hot water. Design details are found in Division 23 and Division 33 of the CSU standards.
- (g) - Connection point for new chilled water service.

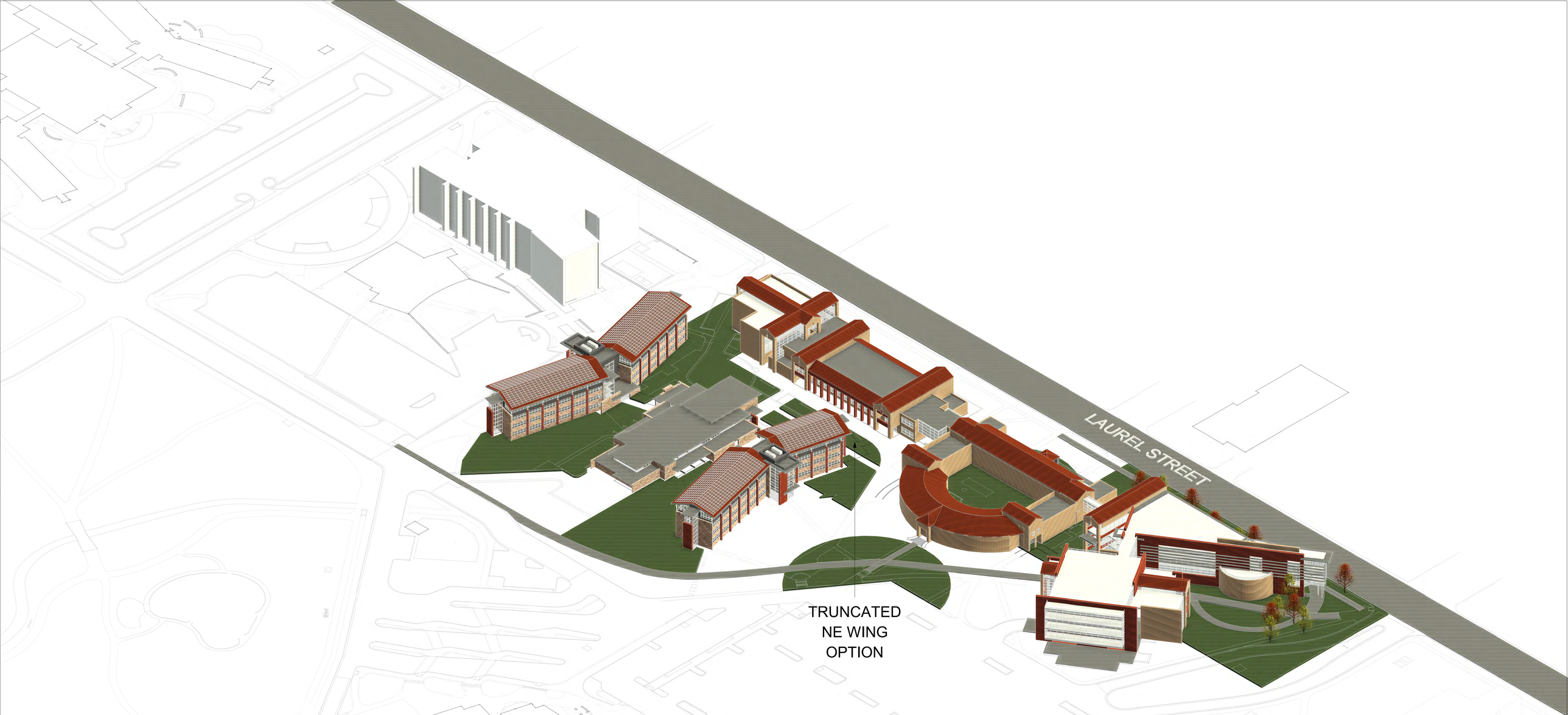
Appendix B - College of Business and Allison Hall - Immediate Area Growth Planning


ALLISON
ROCKWELL
SCOTT BIOENGINEERING
ROCKWELL WEST


ROCKWELL
ALLISON
ROCKWELL WEST
SCOTT BIOENGINEERING

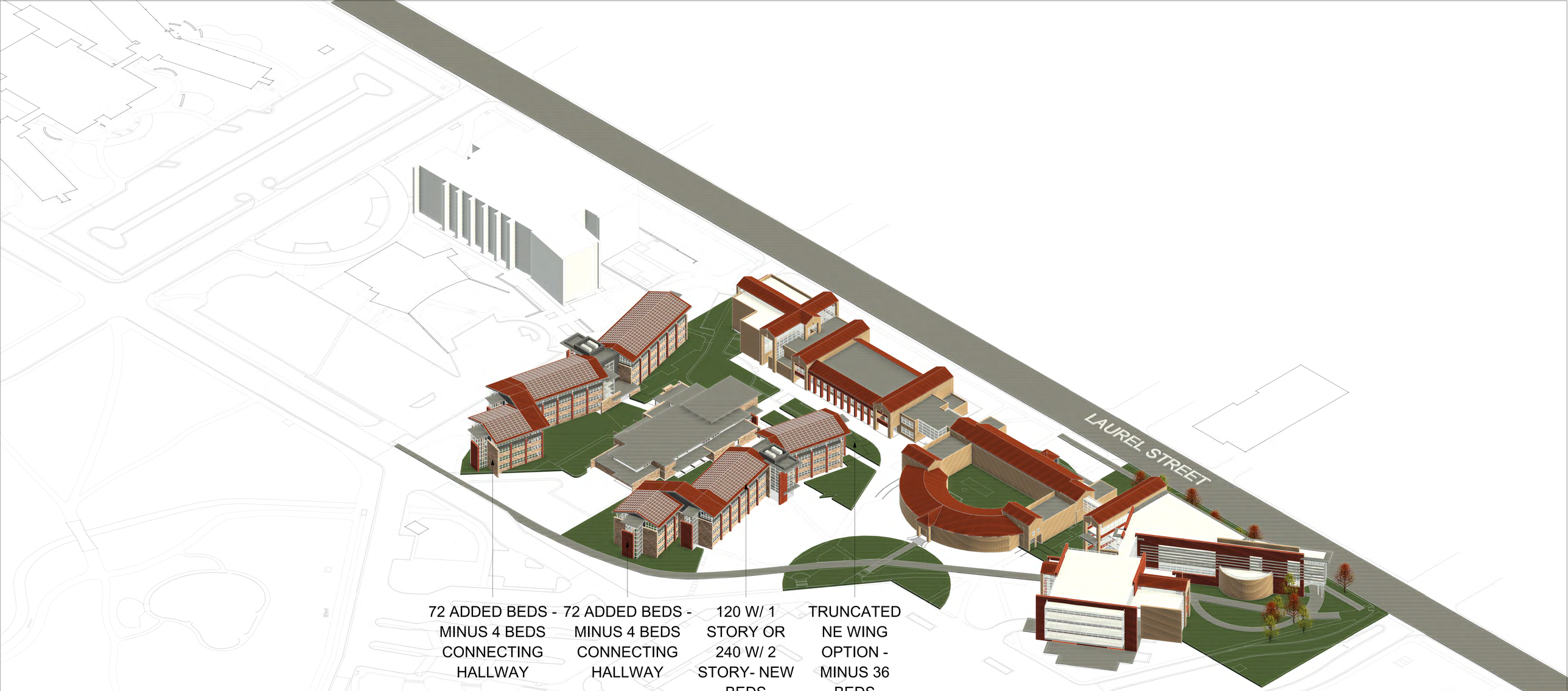
College of Business Master Development Plan with Allison Adaptive Reuse Study

Colorado State University
FACILITIES MANAGEMENT
AT COLORADO STATE UNIVERSITY



College of Business Master Development Plan with Allison Adaptive Reuse Study

Colorado State University
FACILITIES MANAGEMENT
AT COLORADO STATE UNIVERSITY



72 ADDED BEDS - MINUS 4 BEDS CONNECTING HALLWAY

72 ADDED BEDS - MINUS 4 BEDS CONNECTING HALLWAY

120 W/ 1 STORY OR 240 W/ 2 STORY- NEW BEDS

TRUNCATED NE WING OPTION - MINUS 36 BEDS

College of Business Master Development Plan with Allison Adaptive Reuse Study

Colorado State University

FACILITIES MANAGEMENT
AT COLORADO STATE UNIVERSITY

AMMONS HALL

FUTURE COB:
ROCKWELL EAST
GRADE LEVEL
PARKING BELOW -
3 STORY OFFICE/
CLASSROOM ABOVE
42,000 SQFT

COB/COE LIVING
LEARNING CENTER
W/ 4TH FLOOR
ADDITION TO ALLISON

FUTURE COB:
ROCKWELL EAST
4 STORY -BUSINESS
INCUBATOR -OFFICE
AND SEMINAR SPACE
~57,000 SQFT

LAUREL STREET

SOLAR ARRAY

FUTURE COB:
OCCUPANTS MOVE
FROM LEASED SPACE
TO NEW DEVELOPMENT

EXISTING
ROCKWELL
HALL 2-3
STORY W/
BASEMENT
61,000 SQFT

EXISTING
ROCKWELL
WEST
2 STORY +
BASEMENT
55,000 SQFT

FUTURE COB:
4 STORY
CLASSROOM-OFFICE
~30,000 SQFT

EXISTING
SCOTT
BIOENGINEERING
BUILDING
4 STORY+ ME
PENTHOUSE
128,000 SQFT

College of Business Master Development Plan with Allison Adaptive Reuse Study

Colorado State University
FACILITIES MANAGEMENT
AT COLORADO STATE UNIVERSITY

ALLISON HALL

MAIN CAMPUS FLOODWAY

College of Business Master Development Plan with Allison Adaptive Reuse Study

Colorado State University

FACILITIES MANAGEMENT
AT COLORADO STATE UNIVERSITY

Laurel Street

Meridian Avenue

43
SCOTT BIOENGINEERING BLDG.

EXISTING SCOTT BIOENGINEERING BUILDING 4 STORY+ ME PENTHOUSE 128,000 SQFT

13
GREEN HALL

FUTURE COB:
4 STORY
CLASSROOM-OFFICE
~30,000 SQFT

47
ROCKWELL WEST
MIS/CIS/BUSINESS

EXISTING ROCKWELL WEST
2 STORY + BASEMENT
55,000 SQFT

14
ALLISON HALL

COB/COE LIVING LEARNING CENTER W/ 4TH FLOOR ADDITION TO ALLISON

15
ROCKWELL HALL

EXISTING ROCKWELL HALL 2-3 STORY W/ BASEMENT
61,000 SQFT

FUTURE COB:
ROCKWELL EAST
4 STORY -BUSINESS INCUBATOR - OFFICE AND SEMINAR SPACE
~57,000 SQFT

FUTURE COB:
ROCKWELL EAST
GRADE LEVEL PARKING BELOW -
3 STORY OFFICE/ CLASSROOM ABOVE
~42,000 SQFT

AMMC
HALL

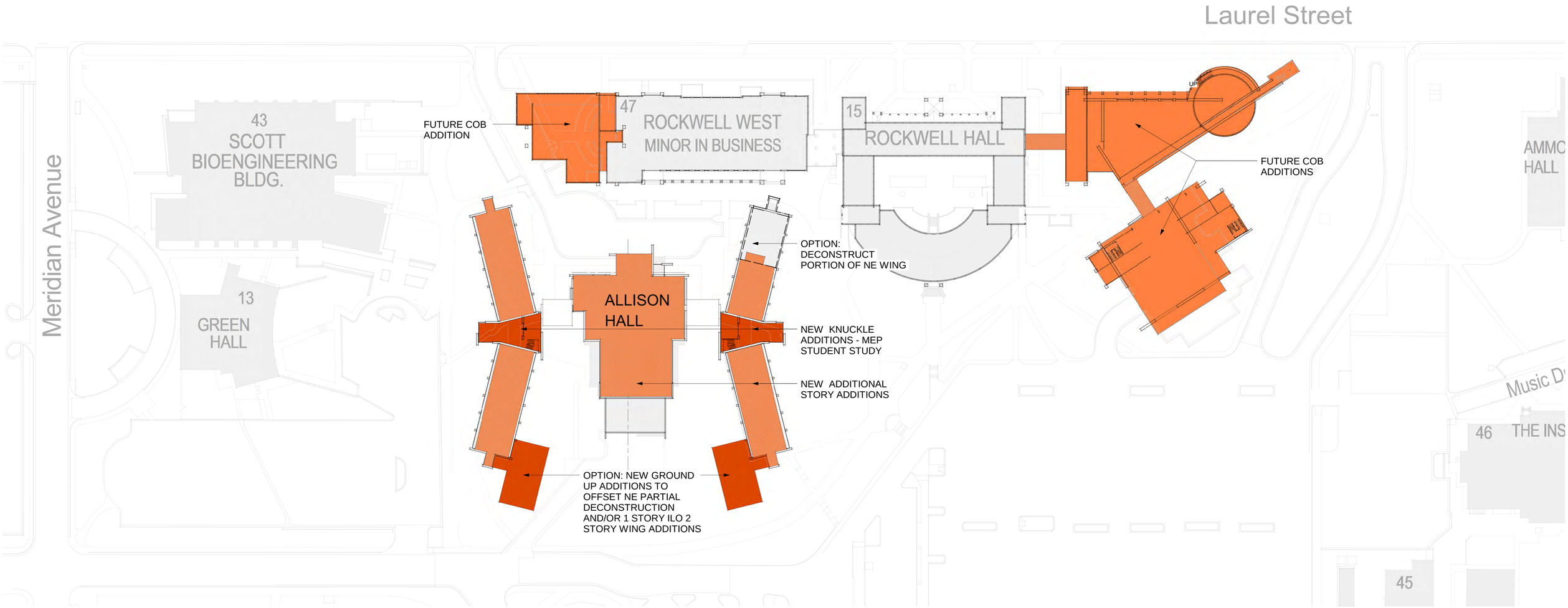
Music D

46
THE INS

45

College of Business Master Development Plan with Allison Adaptive Reuse Study

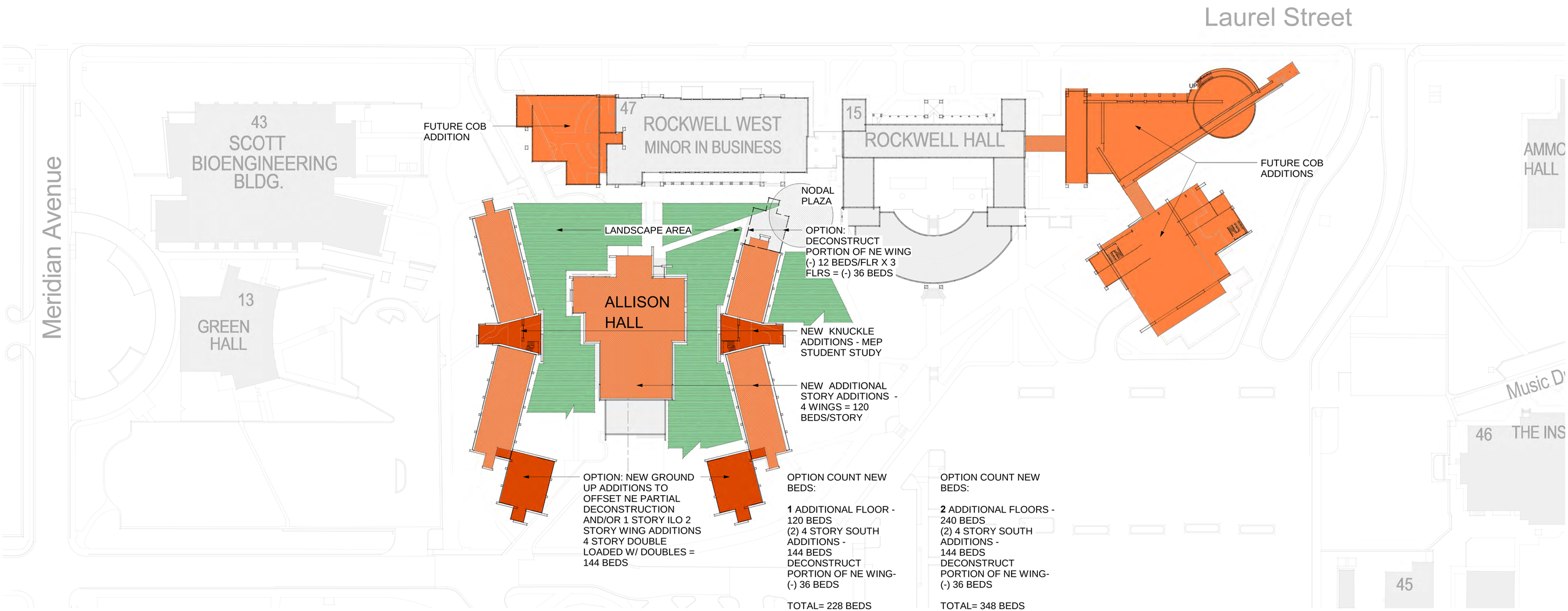
Colorado State University
FACILITIES MANAGEMENT
AT COLORADO STATE UNIVERSITY



1 Allison Additions OPTION
1" = 50'-0"

College of Business Master Development Plan with Allison Adaptive Reuse Study

Colorado State University
FACILITIES MANAGEMENT
AT COLORADO STATE UNIVERSITY

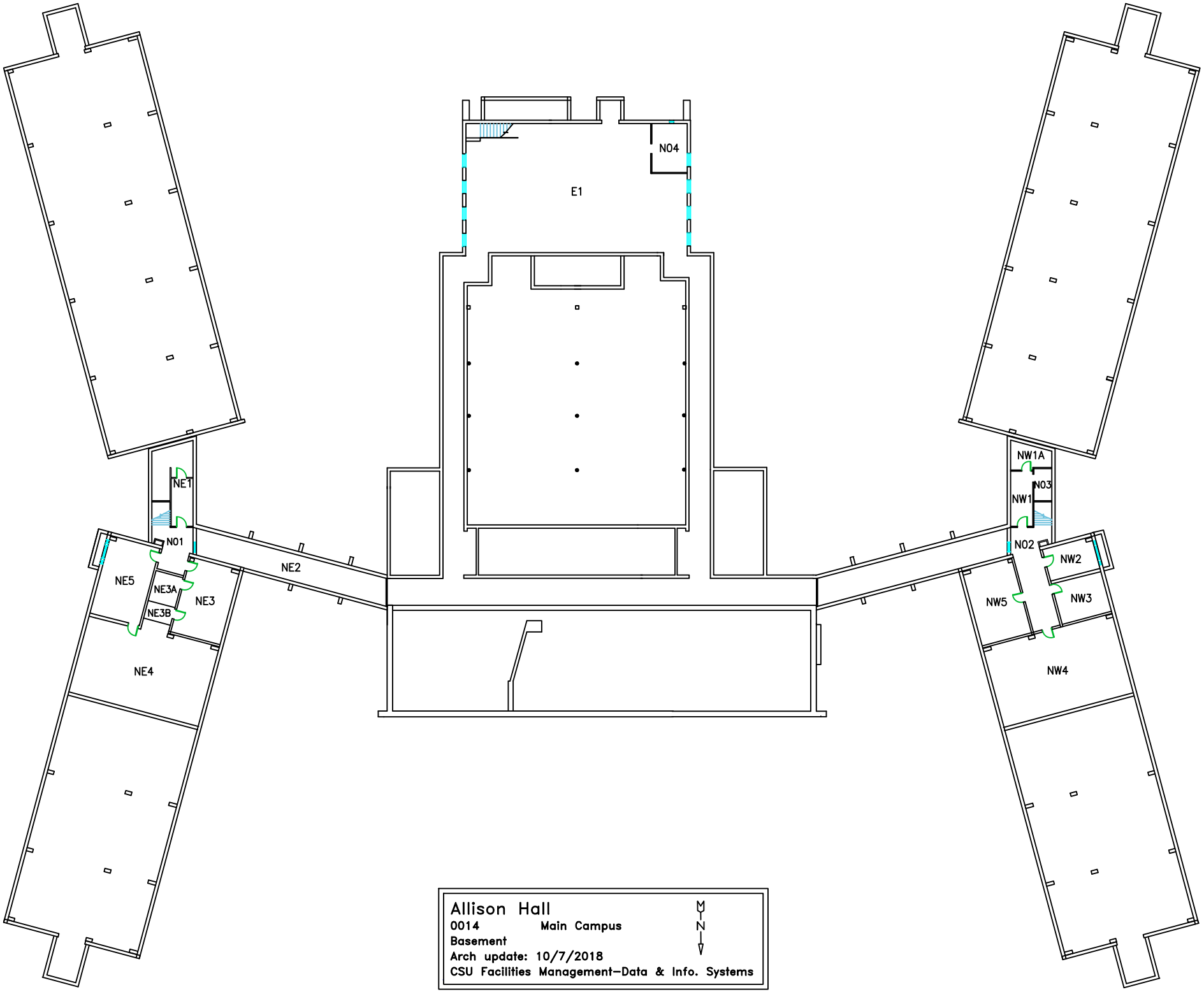


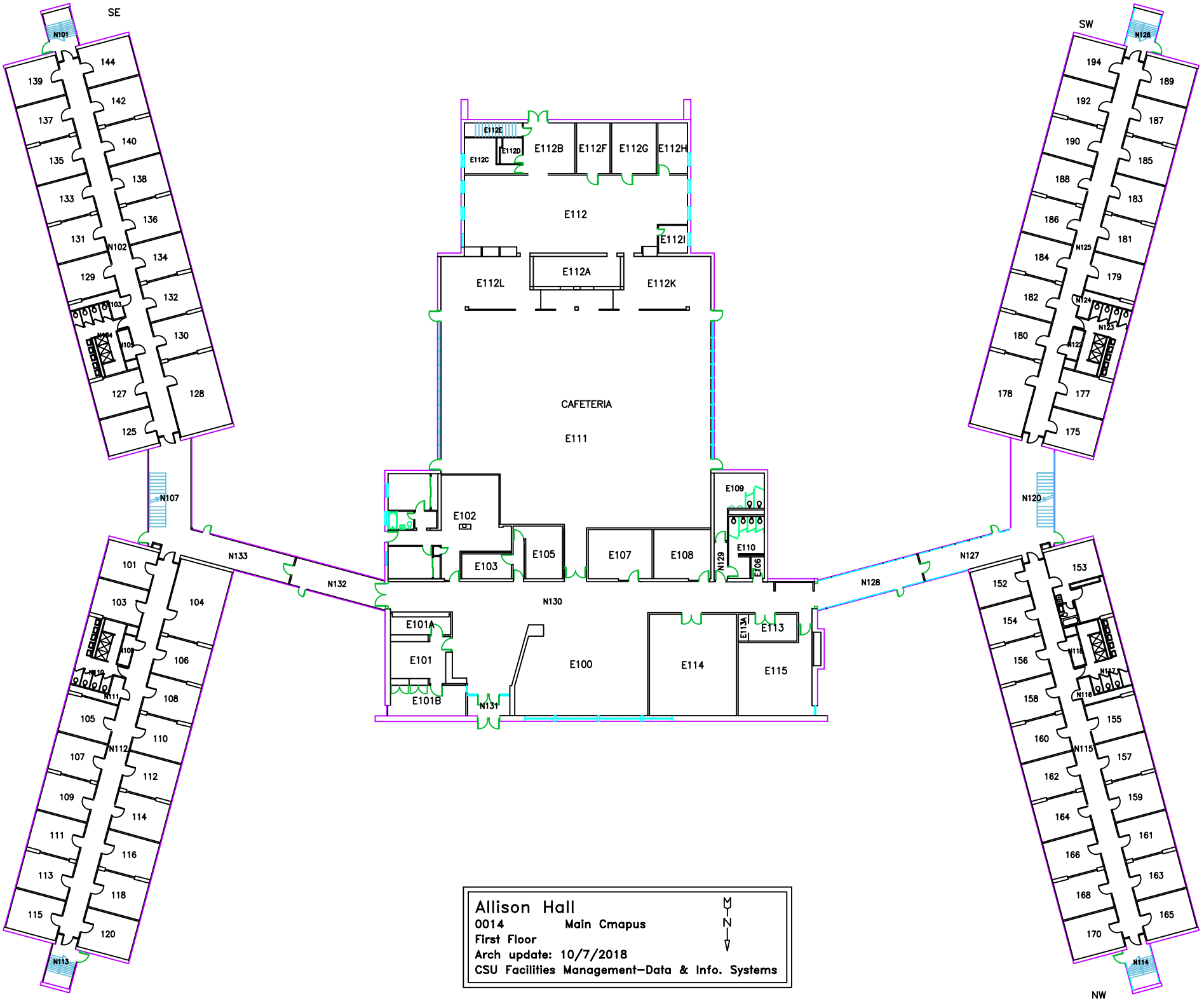
1 Allison Additions OPTION
1" = 50'-0"

College of Business Master Development Plan with Allison Adaptive Reuse Study

Colorado State University
FACILITIES MANAGEMENT
AT COLORADO STATE UNIVERSITY

Appendix C - Existing Building Drawings – Allison


N04
E1
NE1
N01
NE2
NE5
NE3A
NE3B
NE3
NE4
NW1A
N03
NW1
N02
NW2
NW5
NW3
NW4
Allison Hall
0014 Main Campus
Basement
Arch update: 10/7/2018
CSU Facilities Management–Data & Info. Systems
N


SE
SW
NW
N101
N102
N103
N104
N105
N106
N107
N108
N109
N110
N111
N112
N113
N114
N115
N116
N117
N118
N119
N120
N121
N122
N123
N124
N125
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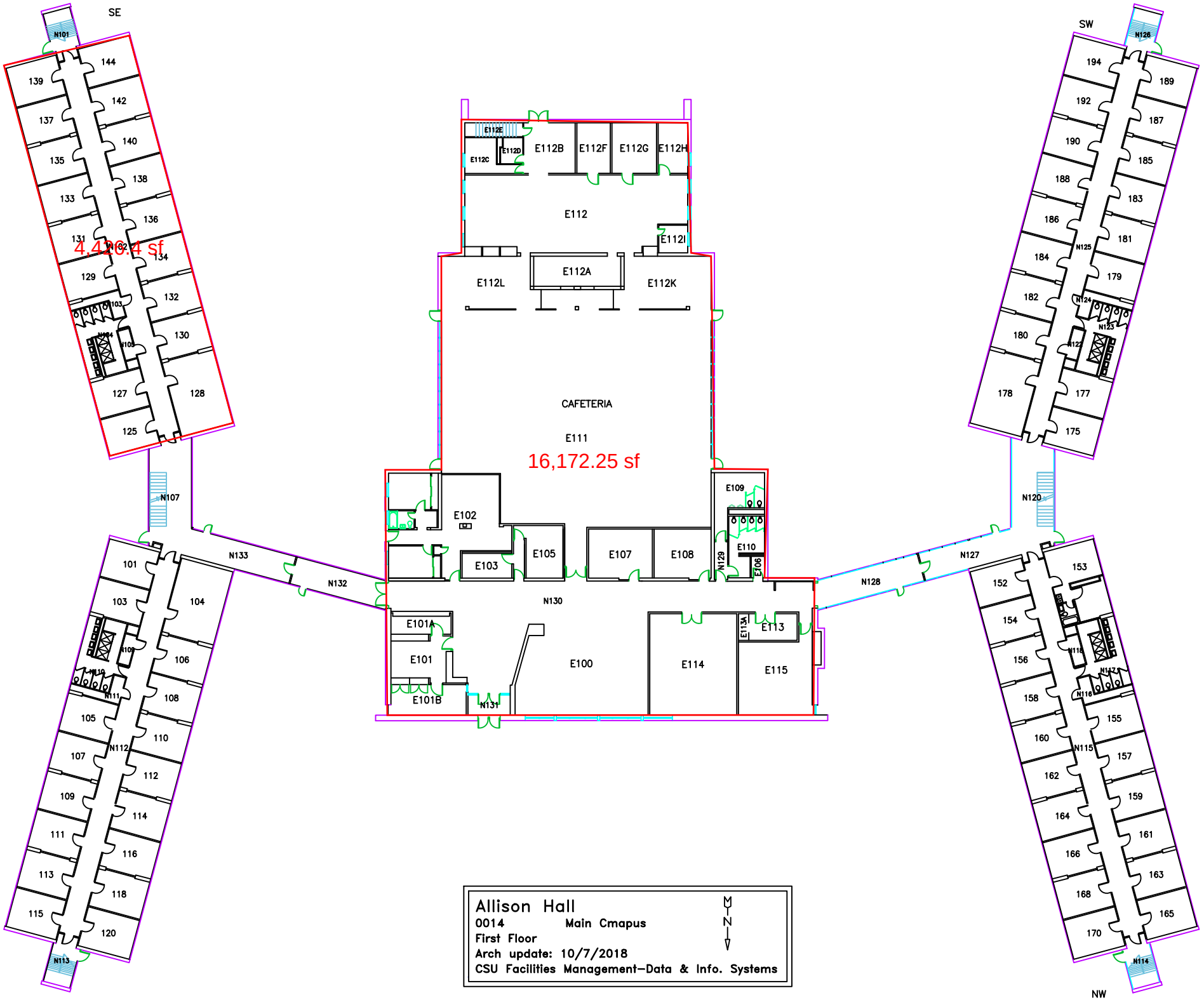
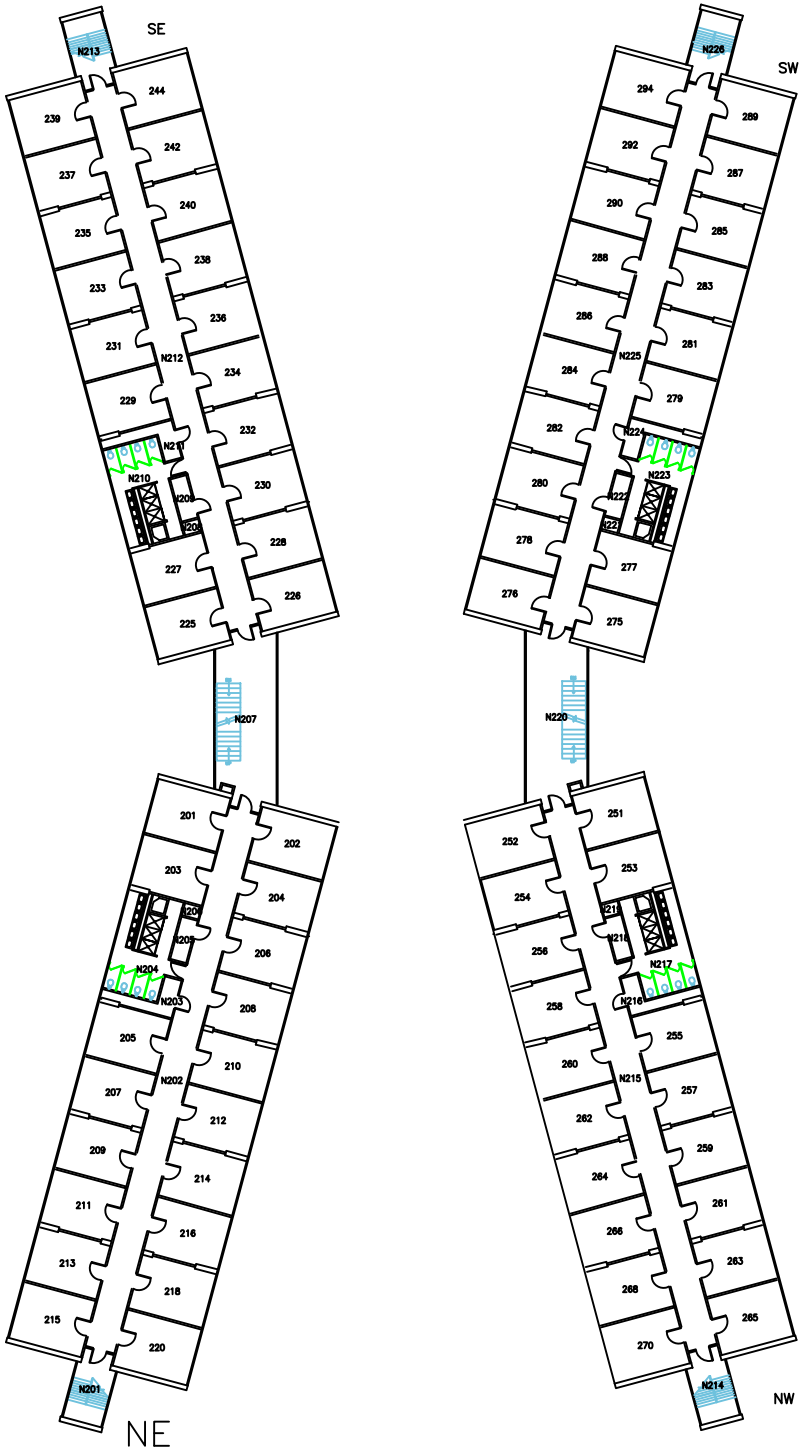
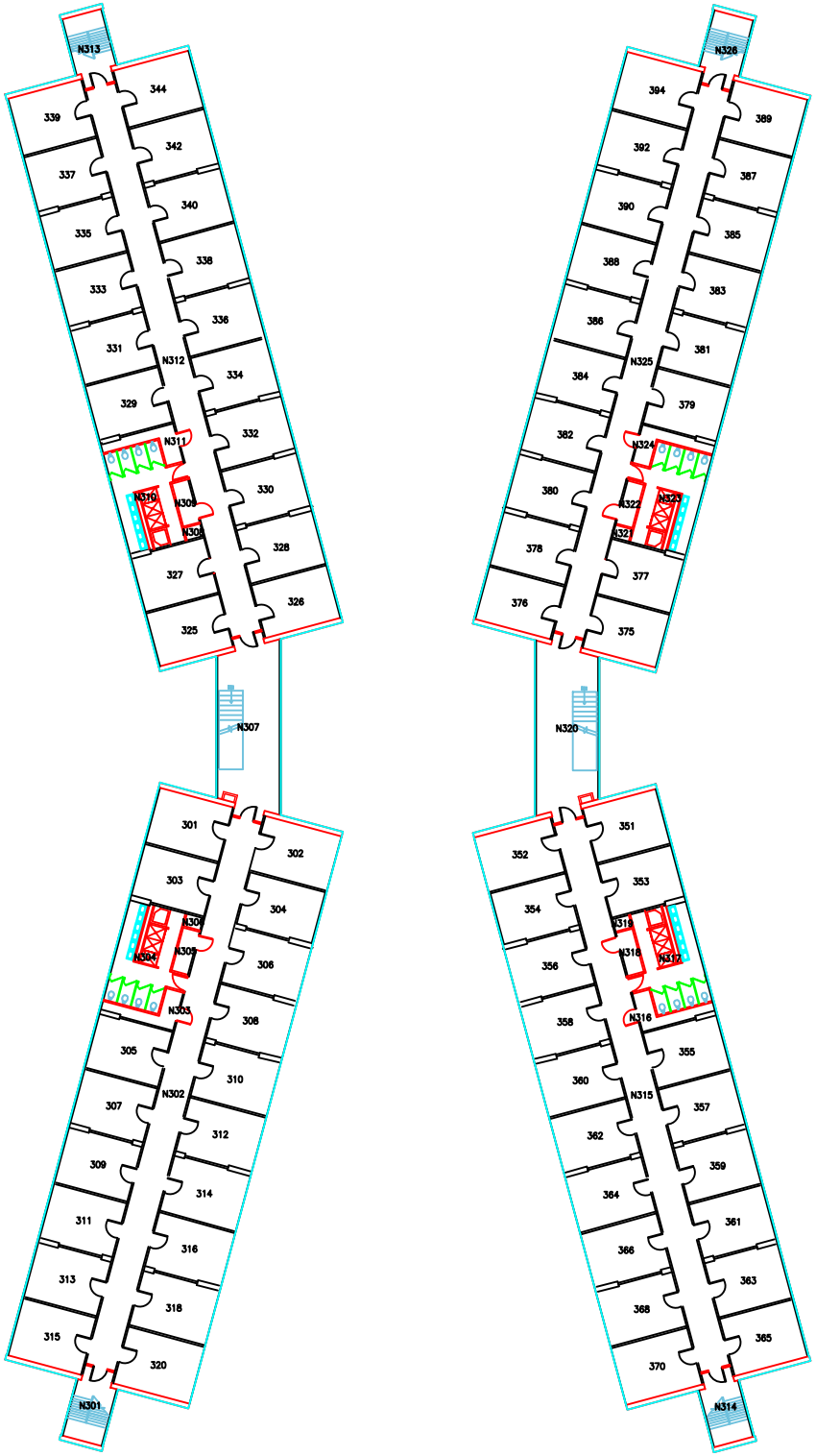
111
113
115
153
152
154
156
158
160
162
164
166
168
170
155
157
159
161
163
165
E112E
E112C
E112D
E112B
E112F
E112G
E112H
E112
E112I
E112L
E112A
E112K
CAFETERIA
E111
E102
E103
E105
E107
E108
E109
E110
E106
E101A
E101
E101B
E100
E114
E113A
E113
E115
Allison Hall
0014 Main Cmapus
First Floor
Arch update: 10/7/2018
CSU Facilities Management–Data & Info. Systems
N


SE
SW
NW
4,426.4 sf
CAFETERIA
E111
16,172.25 sf
E112
E112A
E112B
E112C
E112D
E112E
E112F
E112G
E112H
E112I
E112K
E112L
E100
E101
E101A
E101B
E102
E103
E105
E106
E107
E108
E109
E110
E113
E113A
E114
E115
N101
N102
N103
N104
N105
N106
N107
N108
N109
N110
N111
N112
N113
N114
N115
N116
N117
N118
N120
N122
N123
N124
N125
N126
N127
N128
N129
N130
N131
N132
N133
Allison Hall
0014 Main Cmapus
First Floor
Arch update: 10/7/2018
CSU Facilities Management–Data & Info. Systems
N



Allison Hall
0014
Second Floor
Arch update: 8/1/1993
CSU Facilities Management–Data & Info. Systems

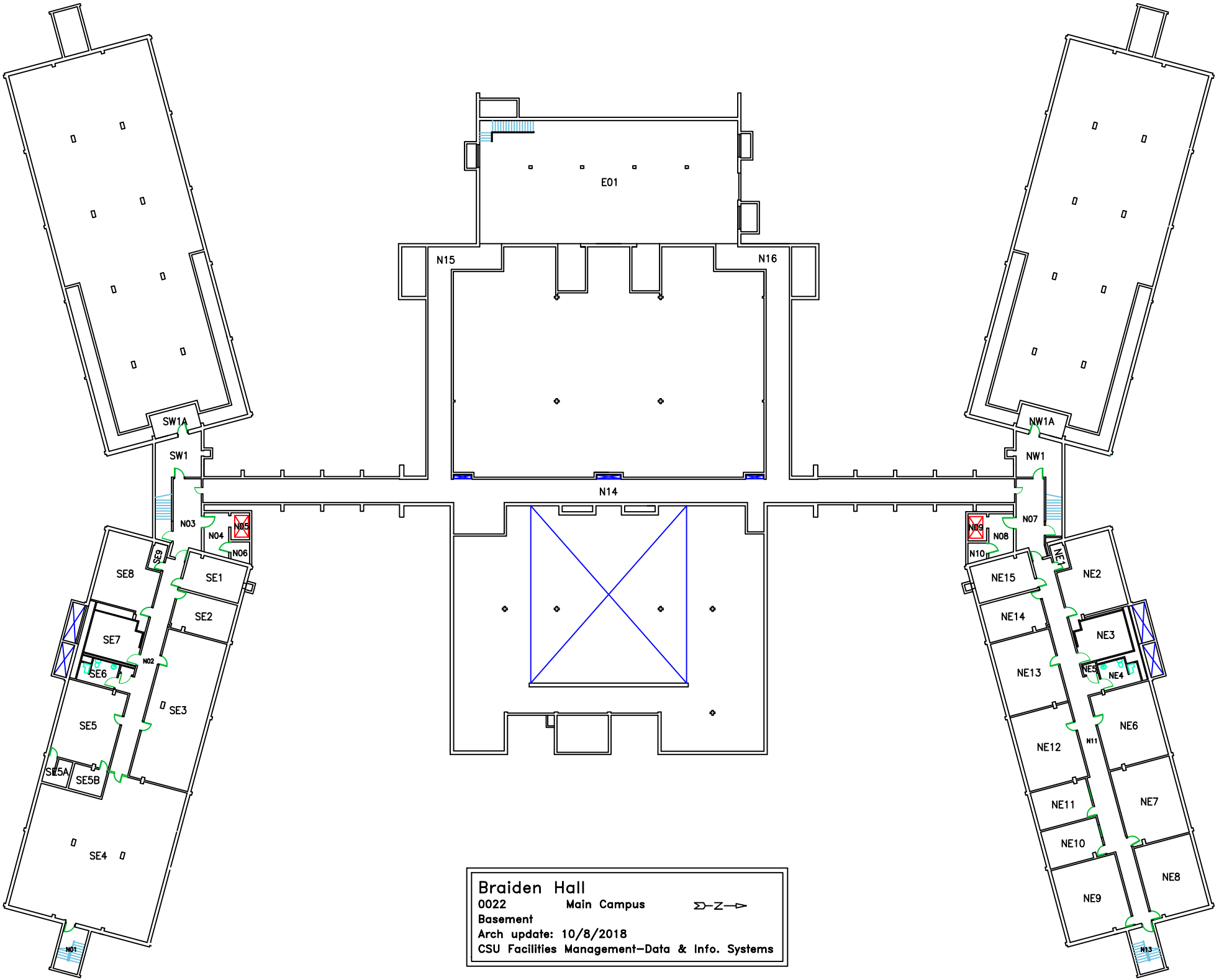
M
N

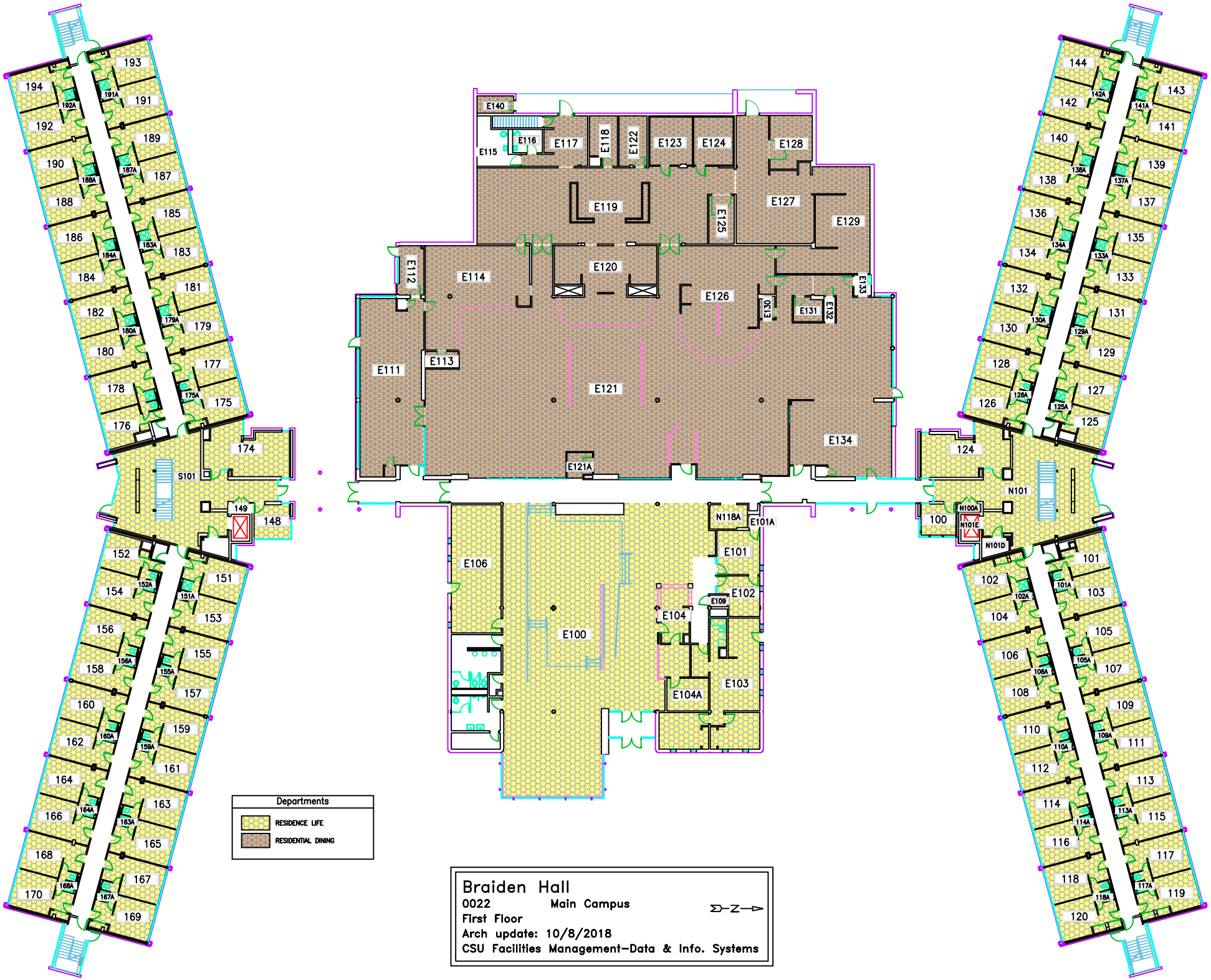


Allison Hall
0014
Third Floor
Arch update: 8/1/1993
CSU Facilities Management–Data & Info. Systems

N

Appendix D - Existing Building Drawings – Braiden


E01
N15
N16
N14
SW1A
SW1
NW1A
NW1
N03
N04
N05
N06
N07
N08
N09
N10
SE9
SE8
SE1
SE2
SE7
N02
SE6
SE3
SE5
SE5A
SE5B
SE4
N01
NE15
NE2
NE14
NE3
NE13
NE5
NE4
NE6
NE12
N11
NE11
NE7
NE10
NE8
NE9
N13
Braiden Hall
0022 Main Campus
Basement
Arch update: 10/8/2018
CSU Facilities Management–Data & Info. Systems


E140
E116
E117
E118
E122
E123
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E128
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E114
E120
E126
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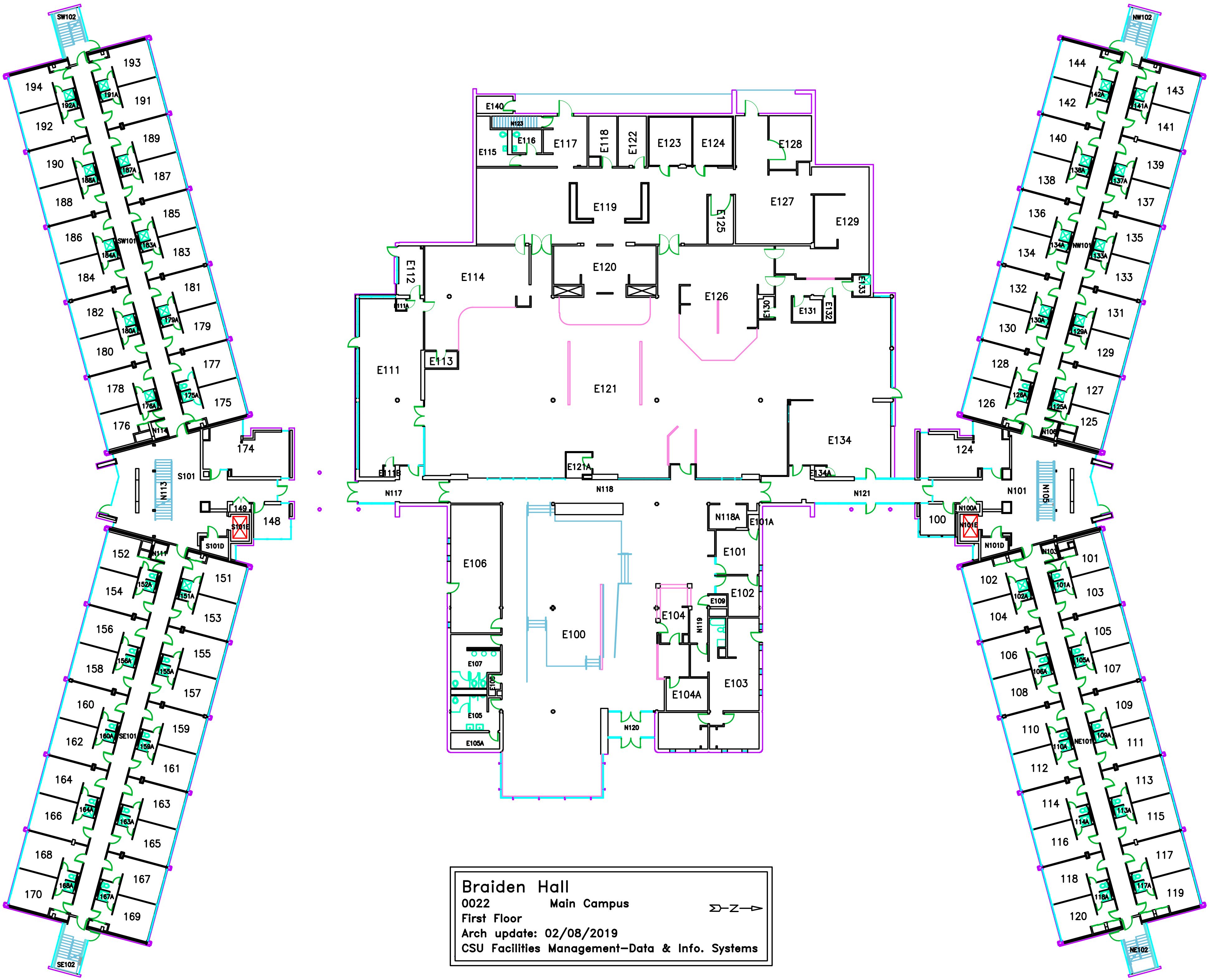
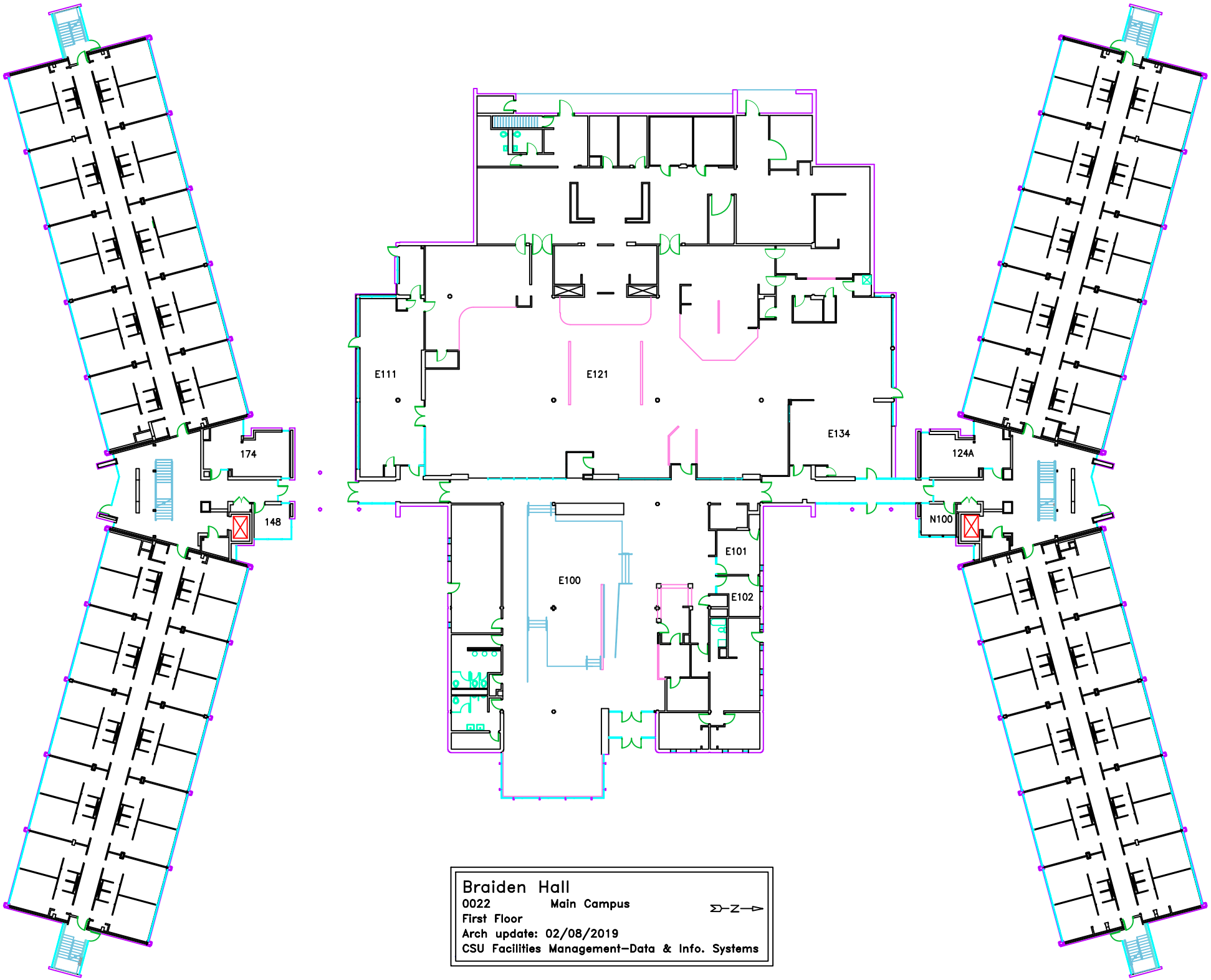
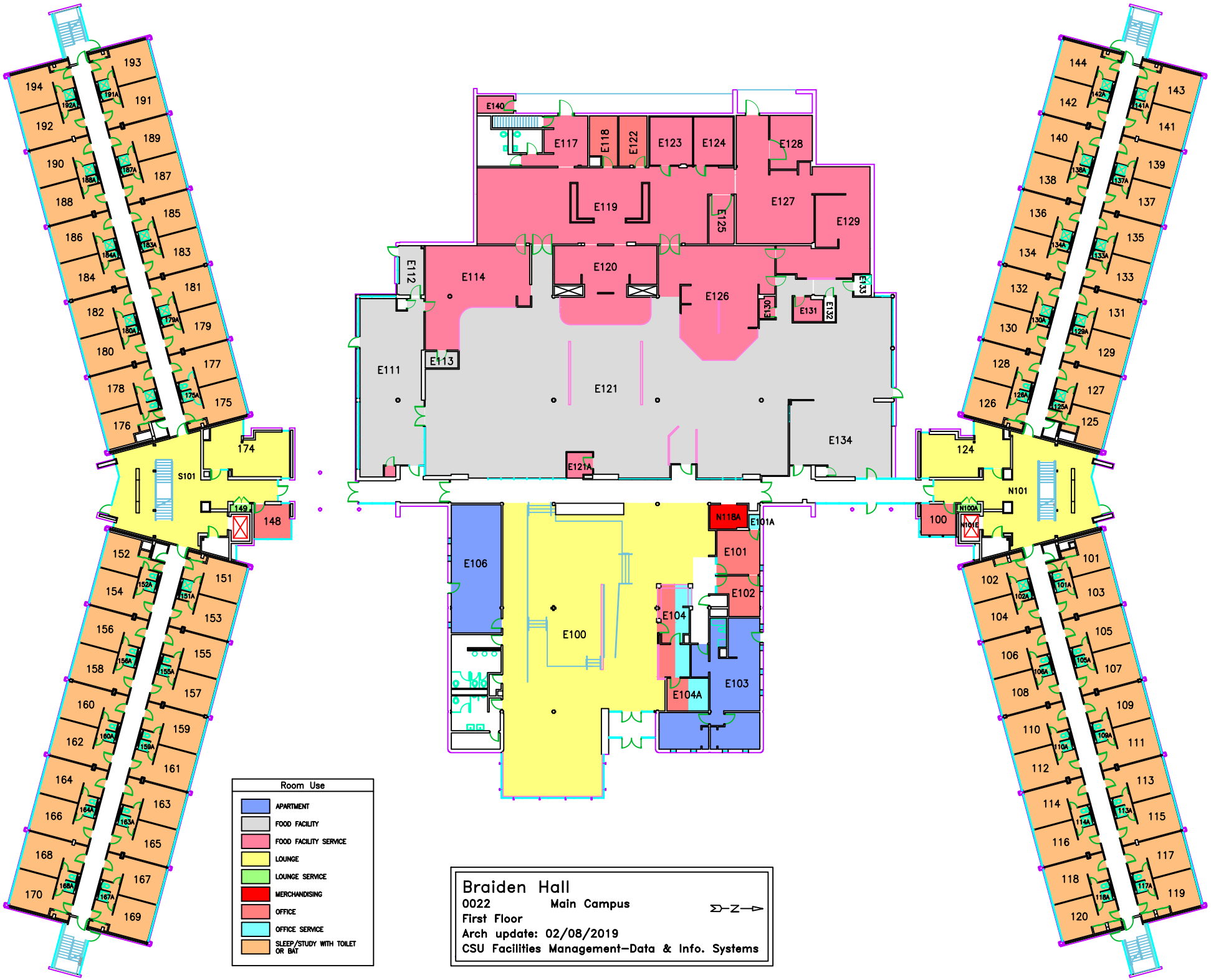
E134
E121A
N118A
E101A
E101
E106
E102
E109
E104
E100
E103
E104A
S101
149
148
174
N101
N100A
N101E
N101D
100
124
Departments
RESIDENCE LIFE
RESIDENTIAL DINING
Braiden Hall
0022 Main Campus
First Floor
Arch update: 10/8/2018
CSU Facilities Management–Data & Info. Systems



Braiden Hall
0022 Main Campus
First Floor
Arch update: 02/08/2019
CSU Facilities Management–Data & Info. Systems



Braiden Hall
0022 Main Campus
First Floor
Arch update: 02/08/2019
CSU Facilities Management–Data & Info. Systems


E140
E117
E118
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E124
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E133
E130
E131
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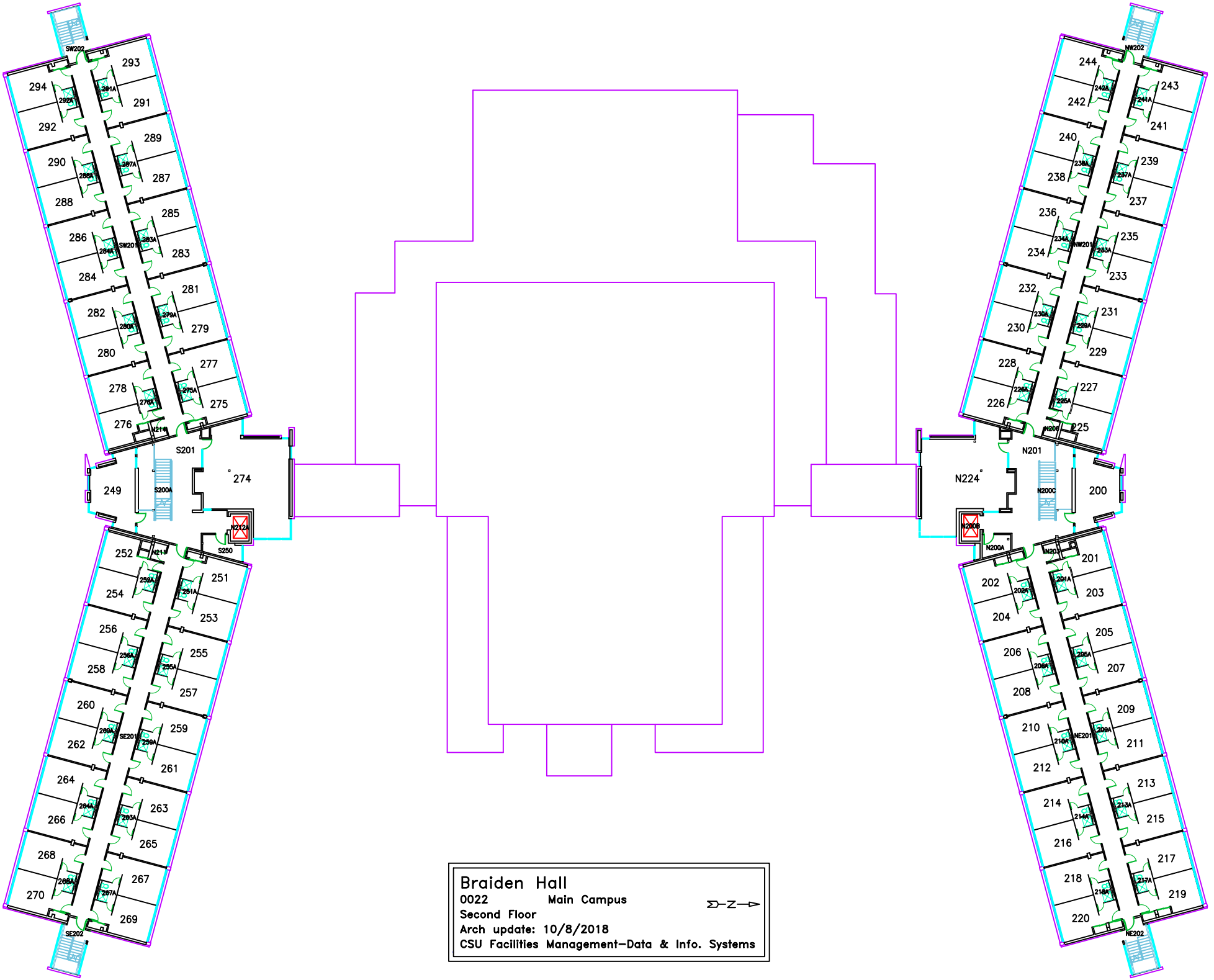
E113
E121
E134
E121A
E106
E100
N118A
E101A
E101
E102
E104
E103
E104A
S101
174
149
148
N101
124
100
N100A
N101E
Room Use
APARTMENT
FOOD FACILITY
FOOD FACILITY SERVICE
LOUNGE
LOUNGE SERVICE
MERCHANDISING
OFFICE
OFFICE SERVICE
SLEEP/STUDY WITH TOILET OR BAT
Braiden Hall
0022 Main Campus
First Floor
Arch update: 02/08/2019
CSU Facilities Management–Data & Info. Systems



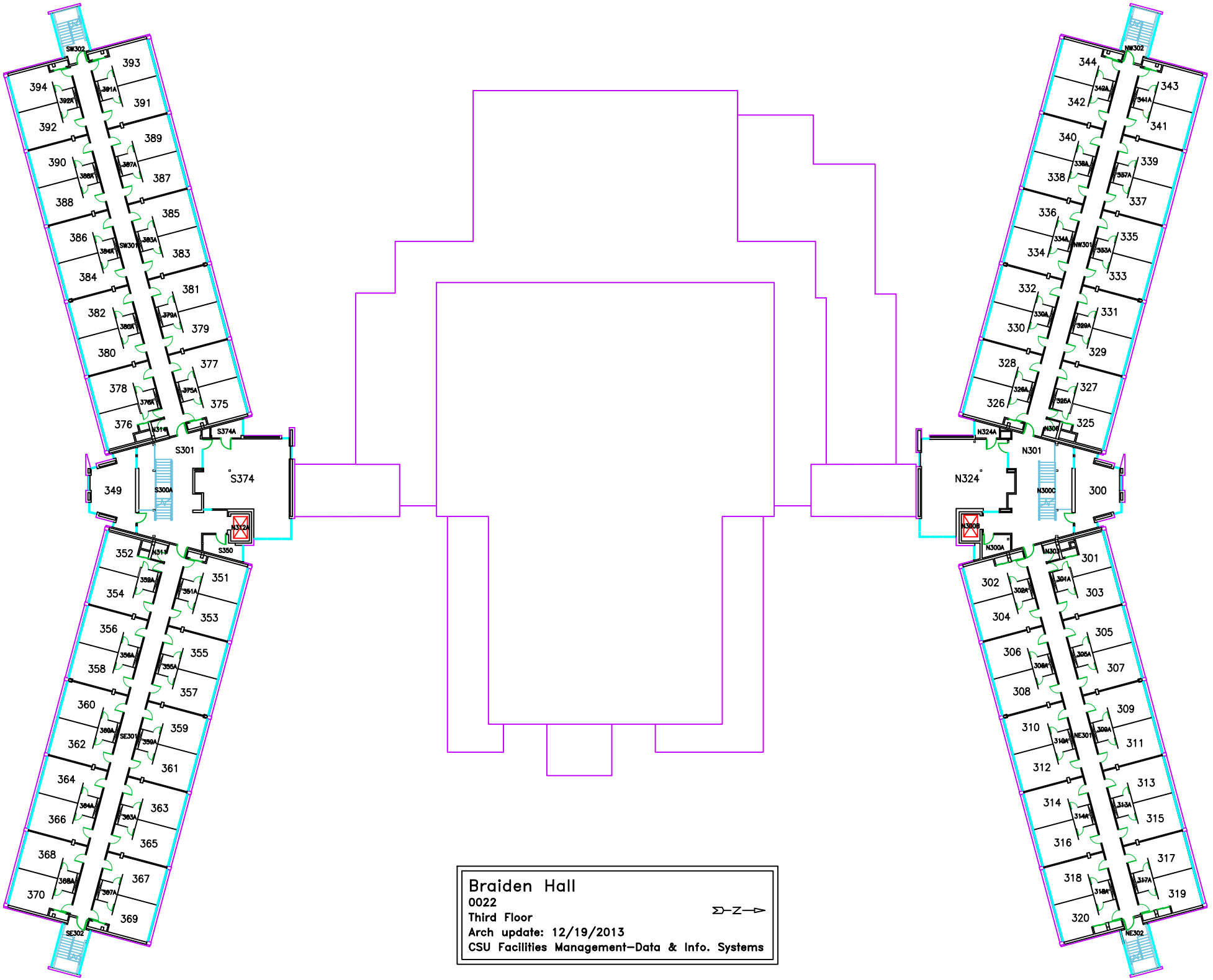
Braiden Hall

0022 Main Campus

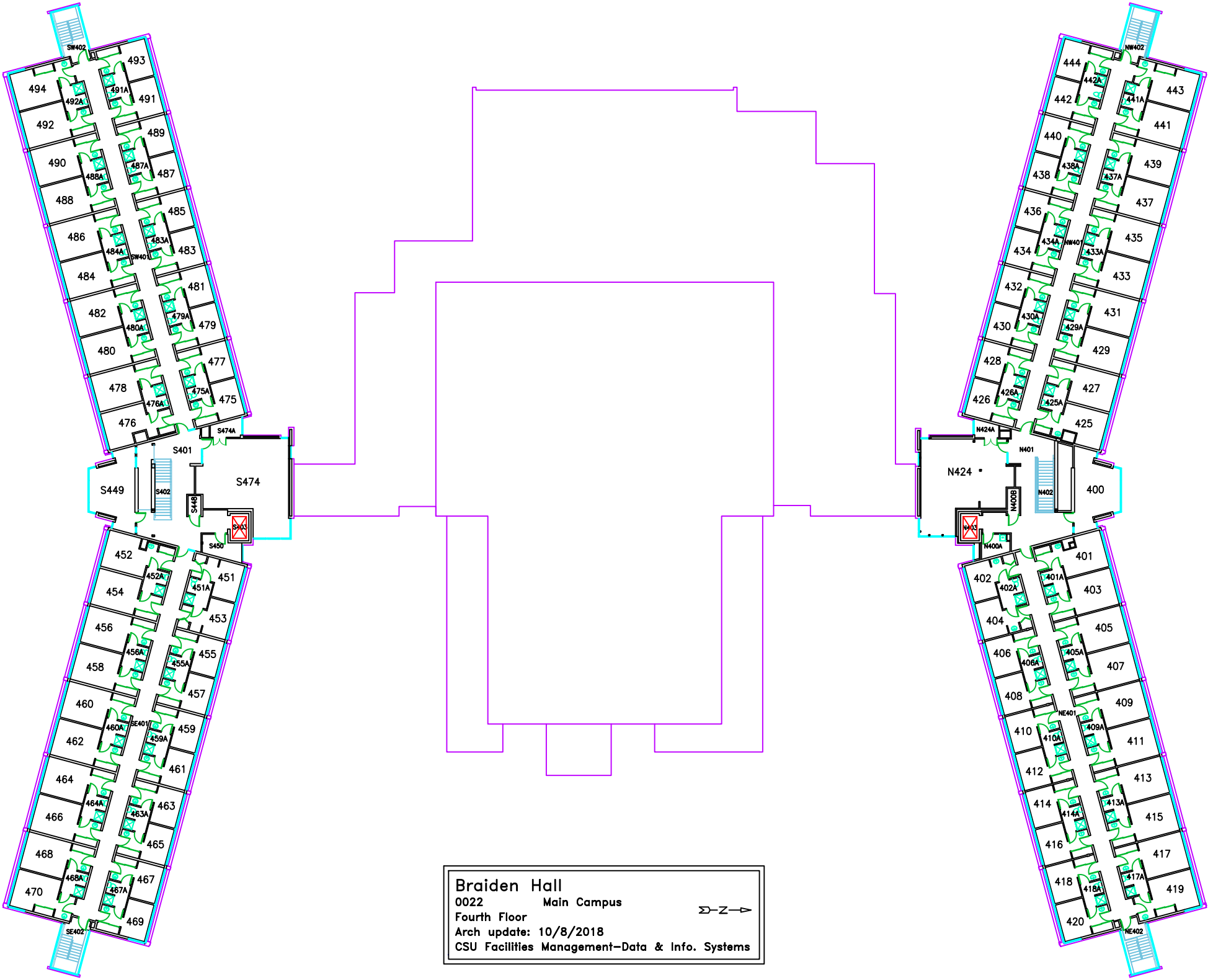
Second Floor

Arch update: 10/8/2018

CSU Facilities Management–Data & Info. Systems



Braiden Hall
0022
Third Floor
Arch update: 12/19/2013
CSU Facilities Management–Data & Info. Systems



Braiden Hall
0022 Main Campus
Fourth Floor
Arch update: 10/8/2018
CSU Facilities Management–Data & Info. Systems

Appendix E - Conceptual Budget Estimate Worksheets and Spatial Analysis

SPATIAL ANALYSIS						
LEVEL	ONE	TWO	THREE	FOUR	FIVE	TOTAL BASE
STUDENT STUDY/ LOUNGE NEW KNUCKLE WEST	2200	2200	2200	2000		8600
STUDENT STUDY/ LOUNGE NEW KNUCKLE EAST	2200	2200	2200	2000		8600
NEW SUITES				22000	22000	44000

TOTAL NEW						61200
TOTAL RENOVATION						91600
TOTAL GSF						152800
TOTAL BUDGET						$ 82,100,000
TOTAL $/GSF						$ 537
TOTAL BEDS						625
TOTAL $/BED						$ 131,360

Braiden and Parmelee Cost Escalation estimate to inform Allison Hall FLODC									
YEAR		2012		2013		2014		2015	
ESCALATION	HAVE RLB VERIFY - ENR ADJUST FOR NOF	0	0%		2%		3%		3%
TDCB		$14,000,000							
FLODC - 85% TDCB		$ 11,900,000	$ -	$ 11,900,000	$ 238,000	$ 12,138,000	$ 364,140	$ 12,502,140	$ 375,064
		2027	2014 TO 2027						
COMPOUNDED ESCALATED FLODC IN 2027		$23,486,729	1.97						
# BEDS	130								
$/BED IN 2026			$180,667						
DESIRED # OF BEDS	225	$40,650,108							
CHECK SQFT METRICS	PL GSF								
4 STORY KNUCKLES									
RENOVATE € BUILDING	FINISHES AND RESTROOMS NEW MEP								
GSF		91600		VERIFIED					
TARGET $/SQFT 2027		$317		ROOM CONFIGURATION REMAINS AS IS NEW FINISHES NEW RESTROOMS					
TOTAL RENOVATION		$29,037,200							
TOTAL FLODC		$69,687,308		Went with $65M for procurement					
SCOPE ALTERNATES									
ADD FLOOR AT CENTER SECTION		7000		TOTAL FOOTPRINT ~15K GSF					
$/SQFT 2027		$650							
TOTAL NEW OVER ABOVE BP		$4,550,000							
25 ADDITIONAL BEDS	250	$4,516,679	25						
ALLISON HALL									
TOTAL DVP BUDGET 2027									

Total Development Project Budget Analysis

Allison Additions and Renovations

Cost Category & Descriptions	$	Estimate	Notes
Adminstrative Costs			
Advertising	$	1,000	
Moving Expenses	$	30,000	EXISTING CAPACITY
PROJECT DEVELOPMENT FEES	$	1,642,000	2% of total project budget
City of Fort Collins Fees (Permits, Discharge, etc)	$		CSU SITE
Water	$		CSU SITE
Electric	$		CSU SITE
Sewer	$		CSU SITE
Storm Water	$	20,000	CSU SITE
Streets/Street Lights	$		CSU SITE
City Plant Investment Fees (PIFs)	$		CSU SITE
Water	$		CSU SITE
Sewer	$		CSU SITE
Storm Water	$		CSU SITE
Easements/R.O.W./Legal	$		CSU SITE
Boiler/Generator Exhaust Air Permit	$	4,000	
Lost Parking Replacement	$	0	WITH STAGING TEMPORARY by DB Firm
HPBCP -LEED Certification	$	30,000	application
SubTotal	**$**	**1,727,000**	
Extraneous Design Costs (Outside of Design-Build Contract)			
Program Plan	$	0	FM PROGRAM PLAN
City Review (SPAR)	$	0	CSU SITE
CSU Internal Design Costs	$	0	FM PROGRAM PLAN
Design Criteria Documents	$	0	DBGMP
Design- Build Proposal Stipends	$	0	DBGMP
Design Contingency	$	0	DBGMP
Cost Estimator	$	0	
Traffic Study	$	0	CSU SITE
Drainage Study	$	25,000	
Specialty Consultants	$	25,000	AV CSU PEER
Commissioning Consultant	$	50,000	design thru occupancy
Vibration Consultant	$	0	
LEED Consultant/ Acoustical Consultant	$	0	DBGMP
Land/SiteSurvey	$	15,000	
Geotechnical Report	$	0	DONE BY HDS
Industrial Hygienist	$	0	DONE WITH REROOFING PROJECT
Poudre Fire Authority Design Review Fee	$	100,000	
Code Review	$	50,000	
Code Inspections	$	50,000	
Roofing Quality Inspector	$	25,000	DBGMP
Structural Peer Review	$	0	DBGMP
SubTotal	**$**	**340,000**	
Extraneous Construction Costs (Outside of Design-Build Contract)			
Remaining HCM	$	155,000	REMOVAL WITH REROOFING PROJECT
Tree Removal	$	21,000	
Demolition	$	0	MAY NEED ALLOWANCE W/ OPTIONS
Constr. Materials Testing & Special Inspections	$	50,000	
Utility Extension to the Project	$	100,000	IN DBGMP SQFT CONSTRUCTION COSTS
City Traffic	$		
City Light & Power	$		
Century Link	$		
Comcast	$		
Xcel	$		
University Needed Improvements	$	0	
Construction Laydown & Staging Area	$	25,000	Potential for adjacent laydown in € parking lot
Stormwater Management	$	0	
Keying/Cylinders	$	25,000	
Telecom	$	200,000	CONDUIT ROUTING IN BENCHMARK COSTS
Security	$	50,000	
Card Access	$		
Cameras	$		
Intrusion	$		
Notifier Network (Fire Alarm) Connection	$	25,000	
Fire Alarms (if not in base bid)	$	0	IN DB SCOPE
Signage/Branding	$	50,000	
Safety Radio	$	70,000	
Test	$		ABOVE
Installation	$		ABOVE
CSU HVAC Controls	$	0	DBGMP HDS - NO FM MONITORING SCOPE
SubTotal	**$**	**771,000**	
Design & Construction Costs (Within DB Contract)			
Base Construction - FLDC - DB	$	69,687,308	75-80% of total proj. budget in DBB
Construction Contingency- DB	$	IN CONTRACT	dbgmp
SubTotal	**$**	**69,687,308**	85%
Owner's Development Contingency			
Development Contingency	$	6,968,731	10% of FLDC
SubTotal	**$**	**6,968,731**	
Furniture, Fixtures & Equipment			
Furniture, Fixtures & Equipment	$		
Design Consultant	$	0	IN FLODC -DBGMP
Furniture	$	2,500,000	
AV Equipment	$	0	in telecom
Kitchen Equipment	$	25,000	
Custodial Equipment	$	25,000	
	$	0	FOR BASE BID SCOPE
Irrigation Equipment	$	10,000	
Site Furnishings	$	40,000	FOR BASE BID SCOPE
SubTotal	**$**	**2,600,000**	
RFP ESTIMATE	**$**	**82,100,000**	
Total Development Cost ESTIMATE - BASE BID		82,094,038	
Difference	**$**	**5,962**	5,962
Anticipated Project Square Feet		152,800 **SF**	
Budgeted Ttl Construction Cost per Square Foot*	**$**	**$456.07**	
Budgeted Total Devel. Cost per Square Foot**	**$**	**$537.30**	

25 ADD BEDS	$	4,516,679
7K ADD AT CTR	$	4,550,000
TOTAL ADD ALT	$	9,066,679

Appendix F – USGBC Projected LEED Checklist

LEED Registered Project Checklist

Project Name

LEED Project #

Yes	?	No			
			Sustainable Sites		**14** Points
Y			Prereq 1	**Erosion & Sedimentation Control**	Required
1			Credit 1	**Site Selection**	1
			Credit 2	**Urban Redevelopment**	1
			Credit 3	**Brownfield Redevelopment**	1
1			Credit 4.1	**Alternative Transportation**, Public Transportation Access	1
1			Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
1			Credit 4.3	**Alternative Transportation**, Alternative Fuel Refueling Stations	1
	1		Credit 4.4	**Alternative Transportation**, Parking Capacity	1
1			Credit 5.1	**Reduced Site Disturbance**, Protect or Restore Open Space	1
1			Credit 5.2	**Reduced Site Disturbance**, Development Footprint	1
1			Credit 6.1	**Stormwater Management**, Rate or Quantity	1
1			Credit 6.2	**Stormwater Management**, Treatment	1
1			Credit 7.1	**Landscape & Exterior Design to Reduce Heat Islands**, Non-Roo	1
	1		Credit 7.2	**Landscape & Exterior Design to Reduce Heat Islands**, Roof	1
1			Credit 8	**Light Pollution Reduction**	1

Yes	?	No			
			Water Efficiency		**5** Points
1			Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1
	1		Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1
	1		Credit 2	**Innovative Wastewater Technologies**	1
	1		Credit 3.1	**Water Use Reduction**, 20% Reduction	1
	1		Credit 3.2	**Water Use Reduction**, 30% Reduction	1

Yes	?	No			
			Energy & Atmosphere		**17** Points
Y			Prereq 1	**Fundamental Building Systems Commissioning**	Required
Y			Prereq 2	**Minimum Energy Performance**	Required
Y			Prereq 3	**CFC Reduction in HVAC&R Equipment**	Required
2			Credit 1.1	**Optimize Energy Performance**, 20% New / 10% Existing	2
	2		Credit 1.2	**Optimize Energy Performance**, 30% New / 20% Existing	2
			Credit 1.3	**Optimize Energy Performance**, 40% New / 30% Existing	2
			Credit 1.4	**Optimize Energy Performance**, 50% New / 40% Existing	2
			Credit 1.5	**Optimize Energy Performance**, 60% New / 50% Existing	2
1			Credit 2.1	**Renewable Energy**, 5%	1
	1		Credit 2.2	**Renewable Energy**, 10%	1
	1		Credit 2.3	**Renewable Energy**, 20%	1
	1		Credit 3	**Additional Commissioning**	1
	1		Credit 4	**Ozone Depletion**	1
1			Credit 5	**Measurement & Verification**	1
1			Credit 6	**Green Power**	1

Yes	?	No			
			Materials & Resources		**13** Points
Y			Prereq 1	**Storage & Collection of Recyclables**	Required
1			Credit 1.1	**Building Reuse**, Maintain 75% of Existing Shell	1
1			Credit 1.2	**Building Reuse**, Maintain 100% of Shell	1
	1		Credit 1.3	**Building Reuse**, Maintain 100% Shell & 50% Non-Shell	1
1			Credit 2.1	**Construction Waste Management**, Divert 50%	1
1			Credit 2.2	**Construction Waste Management**, Divert 75%	1
1			Credit 3.1	**Resource Reuse**, Specify 5%	1
1			Credit 3.2	**Resource Reuse**, Specify 10%	1
1			Credit 4.1	**Recycled Content**, Specify 25%	1
	1		Credit 4.2	**Recycled Content**, Specify 50%	1
1			Credit 5.1	**Local/Regional Materials**, 20% Manufactured Locally	1
	1		Credit 5.2	**Local/Regional Materials**, of 20% Above, 50% Harvested Locally	1
1			Credit 6	**Rapidly Renewable Materials**	1
1			Credit 7	**Certified Wood**	1

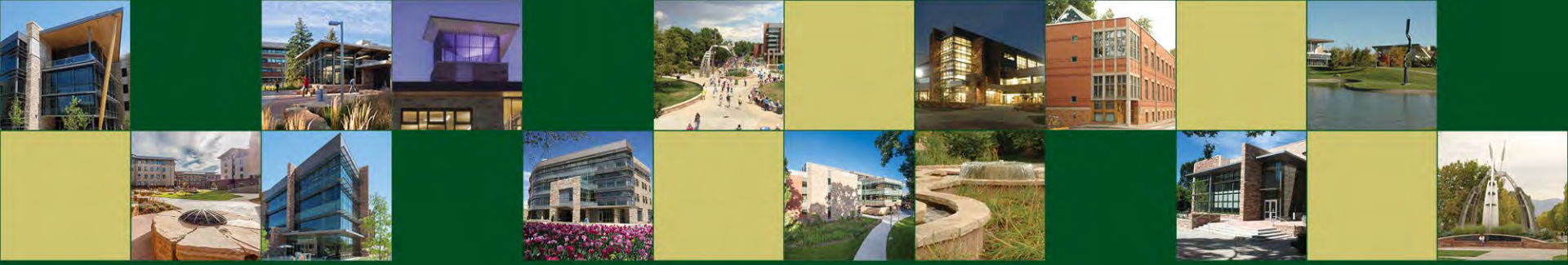
Yes	?	No			
			Indoor Environmental Quality		**15** Points
Y			Prereq 1	**Minimum IAQ Performance**	Required
Y			Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	Required
	1		Credit 1	**Carbon Dioxide** (CO_2) **Monitoring**	1
1			Credit 2	**Increase Ventilation Effectiveness**	1
1			Credit 3.1	**Construction IAQ Management Plan**, During Construction	1
1			Credit 3.2	**Construction IAQ Management Plan**, Before Occupancy	1
1			Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1
1			Credit 4.2	**Low-Emitting Materials**, Paints	1
1			Credit 4.3	**Low-Emitting Materials**, Carpet	1
1			Credit 4.4	**Low-Emitting Materials**, Composite Wood	1
1			Credit 5	**Indoor Chemical & Pollutant Source Control**	1
	1		Credit 6.1	**Controllability of Systems**, Perimeter	1
	1		Credit 6.2	**Controllability of Systems**, Non-Perimeter	1
1			Credit 7.1	**Thermal Comfort**, Comply with ASHRAE 55-1992	1
1			Credit 7.2	**Thermal Comfort**, Permanent Monitoring System	1
1			Credit 8.1	**Daylight & Views**, Daylight 75% of Spaces	1
	1		Credit 8.2	**Daylight & Views**, Views for 90% of Spaces	1

Yes	?	No			
			Innovation & Design Process		**5** Points
1			Credit 1.1	**Innovation in Design**: Specific Title	1
1			Credit 1.2	**Innovation in Design**: Specific Title	1
1	1		Credit 1.3	**Innovation in Design**: Specific Title	1
	1		Credit 1.4	**Innovation in Design**: Specific Title	1
1			Credit 2	**LEED™ Accredited Professional**	1

Yes	?	No		
41	21		**Project Totals** (pre-certification estimates)	**69** Points

Certified 26-32 points **Silver** 33-38 points **Gold** 39-51 points **Platinum** 52-69 points

Appendix G - Aesthetic Guidelines



Colorado State University

Campus Planning & Design Philosophy and Aesthetic Guidelines

July 2023

CSU Campus Overall Design Philosophy

The Colorado State University (CSU) main campus is a carefully planned and executed complex of buildings and landscapes that are authentic to Fort Collins and Colorado, and are a contemporary expression of college life.

Buildings are sited to preserve views to the mountains and campus open spaces, and are expressed in a way that facilitates a connection to the outside. Barriers between inside and outside are broken down through the strategic use of vision glass, atriums, and multi-story volumes at entrances.

CSU Campus Overall Design Philosophy, cont.

There is a consistent thread of local stone in building facades, which grounds buildings to the local environment and thematically ties buildings together. Planes of stone and glass bridge between inside and outside of buildings, further integrating both building and landscape.

The campus pattern results in a strong sense of campus identity to visitors and the campus community alike. They feel a sense of community and connection to the outside environment, which creates an experience unique to Colorado State University.

CSU Campus Planning Philosophy and Aesthetic Guidelines

Colorado State University

CSU Campus Specific Planning Philosophy

The CSU main campus has three primary planning objectives:

1. Sense of community
2. Strong connection to outside environment through internal and external views
3. Materials and forms authentic to local environment

Sense of Community

Community is facilitated by the creation of social spaces scaled from expansive green quads to intimate areas for reflection. Quads, plazas, and courtyards are situated as events along pedestrian corridors, often as “eddy” spaces in association with rivers of pedestrian movement. The core of campus is largely devoid of vehicular movement, which allows social spaces to be safe and unencumbered. Buildings have generous plazas at entrances, creating a “front porch” that separates major pedestrian flow from building and plaza, generating social spaces at the building-landscape interface.

Connection to Outside

Some of the best spaces on the Colorado State University campus are those that “borrow” the exterior landscape of the foothills and mountains. Buildings and open spaces work together to leverage these views. Buildings and outside spaces without external views have internal views that embrace the character of the local environment through scale and materials.

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Use of Authentic Materials and Form

Local stone and native plant materials are used extensively. The overall landscape is considered a learning landscape where the university initiatives in habitat creation, energy conservation, stormwater quality treatment, and alternative transportation are openly integrated and interpreted.

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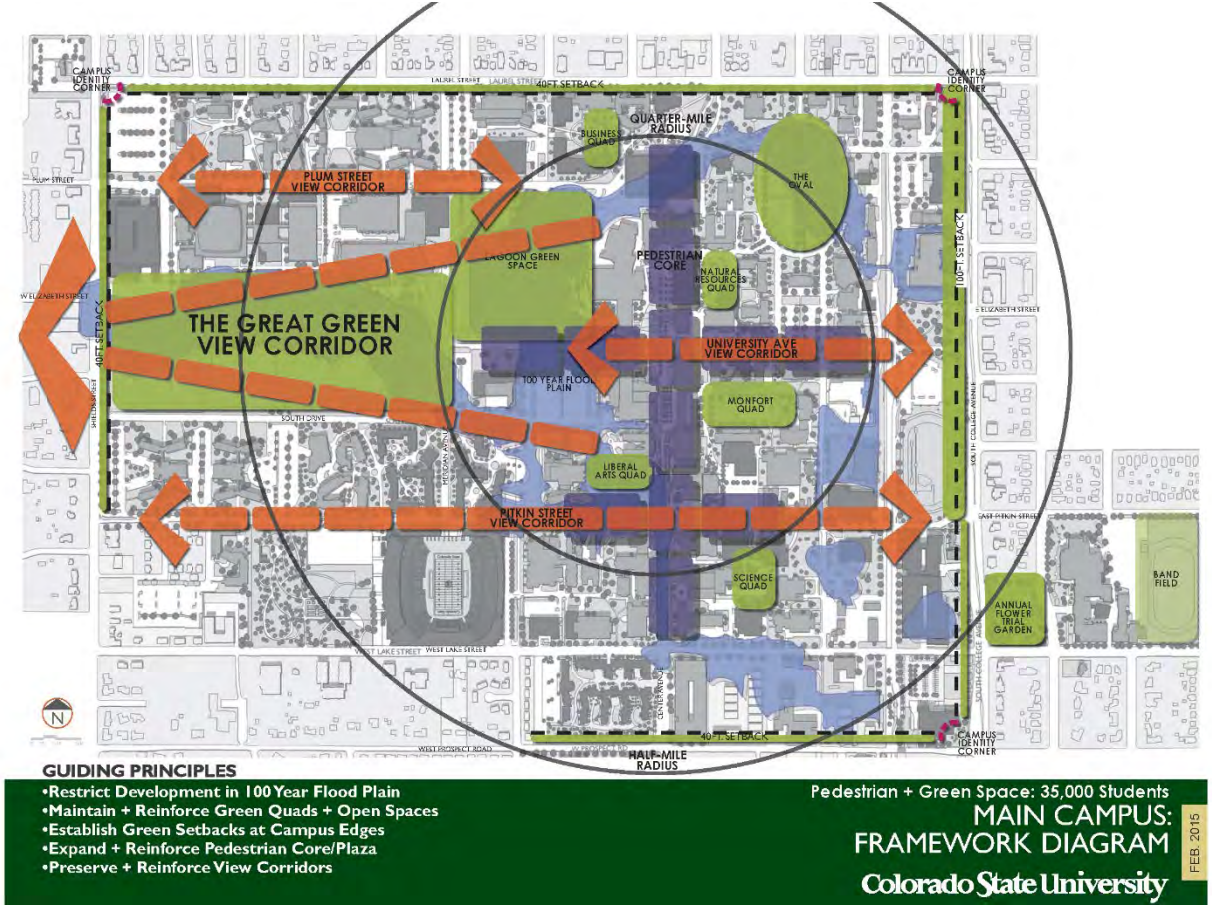
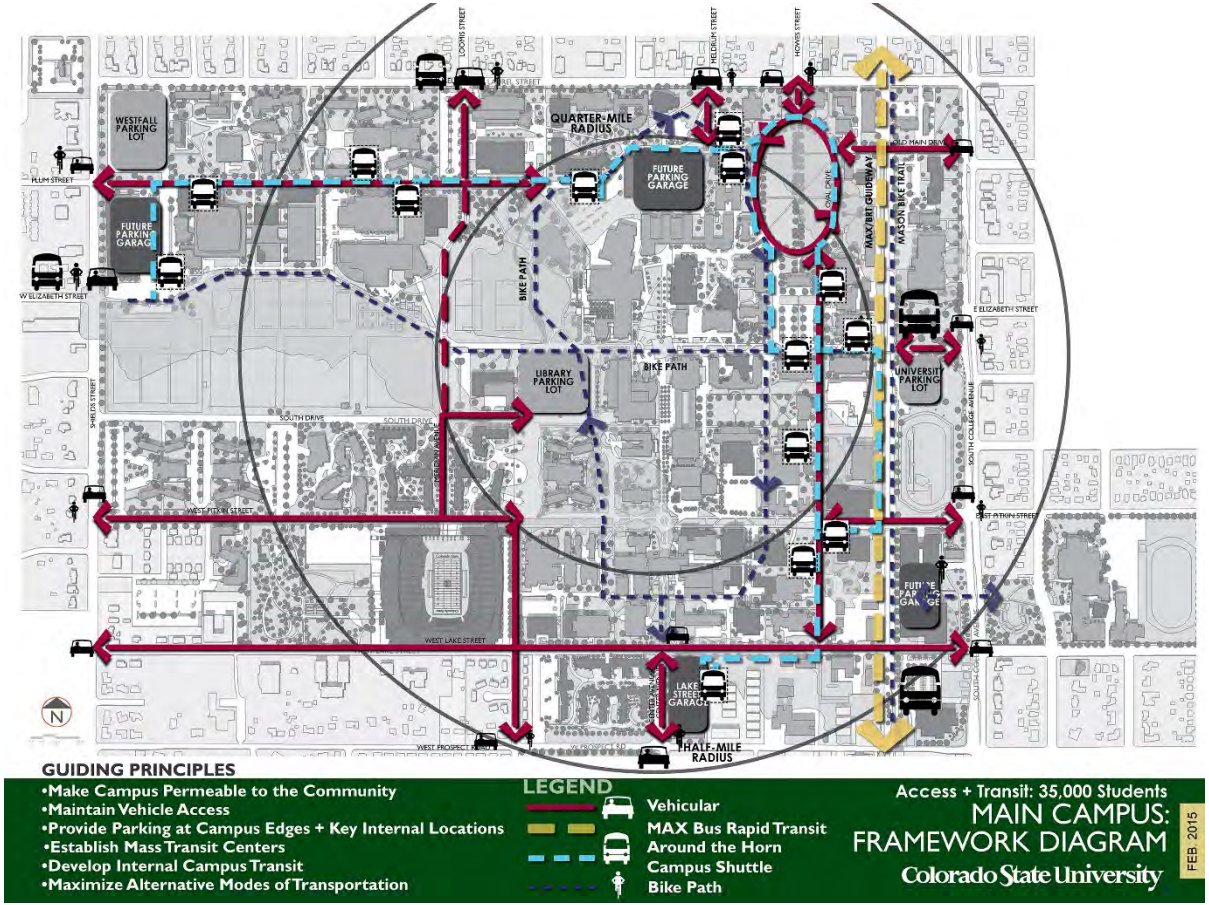
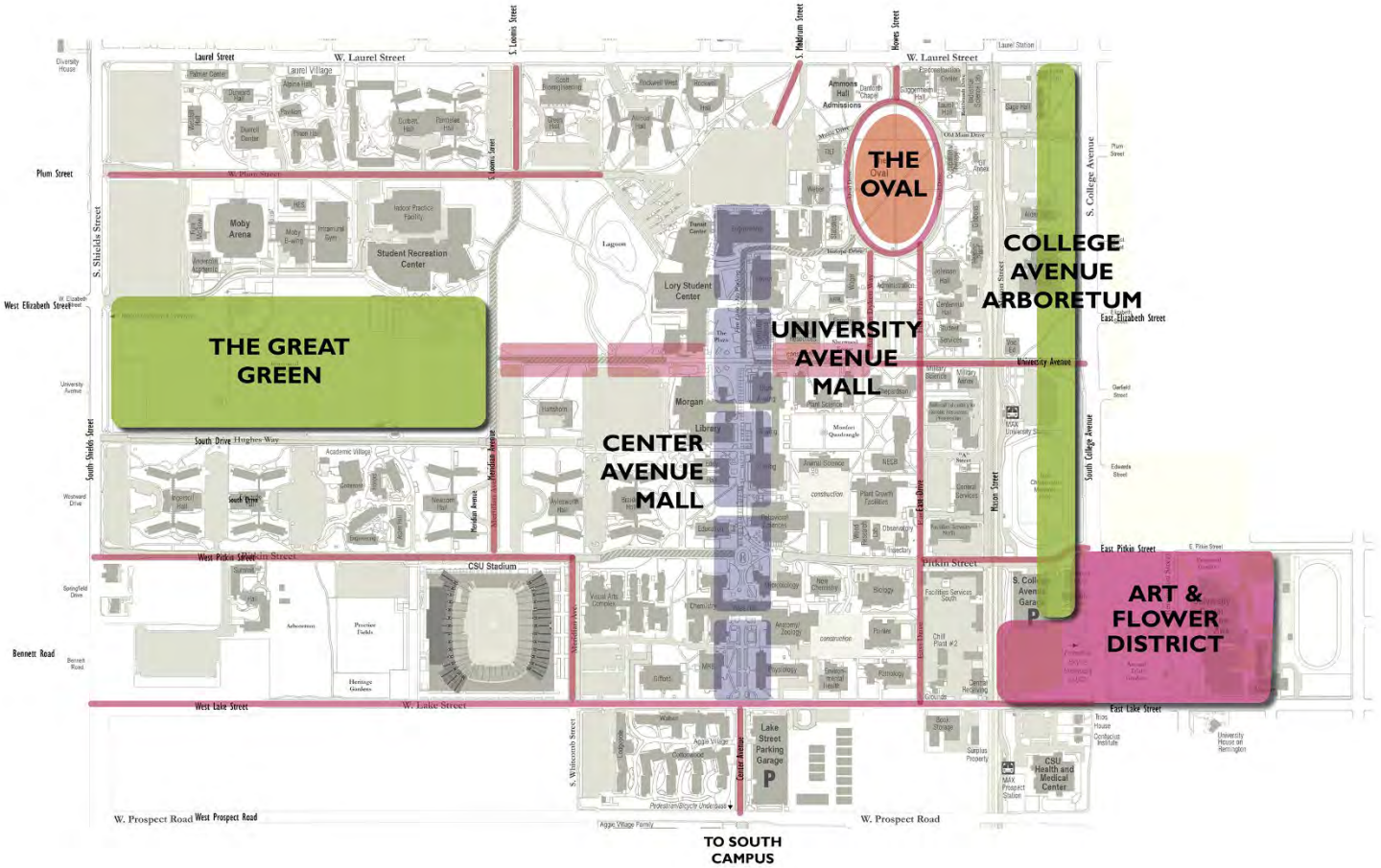
CSU Campus Framework



CSU Campus Transportation Framework



CSU Campus “Experience” Districts



Buildings Placed to Preserve and Create Views

Buildings Placed to Create Outdoor Spaces

Buildings Placed Carefully

- Buildings are defined primarily by pedestrian malls and plazas; secondarily by streets and services areas
- Buildings are placed and to leverage views to the campus and to the mountains and landscape beyond
- Buildings are horizontal in design, not vertical, to help preserve these

Campus Circulation Emphasizes Pedestrians and Bicycles

Transit Circulation Emphasizes Pedestrians and Bicycles

Circulation to Buildings Emphasizes Pedestrians and Bicycles

Circulation Emphasizes Pedestrians and Bicycles

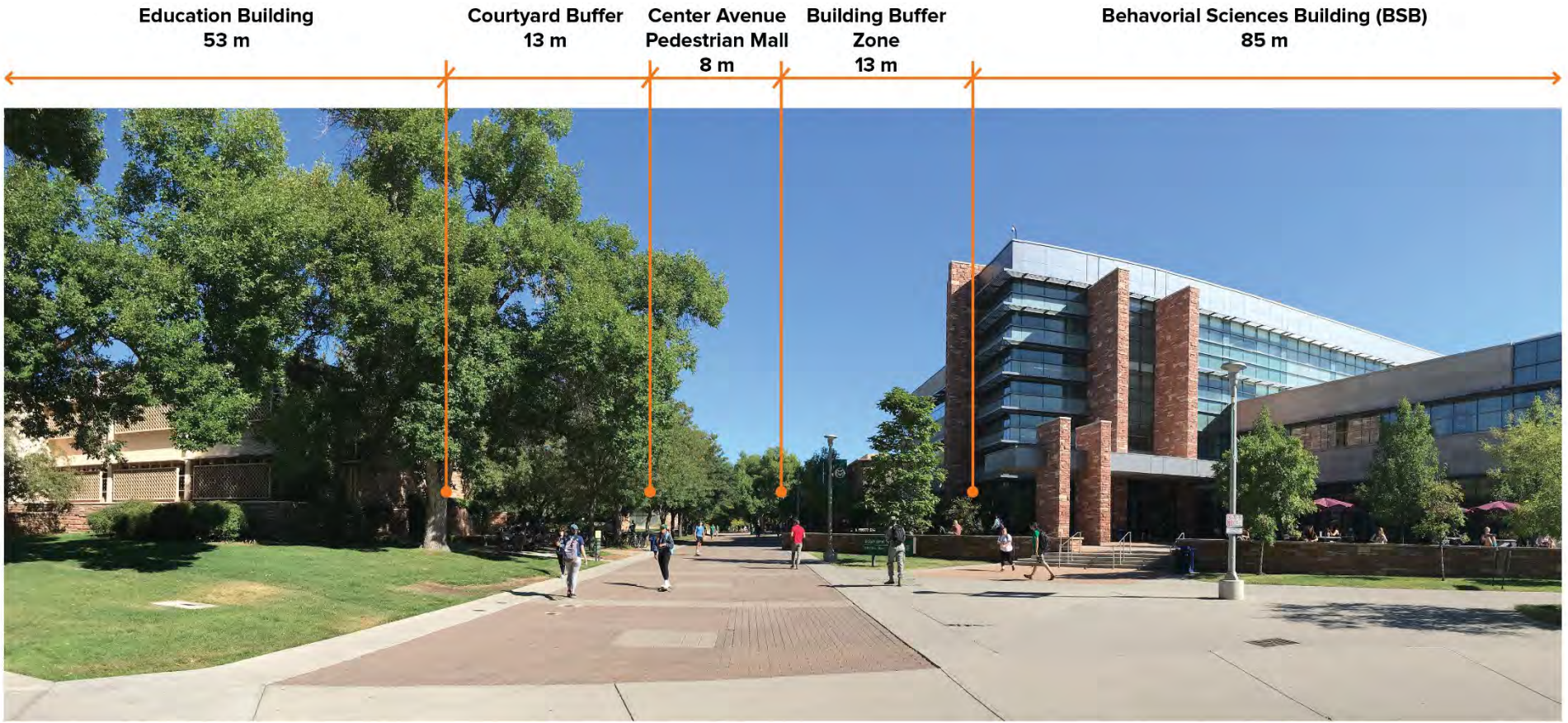
- Core of campus is devoted to bike and pedestrian traffic
- Alternative transportation is actively embraced and integrated throughout the campus:
  - Bike racks and covered bike shelters are prominently located close to high traffic areas and are not hidden
  - Transit centers and bus stops are integrated into the campus
- Service functions are separated from pedestrian zones
- Vehicular circulation and parking are placed on the edge of campus

Social Transition Zones are Critical Campus Elements

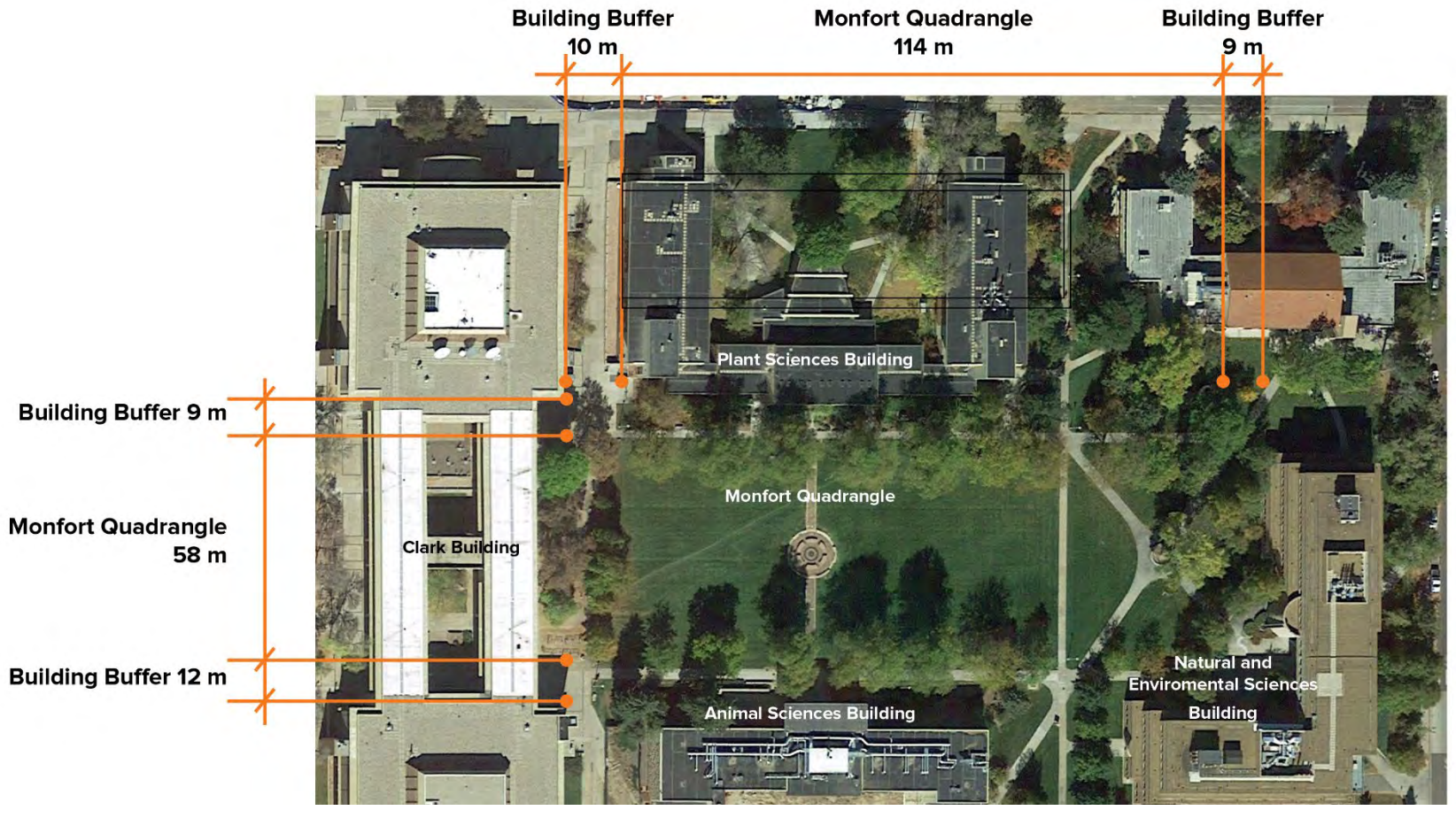
Social Exterior Spaces are Critical Campus Elements

Social Spaces with Water are Critical Campus Elements

Appropriately Sized Spaces are Critical Campus Elements



Social Outdoor Spaces are Critical Campus Elements



Social Spaces are Critical Campus Elements

- Social exterior spaces of different scales are integrated into the campus: pedestrian malls, plazas, courtyards, and seat walls.
- These spaces provide an opportunity for students and staff to interact and relax outside
- These spaces are animated by water and art

Natural Transitions from Outdoor Public Spaces to Indoor Spaces

Natural Transitions from Outdoor Public Spaces to Indoor Spaces

Natural Transitions from Outdoor Public Spaces to Indoor Spaces

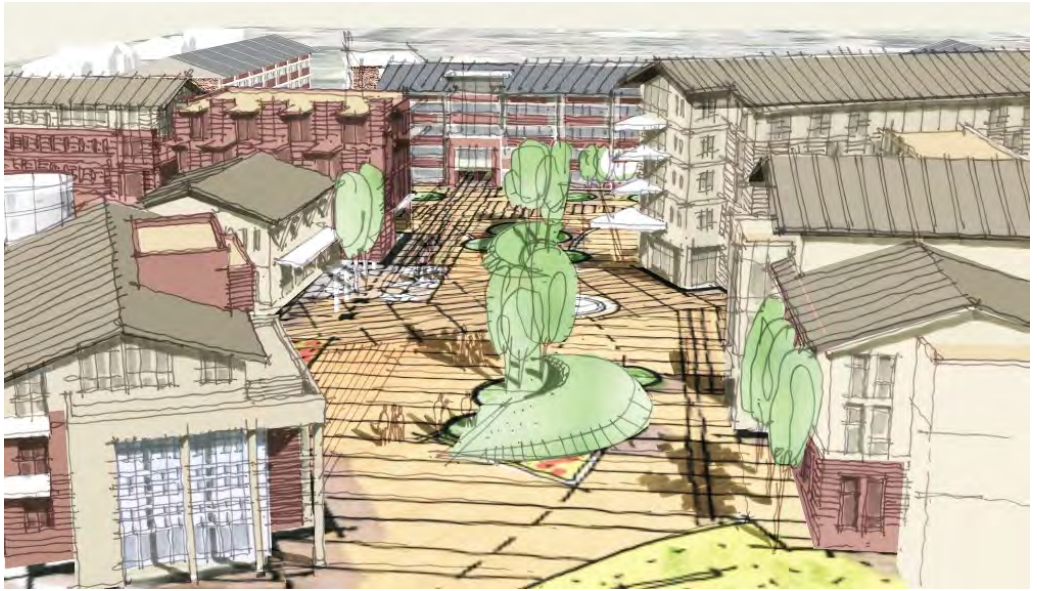
- Buildings have an identifiable, pedestrian-scale front door
- Buildings have a “front porch” – a place for gathering and interaction at main entrances
- Seat walls, trees and landscape bring a pedestrian scale to large buildings

Campus Edges are Park-like – Large Green Buffers

Campus Edges are Park-like

- Edges of campus are more park-like than urban: wide building setbacks, open grass areas, trees and paths
- Promotes an open interface with the surrounding neighborhoods and community
- Creates a sense of friendliness and permanence

Housing as “Villages”



Housing as “Villages”

Housing as “Villages”

Housing as “Villages”

Housing as “Villages”

- Buildings clustered around an internal pedestrian way activated by uses
- Buildings vary in height and orientation
- Establish internal “mid-block” social outdoor spaces
- Create a welcoming sense of arrival and strong indoor-outdoor connections
- Native plants and local materials create a true sense of place

Recreation and Open Space Separate Housing and Academics

Recreation and Open Space Separate Housing and Academics

"The basic idea was to use the west half of campus for housing and the east half for classrooms and work areas. If the typical student spent his time walking back to the dormitory to get out in the weather, this would be good exercise for him."

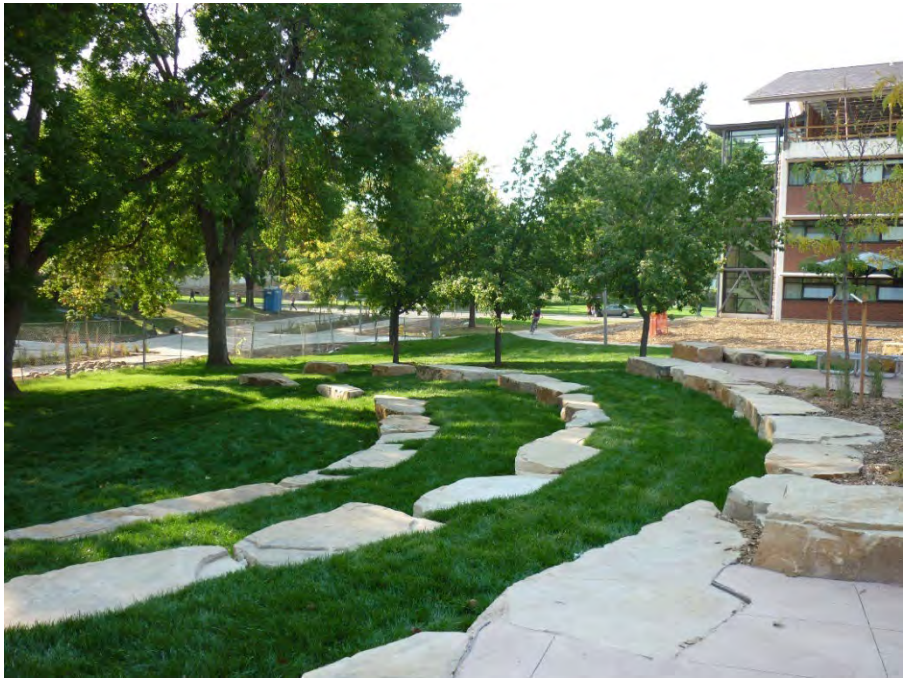
- CSU President William E. Morgan, discussing CSU campus planning during the 1950's

- Recreation facilities are located between student housing and the academic buildings.
- Recreation facilities are located to preserve views to surrounding landscape

A Learning and Sustainable Landscape

A Learning and Sustainable Landscape

A Learning and Sustainable Landscape



A Learning and Sustainable Landscape

- Wetlands incorporated into the landscape
- Permeable paving
- Pollinator gardens
- Green roofs
- Campus planning around the floodplain

Signage and Wayfinding Provide a Sense of Identity

Signage and Wayfinding Provide a Sense of Identity

- Gateway monuments help define campus edges and entries
- A variety of signage and wayfinding provide campus information while expressing the campus “brand”

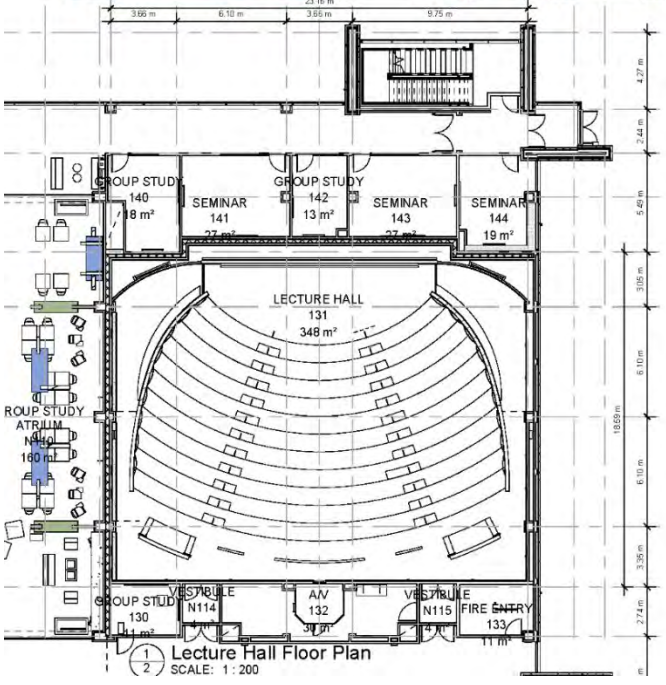
CSU Campus Architectural Aesthetic Guidelines

Colorado State University

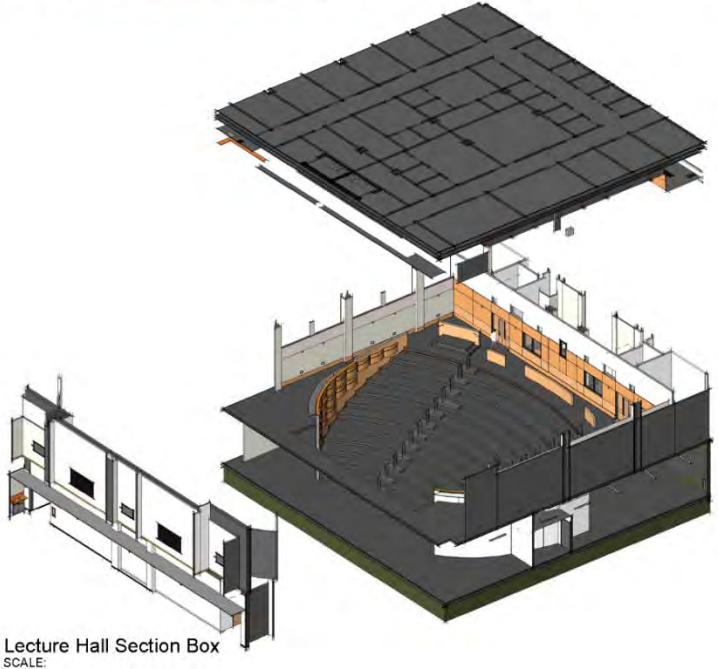
CSU Campus Architectural Vision

- Evolution of the Aesthetic Guidelines
- Existing Mid-Century Modern to inform the current design aesthetic for the new developments
- Master Plan and Opportunity Analysis
- Inclusive, collaborative design and development
- Sustainable building initiatives – High performance buildings
- Use of Building Information Modeling (BIM)
- Campus design coherency and continuity
- Using the work and the campus as a laboratory for classroom instruction/ experiential learning

Large Classroom (BSB Building OL = 360)

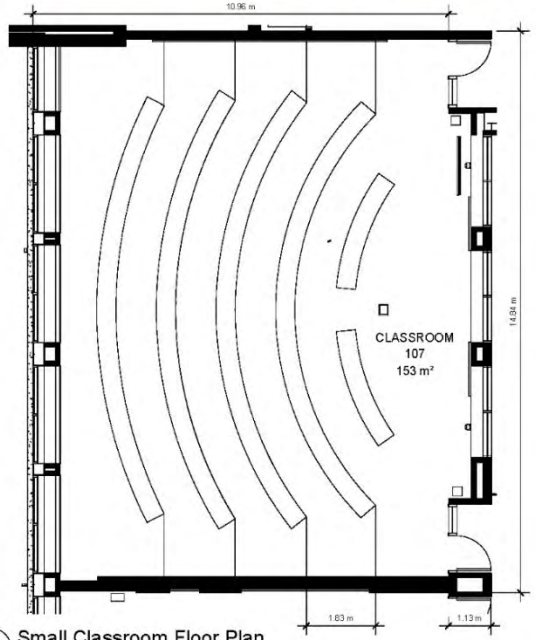


1/2 Lecture Hall Floor Plan
SCALE: 1 : 200

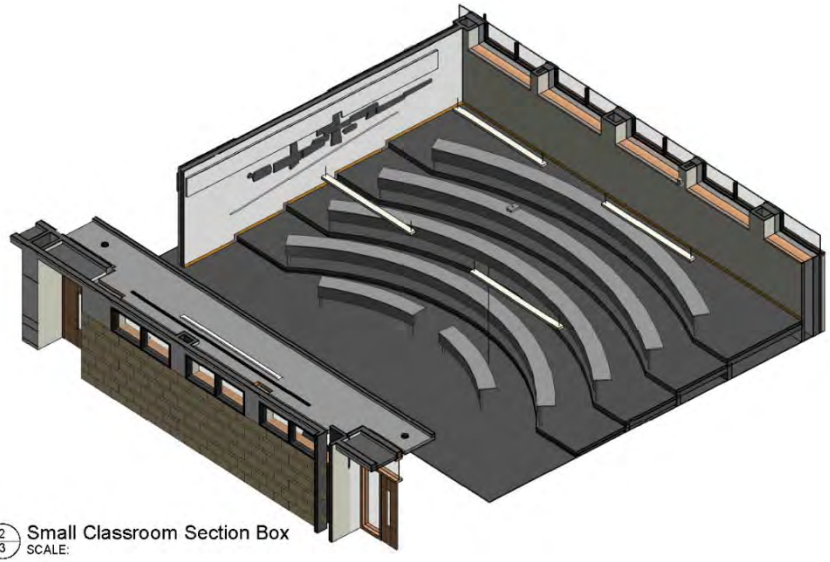


2/2 Lecture Hall Section Box
SCALE:

Small Classroom (BSB Building OL = 85)

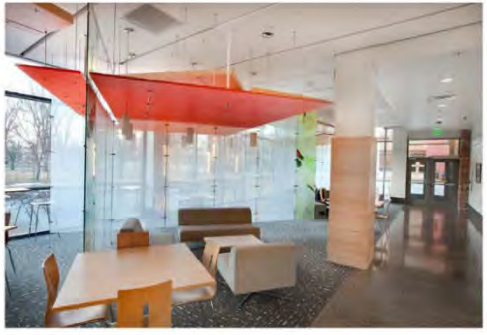


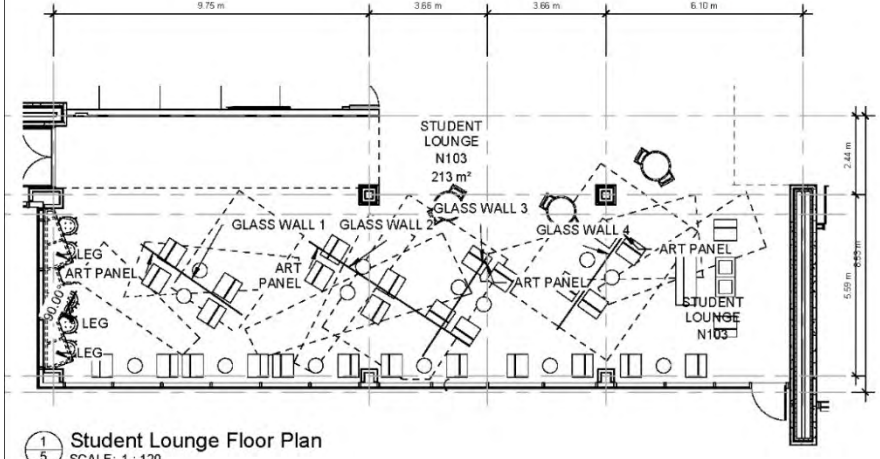
1/3 Small Classroom Floor Plan
SCALE: 1 : 96



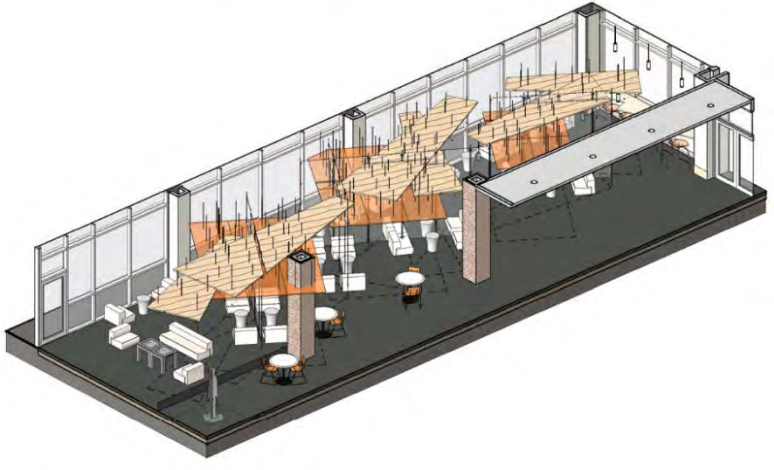
2/3 Small Classroom Section Box
SCALE:

Student Lounge (BSB Building OL = 102)



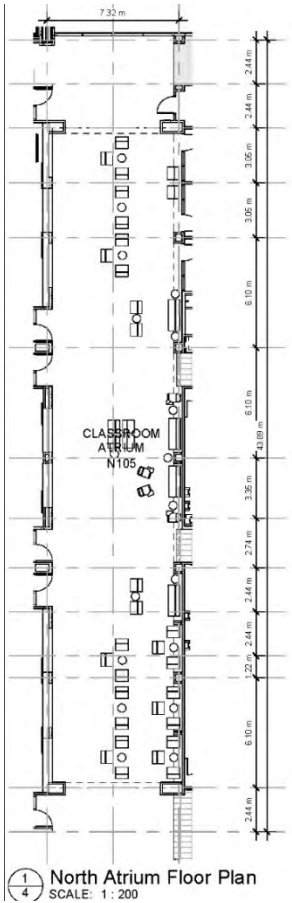


1/5 Student Lounge Floor Plan
SCALE: 1 : 120



2/5 Student Lounge Section Box
SCALE:

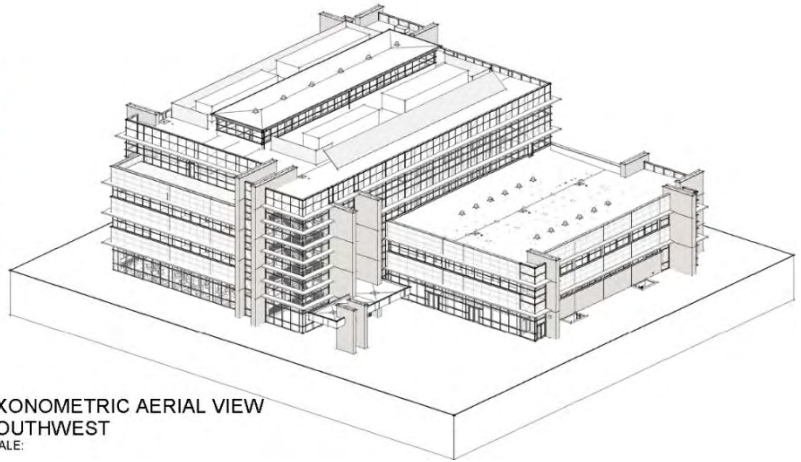
North Atrium (BSB Building OL = 130)



1/4 North Atrium Floor Plan
SCALE: 1 : 200

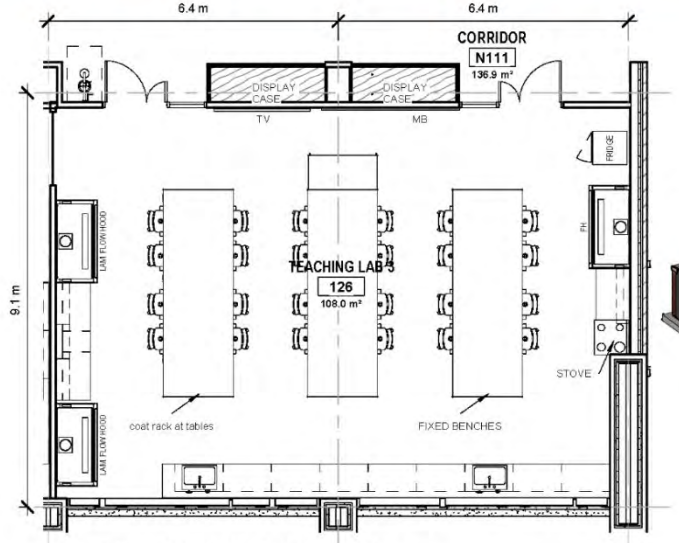
2/4 North Atrium- Section Box
SCALE:

BSB Building Exterior

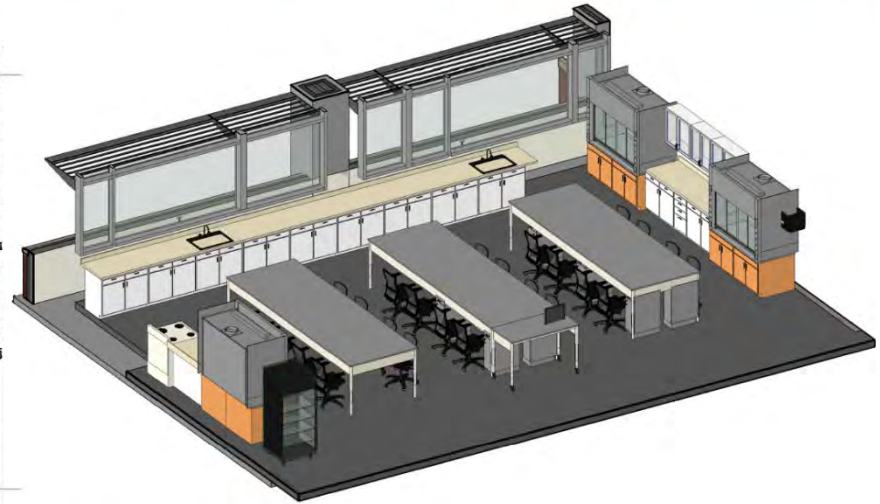


AXONOMETRIC AERIAL VIEW
SOUTHWEST
SCALE:

Teaching Laboratory (BSB Building OL = 25)

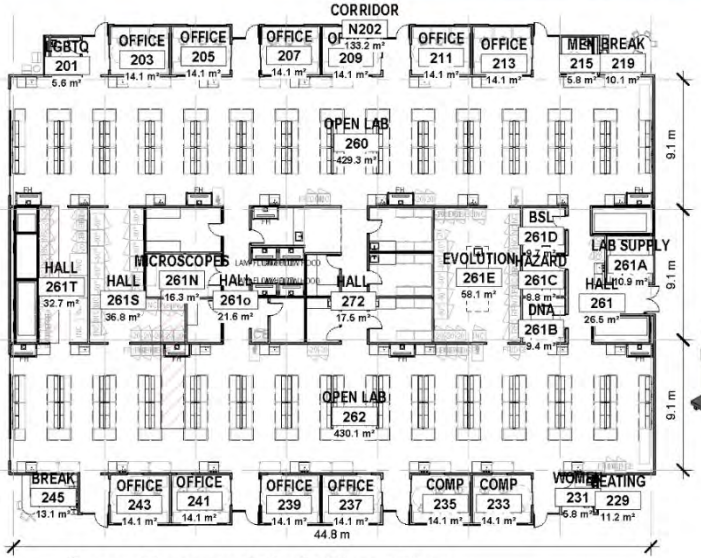


1/6 Teaching Lab Floor Plan
1 : 80

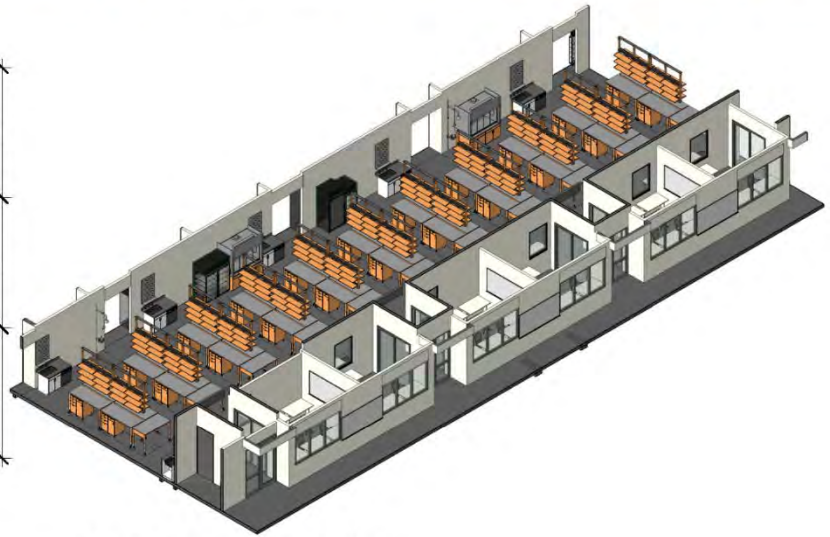


2/6 Teaching Lab Section Box

Open Research Lab Transparency Inside to Outside

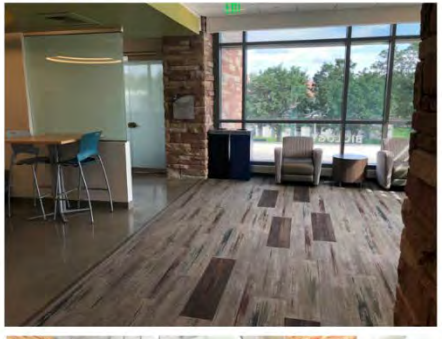


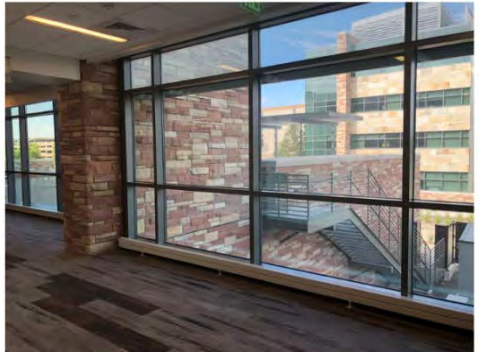
2/7 Open Research Lab Floor Plan
1 : 250



1/7 Open Research Lab Axon

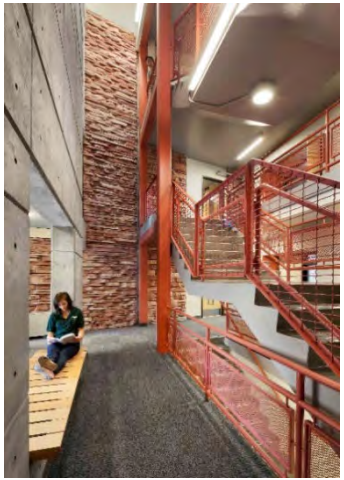
Stone Wall from Outside to Inside (Biology Building)





Housing and Dining Exteriors

Housing and Dining Interiors



Student Housing Common Spaces (Laurel Village)

Student Housing Room Types (Laurel Village)

Community-Style Double

Double room with a community bathroom down the hall

Suite-Style Double with Private Bathroom

Double room with a private bathroom

Community-Style Single

Single room with a community bathroom down the hall

Suite-Style Single with Private Bathroom

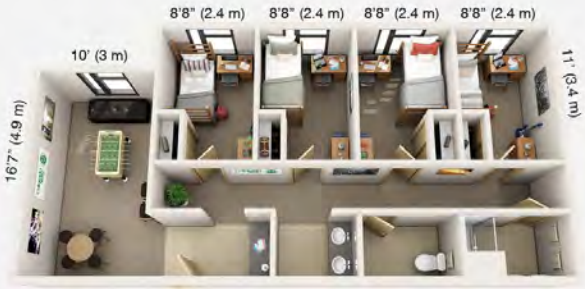
Single room with a private bathroom

Suite-Style Single

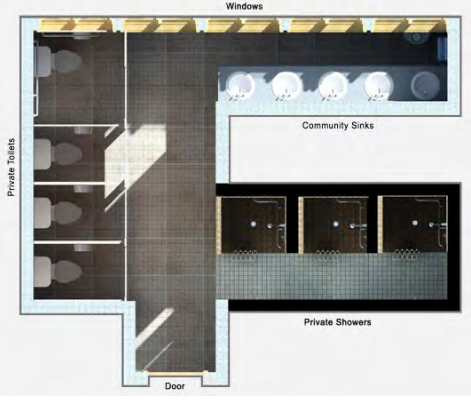
Two single rooms that share a connecting bathroom

Suite-Style Single in Quad

Four single rooms with a common room and bathroom (separate rooms for shower and toilet)



Community Bathroom



Campus Architectural Fabric

Appendix H – Existing Building Structural Analysis

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.

November 11th, 2022

Mr. Randy Lamb
Colorado State University Housing and Dining Services
1624 West Plum St.
Fort Collins, CO 80521

Reference: Allison Hall Addition Floor Feasibility Study
PEC Project No. 218009-013

Dear Mr. Lamb:

This letter is written regarding the feasibility and cost of adding a fourth and fifth floor to Allison Hall at 551 West Laurel St. in Fort Collins, Colorado. It was requested that Professional Engineering Consultants, P.A. (PEC) perform a structural analysis to determine if the existing structure could support an additional fourth and fifth floor. With this, PEC was also requested to determine the estimated structural cost of the proposed renovations. Information provided to PEC for structural analysis includes the original construction documents for Allison Hall and Braden Hall, the renovation plans for the knuckle, and the 4th floor addition to Braden Hall. It is assumed that the proposed additions to Allison Hall would be similar to the additions made to Braden Hall and was the basis of this feasibility study.

PEC has determined that the existing structure of Allison Hall can support an additional fourth and fifth story with minimal retrofit of the existing structure. Appendix A provides conceptual design drawings of the proposed addition to Allison Hall. Included in Appendix A is the proposed floor and roof framing plans of the additional stories on the four residential wings and marked up knuckle plans from the Braden Hall renovation. The similarity between the original conditions of Allison Hall and Braden Hall allowed the assumption that the renovations of the knuckles and stair towers would be similar between both buildings and sufficient to determine an estimated structural cost. Due to this, PEC did not provide schematic foundation and framing plans for the proposed knuckles and stair towers.

The structural cost of adding a fourth story would be approximately $3,190,666.00. The structural cost of adding a fourth and fifth story would be approximately $4,843,441.00. Appendix B provides a structural cost analysis based on the documents provided in Appendix A. The estimated costs above includes the detailing, fabrication, erection, and shoring of the structural steel, concrete, and CMU for the proposed changes to the four residential wings, four exterior stair towers, and the additions to the two knuckles. The estimated cost above does not include any architectural, mechanical, plumbing, or electrical scope of work and also excludes any design contingency, estimating contingency, construction contingency, or escalation contingency. The estimated costs are based on the current prices of materials and commodities which are subject to change.

Thank you for the opportunity to work with you on this project. Should any questions come up, please do not hesitate to contact me.

Sincerely,

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.

Zachary M. Bowden, PE
Structural Division

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.

Appendix A:
Conceptual Design Drawings

351 LINDEN STREET, SUITE 100 FORT COLLINS, CO 80524 970-232-9558 www.pec1.com

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.

FEASIBILITY DESIGN NARRATIVE

Allison Hall Additional Floor Feasibility Study

PEC Project No. 218009-013 November 11th, 2022

Overview

This narrative outlines the schematic design approach of adding an additional two stories to all four dormitories of Allison Hall and two updated knuckles between the North and South dormitories on each end. This schematic design narrative is based on the original structural and architectural drawings of Allison Hall dated December 27th, 1956, the original structural and architectural drawings of Braden Hall dated March 26th, 1962, and the Braden Hall 4th Floor Addition and Renovation dated November 13th, 2013.

Structural Scope Overview

APPLICABLE CODES:

- International Building Code, 2021 Edition.
- Minimum Design Loads for Buildings and Other Structures, ASCE 7-16.
- Building Code Requirements for Structural Concrete, ACI 318-19.
- Building Code Requirements for Masonry Structures, ACI 530-13.
- Specifications for Structural Steel Buildings, AISC 360-16.

STRUCTURAL DESIGN LOADS:

Floor Live Loads (Reference IBC 2021 and ASCE 7-16):

- Lobbies & First Floor Corridors 100 psf
- Assembly Areas 100 psf
- Dormitories 40 psf
- Light Storage 125 psf
- Slab on Grade 100 psf

Roof Live Load:

- 20 psf minimum for construction and maintenance.

Snow Loads (Reference IBC 2021 and ASCE 7-16):

- Ground Snow Load Pg = 35 psf
- Exposure Factor Ce = 1.0
- Thermal Factors Ct = 1.0, heated structures
- Importance Factor I = 1.0
- Minimum Flat Roof Snow Load Pf = 30 psf
- Frost Depth 30 inches; Deep Foundations

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.

STRUCTURAL DESIGN LOADS CONTINUED:

Wind Loads (Reference ASCE 7-16):

- Basic Wind Speed — V = 140 mph (3 second gust)
- Risk Category — II
- Importance Factor — IW = 1.0
- Exposure Category — C
- Internal Pressure — Gcpi = ±0.18 enclosed

Seismic Loads (Reference IBC 2021 and ASCE 7-16):

- Site Class — D
- Importance Factor — Is = 1.0
- Mapped Acceleration Parameters — SS = 0.196 — S1 = 0.056
- Design Acceleration Parameters — SDS = 0.209 — SD1 = 0.090
- Seismic Design Category — B
- Lateral System* — R = 3

*New system: Steel systems not specifically detailed for seismic resistance.

MATERIAL DESIGN STRENGTHS:

- Steel W and WT Shapes: ASTM A992, Grade 50.
- Steel Plate, Angle, and other Shapes (C, M, & S): ASTM A36.
- Steel Pipe: ASTM A53, Grade B (Fy = 35 ksi).
- Hollow Structural Sections: ASTM A500, Grade C (Fy = 50 ksi).
- Anchor Bolts: ASTM F1554, Grade 55 w/ S1.
- Welded Wire Fabric: ASTM A185.
- Concrete Reinforcing Steel: ASTM A615, Grade 60.
- Concrete: Strength as required. (4500 PSI minimum)

STRUCTURAL GRAVITY SYSTEMS:

2-Story Addition to Dormitories:

Assume column grid as seen in original Allison Hall structural drawing and a 9′-6″ floor to floor height.

- Columns: Typical gravity column will be approx. W8x40.
- 5th Floor Structure: The floor would consist of W16x26 composite beams spaced approximately 8′-0″ O.C. with W18x35 composite girders. The floor deck would consist of 5″ normal-weight composite slab with 2″, 20 GA. metal deck.
- Roof Structure: The roof would consist of 1200S200-68 cold-formed joists spaced approximately 16″ O.C. with W18x35 girders. On column lines, the cold-formed joists will be replaced with a W12x14 beam. Roof deck will consist of 1″, 20 GA. metal deck.
- Exterior wall framing will be non-load bearing 4″ CMU wall.

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STRUCTURAL GRAVITY SYSTEMS CONTINUED:

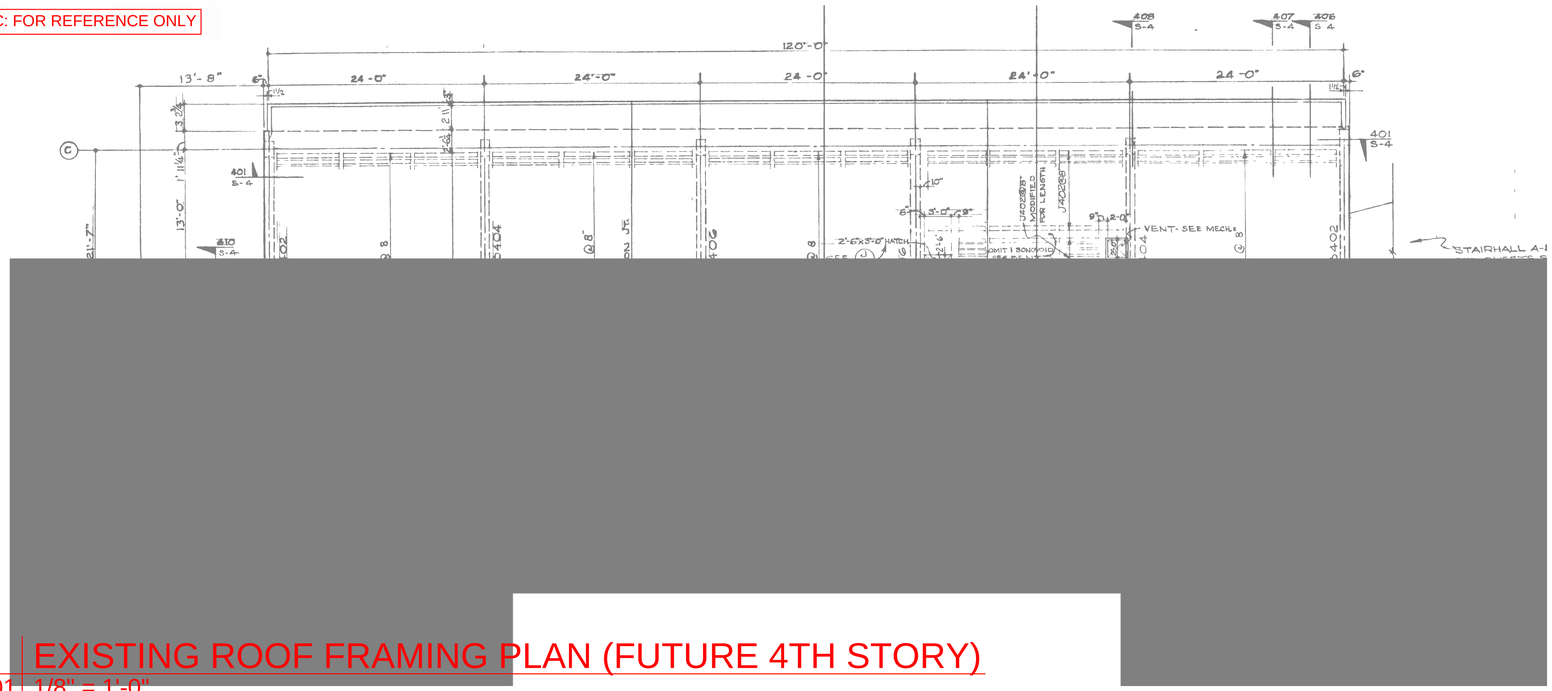
Knuckle Renovation between Dormitories:
Assume the knuckle renovation of Allison Hall is similar to the knuckle renovation of Braden Hall. Each knuckle in Allison Hall will require an elevator shaft similar to what is shown as existing in the Braden Hall renovation.

- Columns: Typical gravity column will be approx. HSS7x7x3/8 and HSS9x7x3/8.
- Floor Structure: New floors will consist of a 9″ reinforced concrete slab over concrete beams and girders.
- Roof Structure: The roof will consist of a 9″ reinforced concrete slab over concrete beams and girders. It is assumed that the mechanical units at the roof would be located on the roof and required additional floor reinforcement in those areas.
- Foundation: Exterior and interior grade beams spanning screw piles.
- Slab on grade: 5″ concrete slab reinforced with #4 at 18″ O.C.

LATERAL FORCE RESISTING SYSTEMS:

The building would be laterally supported using steel systems not specifically detailed for seismic resistance (R=3). This system will be comprised of HSS brace frames

PEC: FOR REFERENCE ONLY



1 EXISTING ROOF FRAMING PLAN (FUTURE 4TH STORY)

S-101 1/8" = 1'-0"

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351 LINDEN ST., SUITE 100
FT. COLLINS, CO 80524
970-232-9558 www.pec1.com

REVISIONS

No.	Date	Description

NOT FOR CONSTRUCTION

ALLISON HALL ADDITION

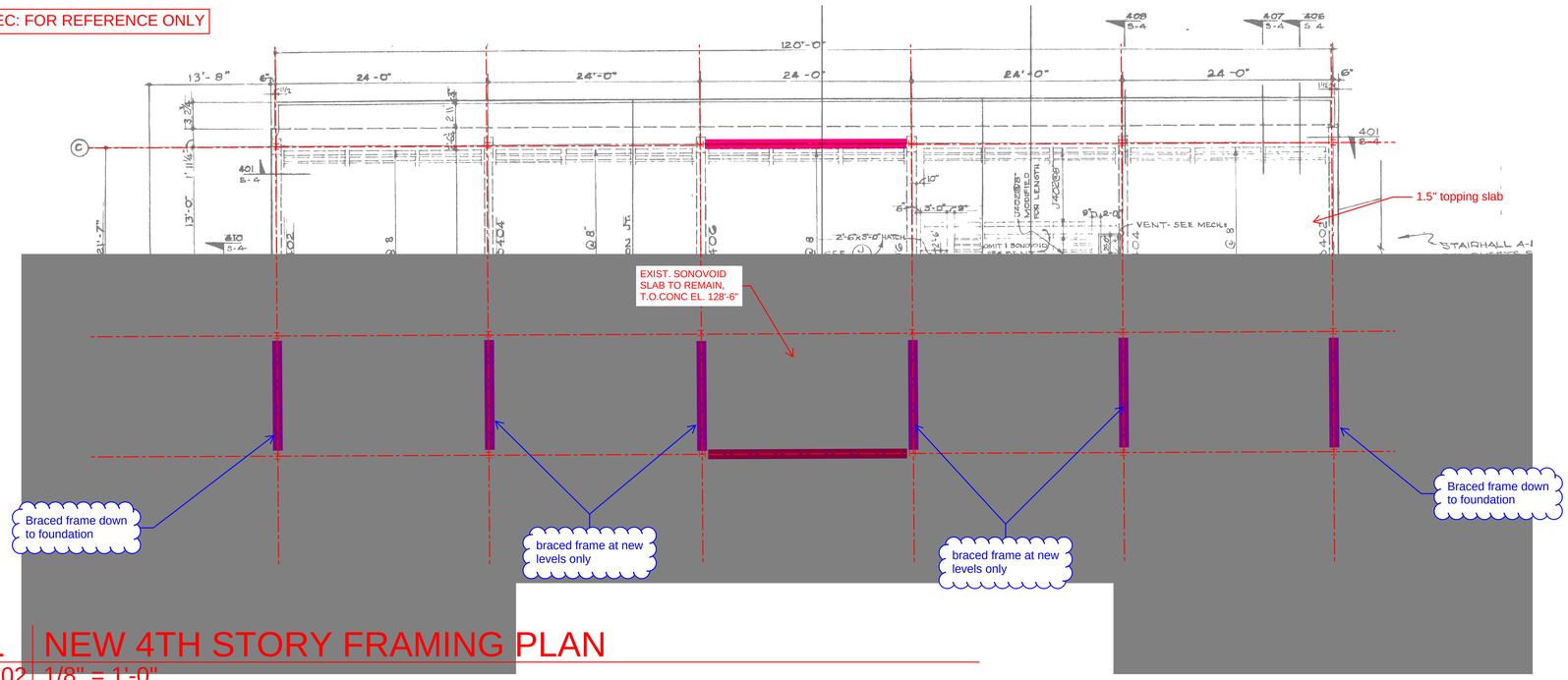
551 W LAUREL ST., FORT COLLINS, CO 80521

EXISTING ROOF FRAMING PLAN

JOB NO. 218009-013
DATE
DRAWN BY BKH
CHECKED BY ZMB

S-101

PEC: FOR REFERENCE ONLY



1 NEW 4TH STORY FRAMING PLAN

S-102 1/8" = 1'-0"

PLAN KEY

- W8X40 COLUMN
- GIRDER
- BEAM
- LIGHTGAUGE JOIST
- BRACEFRAME
- MOMENT FRAME

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REVISIONS

No.	Date	Description

NOT FOR CONSTRUCTION

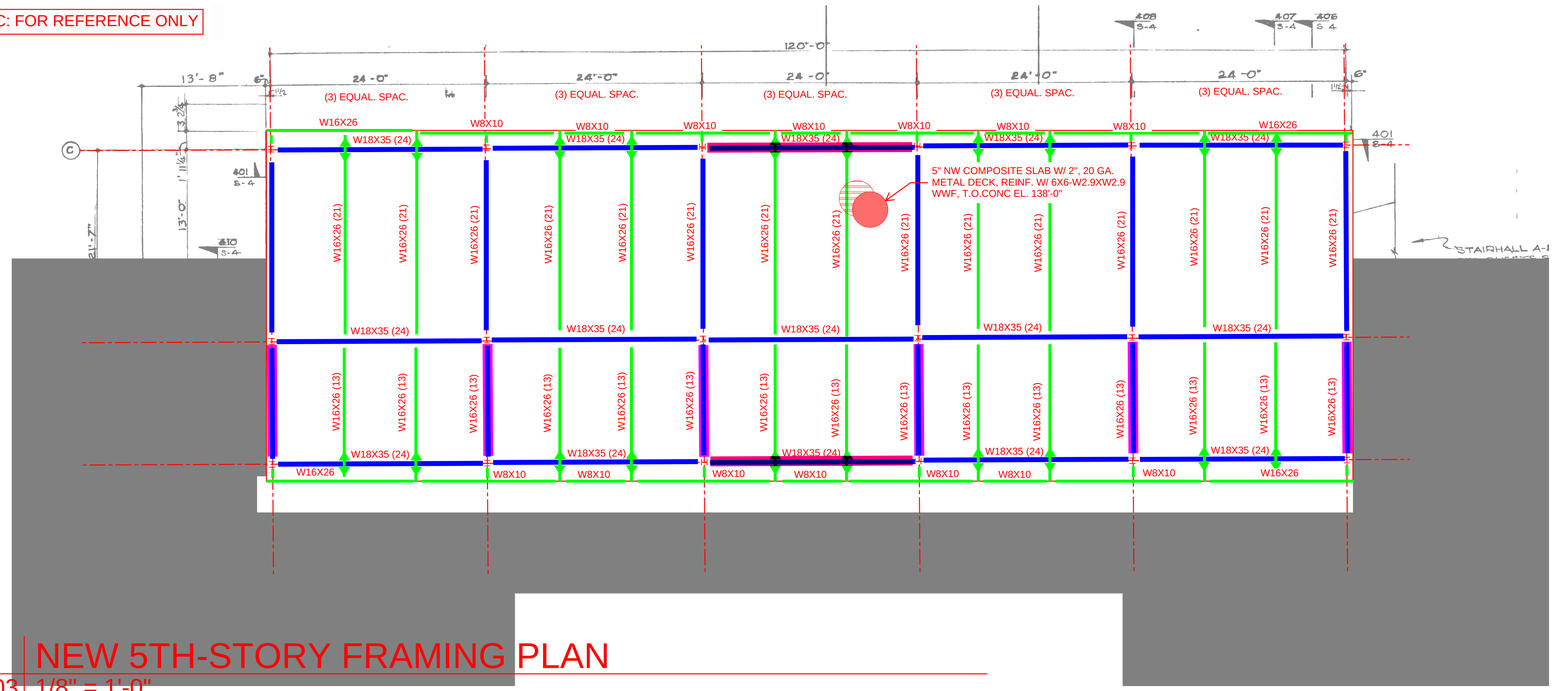
ALLISON HALL ADDITION
551 W LAUREL ST., FORT COLLINS, CO 80521

NEW 4TH-STORY FRAMING PLAN

JOB NO. 218009-013
DATE
DRAWN BY BKH
CHECKED BY ZMB

S-102

PEC: FOR REFERENCE ONLY



1 NEW 5TH-STORY FRAMING PLAN

S-103 1/8" = 1'-0"

PLAN KEY

- W8X40 COLUMN
- GIRDER
- BEAM
- LIGHTGAUGE JOIST
- BRACEFRAME
- MOMENT FRAME

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REVISIONS

No.	Date	Description

NOT FOR CONSTRUCTION

ALLISON HALL ADDITION

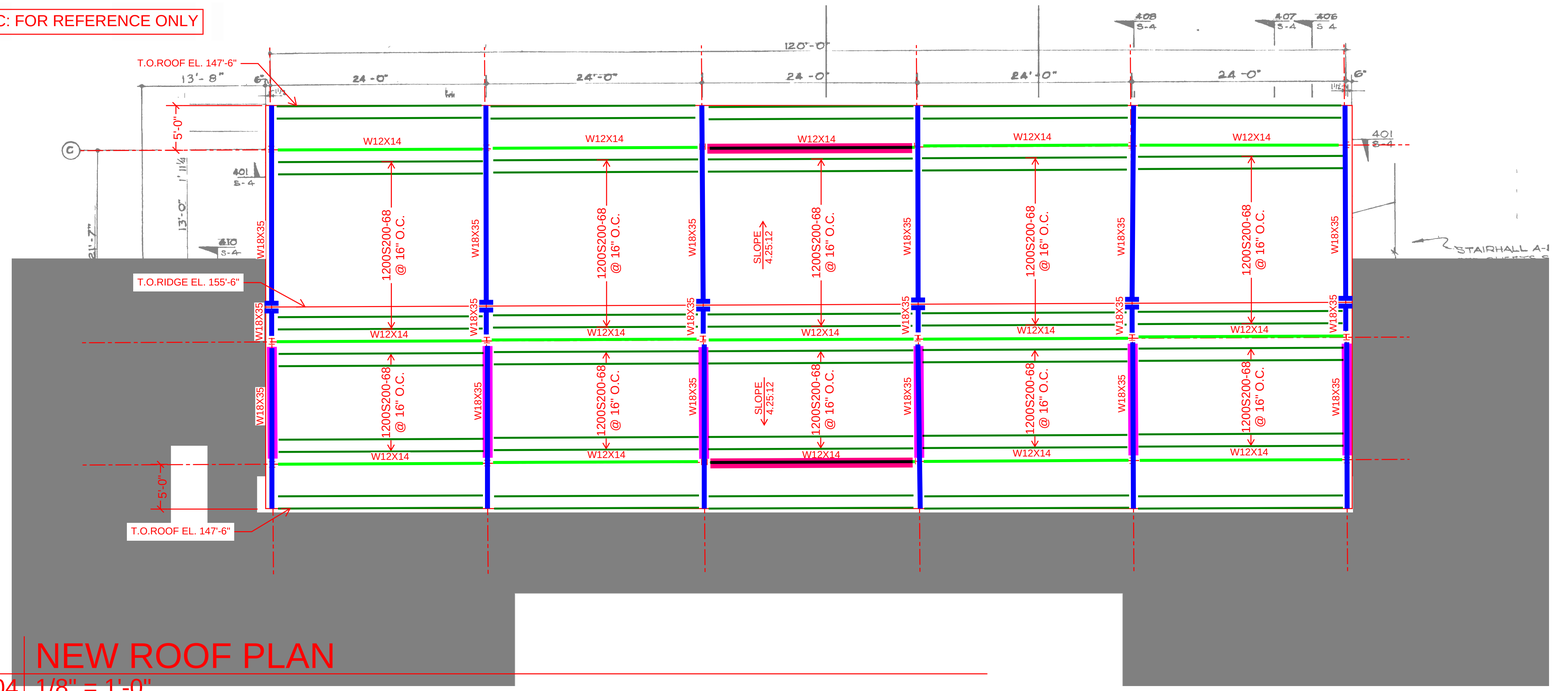
551 W LAUREL ST., FORT COLLINS, CO 80521

NEW 5TH-STORY FRAMING PLAN

JOB NO. 218009-013
DATE
DRAWN BY BKH
CHECKED BY ZMB

S-103

PEC: FOR REFERENCE ONLY



1 NEW ROOF PLAN

S-104 1/8" = 1'-0"

PLAN KEY

- W8X40 COLUMN
- GIRDER
- BEAM
- LIGHTGAUGE JOIST
- BRACEFRAME
- MOMENT FRAME

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REVISIONS

No.	Date	Description

NOT FOR CONSTRUCTION

ALLISON HALL ADDITION

551 W LAUREL ST., FORT COLLINS, CO 80521

NEW ROOF FRAMING PLAN

JOB NO. 218009-013
DATE
DRAWN BY BKH
CHECKED BY ZMB

S-104

JVA Job# 14402

STRUCTURAL GENERAL NOTES

DESIGN LOADS: 2009 International Building Code (IBC), except as noted

Occupancy Category	Importance Factor		
	Snow	Wind	Seismic
II Standard	1.0	1.00	1.00

Roofs:

Roof Live Load		20 psf	
Ground Snow Load	Pg	30 psf	
Flat Roof Snow Load	Pf	30 psf	
Snow Exposure Factor	Ce	1.0	ASCE 7-05 Table 7-2
Thermal Factor,	Ct	1.0	ASCE 7-05 Table 7-3

Floor Live Loads (Reference ASCE 7-05):

Occupancy or Use	Uniformly Distributed (psf)	Concentrated (lbs)	Live Load Reduction
Residential	40	N/A	Yes
Public Spaces	100	2,000	Yes
Corridors above 1st Floor	80	2,000	Yes
Storage Areas	125	N/A	Yes (members supporting 2+ floors)
Stairs	100	300	
Handrail (Top Rail)	50 plf	200	
Grab Bars		250	

Wind:

Basic Wind Speed (3-second gust)	100 mph
Building Enclosure Classification	Internal Pressure Coefficient
Enclosed	GCpi=0.18
Partially Enclosed	GCpi=0.55
Open	GCpi=0.0
Wind Exposure	B

Components & Cladding Wind Pressures (psf)

Walls												
Height (ft)	Zone											
Windward	4 & 5	15.7										
Leeward/Side	4	-17	internally									
	5	-21	within 4'-6 ft of corner									

	Roof			Parapet	
Roof Zone on Sketches	3	within 4'-6 ft of corners	10		
	3	within 4'-6 ft of corners	-44	55	-32
	2	within 4'-6 ft of edges	10		
	2	within 4'-6 ft of edges	-29	40	-28
	1	internally	10		
	1	internally	-17		
	overhang 3	within 4'-6 ft of corners	-44		
	overhang 1, 2	internally	-27		

Pressures noted are for 10 ft² Effective Wind Area and may be reduced for larger areas as allowed by code, but not below 10 psf

Seismic:

Spectral Response	Acceleration	Coefficient	
Short Period	S_s	0.221g	S_{ds} 0.236g
One Second	S_1	0.056g	S_{d1} 0.09g
Soils Site Class	D		
Seismic Design Category	B		
Basic Seismic-Force-Resisting System(s)	Braced Frames (Wings); Shear Walls (Knuckle)		
Design Base Shear	242 kips (Wings); 70k (Knuckle)		
Seismic Response Coefficient(s)	C	0.06 (Wings); .059 (Knuckle)	
Response Modification Factor(s)	R	3.0 (Wings); 4.0 (Knuckle)	
Analysis Procedure	Equivalent Lateral Force		

FOUNDATION DESIGN:
Refer to soils report no. 08-0012A by Ground Engineering, dated October 2, 2008.
Geotechnical Engineer shall verify soil conditions and types during excavation and prior to placement of formwork or concrete

EXISTING DRILLED PIERS (FOR REFERENCE):
Straight shaft drilled piers are designed for

maximum end bearing pressure	25,000 psf
allowable side shear	2,500 psf
uplift side shear	2,500 (T) psf
minimum penetration into bedrock	6 feet

HELICAL PILES:
Piles shall be installed by a contractor certified by the manufacturer and shall develop the manufacturer's recommended installation torque to satisfy the load requirements given on in the Structural Drawings. Piling shall be driven in accordance with the requirements outlined in the Soils Report and the Project Specifications.
Provide for overrun and underrun in drilling lengths.
Shaft dimension, helix diameter, and helix spacing shall be determined by the pier manufacturer based on the criteria presented in the Soils Report and the manufacturer's own requirements.
The Soils Engineer shall be present during pier installation to confirm that the proper installation procedures are used and installation torque is applied to each pier.

REINFORCED CONCRETE:
Design is based on ACI 318-08 "Building Code Requirements for Reinforced Concrete." Concrete work shall conform to ACI 301-05 "Standard Specifications for Structural Concrete."

Structural concrete shall have the following properties:

Intended Use	f'c, psi 28day	Max W/C Ratio	Maximum Aggregate	Slump inches (±1")	Entrained Air Percent (±1.5%)	Cement Type	Admixtures, Comments
Grade beams	4,000	0.50	1" Stone	4	3	I/II	
Walls	4,000	0.50	3/4" Stone	4	3	I/II	
Formed structural slab	4,000	0.48	3/4" Stone	4	3	I	
Exterior slabs on grade (not including exterior flatwork)	3,500	0.45	3/4" Stone	4	6	I/II	
Interior slabs on grade	3,500	0.45	3/4" Stone	4	3	I/II	
Beams, Columns	4,000	0.45	3/4" Stone	4	3	I	
Topping	3,000	0.50	3/8" LW Agg	4	3	I/II	

Detailing, fabrication, and placement of reinforcing steel shall be in accordance with ACI 315-99 "Details and Detailing of Concrete Reinforcement."
Welded wire fabric shall conform to ASTM A185-02.
Reinforcing bars shall conform to ASTM A615-04a, Grade 60, except ties or bars shown to be field-bent, which shall be Grade 40.
Epoxy coated reinforcing bars shall conform to ASTM 775-04.
Bars to be welded shall conform to ASTM 706-04a.
Unless noted otherwise on the Structural Drawings, lap bars 50 diameters (minimum).
At corners and intersections, make horizontal bars continuous or provide matching corner bars for each layer of reinforcement.
Trim openings in walls and slabs with 2-#5 for each layer of reinforcement, fully developed by extension or hook.
In continuous members, splice top bars at mid-span and splice bottom bars over supports.
Except as noted on the drawings, concrete protection for reinforcement in cast-in-place concrete shall be as follows:

Cast against and permanently exposed to earth:	3"
Exposed to earth or weather:	
#6 through #18 bars	2"
#5 bar, W31 or D31 wire, and smaller	1-1/2"
Not exposed to weather or in contact with ground:	
Slabs, walls, joists: #11 bars and smaller	3/4"
Beams and columns:	
Primary reinforcement	1-1/2"
Stirrups, ties, spirals	1-1/2"

Anchor bolts and rods for beam and column-bearing plates shall be placed with setting templates.

STRUCTURAL STEEL:
Structural steel shall be detailed, fabricated, and erected in accordance with the "Specification for Structural Steel Buildings" (AISC 360-05) and the "Code of Standard Practice for Steel Buildings and Bridges" (AISC 303-05) by the American Institute of Steel Construction (AISC).
Structural steel wide flange beams shall conform to ASTM A992-04a, 50 ksi yield.
Other rolled shapes, including plates, channels, rods, and angles shall conform to ASTM A36-04, 36 ksi yield.
Hollow structural section (HSS) rectangular shapes shall conform to ASTM A500-03a, Grade B, 46 ksi yield.
HSS round shapes shall conform to ASTM A500-03a, Grade B, 42 ksi yield.
Pipe shapes shall conform to ASTM A53-02, Grade B, 35 ksi yield.
Except as noted, framed beam connections shall be bearing-type with ¾" diameter, snug tight, ASTM A325-04 bolts, detailed in conformance with the Structural Drawings and the "Steel Construction Manual" by the AISC, 13th Edition. Install bolts in accordance with AISC's "Specification for Structural Joints Using ASTM A325 or A490 Bolts," 2004.
All beams shall have full depth web stiffeners each side of webs above and below columns, unless noted otherwise.
Anchor rods shall conform to ASTM F1554-99, Grade (36, 55, and/or 105) as noted on the Structural Drawings with weldability supplement S1.
Headed anchor studs (HAS) shall conform to ASTM A108-03e1 and shall be welded to structural steel with equipment approved by the stud manufacturer according to the stud manufacturer's recommendations.
Welding shall be done by a certified welder in accordance with the AISC documents listed above, the American Welding Society (AWS) D1.1: 2006 Structural Welding Code, and the recommendations for use of weld E70 electrodes. Where not specifically noted, minimum weld shall be 3/16" fillet by length of contact edge.
All post-installed anchors shall have current International Code Council Evaluation Service (ICC-ES) reports and shall be installed in accordance with the manufacturer's requirements.
Expansion anchors shall be approved "wedge" type unless specifically noted to be "sleeve" type as noted on the Structural Drawings.
Chemical anchors shall be approved epoxy type as appropriate for installation in solid and non-solid base materials.
Grout beneath column base and beam bearing plates shall have a minimum 28-day, compressive strength of 7,500 psi and shall be non-shrink, non-metallic, and tested in accordance with ASTM C1107-04.
All structural steel in contact with surrounding soils must have a thick, bituminous coating as protection against corrosion.

LIGHT GAUGE STRUCTURAL STEEL FRAMING:
Member forming shall conform to American Iron and Steel Institute (AISI) North American Specification for the Design of Cold-Formed Steel Structural Members (NAS-01), including 2004 supplement.
All structural framing (studs, joists, track, runners, bracing, and bridging) shall be galvanized G-60 sheet steel conforming to ASTM A1003-02a.
Studs, tracks, joists and connecting parts shall be 33 ksi yield for 43 mils and lighter and 50 ksi for 54 mils and heavier.
Subcontractor shall provide bridging and blocking at a maximum of 6 foot spacing or as required for stability and stiffness of the final assembly wherever sheathing does not provide adequate bracing.
Where punchouts are within 8" of member ends, install unpunched stiffeners of equal strength and gauge with 4-#10 screws each edge to the stiffened member.
Parallel members in contact shall be connected with #10 screws @ 16" maximum along each contact edge in the field of the member unless noted on drawings.
The Steel Stud Manufacturers Association (SSMA) product identification codes are used to label members on the drawings: [Member Depth in 1/100 inches][Style][Flange Width in 1/100 inches]-[Material Thickness in mils]

Style	Section
S	Stud or Joist
T	Track
U	Channel
F	Furring Channel

Material Thickness (mils)	Reference Only Gauge No.
33	20 - Structural
43	18
54	16
68	14
97	12

LOOSE LINTELS:
Unless noted otherwise, provide loose lintels as follows: (One angle for each 4" of wall thickness to bear 4" minimum each end).

Opening	Angle
0'-8 to 4'-0	3-1/2 x 3-1/2 x 1/4
4'-1 to 5'-4	5 x 3-1/2 x 1/4 (LLV)
5'-5 to 10'-0	6 x 3-1/2 x 5/16 (LLV)

STRUCTURAL MASONRY:
Design is based on ACI 530-05/ASCE 5-05/TMS 402-05, "Building Code Requirements for Masonry Structures," Allowable Stress Design.
Compressive strength of masonry assembly used for design is 1500 psi, based on net-bedded area.
Except at masonry lintels using standard lintel units, bond beam units shall be produced from standard vertically voided units with pre-cut knockout cross walls.
Hollow load-bearing concrete masonry units (CMU) shall be lightweight, 85 to 105 pcf density, conforming to ASTM C90-03, with a minimum compressive strength of 1,900 psi based on average net area.
Facing brick shall conform to ASTM C216-04a Grade SW.
Mortar shall be Type S conforming to ASTM C270-04.
Masonry cement shall not be used unless part of a pre-packaged mortar or grout mix approved by the Structural Engineer.
Provide full shoved mortar in all head and bed joints.
Admixtures shall not be used unless approved by the Architect and/or Structural Engineer.
Grout used in masonry walls and block cells shall be coarse grout, as defined by ASTM C476-02, with a minimum cube strength = 2,000 psi or 3,000 psi concrete using 3/8" diameter aggregate and placed by vibrating unless an approved self-consolidating mix is used.
'Low-lift' grouting shall not exceed 5 feet in height.
Vertically space continuous horizontal joint reinforcing at 16" maximum in all CMU walls. Joint reinforcing shall be welded type with 9 gage side rods and 9 gage trussed or ladder cross rods. Joint reinforcement shall be mill galvanized, hot-dip galvanized, or stainless steel.
Wire ties for veneer shall be 9 gage diameter for cavity widths 2" or less. Where nominal cavity width exceeds 2 inches, veneer ties shall be 1/4" diameter. Ties shall be spaced a maximum of 16" in each direction.
Reinforcing bars shall be as for reinforced concrete except as noted. Unless otherwise noted on the Structural Drawings, lap bars 50 diameters (minimum) at splices. Reinforcement shall be secured against displacement prior to grouting by wire bar locators or other suitable devices at intervals not exceeding 200 bar diameters or 10 feet.
Reinforce and grout vertical cells at corners, ends of walls, jambs of openings, each side of vertical control joints, and at spacing shown on drawings.
Where noted on the drawings, provide clearance between masonry and structural elements, or wrap steel with polyethylene film.
Locate vertical control joints in all masonry walls as shown on the Architectural Drawings, Structural Drawings, or spaced horizontally at 25'-0 maximum spacing where not shown.

SHOP DRAWINGS:
The Structural Drawings are copyrighted and shall not be copied for use as erection plans or shop details. Use of JVA's electronic files as the basis for shop drawings requires prior approval by JVA, a signed release of liability by the General Contractor and/or his subcontractors, and deletion of JVA's name and logo from all sheets so used.
The General Contractor shall submit in writing any requests to modify the Structural Drawings or Project Specifications.
All shop and erection drawings shall be checked and stamped (after having been checked) by the General Contractor prior to submission for Structural Engineer's review; shop drawing submittals not checked by the General Contractor prior to submission to the Structural Engineer will be returned without review.
Furnish two (2) prints of shop and erection drawings to the Structural Engineer for review prior to fabrication for
reinforcing steel,
structural steel,
steel roof deck,
screw piles,
light-gage steel framing
Submit in a timely manner to permit 10 working days for review by the Structural Engineer.
Shop drawings submitted for review do not constitute "request for change in writing" unless specific suggested changes are clearly marked. In any event, changes made by means of the shop drawing submittal process become the responsibility of the one initiating the change.

FIELD VERIFICATION OF EXISTING CONDITIONS:
The General Contractor shall thoroughly inspect and survey the existing structure to verify conditions that affect the work shown on the drawings.
The General Contractor shall report any variations or discrepancies to the Architect and Structural Engineer before proceeding with the work.

STRUCTURAL ERECTION AND BRACING REQUIREMENTS:
The Structural Drawings illustrate and describe the completed structure with elements in their final positions, properly supported, connected, and/or braced.
The Structural Drawings illustrate typical and representative details to assist the General Contractor. Details shown apply at all similar conditions unless otherwise indicated. Although due diligence has been applied to make the drawings as complete as possible, not every detail is illustrated and not every exceptional condition is addressed.
All proprietary connections and elements shall be installed in accordance with the manufacturers' recommendations.
All work shall be accomplished in a workmanlike manner and in accordance with the applicable codes and local ordinances.
The General Contractor is responsible for coordination of all work, including layout and dimension verification, materials coordination, shop drawing review, and the work of subcontractors. Any discrepancies or omissions discovered in the course of the work shall be immediately reported to the Architect and Structural Engineer for resolution. Continuation of work without notification of discrepancies relieves the Architect and Structural Engineer from all consequences.
Unless otherwise specifically indicated, the Structural Drawings do not describe methods of construction.
The General Contractor, in the proper sequence, shall perform or supervise all work necessary to achieve the final completed structure, and to protect the structure, workmen, and others during construction. Such work shall include, but not be limited to temporary bracing, shoring for construction equipment, shoring for excavation, formwork, scaffolding, safety devices and programs of all kinds, support and bracing for cranes and other erection equipment.
Do not backfill against basement or retaining walls until supporting slabs and floor framing are in place and securely anchored, unless adequate temporary bracing is provided.
Temporary bracing shall remain in place until all floors, walls, roofs and any other supporting elements are in place.
The Architect and Structural Engineer bear no responsibility for the above items, and observation visits to the site do not in any way include inspections of these items.

PRECAUTIONARY NOTES ON STRUCTURAL BEHAVIOR:
Interior architectural finish detailing must accommodate the relative differential movements of supporting structural elements.
Where the roof framing element spans are long, applied loading will naturally cause substantial deflection. Interior elements hung from the roof structure will deflect with the roof.
The first floor of the Knuckle is a floating concrete slab-on-grade and may experience movements independent of the structural foundations. Interior elements supported on the slab-on-grade floor will move with the floor. Interior elements supported on foundations and columns will not experience similar or measurable movements.
Exterior/perimeter wall assemblies hung from the edge of the building structure will be directly affected to some degree by changes in external temperature and floor deflection.
Exterior/perimeter and interior architectural finish details should allow for relative movements between elements with different support conditions.

DEFERRED SUBMITTALS:
Portions of the structure have elements of proprietary design and fabrication, which shall be submitted by the supplier for approval after award of contract.
These items shall conform to the load, capacity, size, geometry, connection, and support criteria noted on the Structural Drawings.
Shop drawings and calculations shall be prepared by an engineer registered in the state of Colorado. Final shop drawing submittals shall be stamped and signed.
Furnish deferred submittals for:
supplier engineered screw piles
stairs, handrails
skylight
light-gage structural steel framing
Submittals will be reviewed by the Structural Engineer of Record for compliance with the specified design requirements, stamped as "Reviewed," and forwarded to the local building authority for review as required.
Final issue of the Building Permit may, at the approval authority's option, be contingent on its approval of the deferred submittal documents.
Deferred submittal items shall not be installed until their design calculations and drawings have been reviewed by the Architect, Structural Engineer, and/or local building authority as required.

LETTERS OF CONSTRUCTION COMPLIANCE:
The General Contractor shall determine from the local building authority, at the time the building permit is obtained, whether any letters of construction compliance will be requested from the Structural Engineer.
The Contractor shall notify the Structural Engineer of all such requirements in writing prior to the start of construction.
Two day advance notice shall be given when requesting site visits necessary as the basis for the compliance letter.
The General Contractor shall provide copies of all third-party testing and inspection reports to the Architect and Structural Engineer a minimum of one week prior to the date that the compliance letter is needed.

Structural Drawing List	
S000	COVER SHEET
S001	ABBREVIATIONS AND SYMBOLS
S109	AREA 1 - BASEMENT FOUNDATION PLAN
S110	AREA 4 BASEMENT FOUNDATION PLAN
S111	AREA 4 - FLOOR PLAN LEVEL 1
S112	AREA 4 - FLOOR PLAN LEVEL 2
S113	AREA 4 - FLOOR PLAN LEVEL 3
S114	AREA 4 - FLOOR PLAN LEVEL 4
S115	AREA 4 - ROOF FRAMING PLAN
S120	KNUCKLE PLAN-BASEMENT FOUNDATION
S121	KNUCKLE PLAN-FOUNDATION & LEVEL 1
S122	KNUCKLE PLAN-LEVEL 2
S123	KNUCKLE PLAN-LEVEL 3
S124	KNUCKLE PLAN-LEVEL 4
S125	KNUCKLE PLAN-ROOF
S200	SCHEDULES AND TYPICAL SECTIONS
S201	SECTIONS
S202	SECTIONS
S203	SECTIONS
S204	SECTIONS
S205	SECTIONS
S206	SECTIONS
S207	SECTIONS
S208	BRACED AND RIGID FRAMES & SECTIONS
S209	BRACE AND RIGID FRAME SECTIONS

4240 Architecture Inc.

OWNER	COLORADO STATE UNIVERSITY FACILITY SERVICES NORTH 251 EDISON ST. FORT COLLINS, CO 80523
ARCHITECT	4240 ARCHITECTURE INC 3003 LARIMER STREET DENVER, CO 80205
CONTRACTOR	KIEWIT BUILDING GROUP, INC. 7200 SOUTH ALTON WAY, SUITE A-300 ENGLEWOOD, CO 80112
CIVIL	JVA 1319 SPRUCE STEET BOULDER, CO 80302
LANDSCAPE	RUSSEL + MILLS STUDIOS 141 S. COLLEGE AVE., STE. 104 FORT COLLINS, CO 80524
STRUCTURAL	JVA 25 OLD TOWN SQUARE, SUITE 25 FORT COLLINS, CO 80524
MEP	BEAUDIN GANZE 251 LINDEN STREET #200 FORT COLLINS, CO 80524
ENVELOPE CONSULTANT	TECHNISCAN 155 SOUTH MADISON STREET, SUITE 226 DENVER, CO 80209

Colorado State University

BRAIDEN HALL 4TH FLOOR ADDITION AND RENOVATION (CSU PROJECT #08-045)

1101 BRAIDEN DRIVE
FORT COLLINS, CO 80523

FINAL RECORD DOCUMENTS	2013.11.13
ISS. # DESCRIPTION	DATE
ARCHITECT'S PROJECT NO. :	21067.00

BRAIDEN
COVER SHEET

S000

12/16/2013 1:25:00 PM

SPECIAL INSPECTIONS:
The following Special Inspections and Testing shall be performed by a qualified Special Inspector, retained by the Owner, in accordance with the following sections of IBC Chapter 17:

Section 1704 Special Inspections and the following sub-sections:
1704.2 Inspection of Fabricators
1704.3 Steel Construction
1704.4 Concrete Construction
1704.7 Soils
1704.8 Pile Foundations

TABLE 1704.3
REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD	IBC REFERENCE
1. Material verification of high-strength bolts, nuts and washers:				
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	--	X	Applicable ASTM material specifications; AISC 360, Section A3.3	--
2. Inspection of high-strength bolting:			AISC 360 Section M2.5	1704.3.3
a. Bearing-type connections.	--	X		
3. Material verification of structural steel:				
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	--	--	ASTM A 6 or ASTM A 568	1708.4
b. Manufacturers' certified mill test reports.	--	--	ASTM A 6 or ASTM A 568	
4. Material verification of weld filler materials:				
a. Identification markings to conform to AWS specification in the approved construction documents.	--	--	AISC 360, Section A3.5	--
b. Manufacturer's certificate of compliance required.	--	--	--	--
5. Inspection of welding:				
a. Structural steel:				
i) Complete and partial penetration groove welds.	X	--	AWS D1.1	1704.3.1
ii) Multipass fillet welds	X	--		
iii) Single-pass fillet welds > 5/16"	X	--		
iv) Single-pass fillet welds ≤ 5/16"	--	X		
v) Floor and deck welds	--	X	AWS D1.3	--
b. Reinforcing steel:	--	--	AWS D1.4 ACI 318: 3.5.2	--
i) Verification of weldability of reinforcing steel other than ASTM A 706	--	X		
ii) Reinforcing steel-resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special reinforced concrete shear walls and shear reinforcement	X	--		
iii) Shear reinforcement	X	--		
iv) Other reinforcing steel	--	X		
6. Inspection of steel frame joint details for compliance with approved construction documents:			--	1704.3.2
a. Details such as bracing and stiffening.	--	X		
b. Member locations.	--	X		
c. Application of joint details at each connection.	--	X		

TABLE 1704.4
REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD	IBC REFERENCE
1. Inspection of reinforcing steel, and placement.	--	X	ACI 318: 3.5, 7.1-7.7	1913.4
2.Inspection of reinforcing steel welding in accordance with Table 1704.3, Item 5B.	--	--	AWS D1.4 ACI 318: 3.5.2	--
3. Inspect bolts to be installed in concrete prior and during placement of concrete	X	--	--	1911.5
4.Verifying use of required design mix.	--	X	ACI 318: Ch. 4, 5.2-5.4	1904.2.2, 1913.2, 1913.3
5. At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	--	ASTM C 172 ASTM C 31 ACI 318: 5.6, 5.8	1913.10
6. Inspection of concrete placement for proper application techniques.	X	--	ACI 318: 5.9, 5.10	1913.6, 1913.7, 1913.8
7. Inspection for maintenance of specified curing temperature and techniques.	--	X	ACI 318: 5.11-5.13	1913.9
8. Verification in-situ concrete strength, prior to removal of shores and forms from beams and structural slab	--	X	ACI 318: 6.2	--
9. Inspect formwork for shape, location and dimensions of the concrete member being formed	--	X	ACI 318: 6.1.1	--

TABLE 1704.7
REQUIRED VERIFICATION AND INSPECTION OF SOILS

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. Verify excavations are extended to proper depth and have reached proper material.	--	X
2. Perform classification and testing of controlled fill materials.	--	X
3. Verify use of proper materials, densities and lift thicknesses during placement and compaction of controlled fill.	X	--
4. Prior to placement of controlled fill, observe subgrade and verify that site has been prepared properly.	--	X

TABLE 1704.5.3
REQUIRED VERIFICATION AND INSPECTION OF STRUCTURAL MASONRY CONSTRUCTION (LEVEL 2)

INSPECTION TASK	FREQUENCY OF INSPECTION		REFERENCED FOR CRITERIA		
	Continuous during task listed	Periodically during task listed	IBC Section	ACI 530/ASCE 5 /TMS 402	ACI 530.1/ASCE 6 /TMS 602
1. Verification of f'm prior to construction per the Unit Strength Method		X			Art. 1.4B
2. From the beginning of masonry construction, the following shall be verified to ensure compliance:					
a. Proportions of site-prepared mortar and grout	--	X	--	--	Art. 2.6A
b. Placement of masonry units and construction of mortar joints	--	X	--	--	Art. 3.3B
c. Placement of reinforcement and connectors	--	X	--	Sec. 1.13	Art. 3.4, 3.6A
d. Grout space prior to grouting	X	--	--	--	Art. 3.2D
e. Placement of grout	X	--	--	--	Art. 3.5
3. The inspection program shall verify:					
a. Size and location of structural elements.	--	X	--	--	Art. 3.3G
b. Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction	X	--	--	Sec. 1.2.2 (e), 2.1.4, 3.1.6	--
c. Specified size, grade and type of reinforcement	--	X	--	Sec. 1.13	Art. 2.4, 3.4
d. Protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F).	--	X	Sec. 2104.3, 2104.4	--	Art. 1.8C, 1.8D
4. Preparation of any required grout specimens, mortar specimens and/or prisms shall be observed	X	--	Sec. 2105.2.2, 2105.3	--	Art. 1.4
5. Compliance with required inspection provisions of the construction documents and the approved submittals shall be verified	--	X	--	--	Art. 1.5

TABLE 1704.8
REQUIRED VERIFICATION AND INSPECTION OF DRIVEN DEEP FOUNDATION ELEMENTS

VERIFICATION AND INSPECTION	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. Verify pile materials, sizes and lengths comply with the requirements.	X	--
2. Determine capacities of test piles and conduct additional load tests, as required.	X	--
3. Observe driving operations and maintain complete and accurate records for each pile.	X	--
4. Verify placement locations and plumbness, record final torque value determine required penetrations to achieve design capacity, record tip and butt elevations and document any pile damage.	X	--
5. For steel piles, perform additional inspections in accordance with Section 1704.3	--	--
6. Inspect all pile shaft extension and welds cap welding in accordance with section 1704.3.1	--	X

The Special Inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for inspection of the particular type of construction or operation requiring special inspection.
Duties and responsibilities of the Special Inspector shall be to inspect and/or test the work outlined above and within the Statement of Special Inspections in accordance with Chapter 17 of the IBC for conformance with the approved construction documents. All discrepancies shall be brought to the immediate attention of the contractor for correction.
Per Section 1704.1.2 the Special Inspector shall furnish regular reports to the building official and the Structural Engineer. Progress reports for continuous inspection shall be furnished weekly. Individual reports of periodic inspections shall be furnished within one week of inspection dates. The reports shall note uncorrected deficiencies, correction of previously reported deficiencies, and changes to the approved construction documents authorized by the Structural Engineer of Record.
The Special Inspector shall submit a final signed report within 10 days of the final special inspection stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved construction documents and the applicable workmanship provisions of the IBC. Work not in compliance shall be noted in the report.
The Contractor shall submit a statement of responsibility to the Building Official and the Owner prior to the commencement of work on a main wind- or seismic-force-resisting system, designated seismic system or a wind- or seismic-resisting component listed in the Statement of Special Inspections per section 1706.
Except as noted, the special inspections outlined above are in addition to, and beyond the scope of, periodic Structural Observations as defined in section 1709. Structural Observations are included in the structural engineering design and construction administration services provided by the Structural Engineer.

ABBREVIATIONS KEY

AE	Anchor Rod (Bolt)	ECC	Eccentric	LP	Low Point	REQ	Required
ADL	Additional	E-E	End to End	LSL	Laminated Strand Lumber (generic term)	REQMT	Requirement
ADJ	Adjustable	EF	Each Face			RET	Retaining
AISS	Architectural Exposed Structural Steel	EJ	Expansion Join	LT	Light	RM	Room
		EL	Elevation	LVL	Laminated Veneer Lumber (generic term)	RMO	Rough Masonry Opening
AF	Above Finished Floor	ELEC	Electric (Electrical)			RO	Rough Opening
ALT	Alternate	ENGR	Engineer	MACH	Machine	SC	Slip Critical
AMT	Amount	EQ	Equal	MASY	Masonry	SCH	Schedule
ANCH	Anchor, Anchorage	EQUIP	Equipment	MATL	Material	SDST	Self Drilling Self Tapping
APPROX	Approximate	EQUIV	Equivalent	MAX	Maximum	SECT	Section
ARCH	Architect, -ural	ES	Each Side	MB	Machine bolt	SF	Square Feet
ATR	All Thread Rod	EST	Estimate	MECH	Mechanical	SHT	Sheet
AVG	Average	E-W	East to West	MEZZ	Mezzanine	SHTG	Sheathing
BC	Bottom of Concrete	EXC	Excavate	MFR	Manufacture, -er, -ed	SIM	Similar
BL	Brick Ledge	EXP	Expansion	MIN	Minimum	SLH	Short Leg Horizontal
BLK	Block	EXT	Exterior	ML	Microllam (Trus-joist brand LVL)	SLV	Short Leg Vertical
BLKG	Blocking	FDN	Foundation			SOG	Slab on Grade
BM	Beam	FF	Finished Floor, Fr Face	MO	Masonry Opening	SP	Spaces
BOT	Bottom	F-F	Face to Face	MTL	Metal	SPEC	Specifications
BRG	Bearing	FIG	Figure	NF	Near Face	SQ	Square
BW	Bottom of Wall	FL	Flush	NIC	Not In Contract	ST	Snug Tight
CB	Counterbore	FLG	Flange	NS	Near Side	STD	Standard
CF	Cubic Foot	FLR	Floor	N-S	North to South	STIFF	Stiffener
CG	Center of Gravity	FO	Face of	NTS	Not to Scale	STL	Steel
CIP	Cast in Place	FP	Full Penetratior	OCI	OSHA Column Joist	STRUCT	Structure, al
CJ	Construction Joint (Control Joint)	FS	Footing Step, FarSide	OD	Outside Diameter	SUPT	Support
		FTG	Footing	OF	Outside Face	SY	Square Yard
CLG	Ceiling	GA	Gage (Gauge)	OH	Opposite Hand	SYM	Symmetrical
CLR	Clear	GALV	Galvanized	OPNG	Opening	T&B	Top and Bottom
CM	Construction Manager (Management)	GC	General Contractor	OPP	Opposite	T&G	Tongue and Groove
		GEN	General	OSB	Oriented Strand Board	TB	Top of Beam
CMU	Concrete Masonry Unit	GL	Glue laminated (6lam)	PAF	Powder Actuated Fast'nr	TC	Top of Concrete
COL	Column	GND	Ground	PC	Precast	TD	Top of Deck
COM	Common	GR	Grade	PCF	Pounds Per Cubic Foot	THD	Thread
COMB	Combination	GT	Girder Truss	PEN	Penetration	THK	Thick, -ness
CONC	Concrete	GYP BD	Gypsum Board	PERP	Perpendicular	TJ	Top of Joist
CONN	Connection	HAS	Headed Anchor Stud	PL	Property Line	TL	Total Load
CONT	Continue (Continuous)	HDG	Hot Dipped Galvanized	PLF	Pounds per Linear Foot	TPG	Topping
COORD	Coordinate, -tion	HORIZ	Horizontal	PNL	Panel	TRANS	Transverse
CS	Countersink	HP	High Point	PP	Panel Point	TW	Top of Wall
CTR	Center	HT	Height	PS	Prestressed	TYP	Typical
CY	Cubic Yard	ID	Inside Diameter	PSF	Pounds per Square Foot	ULT	Ultimate
DAB	Deformed Anchor Bar	IF	Inside Face	PSI	Pounds per Square Inch	UNO	Unless Noted Otherwise
DET	Detail	INT	Interior (Intermediate)	PSL	Parallel Strand Lumber (generic term)	VERT	Vertical
DEV	Develop	JB	Joist Bearing			VIF	Verify in Field
DIAG	Diagonal	JST	Joist	PT (1)	Post Tensioned	WA	Wedge Anchor
DIM	Dimension	JT	Joint	PT (2)	Pressure Treated	WP	Work Point
DL	Dead Load	K	Kip (1,000 lbs.)	PTN	Partition	WT	Weight
DN	Down	LD	Load	PWD	Plywood	WWF	Welded Wire Fabric
DP	Drilled Pier	LGS	Light Gage Steel	QTY	Quantity	XS	Extra Strong
DT	Double Tee	LL	Live Load	R	Radius	XSECT	Cross-section
DWG	Drawing	LLH	Long Leg Horizontal	RE	Reference (refer to)	XXS	Double Extra Strong
DWL	Dowel	LLV	Long Leg Vertical	RECT	Rectangle		
EA	Each	LOC	Location	REINF	Reinforce, -ed, -ing		

Symbols Key

GRID	Grid Designation	2 Δ	Revision
		SWx	Shear Wall
(XXX'-X)	Footing Elevation	BL XXX'-X	Brick Ledge
FXX	Footing Mark	RFx	Rigid Frame
FS	Footing Step	Bx	Brace
	Drilled Pier, Pier Mark		CMU THROUGH FRAMING
			Brick
{X}	Pier Penetration		CIP Concrete
	Pilaster W/ Special Reinf. or Anchor Bolts		Precast Concrete
			Wood
100'-0	Top of Floor Elevation		Earth
XXX'-X / XXX'-X	Step In Floor Elevation		Shoring
XXX'-X	Top of Concrete or Masonry Elevation	XX:12	Roof Slope
BL=XXX'-X	Top of Brick Ledge Elevation	SLOPE	Direction of Slope
[XXX'-X]	Top of Steel Elevation	DN UP	Stair or Ramp Direction
JB XX'-X	Joist Bearing Elevation		Direction of Deck Panels
	Tube Steel Column, Column Mark	@	On Center Spacing
		CL	Center Line
	Wide Flange Column Column Mark	PL	Plate
		<E>	Existing
	Joist	<N>	New
	Beam	<R>	To Be Removed
	Hanger	<X>	No. of Headed Anchor Studs
	Fully Welded Moment Connection		Stressing End Anchor
	Loc'n of Bend In Bent Beam		Deadend Anchor
			Intermediate Anchor

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Colorado State University

BRAIDEN HALL 4TH FLOOR ADDITION AND RENOVATION (CSU PROJECT #08-045)
1101 BRAIDEN DRIVE
FORT COLLINS, CO 80523

FINAL RECORD DOCUMENTS	2013.11.13
ISS. # DESCRIPTION	DATE
ARCHITECT'S PROJECT NO. :	21067.00

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ABBREVIATIONS AND SYMBOLS

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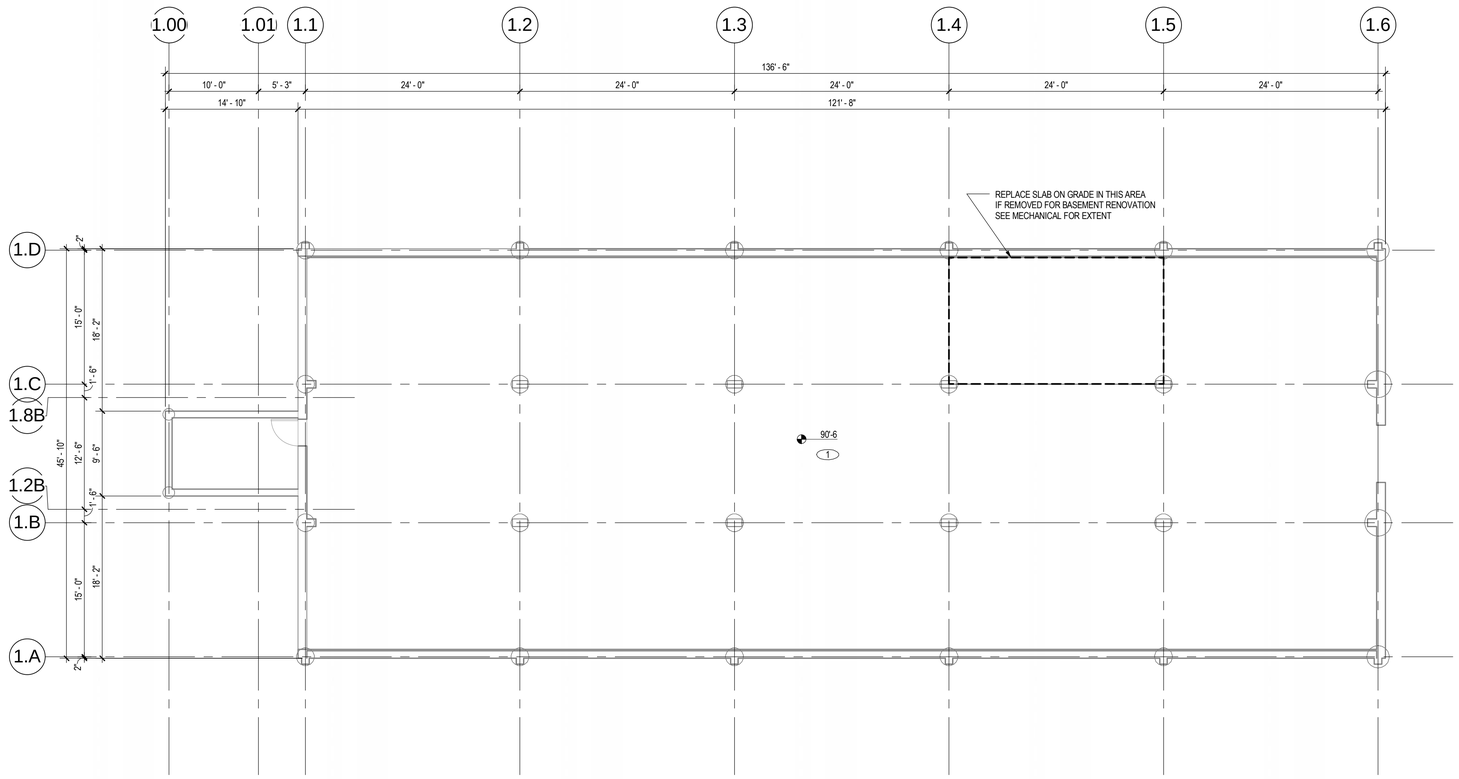

KEY PLAN NOTES
(1) NEW PARTITIONS MUST ALLOW FOR 2" OF SLAB MOVEMENT.

TYPICAL SLAB ON GRADE CONSTRUCTION:
4" CONCRETE SLAB OVER 15 MIL VAPOR BARRIER OVER 4" GRAVEL LAYER AND STRUCTURAL FILL COMPACTED TO 95% STANDARD PROCTOR DENSITY. SEE GEOTECHNICAL REPORT FOR RECOMENDED SOIL CONDITIONING AND FILL PLACEMENT. PLACE FILL IN 6'-8" LIFTS. REINFORCE SLAB ON GRADE W/ #4 @ 16" EACH WAY CENTERED IN SLAB.

AREA 1 - BASEMENT FOUNDATION PLAN

1/8" = 1'-0"

* TOP OF FLOOR SLAB ELEVATION NOTED THUS: XXX'-X
* SEE SHEET S000 FOR GENERAL NOTES

0 2' 4' 8' 16'

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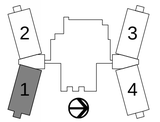

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AREA 1 - BASEMENT FOUNDATION PLAN

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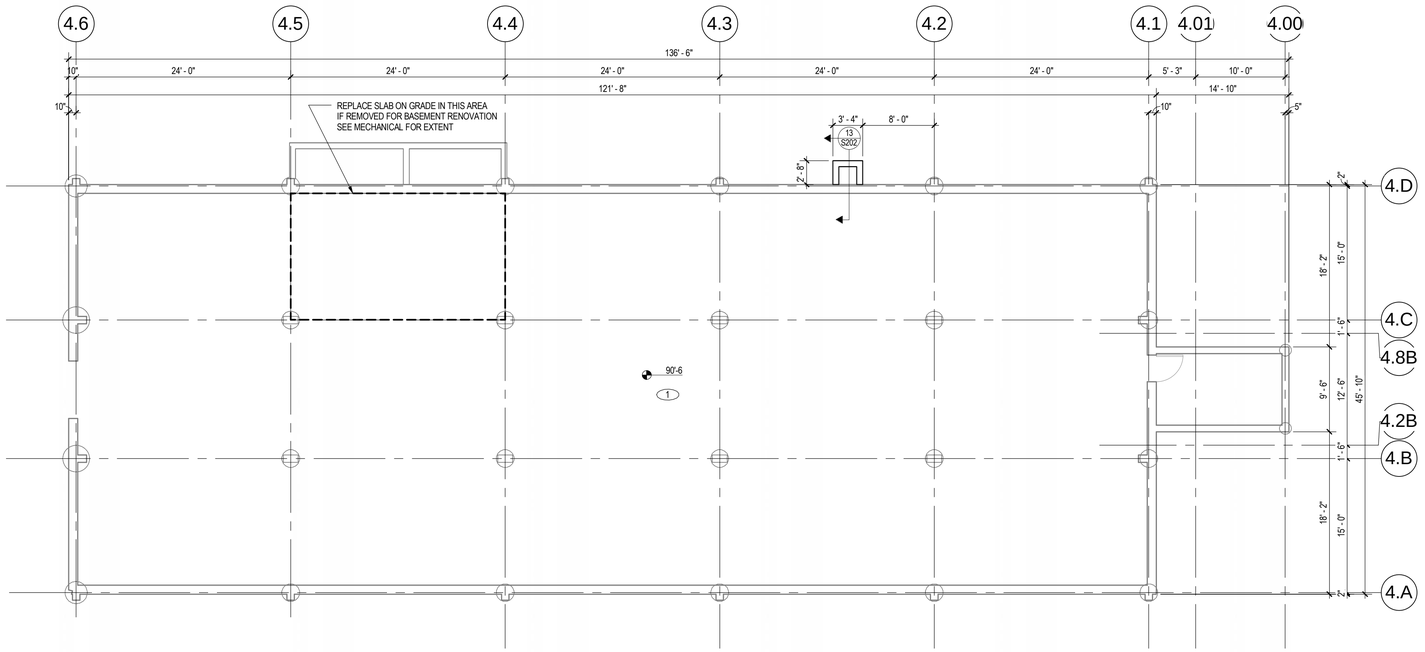

KEY PLAN NOTES
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AREA 4 - BASEMENT FOUNDATION PLAN

1/8" = 1'-0"

* TOP OF FLOOR SLAB ELEVATION NOTED THUS: XXX'-X
* SEE SHEET S000 FOR GENERAL NOTES

0 2' 4' 8' 16'

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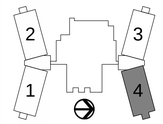

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AREA 4 BASEMENT FOUNDATION PLAN

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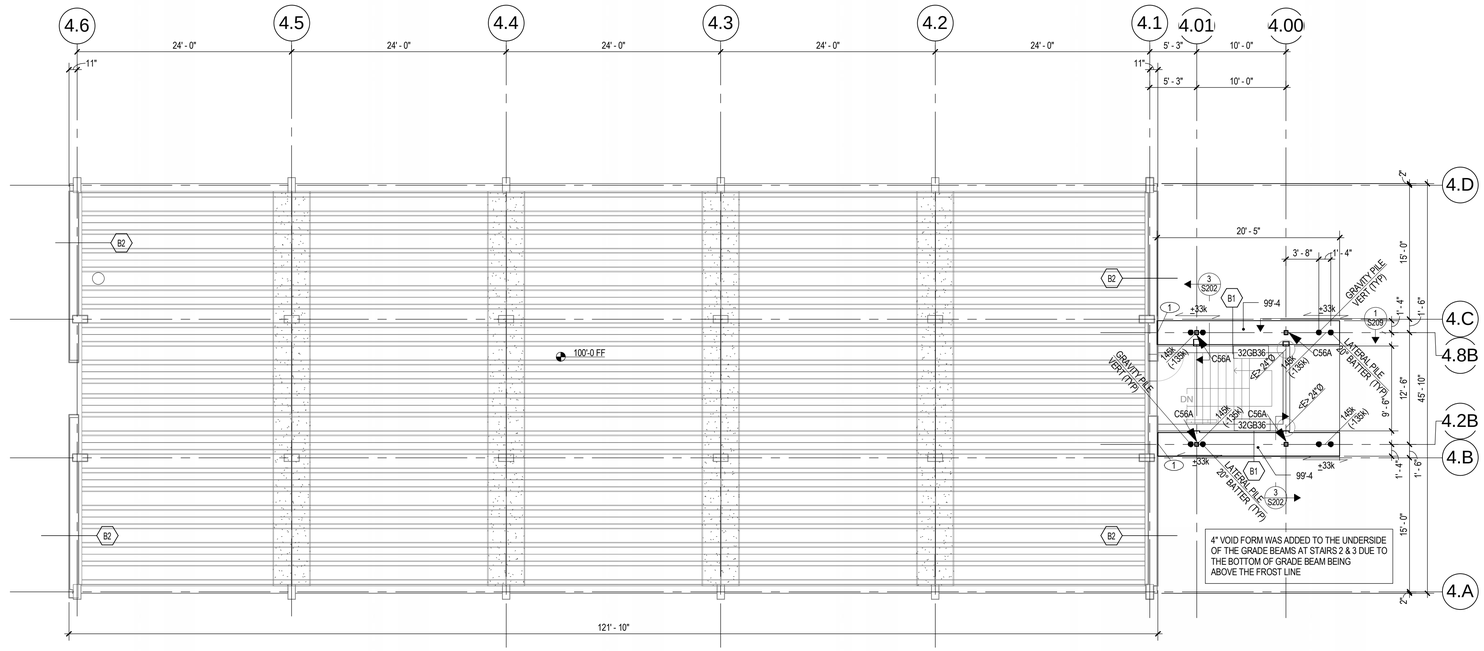


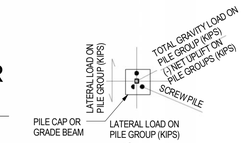
KEY PLAN NOTES	
1	DRILL & EPOXY 2-#5 x 30" (5" EMBED MIN) TOP & BOTTOM OF WALL.

AREA 4 - FOUNDATION AND LEVEL 1 FLOOR PLANS

1/8" = 1'-0"

* TOP OF FLOOR SLAB ELEVATION NOTED THUS: XXX'-X
* TOP OF CONCRETE NOTED THUS: XX'-X
* SEE SHEET S000 FOR GENERAL NOTES
* SEE SHEET S200 FOR COLUMN SCHEDULE
* SEE SHEET S208 FOR BRACED FRAME

0 2' 4' 8' 16'



NOTES ON SCREW PILES:
* ALL SCREW PILES UNDER GRADE BEAMS ARE CENTERED
* INSTALL PILES IN PILE GROUPS WITH A 7.5° BATTER AWAY FROM EACH OTHER UNLESS NOTED OTHERWISE ON THE PLANS

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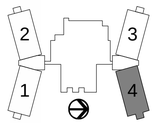

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AREA 4 - FLOOR PLAN LEVEL 1

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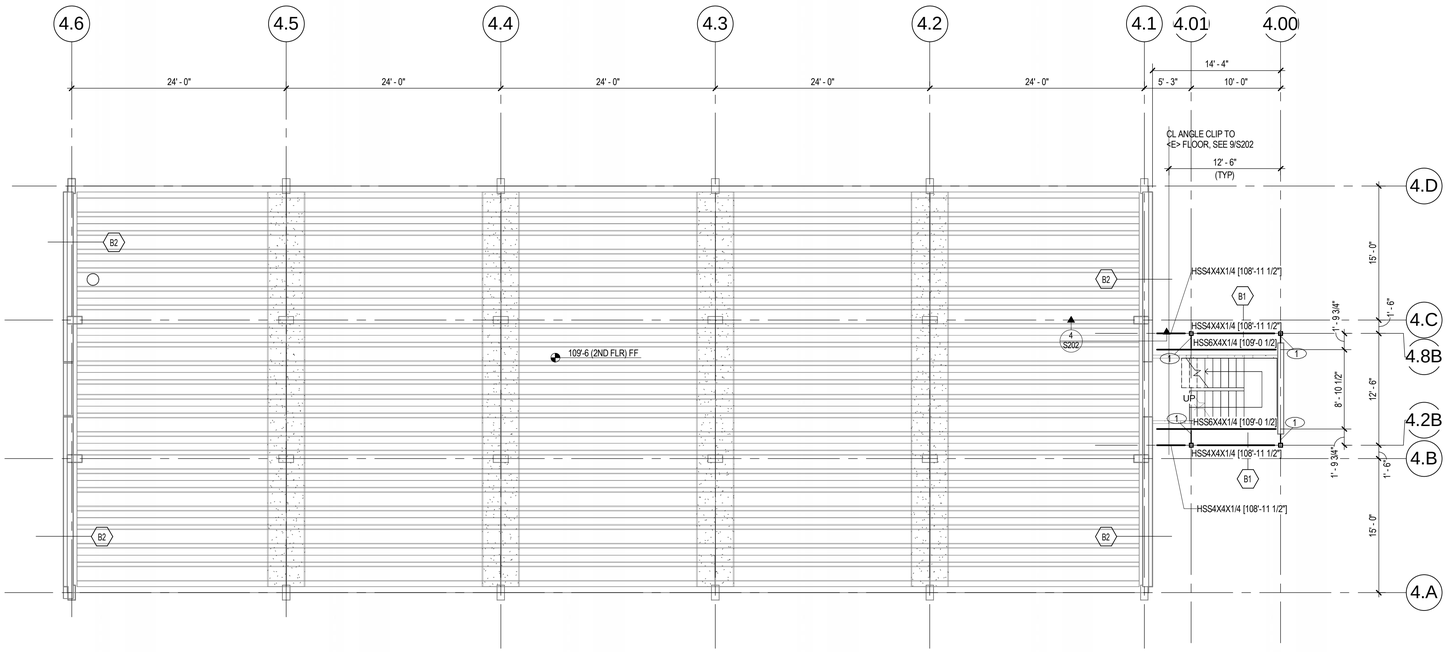

KEY PLAN NOTES	
1	BRACE COLUMN BACK TO <E> STRUCTURE SEE DETAIL 9/S209

AREA 4 - LEVEL 2 FLOOR PLAN

1/8" = 1'-0"

0 2' 4' 8' 16'

* TOP OF FLOOR SLAB ELEVATION NOTED THUS: XXX'-X
* TOP OF STEEL BEAM ELEVATION NOTED THUS: [XXX'-X]
* SEE SHEET S000 FOR GENERAL NOTES
* SEE SHEET S206 FOR BRACED FRAMES

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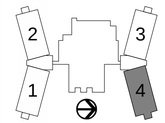

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AREA 4 - FLOOR PLAN LEVEL 2

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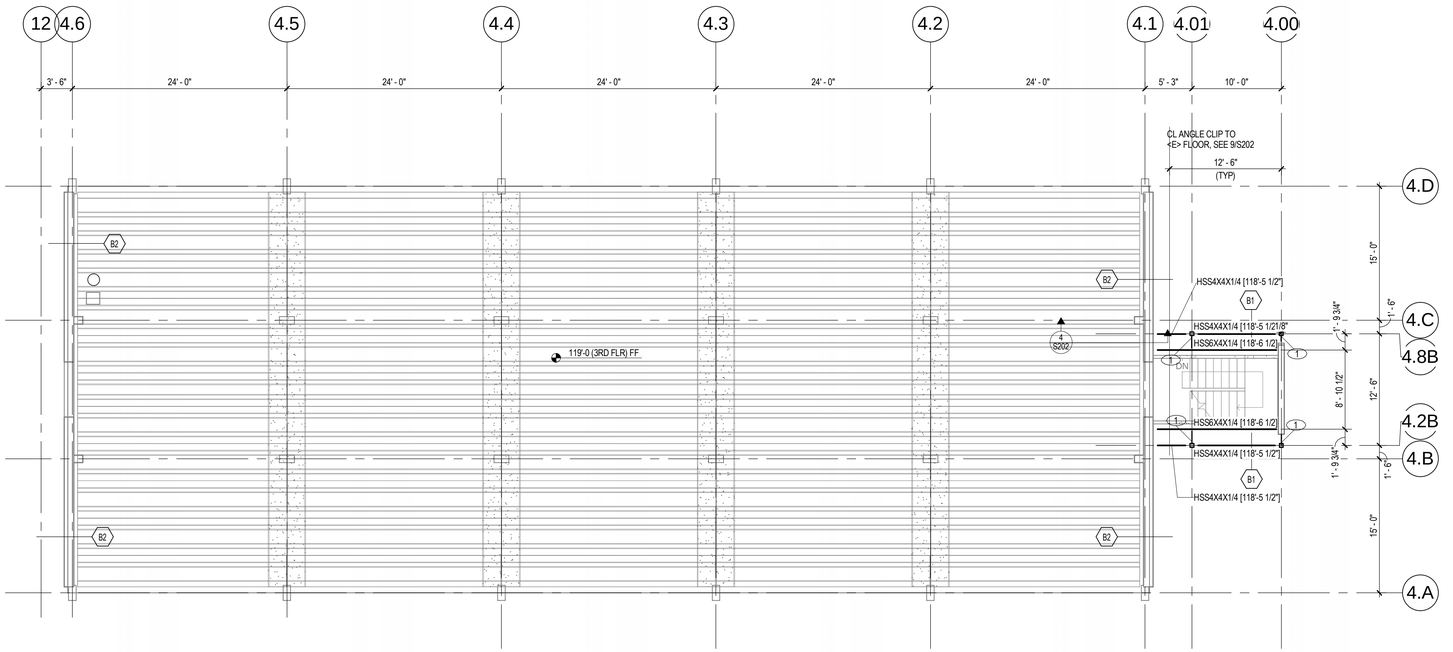

KEY PLAN NOTES	
1	BRACE COLUMN BACK TO <E> STRUCTURE SEE DETAIL 9/S209

AREA 4 - LEVEL 3 FLOOR PLAN

1/8" = 1'-0"

0 2' 4' 8' 16'

* TOP OF FLOOR SLAB ELEVATION NOTED THUS: XXX'-X
* TOP OF STEEL BEAM ELEVATION NOTED THUS: [XXX-X]
* SEE SHEET S000 FOR GENERAL NOTES
* SEE SHEET S208 FOR BRACED FRAMES

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STRUCTURAL JVA
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ENVELOPE CONSULTANT TECHNISCAN
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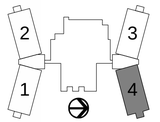
Colorado State University

BRAIDEN HALL 4TH FLOOR ADDITION AND RENOVATION (CSU PROJECT #08-045)
1101 BRAIDEN DRIVE
FORT COLLINS, CO 80523

ISS. #	DESCRIPTION	DATE
	FINAL RECORD DOCUMENTS	2013.11.13

ARCHITECT'S PROJECT NO. : 21067.00



BRAIDEN
AREA 4 - FLOOR PLAN LEVEL 3

S113

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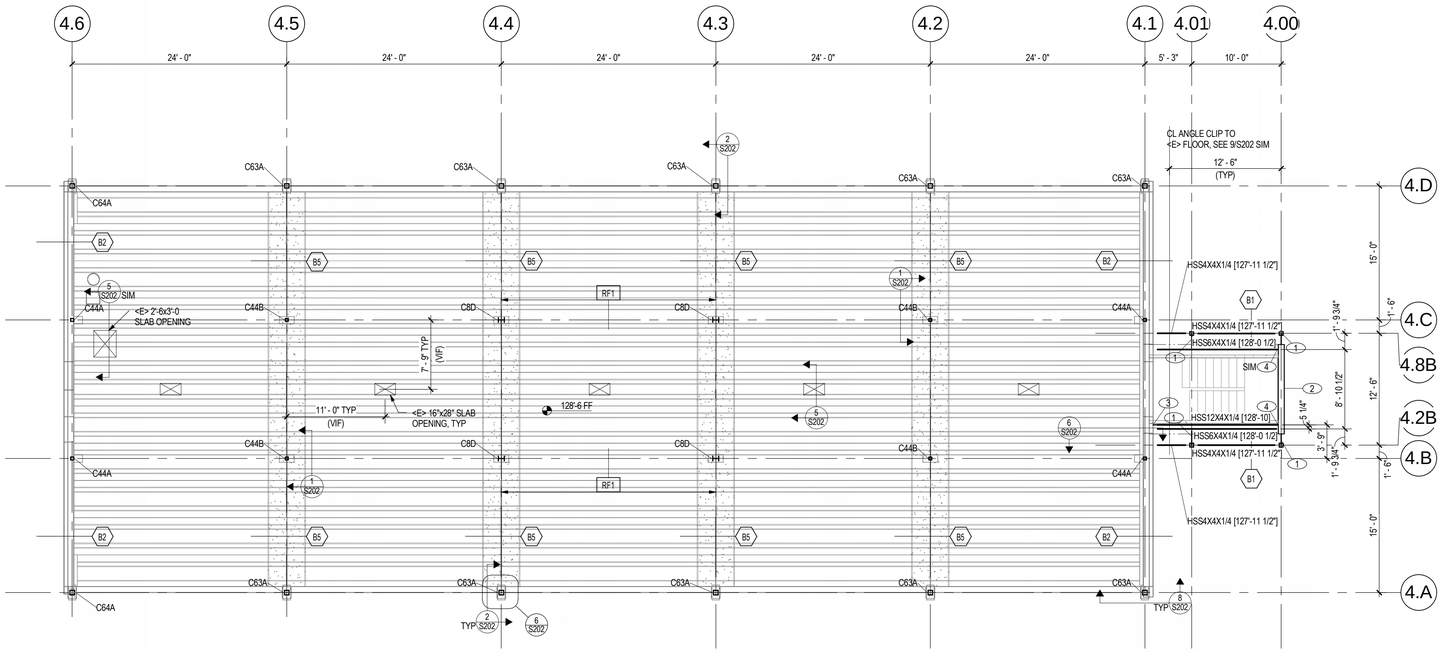

KEY PLAN NOTES	
1	BRACE COLUMN BACK TO <E> STRUCTURE SEE DETAIL 9/S209
2	REMOVE <E> 6" CONCRETE ROOF SLAB AT FACE OF EDGE BEAM
3	BEAM CONNECTION TO EDGE OF FLOOR PER 5/S206
4	BEAM CONNECTION TO WALL PER 4/S206

CONTRACTOR TO LOCATE NEAR SURFACE FLOOR REINFORCING AT COLUMN BASE PLATES. IF INTERFERANCE WITH COLUMN ANCHOR BOLTS IS ANTICIPATED, CONTACT STRUCTURAL ENGINEER FOR BASE PLATE MODIFICATION.

TYPICAL STAIR ASSEMBLY:
CONCRETE FILLED PANS WITH CLOSED RISERS AND STRINGERS PER ARCH'L. FRAME LANDINGS WITH CHANNELS OR ANGLES AS REQUIRED. SUPPORT LANDINGS WITH TUBE STEEL COLUMNS OR HANGERS AS REQUIRED TO AVOID INTERFERENCE WITH STRUCTURAL/ARCHITECTURAL ELEMENTS. STAIR FABRICATOR SHALL DESIGN & DETAIL ALL MEMBERS, CONNECTIONS & ASSEMBLIES REQUIRED FOR FRAMING AND SUPPORT OF STAIRS WHERE NOT SHOWN. COORDINATE ALL STAIR ASSEMBLIES & DETAILS WITH ARCHITECTURAL AND STRUCTURAL DRAWINGS.

TOPPING SLAB:
1 1/2" LIGHT WEIGHT CONCRETE TOPPING ON <E> ROOF STRUCTURE.

AREA 4 - LEVEL 4 PLAN

1/8" = 1'-0"

0 2' 4' 8' 16'

* TOP OF FLOOR SLAB ELEVATION NOTED THUS: XXX'-X
* TOP OF STEEL BEAM ELEVATION NOTED THUS: [XXX'-X]
* SEE ARCH AND MECH DRAWINGS FOR SIZE AND LOCATION OF ROOF OPENINGS AND PENETRATIONS

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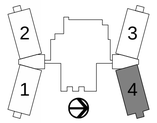

BRAIDEN
AREA 4 - FLOOR PLAN LEVEL 4

S114

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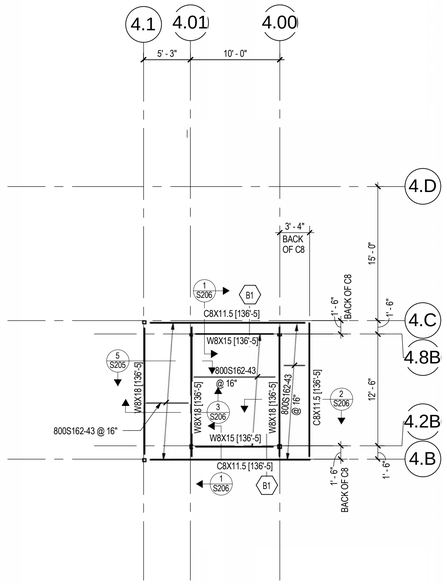


LOW ROOF FRAMING PLAN

1/8" = 1'-0"

LGS ROOF PANEL CONSTRUCTION:
THE FABRICATOR SHALL ASSEMBLE LGS PANELS IN THE SHOP AND THE ERECTOR SHALL ATTACH THE PANELS TO THE SLOPING WF RAFTERS AS FOLLOWS:

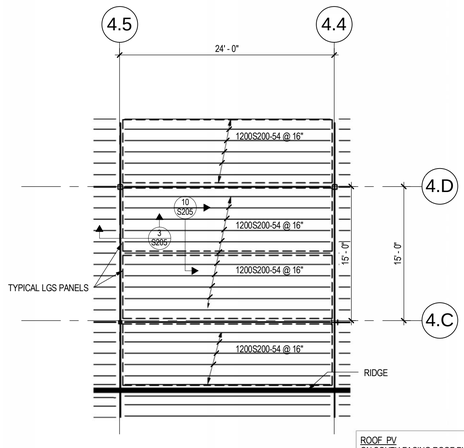
PANEL CONSTRUCTION:

1. PANELS SHALL NOT BE WIDER THAN 8'-0".
2. CONNECT STUDS TO TRACK AS INDICATED IN SECTION 3/S205.
3. CONNECT SUPPORTING EDGE ANGLE TO TRACK AS INDICATED IN SECTION 3/S205.
4. PROVIDE BLOCKING AT 1/3 POINTS ALONG THE LENGTH OF THE LGS JOISTS.
5. THE ROOF DECK SHALL BE SHOP ATTACHED TO THE LGS PANELS AS INDICATED IN THE BOX NOTE ON PLAN. THE ROOF DECK SHALL COVER THE ENTIRE PANEL. DECK SHALL SHALL SPAN OVER A MINIMUM OF 4 ROOF JOISTS (3-SPAN CONDITION).
6. THE FABRICATOR SHALL BE RESPONSIBLE FOR THE LIFT POINT LOCATIONS AND THEIR CONNECTIONS TO THE PANEL.

PANEL ERECTION:

1. THE ERECTOR SHALL LIFT PANELS INTO PLACE USING THE LIFT POINTS SPECIFIED BY THE FABRICATOR.
2. ATTACH THE EDGE ANGLES TO THE SLOPING WF RAFTERS AS INDICATED SECTION 3/S205.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY TEMPORARY BRACING REQUIRED DURING ERECTION.
4. CONNECT EDGES OF PANELS TOGETHER AS INDICATED IN SECTION 10/S205.

THE CONTRACTOR SHALL SUBMIT LGS PANEL SHOP DRAWINGS TO THE STRUCTURAL ENGINEER FOR APPROVAL BEFORE THE CONSTRUCTION AND ERECTION OF THE PANELS HAS BEGUN.



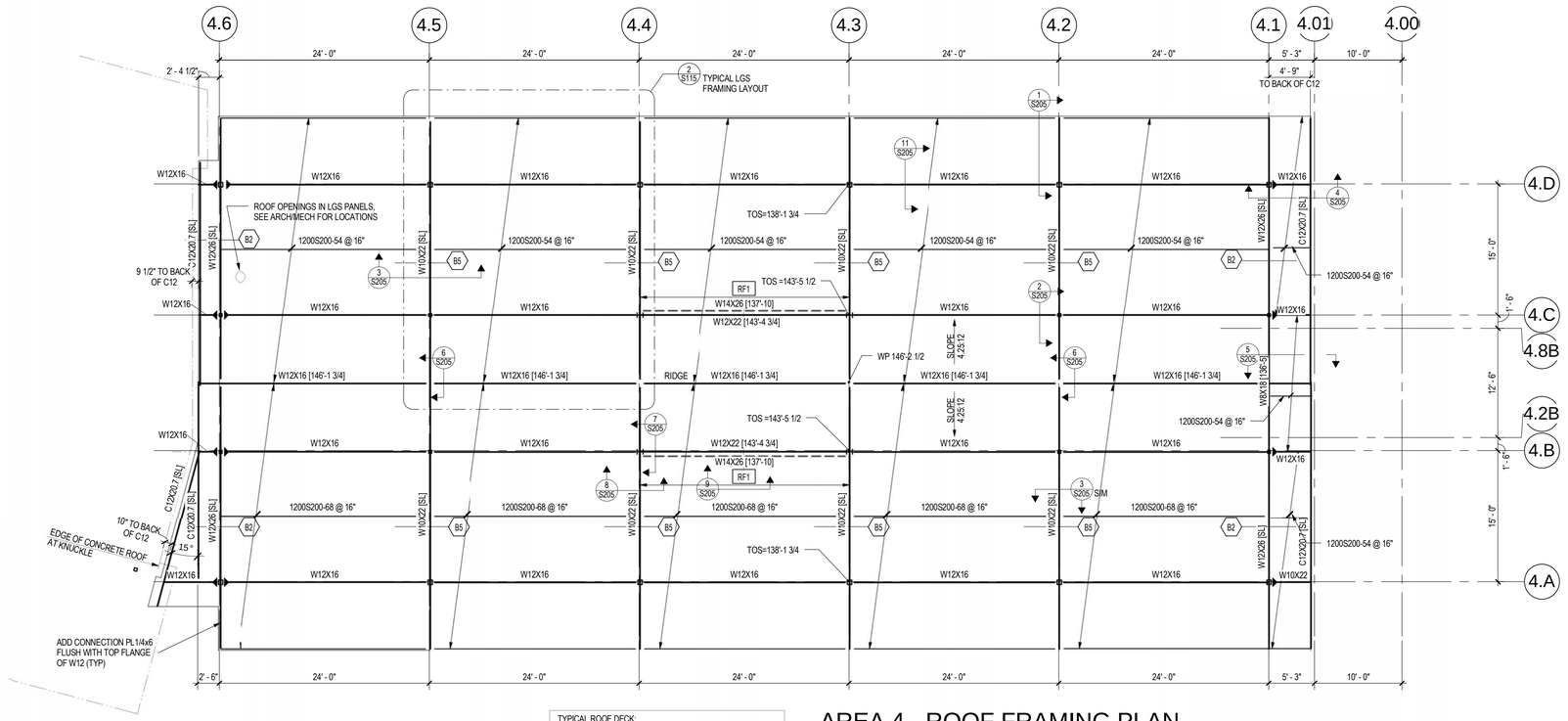
ROOF PV
ON SOUTH FACING ROOF PLANE OF EACH DORM WING

INCREASE ROOF JOIST	1200S200-54 TO 1200S200-68 AND
INCREASE ROOF TRACKS	1200T125-54 TO 1200T125-68

2 S115 TYPICAL LGS FRAMING

1/8" = 1'-0"

0 1' 2' 4' 8'



TYPICAL ROOF DECK:
1" x 20 GA PAINTED STEEL DECK (1.0E) W/ #12 SDST SCREWS @ 8" AT LGS SUPPORTS, HILTI X-EDNI 0.145 DIA. PAF @ 8" AT STRUCTURAL STEEL SUPPORTS, & EDGES (32/4) AND #10 SDST SCREWS @ 16" AT SIDELAPS (1 SCREW PER DECK SPAN); STEEL DECK SHALL BE CONTINUOUS OVER THREE OR MORE SUPPORTS; PAINT TOP AND BOTTOM.

AREA 4 - ROOF FRAMING PLAN

1/8" = 1'-0"

0 2' 4' 8' 16'

* TOP OF STEEL BEAM ELEVATION NOTED THUS: [XXX'-XX]
* AT SLOPING [SL] BEAMS, HIGH POINT ELEVATION NOTED "HP" , LOW POINT ELEVATION NOTED "LP"
* [WP] INDICATES WORK POINT ELEVATION. SEE SECTIONS.

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CIVIL	JVA 1319 SPRUCE STEET BOULDER, CO 80302
LANDSCAPE	RUSSEL + MILLS STUDIOS 141 S. COLLEGE AVE., STE. 104 FORT COLLINS, CO 80524
STRUCTURAL	JVA 25 OLD TOWN SQUARE, SUITE 25 FORT COLLINS, CO 80524
MEP	BEAUDIN GANZE 251 LINDEN STREET #200 FORT COLLINS, CO 80524
ENVELOPE CONSULTANT	TECHNISCAN 155 SOUTH MADISON STREET, SUITE 226 DENVER, CO 80209

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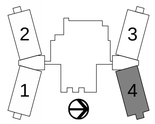

BRAIDEN
AREA 4 - ROOF FRAMING PLAN

S115

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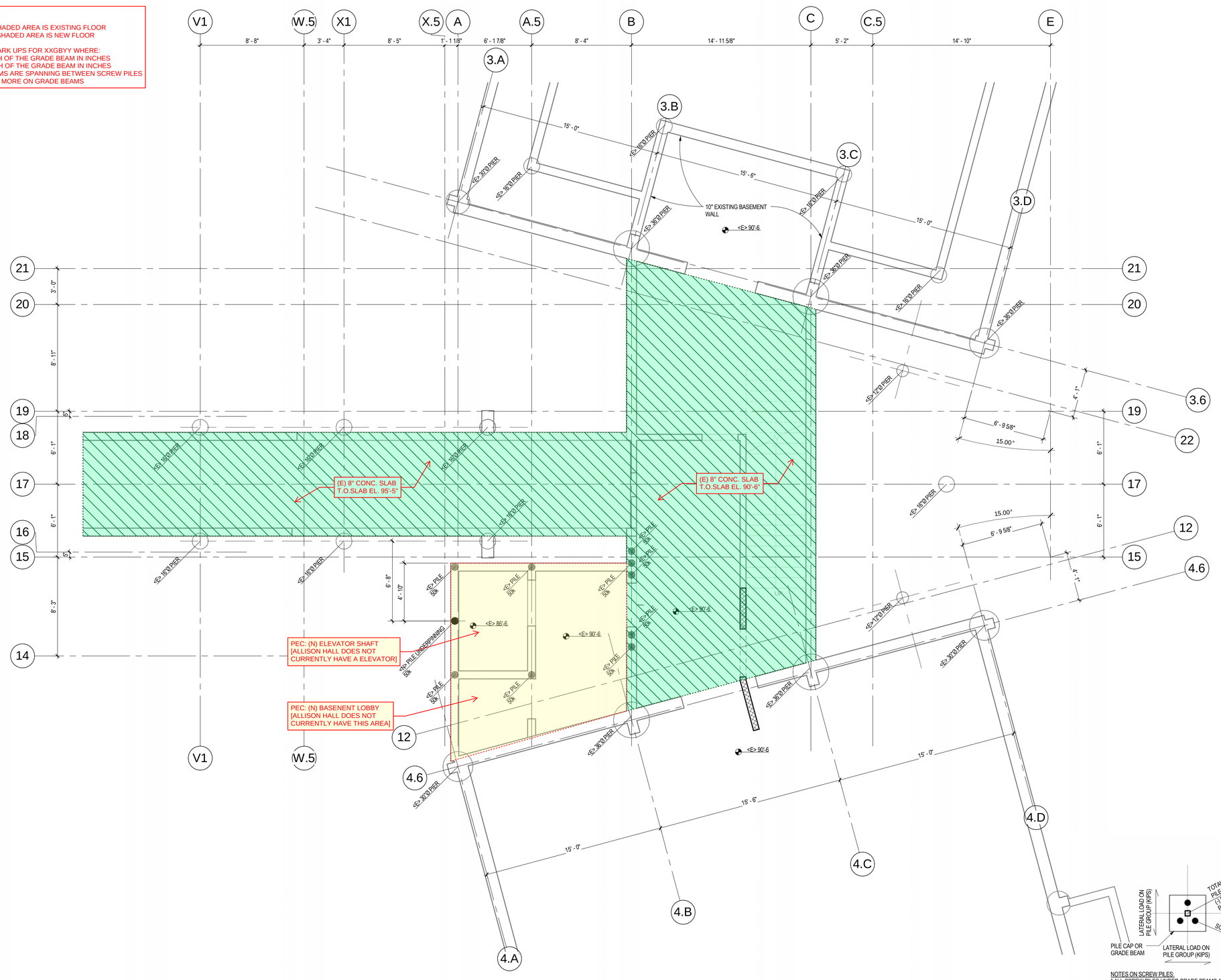
PEC: FOR REFERENCE ONLY

PEC NOTES:

LIGHT GREEN SHADED AREA IS EXISTING FLOOR
LIGHT YELLOW SHADED AREA IS NEW FLOOR

GRADE BEAM MARK UPS FOR XXGBYY WHERE:
XX = WIDTH OF THE GRADE BEAM IN INCHES
YY = DEPTH OF THE GRADE BEAM IN INCHES
ALL GRADE BEAMS ARE SPANNING BETWEEN SCREW PILES
REF. 6/S200 FOR MORE ON GRADE BEAMS



NOTES ON SCREW PILES:
* ALL SCREW PILES UNDER GRADE BEAMS ARE CENTERED
* INSTALL PILES IN PILE GROUPS WITH A 7.5° (MIN) BATTER AWAY FROM EACH OTHER UNLESS NOTED OTHERWISE ON THE PLANS

KEY PLAN NOTES	
1	DRILL & EPOXY 2-#5 x 30" (5" EMBED MIN) TOP & BOTTOM OF WALL. WHERE NEW BASEMENT WALL MEETS EXISTING WALL, DRILL & EPOXY #5 x 30" AT EACH HORIZONTAL BAR AT EXTERIOR FACE ONLY. SEE 9/S201

KNUCKLE PLAN-BASEMENT FOUNDATION

1/4" = 1'-0"

0 1' 2' 4' 8'

* ELEVATION 100'-0 = USGS XXXX.X
* TOP OF FLOOR SLAB ELEVATION NOTED THUS: XXX'-X
* TOP OF CONCRETE NOTED THUS: XXX'-X
* SEE SHEET S000 FOR GENERAL NOTES
* SEE SHEET S200 FOR COLUMN SCHEDULE

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CIVIL	JVA 1319 SPRUCE STEET BOULDER, CO 80302
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STRUCTURAL	JVA 25 OLD TOWN SQUARE, SUITE 25 FORT COLLINS, CO 80524
MEP	BEAUDIN GANZE 251 LINDEN STREET #200 FORT COLLINS, CO 80524
ENVELOPE CONSULTANT	TECHNISCAN 155 SOUTH MADISON STREET, SUITE 226 DENVER, CO 80209

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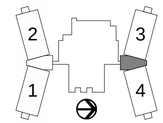


BRAIDEN
KNUCKLE PLAN-BASEMENT FOUNDATION

S120

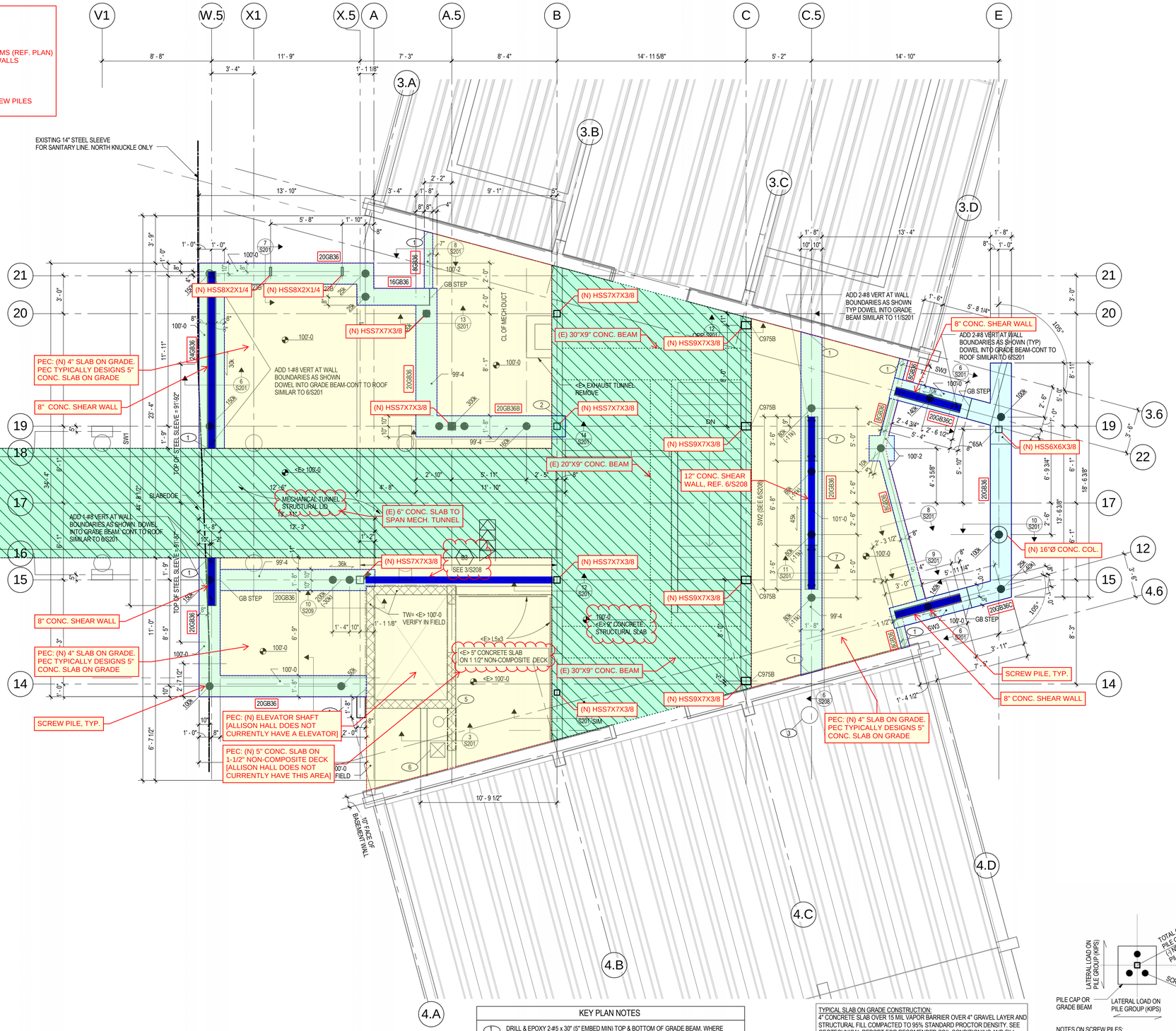
PEC: FOR REFERENCE ONLY

PEC NOTES:

LIGHT GREEN SHADED AREA IS EXISTING FLOOR
LIGHT YELLOW SHADED AREA IS NEW FLOOR

WIDE BLUE LINES ARE LATERAL RESISTING SYSTEMS (REF. PLAN)
WIDE ORANGE LINES ARE CONC. LOAD BEARING WALLS

GRADE BEAM MARK UPS FOR XXGBYY WHERE:
XX = WIDTH OF THE GRADE BEAM IN INCHES
YY = DEPTH OF THE GRADE BEAM IN INCHES
ALL GRADE BEAMS ARE SPANNING BETWEEN SCREW PILES
REF. 6/S200 FOR MORE ON GRADE BEAMS



KEY PLAN NOTES

1. DRILL & EPOXY 2-#5 x 30" (5" EMBED MIN) TOP & BOTTOM OF GRADE BEAM. WHERE NEW BASEMENT WALL MEETS EXISTING WALL, DRILL & EPOXY #5 x 30" AT EACH HORIZONTAL BAR AT EXTERIOR FACE ONLY.
2. CUT SLOT IN <E> WALL FOR <N> GRADE BEAM. PROVIDE 3/4" GAP ON BOTH SIDES.
3. 16'Ø FLOOR OPENINGS MUST BE LOCATED BETWEEN <E> FLOOR JOISTS. FIELD VERIFY JOIST LOCATION PRIOR TO CUTTING OPENINGS. COORDINATE EXACT LOCATION WITH MECHANICAL.
5. CUT 10'Ø OPENING THRU <E> FLOOR. COORDINATE FINAL LOCATIONS WITH MECHANICAL
6. CUT 14"x14" OPENING THRU <E> FLOOR. COORDINATE FINAL LOCATION W/ MECHANICAL
7. ARCHITECTUALLY EXPOSED CONCRETE BOTH FACES

TYPICAL SLAB ON GRADE CONSTRUCTION:
4" CONCRETE SLAB OVER 15 MIL VAPOR BARRIER OVER 4" GRAVEL LAYER AND STRUCTURAL FILL COMPACTED TO 95% STANDARD PROCTOR DENSITY. SEE GEOTECHNICAL REPORT FOR RECOMENDED SOIL CONDITIONING AND FILL PLACEMENT. PLACE FILL IN 6"-8" LIFTS. REINFORCE SLAB ON GRADE W/ #4 @ 16" EACH WAY CENTERED IN SLAB.

NOTES ON SCREW PILES:
* ALL SCREW PILES UNDER GRADE BEAMS ARE CENTERED
* INSTALL PILES IN PILE GROUP WITH A 7.5° (MIN) BATTER AWAY FROM EACH OTHER UNLESS NOTED OTHERWISE ON THE PLANS

KNUCKLE PLAN-FOUNDATION & LEVEL 1

1/4" = 1'-0"

0 1' 2' 4' 8'

* ELEVATION 100'-0 = USGS XXXX.X
* TOP OF FLOOR SLAB ELEVATION NOTED THUS: XXX'-X
* TOP OF CONCRETE NOTED THUS: XXX'-X
* TOP OF SCREW PILES = 97'-0 UNLESS NOTED OTHERWISE
* SEE SHEET S000 FOR GENERAL NOTES
* SEE SHEET S200 FOR COLUMN SCHEDULE

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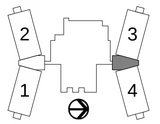


BRAIDEN
KNUCKLE PLAN-FOUNDATION & LEVEL 1

S121

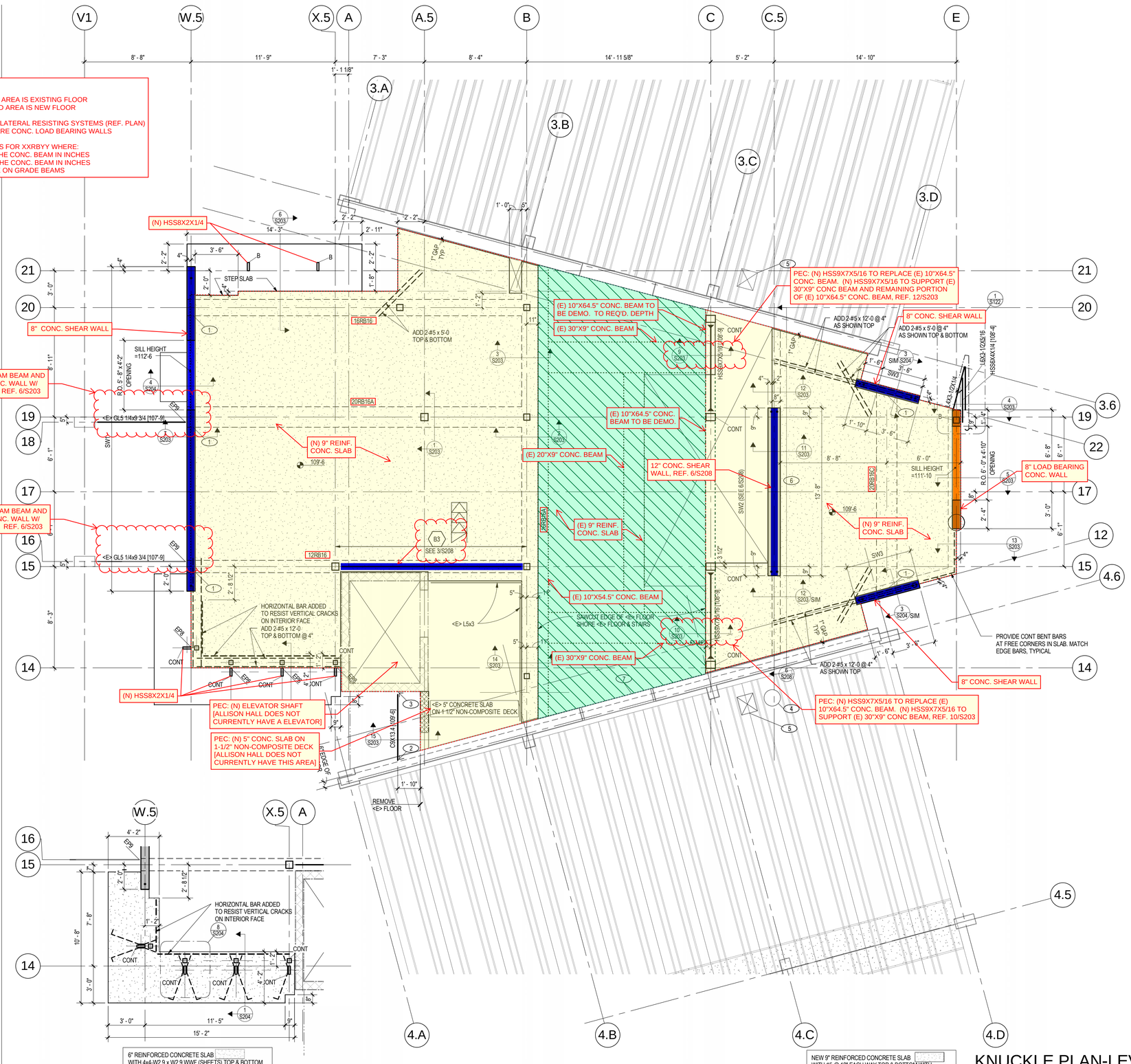
PEC: FOR REFERENCE ONLY

PEC NOTES:

LIGHT GREEN SHADED AREA IS EXISTING FLOOR
LIGHT YELLOW SHADED AREA IS NEW FLOOR

WIDE BLUE LINES ARE LATERAL RESISTING SYSTEMS (REF. PLAN)
WIDE ORANGE LINES ARE CONC. LOAD BEARING WALLS

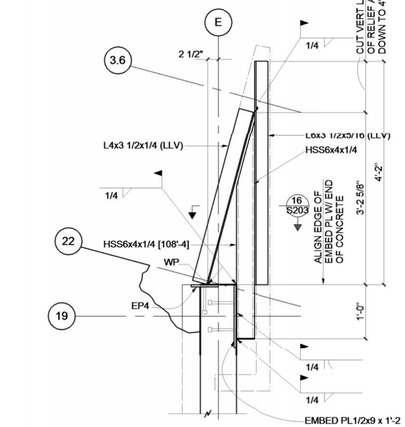
CONC. BEAM MARK UPS FOR XXRBYY WHERE:
XX = WIDTH OF THE CONC. BEAM IN INCHES
YY = DEPTH OF THE CONC. BEAM IN INCHES
REF. 8/S200 FOR MORE ON GRADE BEAMS



SUNSHADE PLAN-LEVEL 2

1/4" = 1'-0"

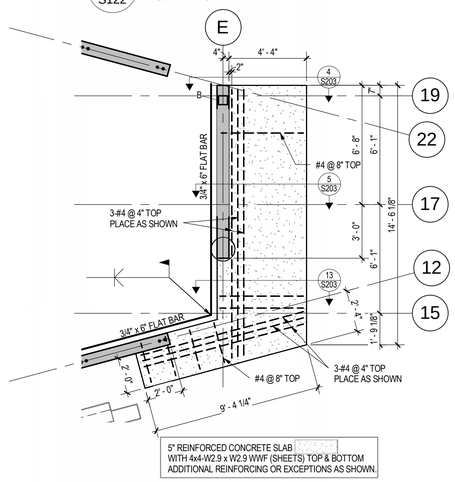
6" REINFORCED CONCRETE SLAB WITH 4x4-W2.9 x W2.9 WWF (SHEETS) TOP & BOTTOM ADDITIONAL REINFORCING OR EXCEPTIONS AS SHOWN.



1 S122

PLAN VIEW

3/4" = 1'-0"



5" REINFORCED CONCRETE SLAB WITH 4x4-W2.9 x W2.9 WWF (SHEETS) TOP & BOTTOM ADDITIONAL REINFORCING OR EXCEPTIONS AS SHOWN.

SUNSHADE PLAN-LEVEL 2

1/4" = 1'-0"

KEY PLAN NOTES	
1	POCKET BEAM INTO WALL. SEE 7/S207
2	CONNECT C9 TO <E> STRUCTURE. SEE 4/S201
3	SEE 12/S204
4	16"Ø FLOOR OPENINGS MUST BE LOCATED BETWEEN <E> FLOOR JOISTS. FIELD VERIFY JOIST LOCATION PRIOR TO CUTTING OPENINGS. COORDINATE EXACT LOCATION WITH MECHANICAL.
5	16"x18" FLOOR OPENING MUST BE LOCATED BETWEEN <E> FLOOR JOISTS. FIELD VERIFY JOIST LOCATION PRIOR TO CUTTING OPENING. DO NOT OVER-CUT OPENING AT CORNERS. COORDINATE EXACT LOCATIONS W/ MECH.
6	ARCHITECTURALLY EXPOSED CONCRETE BOTH FACES
7	VERIFY IN FIELD 1" FLOOR SEPARATION TO DORM WING. CONTACT STRUCTURAL ENGINEER IF MINIMUM SEPARATION IS NOT FOUND.

NEW 9" REINFORCED CONCRETE SLAB WITH #5 @ 12" EACH WAY TOP & BOTTOM WITH ADDITIONAL REINFORCING OR EXCEPTIONS AS NOTED. HOOK ENDS OF TOP BARS AT SLAB EDGES. SEE S000 FOR LAP SPLICE LENGTHS AND LOCATIONS

KNUCKLE PLAN-LEVEL 2

1/4" = 1'-0"

0 1' 2' 4' 8'

* TOP OF FLOOR SLAB ELEVATION NOTED THUS: XXX-X
* SEE SHEET S000 FOR GENERAL NOTES
* SEE SHEET S300 FOR PIER AND COLUMNS SCHEDULES
* SEE ARCHITECTURAL DRAWINGS FOR UNDIMENSIONED OPENING LOCATIONS

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BRAIDEN
KNUCKLE PLAN-LEVEL 2

S122

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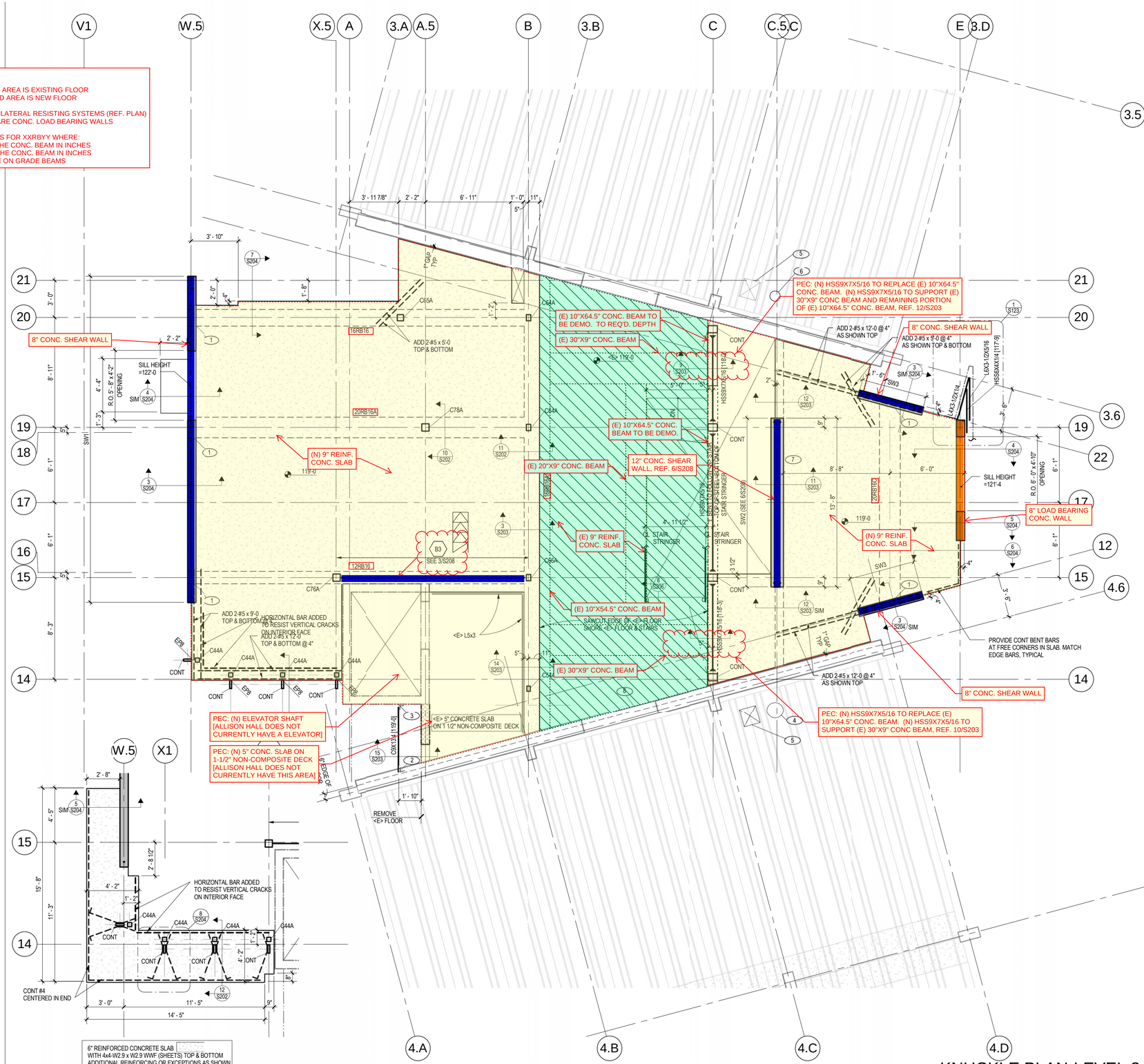
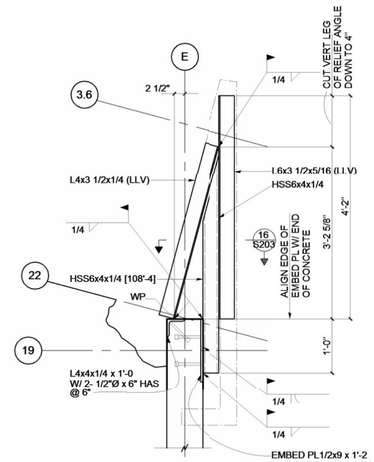
PEC NOTES:

LIGHT GREEN SHADED AREA IS EXISTING FLOOR
LIGHT YELLOW SHADED AREA IS NEW FLOOR

WIDE BLUE LINES ARE LATERAL RESISTING SYSTEMS (REF. PLAN)
WIDE ORANGE LINES ARE CONC. LOAD BEARING WALLS

CONC. BEAM MARK UPS FOR XXRBYY WHERE:
XX = WIDTH OF THE CONC. BEAM IN INCHES
YY = DEPTH OF THE CONC. BEAM IN INCHES
REF. 8/S200 FOR MORE ON GRADE BEAMS

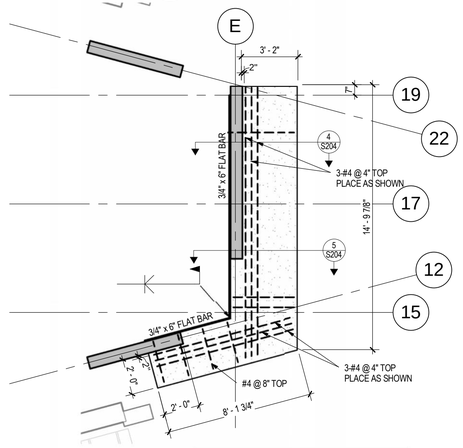




1 S123

PLAN VIEW

3/4" = 1'-0"



5" REINFORCED CONCRETE SLAB WITH 4x4-W2.9 x W2.9 WWF (SHEETS) TOP & BOTTOM ADDITIONAL REINFORCING OR EXCEPTIONS AS SHOWN. HOOK ENDS OF TOP BARS AT SLAB EDGES.

SUNSHADE PLAN-LEVEL 3

1/4" = 1'-0"

6" REINFORCED CONCRETE SLAB WITH 4x4-W2.9 x W2.9 WWF (SHEETS) TOP & BOTTOM ADDITIONAL REINFORCING OR EXCEPTIONS AS SHOWN. HOOK ENDS OF TOP BARS AT SLAB EDGES.

SUNSHADE 2 PLAN-LEVEL 3

1/4" = 1'-0"

KEY PLAN NOTES

1. POCKET BEAM INTO WALL. SEE 7/S207
2. CONNECT C9 TO <E> STRUCTURE. SEE 4/S201
3. SEE 12/S204
4. 16"Ø FLOOR OPENINGS MUST BE LOCATED BETWEEN <E> FLOOR JOISTS. FIELD VERIFY JOIST LOCATION PRIOR TO CUTTING OPENINGS. COORDINATE EXACT LOCATION WITH MECHANICAL.
5. 16"x18" FLOOR OPENING MUST BE LOCATED BETWEEN <E> FLOOR JOISTS. FIELD VERIFY JOIST LOCATION PRIOR TO CUTTING OPENING. DO NOT OVER-CUT OPENING AT CORNERS. COORDINATE EXACT LOCATIONS W/ MECH.
6. 10"Ø FLOOR OPENINGS MUST BE LOCATED BETWEEN <E> FLOOR JOISTS. FIELD VERIFY JOIST LOCATION PRIOR TO CUTTING OPENINGS. COORDINATE EXACT LOCATION WITH MECHANICAL.
7. ARCHITECTURALLY EXPOSED CONCRETE BOTH FACES
8. VERIFY IN FIELD 1" FLOOR SEPARATION TO DORM WING. CONTACT STRUCTURAL ENGINEER IF MINIMUM SEPARATION IS NOT FOUND.

TYPICAL STAIR ASSEMBLY:
PRE-CAST TREADS OVER METAL PANS WITH CLOSED RISERS AND STRINGERS. PER ARCHITECTURAL. FRAME LANDINGS WITH TUBES AND ANGLES AS REQUIRED.STAIR FABRICATOR SHALL DESIGN AND DETAIL ALL MEMBERS, CONNECTIONS AND ASSEMBLIES REQUIRED FOR FRAMING AND SUPPORT OF STAIRS WHERE NOT SHOWN. COORDINATE ALL STAIR ASSEMBLIES AND DETAILS WITH ARCHITECTURAL AND STRUCTURAL DRAWINGS.

NEW 9" REINFORCED CONCRETE SLAB WITH #5 @ 12" EACH WAY TOP & BOTTOM WITH ADDITIONAL REINFORCING OR EXCEPTIONS AS NOTED. HOOK ENDS OF TOP BARS AT SLAB EDGES. SEE S000 FOR LAP SPLICE LENGTHS AND LOCATIONS

KNUCKLE PLAN-LEVEL 3

1/4" = 1'-0"

XXX'-X

0 1' 2' 4' 8'

* TOP OF FLOOR SLAB ELEVATION NOTED THUS:
* SEE SHEET S000 FOR GENERAL NOTES
* SEE SHEET S200 FOR COLUMN SCHEDULE
* SEE ARCHITECTURAL DRAWINGS FOR UNDIMENSIONED OPENING LOCATIONS

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STRUCTURAL JVA
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BRAIDEN HALL 4TH FLOOR ADDITION AND RENOVATION (CSU PROJECT #08-045)
1101 BRAIDEN DRIVE
FORT COLLINS, CO 80523

FINAL RECORD DOCUMENTS 2013.11.13

ISS. # DESCRIPTION DATE

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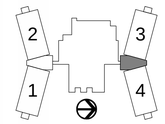

BRAIDEN
KNUCKLE PLAN-LEVEL 3

S123

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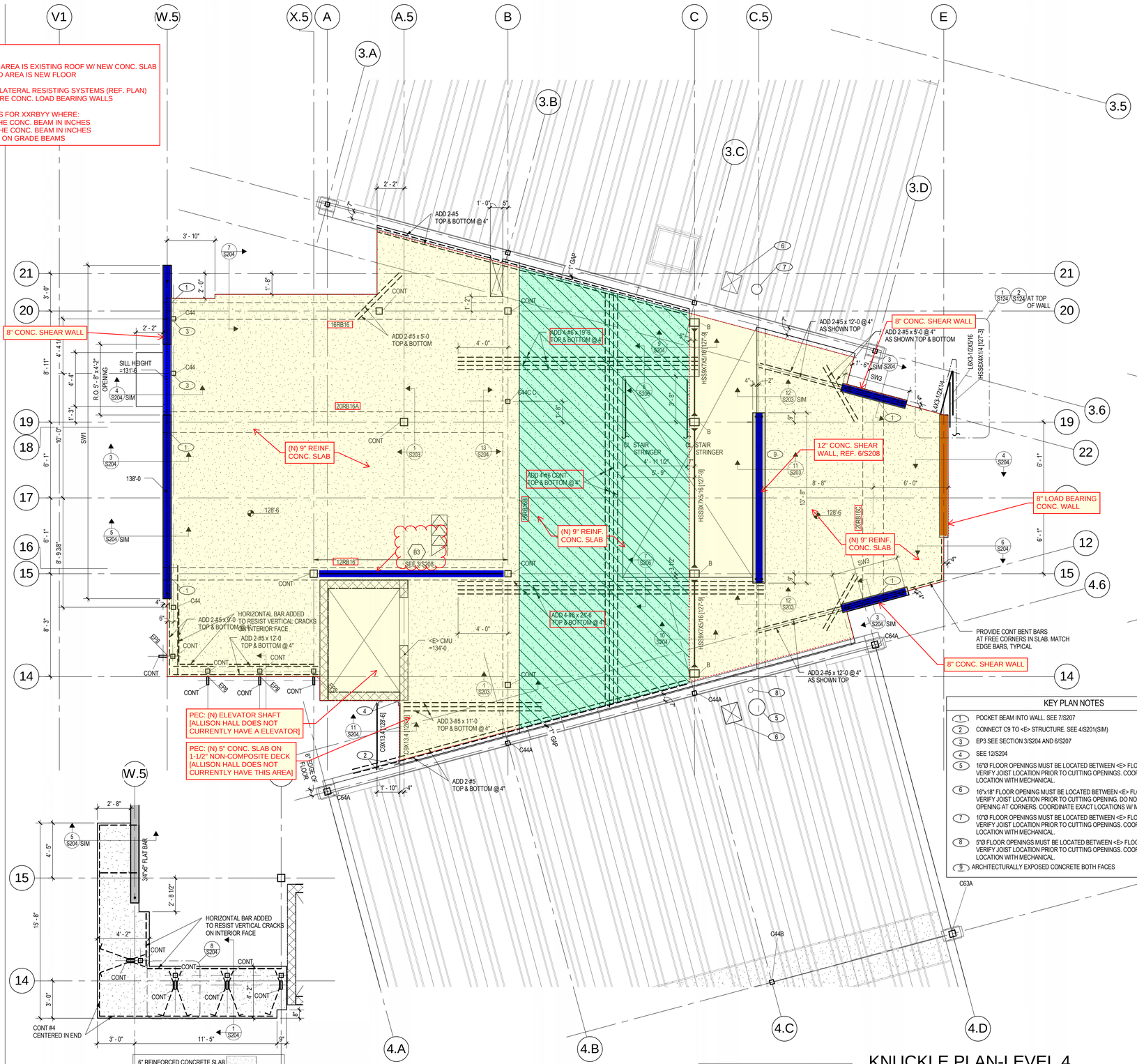
PEC: FOR REFERENCE ONLY

PEC NOTES:

LIGHT GREEN SHADED AREA IS EXISTING ROOF W/ NEW CONC. SLAB
LIGHT YELLOW SHADED AREA IS NEW FLOOR

WIDE BLUE LINES ARE LATERAL RESISTING SYSTEMS (REF. PLAN)
WIDE ORANGE LINES ARE CONC. LOAD BEARING WALLS

CONC. BEAM MARK UPS FOR XXRBYY WHERE:
XX = WIDTH OF THE CONC. BEAM IN INCHES
YY = DEPTH OF THE CONC. BEAM IN INCHES
REF. 8/S200 FOR MORE ON GRADE BEAMS



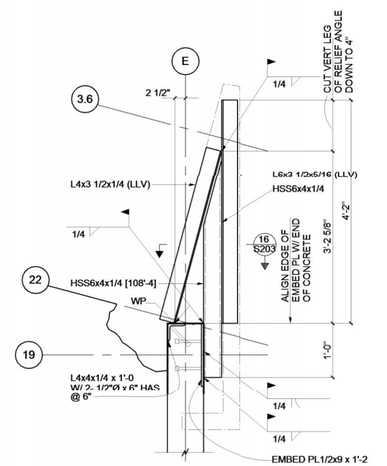
KEY PLAN NOTES

1. POCKET BEAM INTO WALL. SEE 7/S207
2. CONNECT C9 TO <E> STRUCTURE. SEE 4/S201(SIM)
3. EP3 SEE SECTION 3/S204 AND 6/S207
4. SEE 12/S204
5. 16"Ø FLOOR OPENINGS MUST BE LOCATED BETWEEN <E> FLOOR JOISTS. FIELD VERIFY JOIST LOCATION PRIOR TO CUTTING OPENINGS. COORDINATE EXACT LOCATION WITH MECHANICAL.
6. 16"x18" FLOOR OPENING MUST BE LOCATED BETWEEN <E> FLOOR JOISTS. FIELD VERIFY JOIST LOCATION PRIOR TO CUTTING OPENING. DO NOT OVER-CUT OPENING AT CORNERS. COORDINATE EXACT LOCATIONS W/ MECH.
7. 10"Ø FLOOR OPENINGS MUST BE LOCATED BETWEEN <E> FLOOR JOISTS. FIELD VERIFY JOIST LOCATION PRIOR TO CUTTING OPENINGS. COORDINATE EXACT LOCATION WITH MECHANICAL.
8. 5"Ø FLOOR OPENINGS MUST BE LOCATED BETWEEN <E> FLOOR JOISTS. FIELD VERIFY JOIST LOCATION PRIOR TO CUTTING OPENINGS. COORDINATE EXACT LOCATION WITH MECHANICAL.
9. ARCHITECTURALLY EXPOSED CONCRETE BOTH FACES

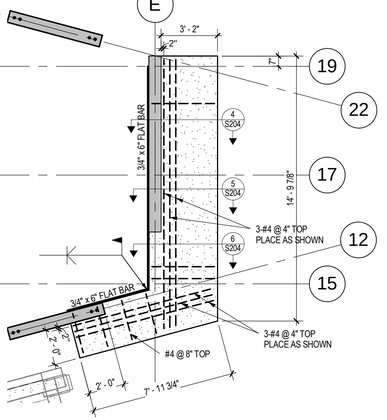
NEW 9" REINFORCED CONCRETE SLAB WITH #5 @ 12" EACH WAY TOP & BOTTOM WITH ADDITIONAL REINFORCING OR EXCEPTIONS AS NOTED. HOOK ENDS OF TOP BARS AT SLAB EDGES. SEE S000 FOR LAP SPLICE LENGTHS AND LOCATIONS

KNUCKLE PLAN-LEVEL 4
1/4" = 1'-0"

* TOP OF FLOOR SLAB ELEVATION NOTED THUS: XXX'-X
* SEE SHEET S000 FOR GENERAL NOTES
* SEE SHEET S300 FOR PIER AND COLUMNS SCHEDULES
* SEE ARCHITECTURAL DRAWINGS FOR UNDIMENSIONED OPENING LOCATIONS

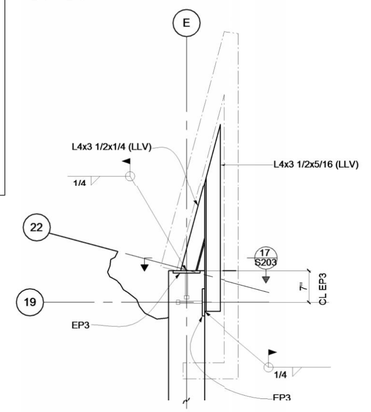


1 S124 PLAN VIEW
3/4" = 1'-0"



5" REINFORCED CONCRETE SLAB WITH 4x4-W2.9 x W2.9 WWF (SHEETS) TOP & BOTTOM ADDITIONAL REINFORCING OR EXCEPTIONS AS SHOWN. HOOK ENDS OF TOP BARS AT SLAB EDGES.

SUNSHADE PLAN-LEVEL 4
1/4" = 1'-0"



2 S124 PLAN VIEW
3/4" = 1'-0"

6" REINFORCED CONCRETE SLAB WITH 4x4-W2.9 x W2.9 WWF (SHEETS) TOP & BOTTOM ADDITIONAL REINFORCING OR EXCEPTIONS AS SHOWN. HOOK ENDS OF TOP BARS AT SLAB EDGES.

SUNSHADE PLAN-LEVEL 4
1/4" = 1'-0"

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CIVIL — JVA, 1319 SPRUCE STEET, BOULDER, CO 80302
LANDSCAPE — RUSSEL + MILLS STUDIOS, 141 S. COLLEGE AVE., STE. 104, FORT COLLINS, CO 80524
STRUCTURAL — JVA, 25 OLD TOWN SQUARE, SUITE 25, FORT COLLINS, CO 80524
MEP — BEAUDIN GANZE, 251 LINDEN STREET #200, FORT COLLINS, CO 80524
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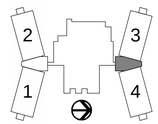

BRAIDEN
KNUCKLE PLAN-LEVEL 4

S124

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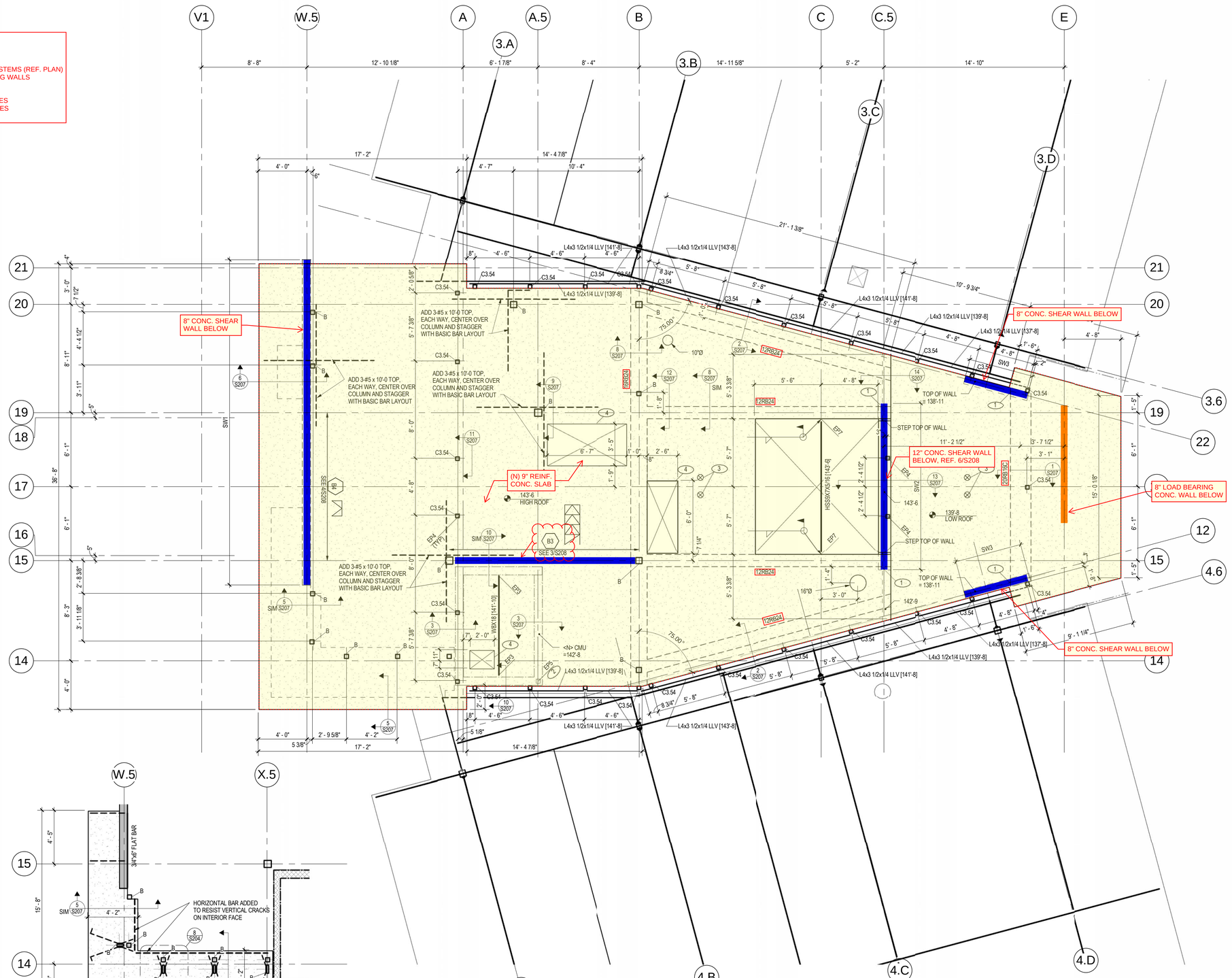
PEC: FOR REFERENCE ONLY

PEC NOTES:

LIGHT YELLOW SHADED AREA IS NEW ROOF

WIDE BLUE LINES ARE LATERAL RESISTING SYSTEMS (REF. PLAN)
WIDE ORANGE LINES ARE CONC. LOAD BEARING WALLS

CONC. BEAM MARK UPS FOR XXRBYY WHERE:
XX = WIDTH OF THE CONC. BEAM IN INCHES
YY = DEPTH OF THE CONC. BEAM IN INCHES
REF. 8/S200 FOR MORE ON GRADE BEAMS



SUNSHADE PLAN-LEVEL 5

1/4" = 1'-0"

KEY PLAN NOTES

1. POCKET BEAM INTO WALL. CAST BEAM DIRECTLY TO WALL (7/S207)
2. SET EMBED PLATE IN TOP OF CMU AT ELEVATION = 142'-9 CENTER IN CORNER. GROUT CORNER SOLID
3. ROOF DRAIN. SEE MECHANICAL
4. OPENING FOR DUCTS, SEE MECHANICAL. ADD 2-#5 T&B TO ALL SIDES OF OPENINGS AND EXTEND 2'-0 BEYOND OPENING

NEW 9" REINFORCED CONCRETE SLAB WITH #5 @ 12" EACH WAY TOP & BOTTOM WITH ADDITIONAL REINFORCING OR EXCEPTIONS AS NOTED. HOOK ENDS OF TOP BARS AT SLAB EDGES. SEE S000 FOR LAP SPLICE LENGTHS AND LOCATIONS

KNUCKLE PLAN-ROOF

1/4" = 1'-0"

0 1' 2' 4' 8'

* TOP OF FLOOR SLAB ELEVATION NOTED THUS: XXX'-X
* SEE SHEET S000 FOR GENERAL NOTES

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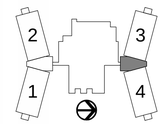
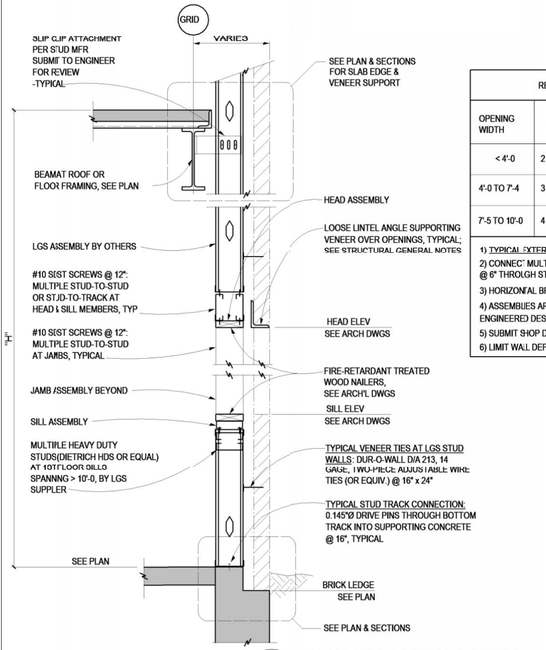


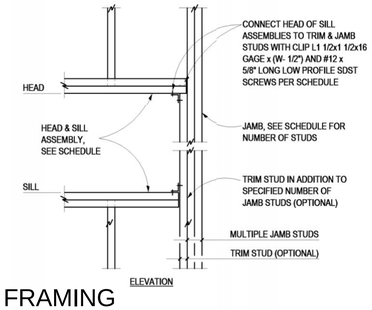
BRAIDEN
KNUCKLE PLAN-ROOF

S125



RECOMMENDED MINIMUM EXTERIOR LGS STUD WALL AND OPENING ASSEMBLIES				
OPENING WIDTH	JAMB	HEAD	SILL	NUMBER OF #10 SDST SCREWS AT CLIP ANGLE CONNECTING HEAD & SILL TO JAMB
< 4'-0	2 STUDS	1 TRACK (FLAT) + 2 STUDS	1 TRACK (FLAT)	2 EACH LEG (4 TOTAL)
4'-0 TO 7'-4	3 STUDS	1 TRACK (FLAT) + 2 STUDS	1 TRACK + 1 STUD (FLAT)	3 EACH LEG (6 TOTAL)
7'-5 TO 10'-0	4 STUDS	1 TRACK (FLAT) + 2 STUDS	1 TRACK + 2 STUDS (FLAT)	4 EACH LEG (8 TOTAL)

1) TYPICAL EXTERIOR WALL STUDS: 600S162-43 @ 16" (H < 14'), CONTINUOUS 600T125-54 TOP & BOTTOM TRACKS
2) CONNECT MULTIPLE STUDS AT HEAD AND SILL JAMBS WITH #10 x 5/8" LONG LOW PROFILE SDST SCREWS @ 6" THROUGH STUD & TRACK WEBS.
3) HORIZONTAL BRIDGING BETWEEN STUDS NOT REQUIRED AT COMPLETED WALL ASSEMBLIES.
4) ASSEMBLIES ARE RECOMMENDED MINIMUMS ONLY AND MAY VARY BASED ON LGS SUPPLIER'S ENGINEERED DESIGN.
5) SUBMIT SHOP DRAWINGS AND CALCULATIONS FOR REVIEW PER SPECIFICATIONS PRIOR TO CONSTRUCTION
6) LIMIT WALL DEFLECTION TO L/180 UNDER FULL WIND LOAD

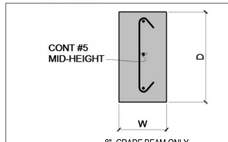


5 S200 SCHEMATIC METAL FRAMING
3/4" = 1'-0"

DRILLED ANCHOR SCHEDULE				
BOLT DIAMETER	EXPANSION		EPOXY	
	* EMBEDMENT CONC	* EDGE DISTANCE	* EMBEDMENT CONC	* EDGE DISTANCE
1/2"	3 1/2"	5"	5"	5"
5/8"	4"	6"	6 5/8"	6 1/2"
3/4"	4 3/4"	7"	8 1/4"	8"

* EMBEDMENTS AND EDGE DISTANCES ARE RECOMMENDED MINIMUMS TO BE USED UNLESS SHOWN OTHERWISE ON THE DRAWINGS. MINIMUMS MAY VARY WITH MANUFACTURER. CONTRACTOR SHALL OBTAIN APPROVAL OF ENGINEER PRIOR TO INSTALLING DRILLED ANCHORS WITH REQUIREMENTS THAT DIFFER FROM THOSE SHOWN ABOVE.

7 S200 SCHEDULE
3/4" = 1'-0"

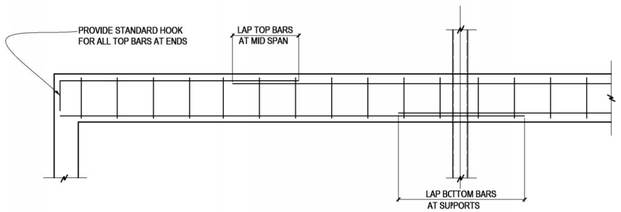


8" GRADE BEAM ONLY

GRADE BEAM SCHEDULE						
MARK	W	D	TOP REINF	BOTTOM REINF	TIES	NOTES
8"						
8GB36	8"	36"	2-#5	2-#5	#4 @ 16"	
16GB36	16"	36"	2-#8	2-#8	#4 @ 16"	
20GB36	20"	36"	2-#9	2-#9	#4 @ 16"	
20GB36A	20"	36"	2-#9	2-#9	#4 @ 16"	PROVIDE CLOSED STIRRUPS
20GB36B	20"	36"	4-#8	2-#6	#4 @ 4"	SEE 14/S201
20GB36C	20"	36"	3-#8	3-#8	#4 @ 8"	
24GB36	20"	36"	4-#8	4-#8	#4 @ 16"	PROVIDE CLOSED STIRRUPS
32GB36	32"	36"	2-#8	3-#8	#4 @ 16"	

1.) SEE GENERAL NOTES ON S000 FOR COVER REQUIREMENTS, SPLICE LENGTHS AND SPLICE LOCATIONS
2.) SEE 1/S201 FOR REBAR LAYOUT AT GRADE BEAM INTERSECTIONS

8 S200 SCHEDULE
1/2" = 1'-0"



BEAM SCHEDULE							
BEAM MARK	SIZE		REINFOCEMENT		STIRRUPS		REMARKS
	W	D	TOP NO. SIZE	BOTTOM NO. SIZE	SIZE	SPACING	
12RB16	12"	16"	2-#8	2-#7	#4	7"	
16RB16	16"	16"	2-#7	2-#7	#4	7"	REDUCE STIRRUP SPACING TO 7" WITHIN 3'-0 OF SUPPORT
16RB16A	16"	16"	2-#6	2-#6	#4	7"	REDUCE STIRRUP SPACING TO 7" WITHIN 3'-0 OF SUPPORT
16RB16B	16"	16"	2-#6	2-#6	#4	7"	REDUCE STIRRUP SPACING TO 7" WITHIN 3'-0 OF SUPPORT (SEE 13/S204)
20RB16A	20"	16"	5-#7	4-#7	#4	7"	REDUCE STIRRUP SPACING TO 7" WITHIN 3'-0 OF SUPPORT (SEE 13/S204)
20RB16B	20"	16"	2-#5	4-#6	#4	7"	REDUCE STIRRUP SPACING TO 7" WITHIN 3'-0 OF SUPPORT
20RB16C	20"	16"	2-#5	4-#7	#4	7"	REDUCE STIRRUP SPACING TO 7" WITHIN 3'-0 OF SUPPORT
12RB24	12"	24"	2-#5	3-#7	#4	11"	REDUCE STIRRUP SPACING TO 11" WITHIN 3'-0 OF SUPPORT
12RB24A	12"	24"	2-#5	3-#6	#4	11"	REDUCE STIRRUP SPACING TO 11" WITHIN 3'-0 OF SUPPORT
16RB24	16"	24"	3-#6	3-#6	#4	11"	REDUCE STIRRUP SPACING TO 11" WITHIN 3'-0 OF SUPPORT (ALSO SEE 12/S207)

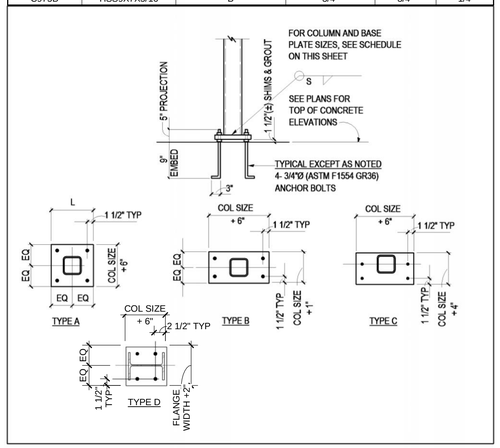
1.) COVER REQUIREMENTS ARE PER GENERAL NOTES ON S000 UNLESS NOTED OTHERWISE

EMBEDDED PLATE SCHEDULE								
MARK	PLATE			HEADED ANCHOR STUDS/REBAR				
	LENGTH	WIDTH	THICKNESS	NUMBER	DIAMETER	LENGTH	COLUMN	ROW
EP1	16"	8"	1/2"	8	1/2" Ø	6"	6	4
EP2	12"	12"	1/2"	4	3/4" Ø	6"	8	8
EP3	8"	6"	1/2"	2	1/2" Ø	6"	NA	6
EP4	6"	6"	3/8"	4	1/2" Ø	6"	4	4
EP5	7"	7"	3/4"	4	1/2" Ø	6"	4	4
EP6	9"	4"	3/8"	2	1/2" Ø	6"	NA	3
EP7	9"	12"	3/8"	3	1/2" Ø	6"	4	NA
EP8	9"	9"	3/8"	2	#4	24"	7	NA
EP9	9 3/4"	5 1/4"	3/8"	2	1/2" Ø	6"	NA	6

* ALL EMBEDDED PLATES SHALL BE PLACED WITH EXPOSED FACE FLUSH TO EXPOSED FACE OF MASONRY OR CONCRETE WALL., UNO

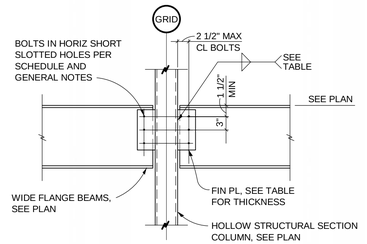
1 S200 SCHEDULE
3/4" = 1'-0"

Structural Column & Baseplate Schedule					
COL MARK	COL SIZE	BASEPLATE TYPE	PL SIZE	BOLTS	WELD (S)
C3.54		EP4			
C8D	W8X40	D	3/4"	3/4"	1/4
C44	HSS4X4X1/4	B	3/4"	3/4"	1/4
C44A	HSS4X4X1/4	A	3/4"	3/4"	1/4
C44B	HSS4X4X1/4	A	3/4"	3/4"	1/4
C44C	HSS4X4X1/4	C	3/4"	3/4"	1/4
C54	HSS5X5X1/4	SEE 12/S201			
C54A	HSS5X5X1/4	SEE 12/S201			
C56A	HSS5X5X3/8	SEE 1/S209			
C63A	HSS6X6X3/16	A	3/4"	3/4"	1/4
C64A	HSS6X6X1/4	A	3/4"	3/4"	1/4
C64B	HSS6X6X1/4	B	3/4"	3/4"	1/4
C65A	HSS6X6X5/16	A	3/4"	3/4"	1/4
C66A	HSS6X6X3/8	B	3/4"	3/4"	1/4
C66B	HSS6X6X3/8	B	1"	3/4"	1/4
C76A	HSS7X7X3/8	SEE 10/S209			
C78A	HSS7X7X1/2	A	1"	3/4"	1/4
C823	HSS8X2X3/16	NO BASE PLATE			
C823B	HSS8X2X3/16	B	3/4"	3/4"	1/4
C975B	HSS9X7X5/16	B	3/4"	3/4"	1/4



2 S200 SCHEDULE
3/4" = 1'-0"

6 S200 SCHEDULE
3/4" = 1'-0"



BOLTS SHALL BE 3/4" DIA. TYPICAL, EXCEPT AT LOCATIONS NOTED ON PLAN WHERE 1" DIA. BOLTS ARE REQUIRED

SHEAR TAB / BEAM TO HSS COLUMN CONNECTION SCHEDULE						
BEAM SIZE	# OF BOLTS	FIN PL THICKNESS	WELD	MINIMUM HSS WALL THICKNESS	CAPACITIES (KIPS)	
					3/4" BOLTS	1" BOLTS
W8, W10	2	3/8"	1/4"	3/16"	21.2	27.7
W12, W14	3	3/8"	1/4"	3/16"	31.8	40.0
W16	4	3/8"	1/4"	3/16"	42.4	52.2
W18	5	3/8"	1/4"	3/16"	53.0	64.4
W21	6	3/8"	1/4"	3/16"	63.6	76.7
W24	7	3/8"	1/4"	1/4"	74.2	88.9

ASSUMPTIONS: (DERIVED FROM AISC STEEL CONSTRUCTION MANUAL, 13TH EDITION TABLES 10-9a
1. FLEXIBLE SUPPORT USING A325-N BOLTS IN SHORT SLOTTED HOLES
2. b/t < 37.3 FOR 46ksi HOLLOW STRUCTURAL SECTION
3. E70XX WELD ELECTRODES
4. Fy = 36ksi FOR FIN PLATES
5. BLOCK SHEAR AND BENDING CAPACITY OF COPED MEMBERS MAY GOVERN CAPACITY AND IS CHECKED SEPARATELY
6. MINIMUM WEB THICKNESS, t_w FOR WIDE FLANGE BEAMS IS 3/16"

3 S200 SCHEDULE
3/4" = 1'-0"

BEAM TO BEAM CONNECTION SCHEDULE						
BEAM SIZE	# OF BOLTS	CONNECTION ANGLE	SINGLE ANGLE ASD CAPACITIES (KIPS)		DOUBLE ANGLE ASD CAPACITIES (KIPS)	
			3/4" BOLTS	1" BOLTS	3/4" BOLTS	1" BOLTS
W8, W10	2	L4x3 1/2x 3/8	11	19	29.5	42.4
W12, W14	3	L4x3 1/2x 3/8	20	37	63.6	66.9
W16	4	L4x3 1/2x 3/8	32	58	84.8	91.4
W18	5	L4x3 1/2x 3/8	44	78	106	116
W21	6	L4x3 1/2x 3/8	55	98	127	140
W24	7	L4x3 1/2x 3/8	66	117	148	165
W27	8	L4x3 1/2x 3/8	77	137	170	189

ASSUMPTIONS: (DERIVED FROM AISC STEEL CONSTRUCTION MANUAL 13th EDITION, TABLE 10-1.
1. FLEXIBLE SUPPORT USING A325-N BOLTS IN STANDARD HOLES
2. Fy = 36ksi FOR CONNECTION ANGLE
3. BLOCK SHEAR AND BENDING CAPACITY OF COPED MEMBERS MAY GOVERN CAPACITY AND IS CHECKED SEPARATELY
4. MINIMUM WEB THICKNESS, tw FOR WIDE FLANGE BEAMS IS 1/4"
5. MINIMUM LENGTH OF ANGLE IS 1/2 OF BEAM DEPTH

4 S200 SCHEDULE
3/4" = 1'-0"

4240 Architecture Inc.

OWNER COLORADO STATE UNIVERSITY
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MEP BEAUDIN GANZE
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Colorado State University
BRAIDEN HALL 4TH FLOOR ADDITION AND RENOVATION (CSU PROJECT #08-045)
1101 BRADEN DRIVE
FORT COLLINS, CO 80523

FINAL RECORD DOCUMENTS	2013.11.13
ISS. # DESCRIPTION	DATE
ARCHITECT'S PROJECT NO. :	21067.00

BRAIDEN
SCHEDULES AND TYPICAL SECTIONS

S200

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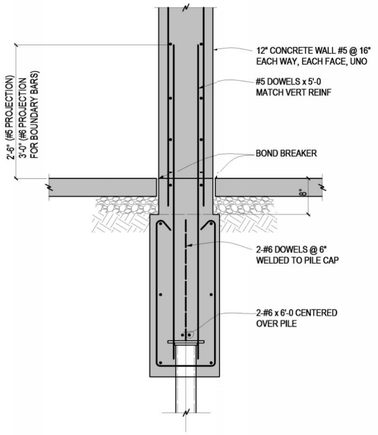
PEC: FOR REFERENCE ONLY



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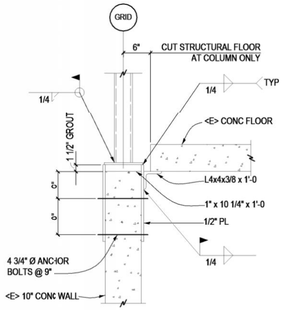

12 S201 SECTION
3/4" = 1'-0"

NOT USED

13 S201 SECTION
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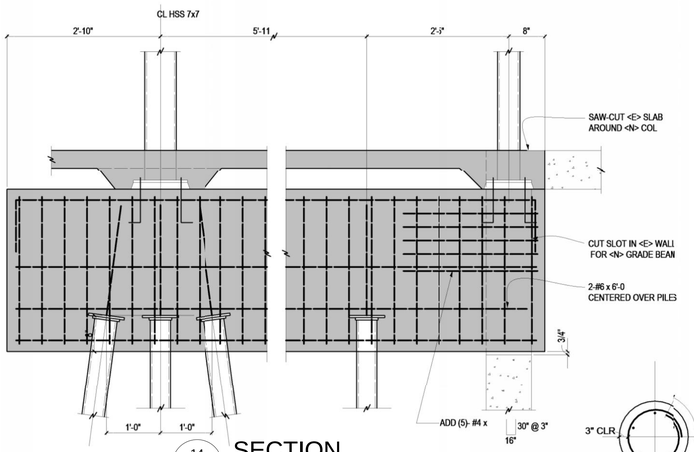

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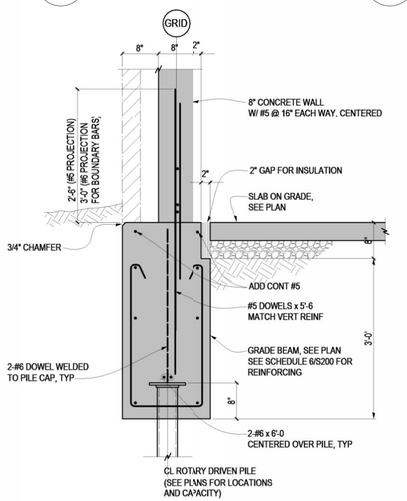

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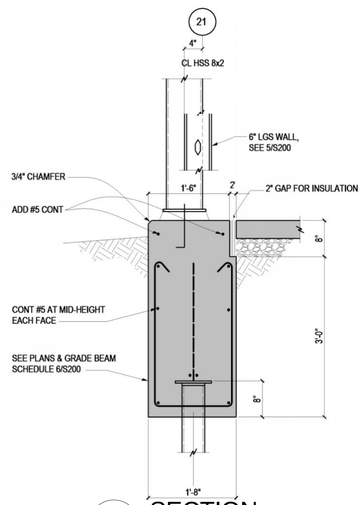

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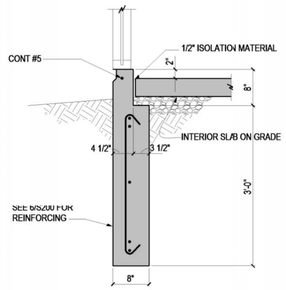

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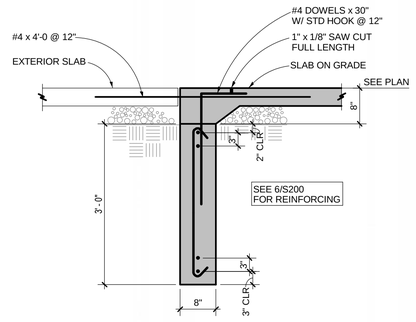

TYPICAL EXTERIOR DOOR THRESHOLD

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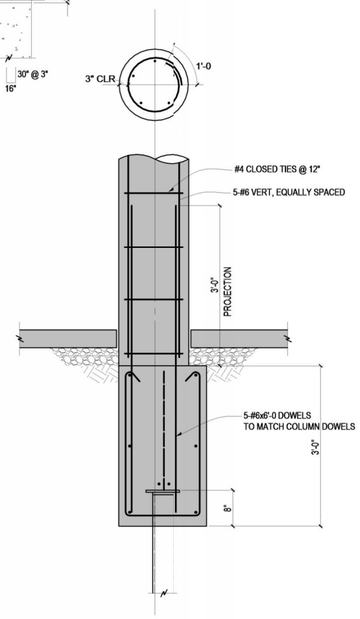

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3/4" = 1'-0"

TYPICAL CONCRETE WALL & GRADE BEAM INTERSECTIONS

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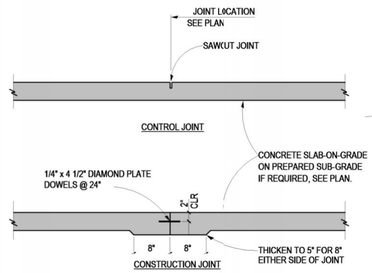
0 6" 1' 2' 3'



TYPICAL JOINTS AT INTERIOR SLAB-ON-GRADE

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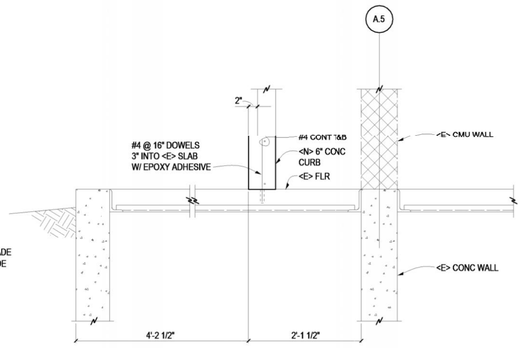

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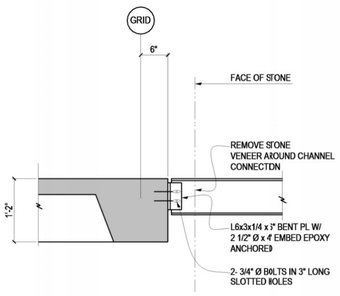

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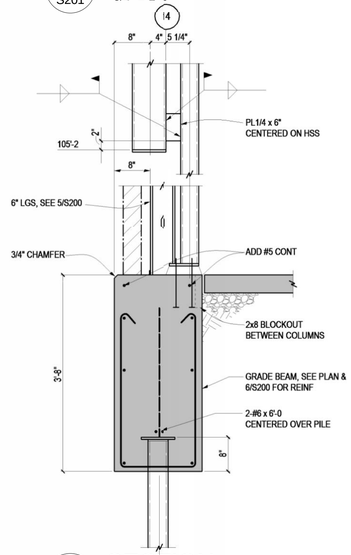

5 S201 SECTION
3/4" = 1'-0"

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4240 Architecture Inc.

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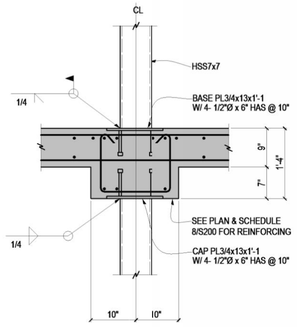
BRAIDEN
SECTIONS

S201



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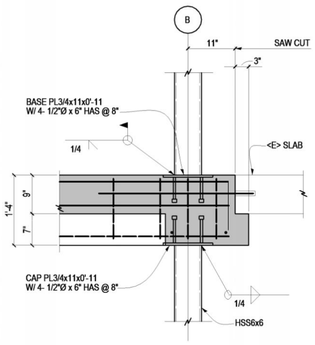

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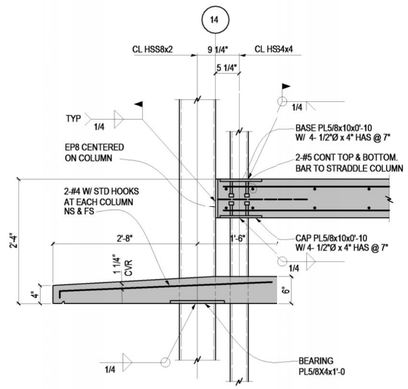

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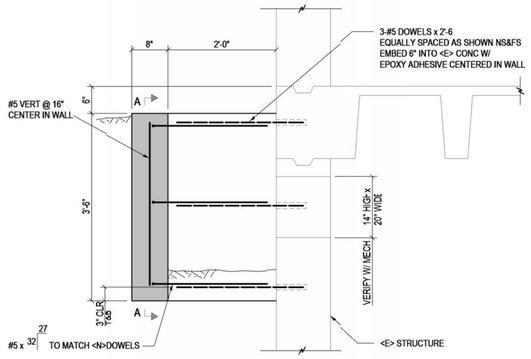

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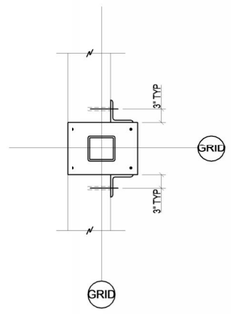

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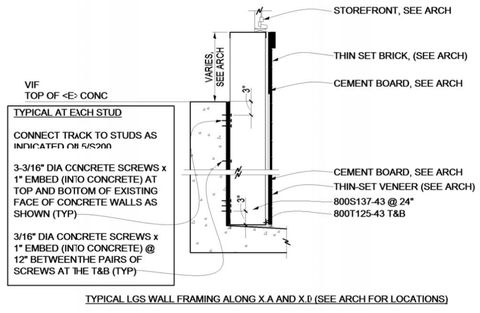

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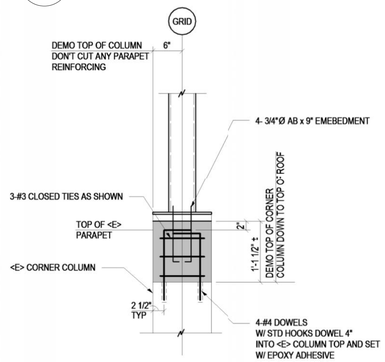

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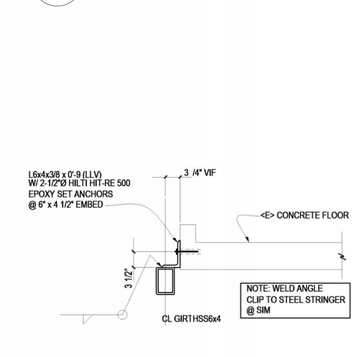

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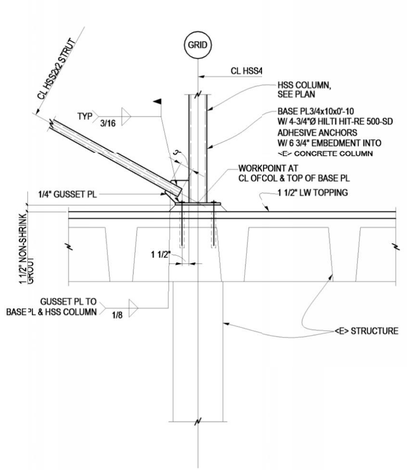

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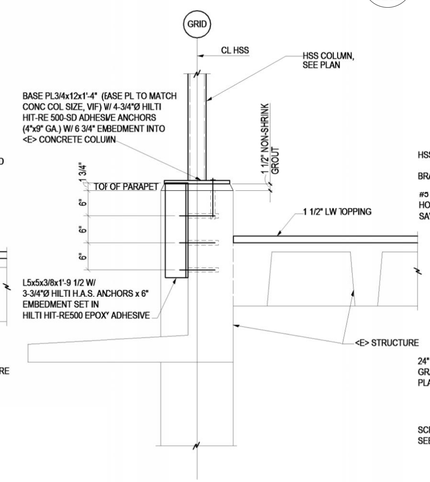

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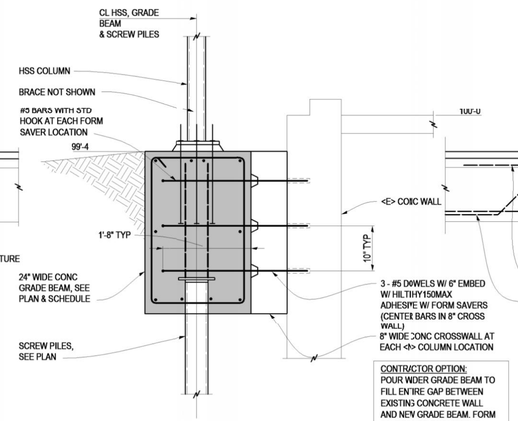

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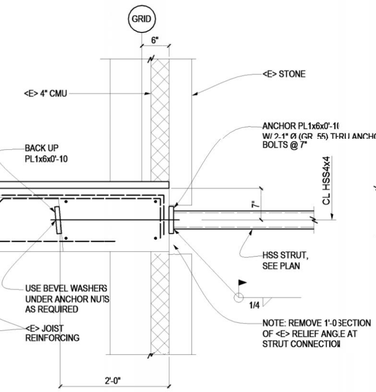

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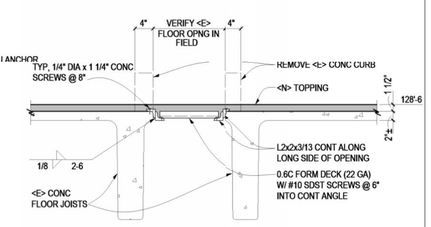

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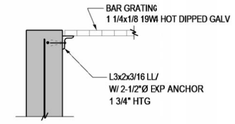

SECTION A-A

4240 Architecture Inc.

OWNER	COLORADO STATE UNIVERSITY FACILITY SERVICES NORTH 251 EDISON ST. FORT COLLINS, CO 80523
ARCHITECT	4240 ARCHITECTURE INC 3003 LARIMER STREET DENVER, CO 80205
CONTRACTOR	KIEWIT BUILDING GROUP, INC. 7200 SOUTH ALTON WAY, SUITE A-300 ENGLEWOOD, CO 80112
CIVIL	JVA 1319 SPRUCE STEET BOULDER, CO 80302
LANDSCAPE	RUSSEL + MILLS STUDIOS 141 S. COLLEGE AVE., STE. 104 FORT COLLINS, CO 80524
STRUCTURAL	JVA 25 OLD TOWN SQUARE, SUITE 25 FORT COLLINS, CO 80524
MEP	BEAUDIN GANZE 251 LINDEN STREET #200 FORT COLLINS, CO 80524
ENVELOPE CONSULTANT	TECHNISCAN 155 SOUTH MADISON STREET, SUITE 226 DENVER, CO 80209

Colorado State University

BRAIDEN HALL 4TH FLOOR ADDITION AND RENOVATION (CSU PROJECT #08-045)
1101 BRAIDEN DRIVE
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BRAIDEN
SECTIONS

S202

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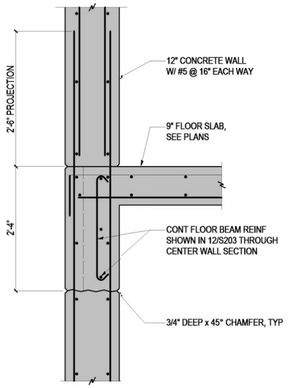

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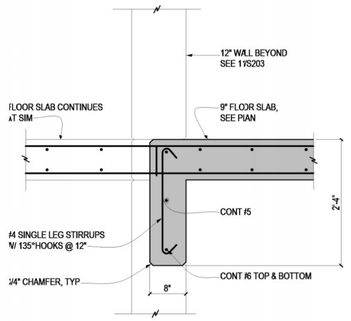

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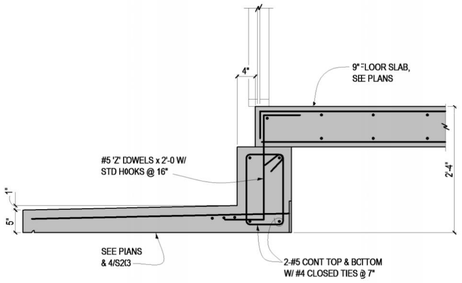

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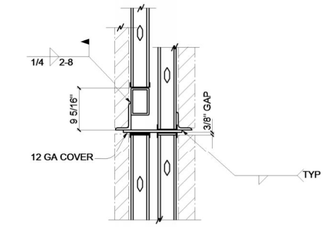

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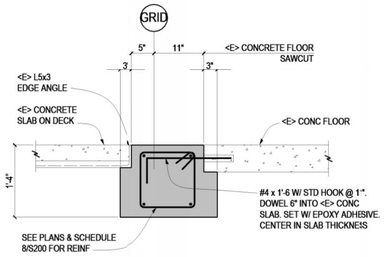

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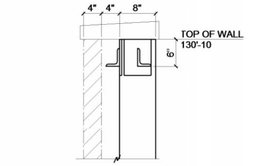

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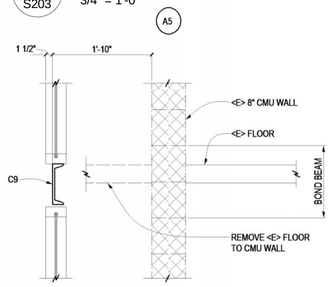

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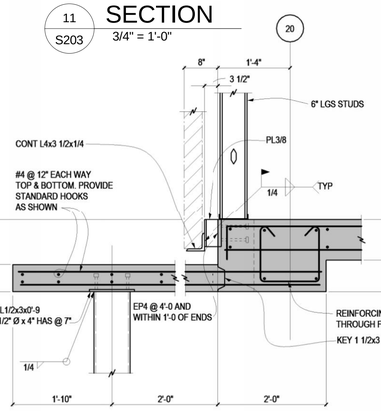

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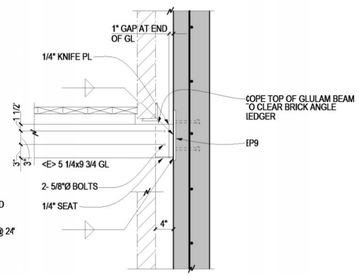

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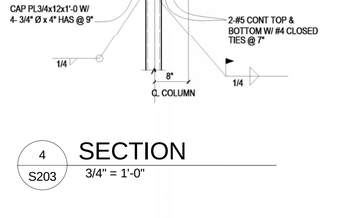
NOT USED

8 S203 SECTION 3/4" = 1'-0"



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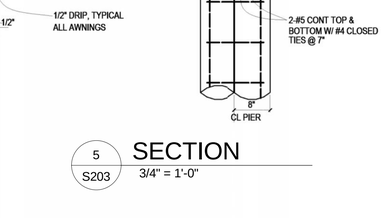

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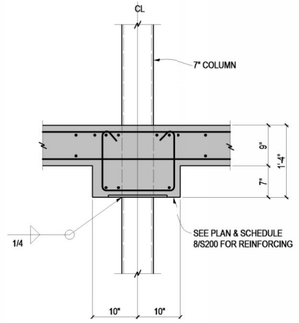

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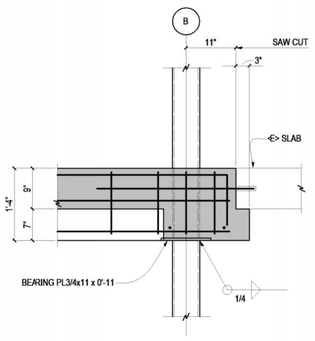

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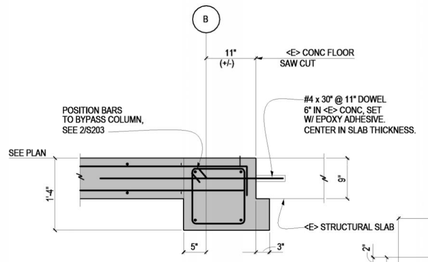

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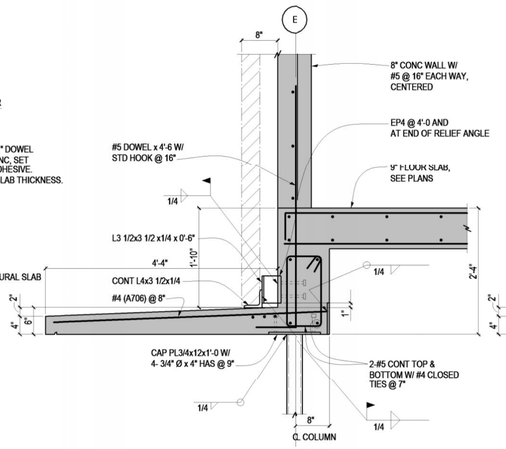

4 S203 SECTION 3/4" = 1'-0"

5 S203 SECTION 3/4" = 1'-0"

0 6" 1' 2' 3'

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4240 Architecture Inc.

OWNER	COLORADO STATE UNIVERSITY FACILITY SERVICES NORTH 251 EDISON ST. FORT COLLINS, CO 80523
ARCHITECT	4240 ARCHITECTURE INC 3003 LARIMER STREET DENVER, CO 80205
CONTRACTOR	KIEWIT BUILDING GROUP, INC. 7200 SOUTH ALTON WAY, SUITE A-300 ENGLEWOOD, CO 80112
CIVIL	JVA 1319 SPRUCE STEET BOULDER, CO 80302
LANDSCAPE	RUSSEL + MILLS STUDIOS 141 S. COLLEGE AVE., STE. 104 FORT COLLINS, CO 80524
STRUCTURAL	JVA 25 OLD TOWN SQUARE, SUITE 25 FORT COLLINS, CO 80524
MEP	BEAUDIN GANZE 251 LINDEN STREET #200 FORT COLLINS, CO 80524
ENVELOPE CONSULTANT	TECHNISCAN 155 SOUTH MADISON STREET, SUITE 226 DENVER, CO 80209

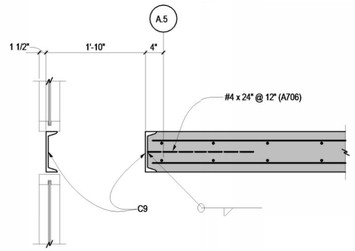
Colorado State University

BRAIDEN HALL 4TH FLOOR ADDITION AND RENOVATION (CSU PROJECT #08-045)
1101 BRAIDEN DRIVE
FORT COLLINS, CO 80523

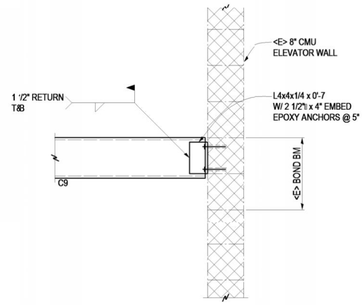
FINAL RECORD DOCUMENTS	2013.11.13
ISS. # DESCRIPTION	DATE
ARCHITECT'S PROJECT NO. :	21067.00

BRAIDEN
SECTIONS

S203



11 S204 SECTION
3/4" = 1'-0"



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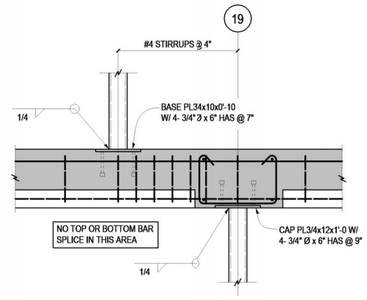
3/4" = 1'-0"



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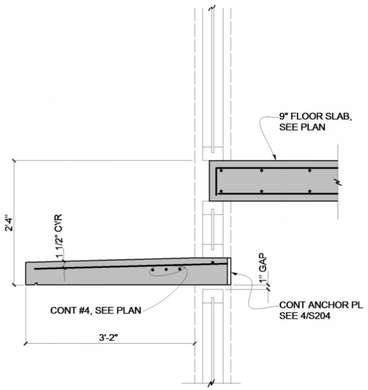
3/4" = 1'-0"



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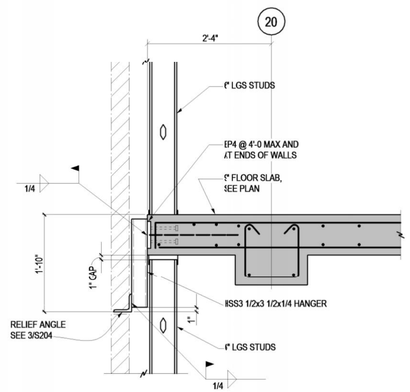
3/4" = 1'-0"



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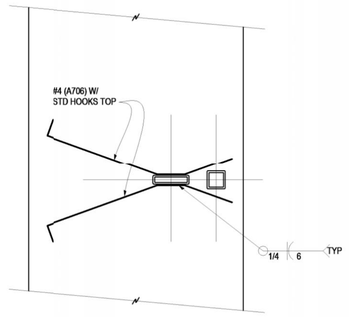
3/4" = 1'-0"



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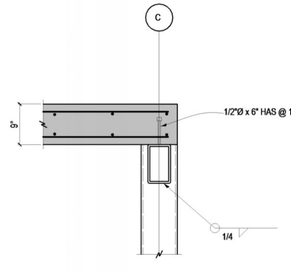
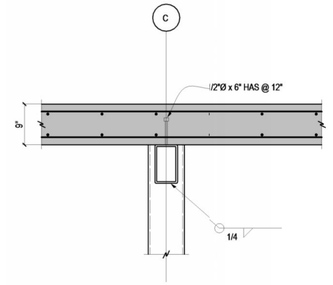
3/4" = 1'-0"



9 S204 SECTION
3/4" = 1'-0"



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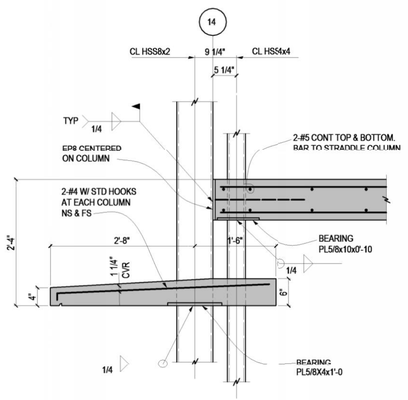
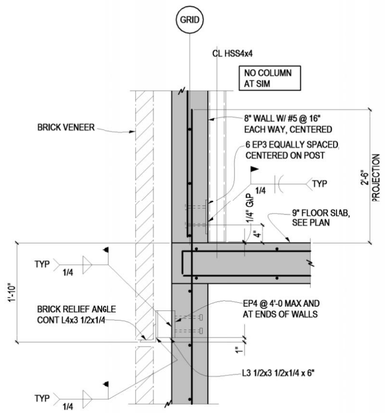
3/4" = 1'-0"



1 S204 SECTION
3/4" = 1'-0"

NOT USED

2 S204 SECTION
3/4" = 1'-0"



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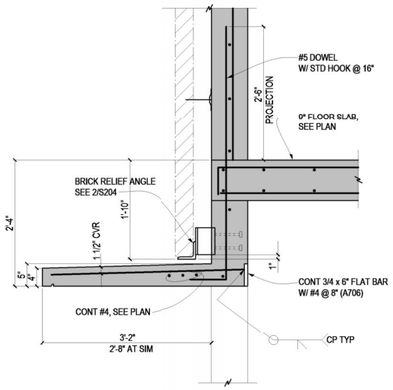

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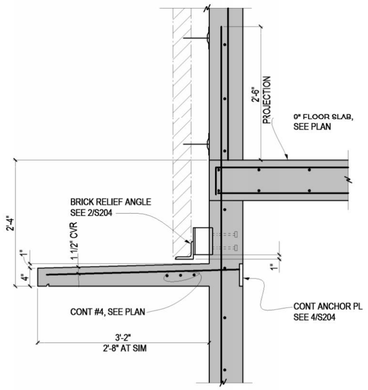

5 S204 SECTION
3/4" = 1'-0"

12/16/2013 1:25:42 PM

4240 Architecture Inc.

OWNER	COLORADO STATE UNIVERSITY FACILITY SERVICES NORTH 251 EDISON ST. FORT COLLINS, CO 80523
ARCHITECT	4240 ARCHITECTURE INC 3003 LARIMER STREET DENVER, CO 80205
CONTRACTOR	KIEWIT BUILDING GROUP, INC. 7200 SOUTH ALTON WAY, SUITE A-300 ENGLEWOOD, CO 80112
CIVIL	JVA 1319 SPRUCE STEET BOULDER, CO 80302
LANDSCAPE	RUSSEL + MILLS STUDIOS 141 S. COLLEGE AVE., STE. 104 FORT COLLINS, CO 80524
STRUCTURAL	JVA 25 OLD TOWN SQUARE, SUITE 25 FORT COLLINS, CO 80524
MEP	BEAUDIN GANZE 251 LINDEN STREET #200 FORT COLLINS, CO 80524
ENVELOPE CONSULTANT	TECHNISCAN 155 SOUTH MADISON STREET, SUITE 226 DENVER, CO 80209

Colorado State University

BRAIDEN HALL 4TH FLOOR ADDITION AND RENOVATION (CSU PROJECT #08-045)
1101 BRAIDEN DRIVE
FORT COLLINS, CO 80523

FINAL RECORD DOCUMENTS	2013.11.13
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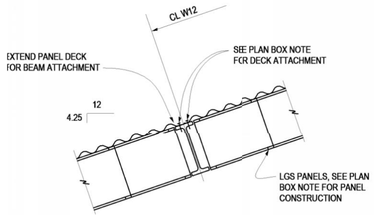
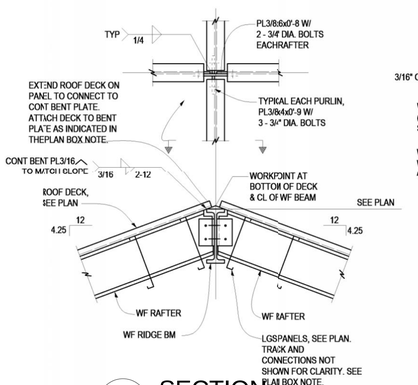
BRAIDEN
SECTIONS

S204

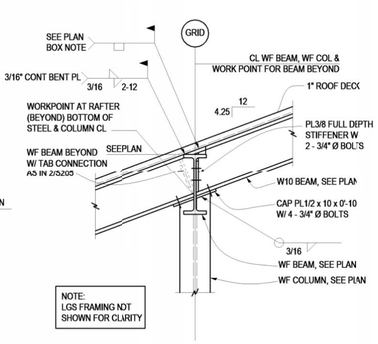


ROOF LGS FRAMING SHALL BE CONSTRUCTED IN PANELS AND LIFTED INTO PLACE. SEE PLAN BOX NOTE.

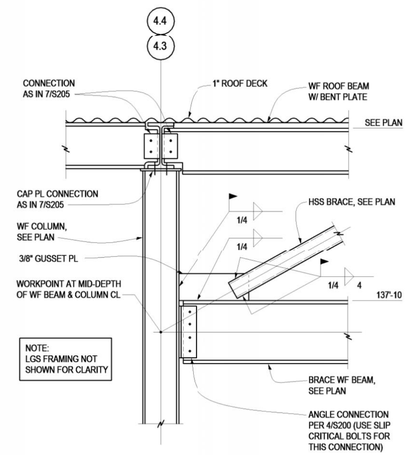
11 S205 SECTION 3/4" = 1'-0"



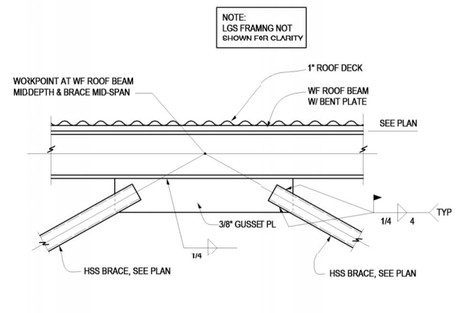
6 S205 SECTION 3/4" = 1'-0"



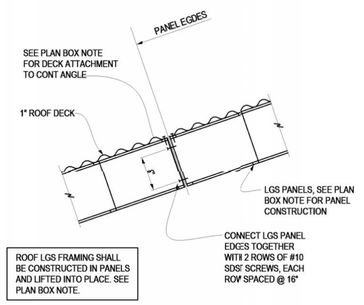
7 S205 SECTION 3/4" = 1'-0"



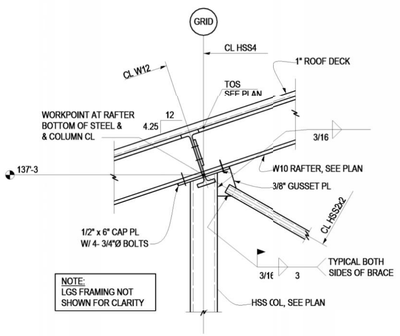
8 S205 SECTION 3/4" = 1'-0"



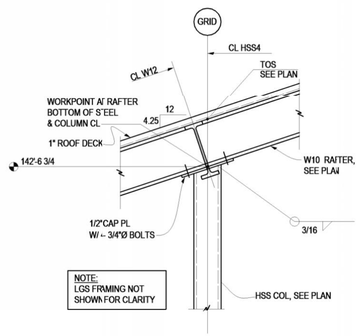
9 S205 SECTION 3/4" = 1'-0"



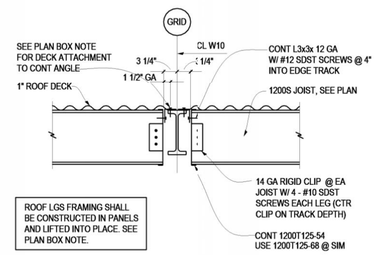
10 S205 SECTION 3/4" = 1'-0"



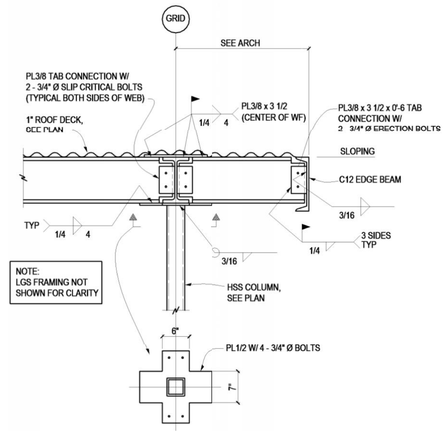
1 S205 SECTION 3/4" = 1'-0"



2 S205 SECTION 3/4" = 1'-0"



3 S205 SECTION 3/4" = 1'-0"



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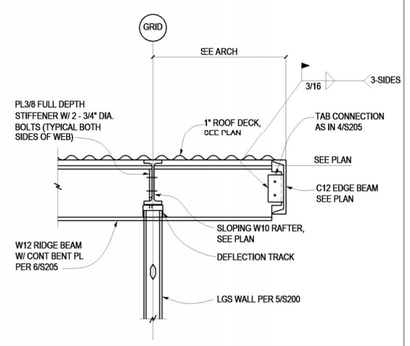

5 S205 SECTION 3/4" = 1'-0"

12/16/2013 1:25:44 PM

4240 Architecture Inc.

OWNER	COLORADO STATE UNIVERSITY FACILITY SERVICES NORTH 251 EDISON ST. FORT COLLINS, CO 80523
ARCHITECT	4240 ARCHITECTURE INC 3003 LARIMER STREET DENVER, CO 80205
CONTRACTOR	KIEWIT BUILDING GROUP, INC. 7200 SOUTH ALTON WAY, SUITE A-300 ENGLEWOOD, CO 80112
CIVIL	JVA 1319 SPRUCE STEET BOULDER, CO 80302
LANDSCAPE	RUSSEL + MILLS STUDIOS 141 S. COLLEGE AVE., STE. 104 FORT COLLINS, CO 80524
STRUCTURAL	JVA 25 OLD TOWN SQUARE, SUITE 25 FORT COLLINS, CO 80524
MEP	BEAUDIN GANZE 251 LINDEN STREET #200 FORT COLLINS, CO 80524
ENVELOPE CONSULTANT	TECHNISCAN 155 SOUTH MADISON STREET, SUITE 226 DENVER, CO 80209

Colorado State University
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1101 BRADEN DRIVE
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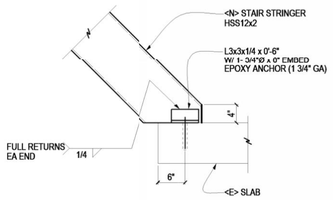
BRAIDEN
SECTIONS

S205



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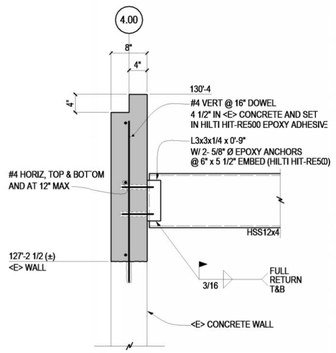
3/4" = 1'-0"



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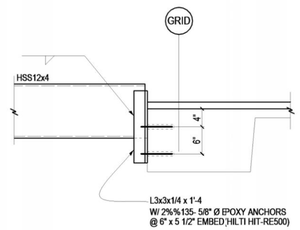
3/4" = 1'-0"



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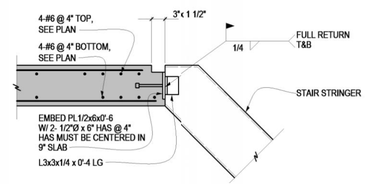
3/4" = 1'-0"



6 / S206 SECTION
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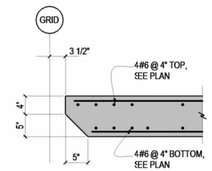

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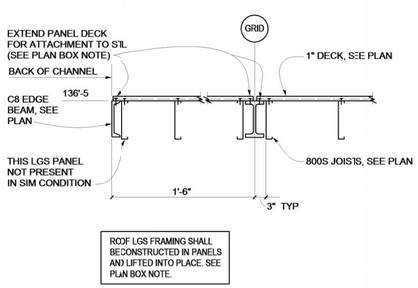
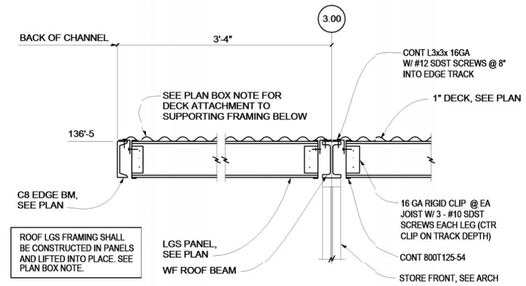


1 / S206 SECTION
3/4" = 1'-0"

0 6" 1' 2' 3'



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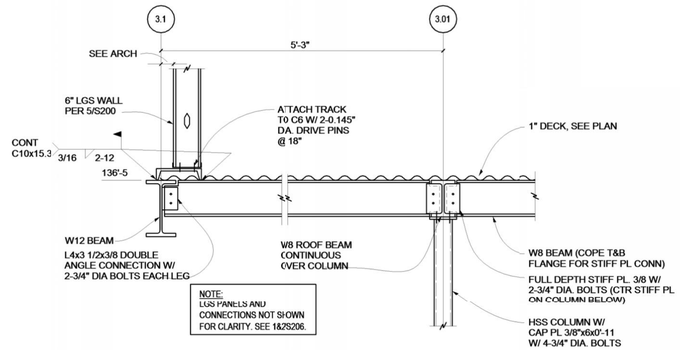

3 / S206 SECTION
3/4" = 1'-0"

12/16/2013 1:25:48 PM

4240 Architecture Inc.

OWNER	COLORADO STATE UNIVERSITY FACILITY SERVICES NORTH 251 EDISON ST. FORT COLLINS, CO 80523
ARCHITECT	4240 ARCHITECTURE INC 3003 LARIMER STREET DENVER, CO 80205
CONTRACTOR	KIEWIT BUILDING GROUP, INC. 7200 SOUTH ALTON WAY, SUITE A-300 ENGLEWOOD, CO 80112
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Colorado State University

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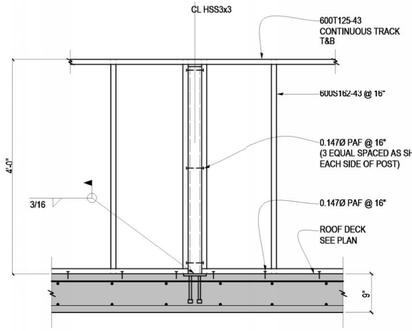
BRAIDEN
SECTIONS

S206

PEC: FOR REFERENCE ONLY



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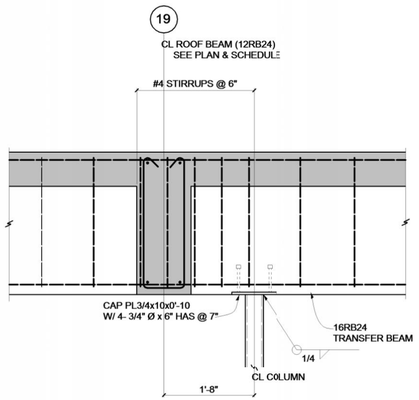

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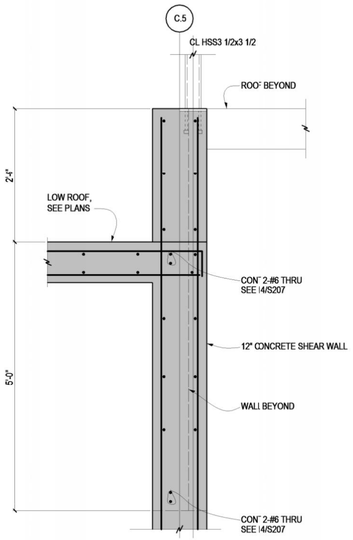

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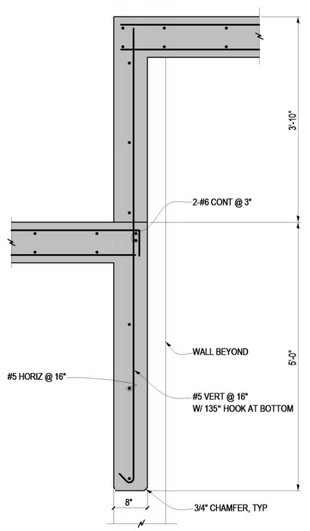
3/4" = 1'-0"



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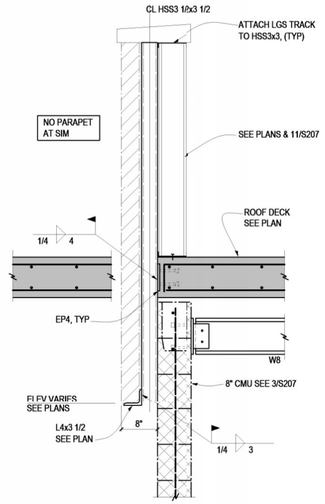
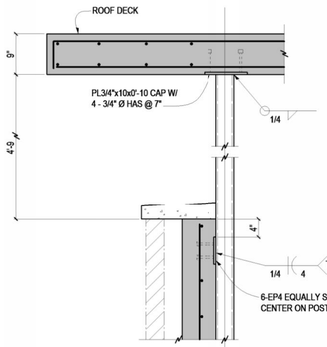
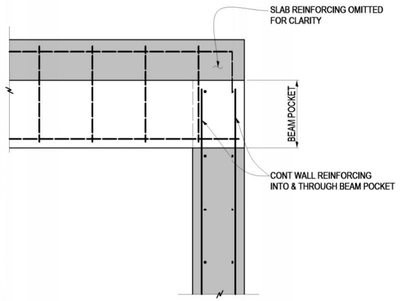
3/4" = 1'-0"



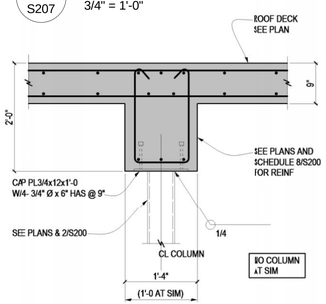
10 S207 SECTION
3/4" = 1'-0"



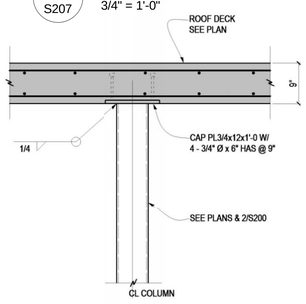
6 S207 SECTION CL HSS4x4
3/4" = 1'-0"



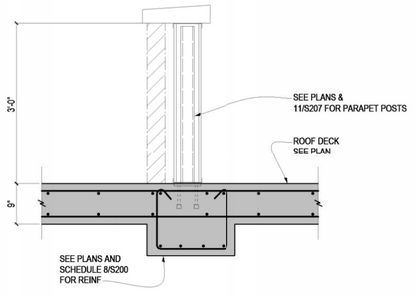
7 S207 SECTION
3/4" = 1'-0"



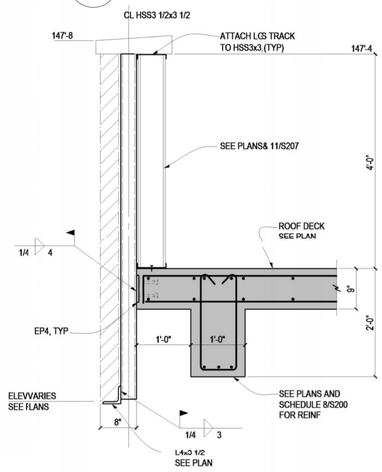
8 S207 SECTION
3/4" = 1'-0"



9 S207 SECTION
3/4" = 1'-0"



1 S207 SECTION
3/4" = 1'-0"
0 6" 1' 2' 3'



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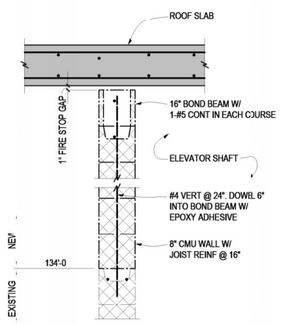
3/4" = 1'-0"



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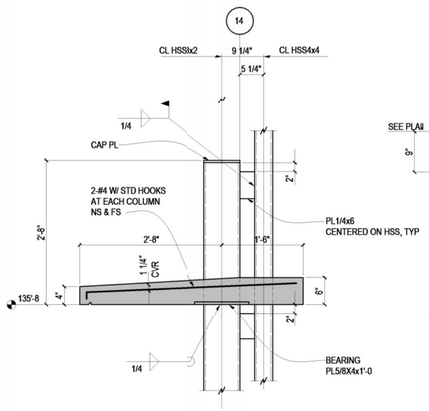
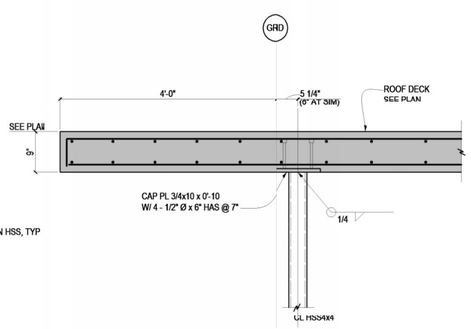


4 S207 SECTION
3/4" = 1'-0"



5 S207 SECTION
3/4" = 1'-0"

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4240 Architecture Inc.

OWNER	COLORADO STATE UNIVERSITY FACILITY SERVICES NORTH 251 EDISON ST. FORT COLLINS, CO 80523
ARCHITECT	4240 ARCHITECTURE INC 3003 LARIMER STREET DENVER, CO 80205
CONTRACTOR	KIEWIT BUILDING GROUP, INC. 7200 SOUTH ALTON WAY, SUITE A-300 ENGLEWOOD, CO 80112
CIVIL	JVA 1319 SPRUCE STEET BOULDER, CO 80302
LANDSCAPE	RUSSEL + MILLS STUDIOS 141 S. COLLEGE AVE., STE. 104 FORT COLLINS, CO 80524
STRUCTURAL	JVA 25 OLD TOWN SQUARE, SUITE 25 FORT COLLINS, CO 80524
MEP	BEAUDIN GANZE 251 LINDEN STREET #200 FORT COLLINS, CO 80524
ENVELOPE CONSULTANT	TECHNISCAN 155 SOUTH MADISON STREET, SUITE 226 DENVER, CO 80209

Colorado State University

BRAIDEN HALL 4TH FLOOR ADDITION AND
RENOVATION (CSU PROJECT #08-045)
1101 BRADEN DRIVE
FORT COLLINS, CO 80523

FINAL RECORD DOCUMENTS	2013.11.13
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BRAIDEN
SECTIONS

S207

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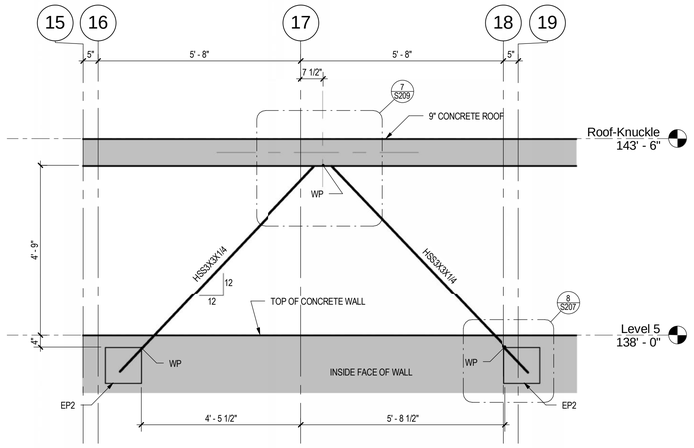
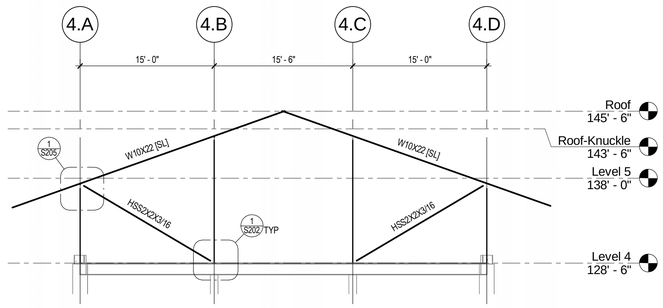
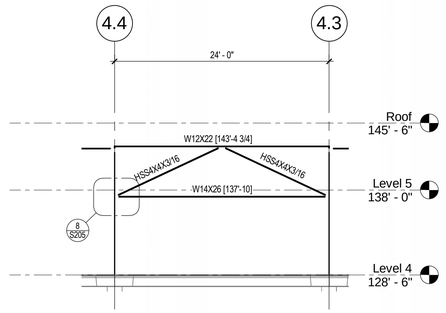


4 S208 BRACE B4 ON GRID LINE W.5
1/2" = 1'-0"

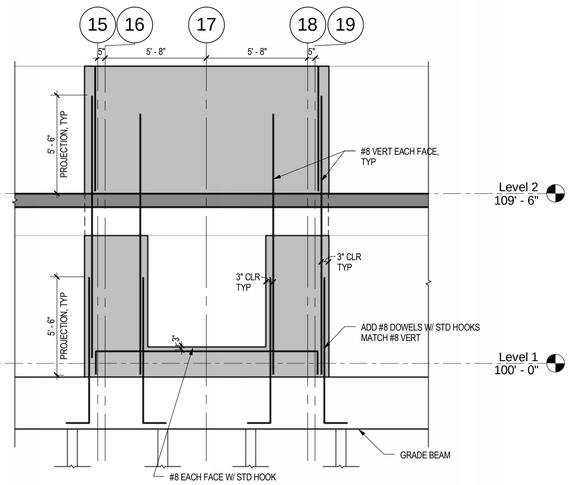


BRACED FRAMES B5 ON GRID LINES 4.2, 4.3, 4.4 AND 4.5

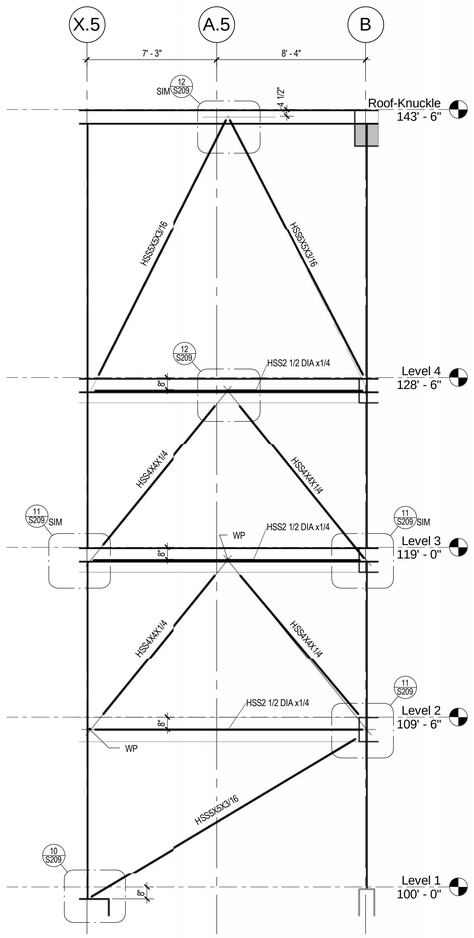
7 S208 1/8" = 1'-0"



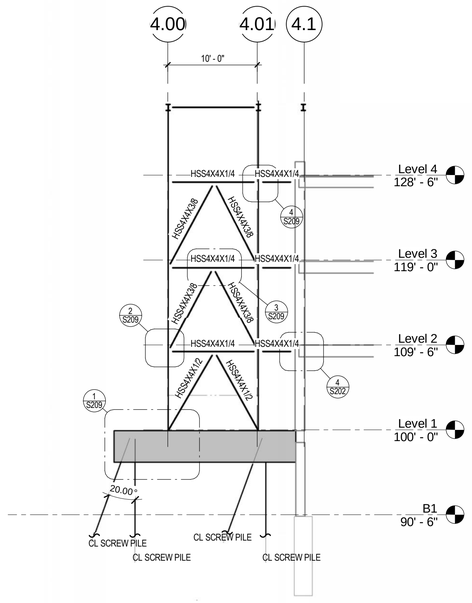
5 S208 RIGID FRAME RF1 ON GRID LINES 4.B AND 4.C
1/8" = 1'-0"



6 S208 SECTION SW2
1/4" = 1'-0"

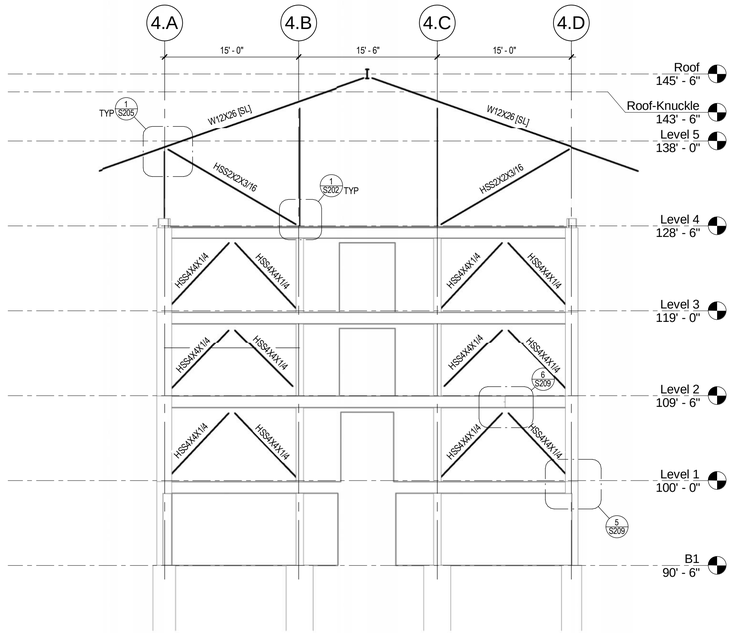


3 S208 BRACE B3 ON GRID LINE 15
1/4" = 1'-0"



1 S208 BRACE B1
1/8" = 1'-0"

0 2' 4' 8' 16'



2 S208 BRACED FRAMES B2 ON GRID LINE 4.6 AND 4.1
1/8" = 1'-0"

4240 Architecture Inc.

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CONTRACTOR KIEWIT BUILDING GROUP, INC.
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CIVIL JVA
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251 LINDEN STREET #200
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155 SOUTH MADISON STREET, SUITE 226
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Colorado State University

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1101 BRAIDEN DRIVE
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BRAIDEN
BRACED AND RIGID FRAMES & SECTIONS

S208

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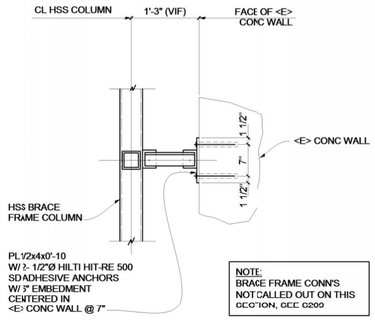
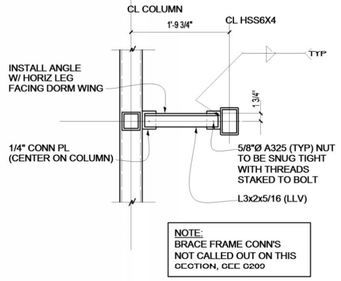
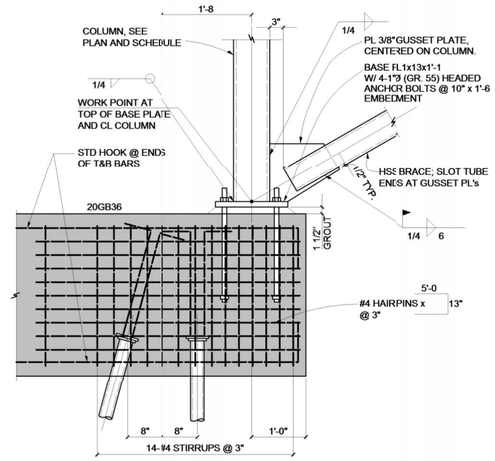


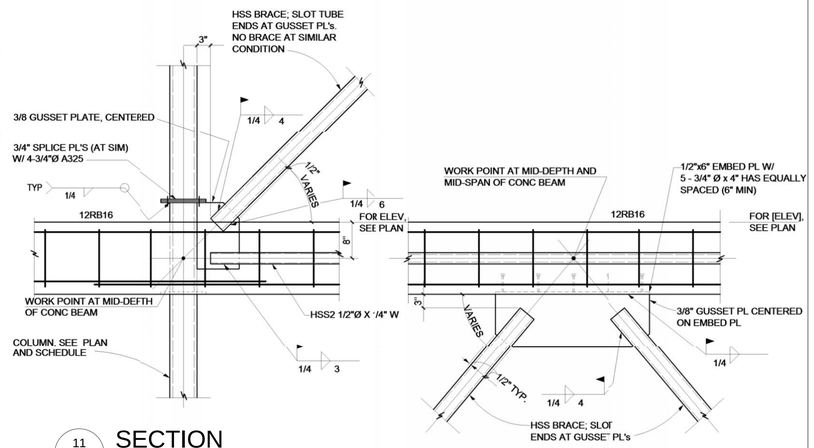
COLUMN BRACE BACK TO <E> CONC WALL



COLUMN BRACE BACK <E> STAIRS

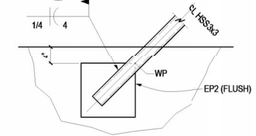


10 S209 SECTION 3/4" = 1'-0"

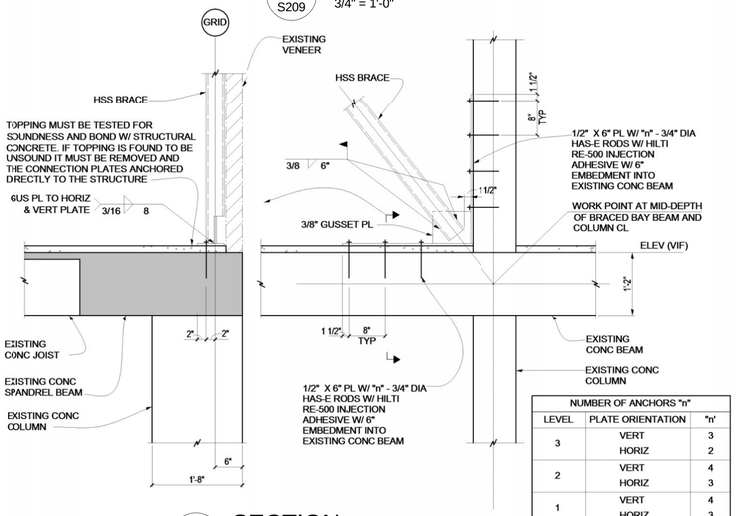


11 S209 SECTION 3/4" = 1'-0"

12 S209 SECTION 3/4" = 1'-0"

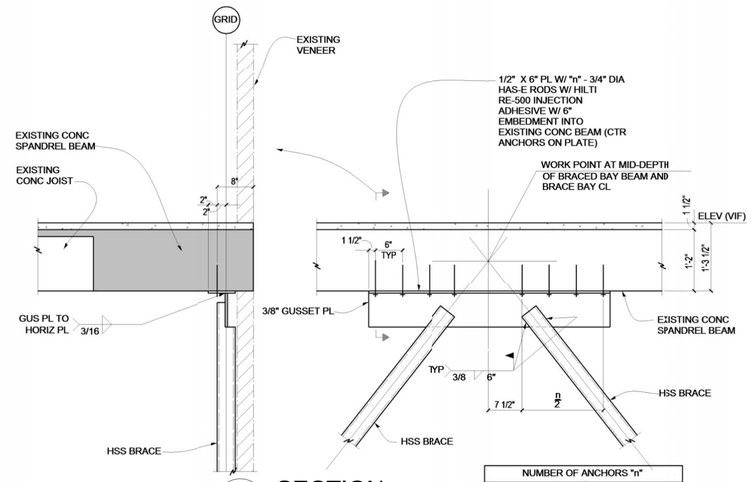


9 S209 SECTION 3/4" = 1'-0"



NUMBER OF ANCHORS "n"		
LEVEL	PLATE ORIENTATION	"n"
3	VERT	3
	HORIZ	2
2	VERT	4
	HORIZ	3
1	VERT	4
	HORIZ	3

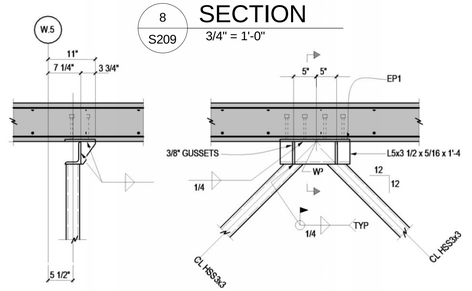
5 S209 SECTION 3/4" = 1'-0"



NUMBER OF ANCHORS "n"	
LEVEL	"n"
3	6
2	8
1	8

6 S209 SECTION 3/4" = 1'-0"

8 S209 SECTION 3/4" = 1'-0"



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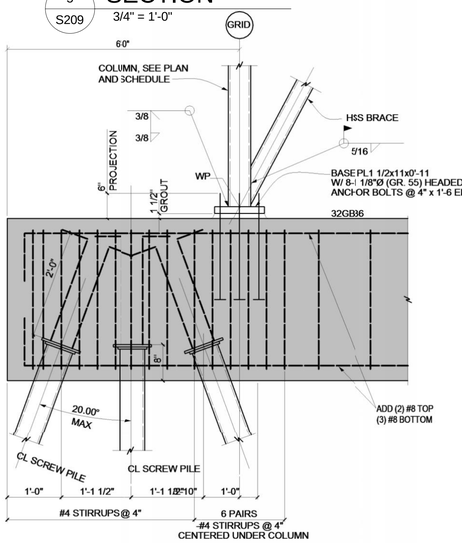
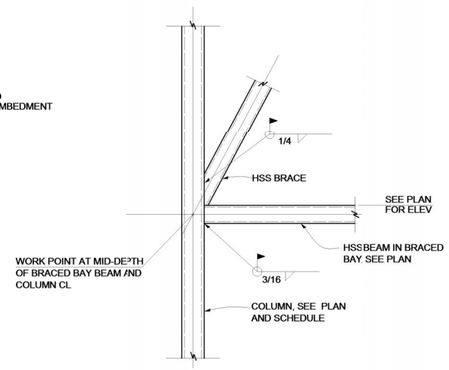
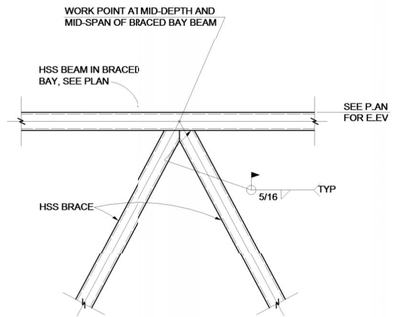


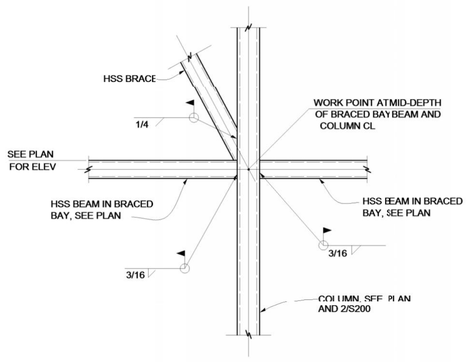
1 S209 SECTION 3/4" = 1'-0"



2 S209 SECTION 3/4" = 1'-0"



3 S209 SECTION 3/4" = 1'-0"



4 S209 SECTION 3/4" = 1'-0"

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BRAIDEN
BRACE AND RIGID FRAME SECTIONS

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PROFESSIONAL ENGINEERING CONSULTANTS, P.A.

Appendix B:
Structural Cost Estimation

351 LINDEN STREET, SUITE 100 FORT COLLINS, CO 80524 970-232-9558 www.pec1.com

CSU_Allison Hall Expansion_Structural

221109_Conceptual - R0

November 10, 2022
Gross Building Area:

DESCRIPTION	TOTAL COST	DETAIL AREA (SF)	$/SF	$/GSF
LEVEL 4 EXTERIOR STAIRS	$352,610			
LEVEL 4 KNUCKLE IN-FILL	$1,757,309			
LEVEL 4 STRUCTURAL	$1,080,747			
LEVEL 5 EXTERIOR STAIRS	$87,600			
LEVEL 5 KNUCKLE IN-FILL	$327,587			
LEVEL 5 STRUCTURAL	$1,237,588			
TOTAL PROJECT COST	**$4,843,441**			**$0.00**

INCLUSIONS:

Includes only structural cost associated with (4) four residential wings, (4) four exterior stair towers, and (2) two knuckle

- Structural Concrete:
- Pad footings, grade beams, shear concrete walls, beams, stair pans & landings, and slabs
- Reinforcement
- Concrete pumping, bracing, and shoring

- Structural Steel: Detailing, Fabrication, and Erection
- Steel columns, beams, decking, brace frames, moment frames, crane & pad

- Miscellaneous steel:
- Stairs, handrails, elevator pit ladder, angles, lintels, and embeds

- Concrete Masonry Unit:
- 8" Standard gray CMU at the elevator shaft including reinforcement

EXCLUSIONS:

Any and all architectural, mechanical, plumbing, or electrical scope of work
Design contingency, estimating contingency, construction contingency, or escalation contingency

Due to the on-going unprecedented material and commodity cost increases occurring locally and nationally in the construction industry, our subcontractors and suppliers may not be able to guarantee pricing provided for this project until shipment date or they can only hold their pricing for a short period of time (5 or 10 days). Saunders has included construction costs as we understand them today but cannot account for future cost escalation due to the uncertainty of material costs and related procurement issues . Given this very unique dilemma and the continuous volatility in the marketplace, we highly recommend that you as the Owner carry a hard construction cost allowance to cover these additional, potential escalation costs beyond this time period. Saunders will make every effort to minimize the cost impacts of these material increases while communicating with you specific dates upon which materials must be procured to meet your desired schedule and avoid further cost impacts.

CSU_Allison Hall Expansion_Structural

221109_Conceptual - R0

November 10, 2022
Gross Building Area:

DESCRIPTION	QUANTITY	UM	UNIT COST	TOTAL COST
LEVEL 4 EXTERIOR STAIRS				
03 CONCRETE				
03 31 00 Structural Concrete				
Grade Beams - 2'8" x 3' - 150 LB/CY Rebar	48.41	CY	$875.00	$42,361
Subtotal 03 31 00 Structural Concrete				**$42,361**
Subtotal 03 CONCRETE				**$42,361**
05 METALS				
05 12 00 Structural Steel Framing				
Roof Level framing - (w8x18, and w8x11.5) (15 lbs/sf)	9.66	TONS	$7,500.00	$72,432
Exterior Stair - Bracing (HSS 4x4x1/2, 4x4x3/8, 4x4x1/4)	16.00	TONS	$7,500.00	$120,000
Subtotal 05 12 00 Structural Steel Framing				**$192,432**
05 31 23 Steel Roof Decking				
Metal Roof Deck - 1" Typical	1,292.60	SF	$2.70	$3,490
Light Gage Metal Studs - 1200S200-68	1,293.00	SF	$5.00	$6,465
"X" Bracing and attachment points	1,292.58	SF	$1.75	$2,262
Subtotal 05 31 23 Steel Roof Decking				**$12,217**
05 51 13 Metal Pan Stairs				
Stair - Pan Stairs	64.00	RISER	$900.00	$57,600
Subtotal 05 51 13 Metal Pan Stairs				**$57,600**
Subtotal 05 METALS				**$262,249**
31 EARTHWORK				
31 63 26 Drilled Caissons				
Helical Piers	32.00	EA	$1,500.00	$48,000
Subtotal 31 63 26 Drilled Caissons				**$48,000**
Subtotal 31 EARTHWORK				**$48,000**
Subtotal LEVEL 4 EXTERIOR STAIRS				**$352,610**
LEVEL 4 KNUCKLE IN-FILL				
03 CONCRETE				
03 31 00 Structural Concrete				
Col/Pad Footing - 2' x 2' x 12" - 125 LB/CY Rebar	2.00	EA	$578.00	$1,156
Grade Beams - 8" x 3' - 125 LB/CY Rebar (basement)	7.13	CY	$1,650.00	$11,764
Grade Beams - 1' 8" x 3'8" - 150 LB/CY Rebar (Foundation)	69.69	CY	$1,205.00	$83,971
Grade Beams - 8" x 3'0" - 150 LB/CY Rebar (Foundation)	7.58	CY	$1,650.00	$12,502
Grade Beams - 20" x 7" (Levels)	24.81	CY	$1,650.00	$40,929
Grade Beams - 9" x 9" (Levels)	11.81	CY	$1,650.00	$19,483
Grade Beams - 12" x 7" (Roof)	3.60	CY	$1,650.00	$5,932
Grade Beams - 16" x 7" (Roof)	1.91	CY	$1,650.00	$3,152
Core/Shear Wall - 8" w/reinforcing	5,370.47	SF	$45.24	$242,960
Core/Shear Wall - 12" w/reinfocing	1,300.02	SF	$52.10	$67,731
Elevator Pit -Walls	11.43	CY	$1,125.00	$12,862
Subtotal 03 31 00 Structural Concrete				**$502,443**
03 35 00 Concrete Finishing				

CSU_Allison Hall Expansion_Structural

221109_Conceptual - R0

November 10, 2022

Gross Building Area:

DESCRIPTION	QUANTITY	UM	UNIT COST	TOTAL COST
SOG - 5" Thick w/reinforcing (Foundation / Level 1)	2,102.01	SF	$8.50	$17,867
Concrete Slab - 9" Thick w/reinforcing	11,888.27	SF	$45.00	$534,972
Concrete Sun Shades - 6" Thick w/reinforcing	1,297.10	SF	$40.00	$51,884
Subtotal 03 35 00 Concrete Finishing				**$604,723**
Subtotal 03 CONCRETE				**$1,107,167**
04 MASONRY				
04 22 00 Concrete Unit Masonry				
CMU - 8" Structural Reinforced Block (Elevator Shaft)	3,178.87	SF	$28.00	$89,008
Subtotal 04 22 00 Concrete Unit Masonry				**$89,008**
Subtotal 04 MASONRY				**$89,008**
05 METALS				
05 12 00 Structural Steel Framing				
Floor Level framing - (HSS columns - Foundation - Level 1) (6 lbs/sf)	6.75	TONS	$10,500.00	$70,910
Floor Level framing - (HSS columns - Level 2) (6 lbs/sf)	8.62	TONS	$10,500.00	$90,471
Floor Level framing - (HSS columns - Level 3) (6 lbs/sf)	8.60	TONS	$10,500.00	$90,289
Floor Level framing - (HSS columns - Level 4) (6 lbs/sf)	8.60	TONS	$10,500.00	$90,303
Floor Level framing - (HSS columns - Foor Level) (6 lbs/sf)	12.02	TONS	$10,500.00	$126,160
Subtotal 05 12 00 Structural Steel Framing				**$468,134**
Subtotal 05 METALS				**$468,134**
31 EARTHWORK				
31 63 26 Drilled Caissons				
Helical Piers - (Basement Foundation)	14.00	EA	$1,500.00	$21,000
Helical Piers - (Foundation)	48.00	EA	$1,500.00	$72,000
Subtotal 31 63 26 Drilled Caissons				**$93,000**
Subtotal 31 EARTHWORK				**$93,000**
Subtotal LEVEL 4 KNUCKLE IN-FILL				**$1,757,309**
LEVEL 4 STRUCTURAL				
05 METALS				
05 12 00 Structural Steel Framing				
Moment Frame - (w12x22, w14x26, & HSS 4x4x3/16) (1.5 tons/ea)	16.00	TONS	$8,000.00	$128,000
Roof Level framing - (w12x14, w18x35, & w8x40 columns) (5 lbs/sf)	54.83	TONS	$7,250.00	$397,500
Exterior - 3/4" Gussets and HSS Bracing (1 ton/ea)	32.00	TONS	$7,250.00	$232,000
Interior - 3/4" Gussets and HSS Bracing (1 ton/ea)	16.00	TONS	$7,250.00	$116,000
Subtotal 05 12 00 Structural Steel Framing				**$873,500**
05 31 23 Steel Roof Decking				
Metal Roof Deck - 1" Typical	21,931.01	SF	$2.70	$59,214
Light Gage Metal Studs - 1200S200-68	21,931.00	SF	$5.00	$109,655
"X" Bracing and attachment points	21,931.00	SF	$1.75	$38,379
Subtotal 05 31 23 Steel Roof Decking				**$207,248**
Subtotal 05 METALS				**$1,080,747**
Subtotal LEVEL 4 STRUCTURAL				**$1,080,747**

CSU_Allison Hall Expansion_Structural

221109_Conceptual - R0

November 10, 2022
Gross Building Area:

DESCRIPTION	QUANTITY	UM	UNIT COST	TOTAL COST
LEVEL 5 EXTERIOR STAIRS				
05 METALS				
05 12 00 Structural Steel Framing				
Exterior Stair - Bracing (HSS 4x4x1/2, 4x4x3/8, 4x4x1/4)	4.00	TONS	$7,500.00	$30,000
Subtotal 05 12 00 Structural Steel Framing				**$30,000**
05 51 13 Metal Pan Stairs				
Stair - Pan Stairs	64.00	RISER	$900.00	$57,600
Subtotal 05 51 13 Metal Pan Stairs				**$57,600**
Subtotal 05 METALS				**$87,600**
Subtotal LEVEL 5 EXTERIOR STAIRS				**$87,600**
LEVEL 5 KNUCKLE IN-FILL				
03 CONCRETE				
03 31 00 Structural Concrete				
Grade Beams - 20" x 7" (Levels)	8.78	CY	$1,650.00	$14,480
Grade Beams - 9" x 9" (Levels)	1.76	CY	$1,650.00	$2,911
Core/Shear Wall - 8" w/reinforcing	1,205.46	SF	$45.24	$54,535
Core/Shear Wall - 12" w/reinfocing	130.82	SF	$52.10	$6,816
Subtotal 03 31 00 Structural Concrete				**$78,742**
03 35 00 Concrete Finishing				
Concrete Slab - 9" Thick w/reinforcing	2,750.32	SF	$45.00	$123,764
Concrete Sun Shades - 6" Thick w/reinforcing	398.37	SF	$40.00	$15,935
Subtotal 03 35 00 Concrete Finishing				**$139,699**
Subtotal 03 CONCRETE				**$218,441**
04 MASONRY				
04 22 00 Concrete Unit Masonry				
CMU - 8" Structural Reinforced Block (Elevator Shaft)	597.41	SF	$28.00	$16,728
Subtotal 04 22 00 Concrete Unit Masonry				**$16,728**
Subtotal 04 MASONRY				**$16,728**
05 METALS				
05 12 00 Structural Steel Framing				
Floor Level framing - (HSS columns - Level 5) (6 lbs/sf)	8.80	TONS	$10,500.00	$92,419
Subtotal 05 12 00 Structural Steel Framing				**$92,419**
Subtotal 05 METALS				**$92,419**
Subtotal LEVEL 5 KNUCKLE IN-FILL				**$327,587**
LEVEL 5 STRUCTURAL				
03 CONCRETE				
03 35 00 Concrete Finishing				
Concrete Slab - 5" thick w/reinforcing	19,148.99	SF	$8.50	$162,766
Concrete Slab - Prem for Corrosion Inhibitor 2 GL/CY	269.15	CY	$27.70	$7,455
Subtotal 03 35 00 Concrete Finishing				**$170,222**

CSU_Allison Hall Expansion_Structural

221109_Conceptual - R0

November 10, 2022

Gross Building Area:

DESCRIPTION	QUANTITY	UM	UNIT COST	TOTAL COST
Subtotal 03 CONCRETE				**$170,222**
05 METALS				
05 12 00 Structural Steel Framing				
Moment Frame - (w12x22, w14x26, & HSS 4x4x3/16) (1.5 tons/ea)	8.00	TONS	$8,000.00	$64,000
Floor Level framing - (w12x14, w18x35, & w8x40 columns) (12 lbs/sf)	114.40	TONS	$7,250.00	$829,366
Exterior - 3/4" Gussets and HSS Bracing (1 ton/ea)	8.00	TONS	$7,250.00	$58,000
Interior - 3/4" Gussets and HSS Bracing (1 ton/ea)	16.00	TONS	$7,250.00	$116,000
Subtotal 05 12 00 Structural Steel Framing				**$1,067,366**
Subtotal 05 METALS				**$1,067,366**
Subtotal LEVEL 5 STRUCTURAL				**$1,237,588**
DIRECT TOTAL				**$4,843,441**

CSU_Allison Hall Expansion_Structural

221109_Conceptual - R0

November 10, 2022
Gross Building Area: SF

INDIRECT	AMOUNT	TOTAL COST
INDIRECT SUBTOTAL		
TOTAL PROJECT COST		**$4,843,441**

*** NOTE ***
No General Conditions or General Requirements have been included
No General Contractor Overhead and Fee
No Plan check or Building Permit Fees,
No City and County Use Taxes
No Fire Department plan check and permit fees
No warranty
No General liability insurance
No Builders Risk
No Performance & Payment Bond
No Contingencies
No Design services
No Preconstruction services fee

Appendix I - Geotechnical Report

Geotechnical Engineering Report

CSU Allison Hall Improvements
Fort Collins, Colorado
November 1, 2022
Terracon Project No. 20225056

Prepared for:
Professional Engineering Consultants, P.A.
Fort Collins, Colorado

Prepared by:
Terracon Consultants, Inc.
Fort Collins, Colorado

Explore with us

1901 Sharp Point Drive, Suite C
Fort Collins, CO 80525
P (970) 484-0359
F (970) 484-0454
Terracon.com

November 1, 2022

Professional Engineering Consultants, P.A.
351 Linden Street, Suite 100
Fort Collins, Colorado 80524

Attn: Mr. Zach Bowden, P.E.
P: (970) 232-9558
E: Zach.Bowden@pec1.com

Re: Geotechnical Engineering Report
CSU Allison Hall Improvements
551 West Laurel Street
Fort Collins, Colorado
Terracon Project No. 20225056

Dear Mr. Bowden:

Terracon Consultants, Inc. (Terracon) has completed the geotechnical engineering services for the project referenced above. This study was performed in general accordance with Terracon Proposal No. P20225056 dated August 1, 2022. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning the existing drilled pier and potential new drilled piers for the proposed project.

We appreciate the opportunity to be of service to you on this project. Materials testing and construction observation services are provided by Terracon as well. We would be pleased to discuss these services with you. If you have any questions concerning this report, or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

Kurt F. Stauder
Project Geologist

Eric D. Bernhardt, P.E.
Geotechnical Department Manager

REPORT TOPICS

Note: This report was originally delivered in a web-based format. Orange Bold text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the *GeoReport* logo will bring you back to this page. For more interactive features, please view your project online at client.terracon.com.

ATTACHMENTS

Note: Refer to each individual Attachment for a listing of contents.

Geotechnical Engineering Report

CSU Allison Hall Improvements

551 West Laurel Street

Fort Collins, Colorado

Terracon Project No. 20225056

November 1, 2022

INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed Allison Hall Improvements located at 551 West Laurel Street in Fort Collins, Colorado. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil and rock conditions
- Groundwater conditions
- Drilled pier foundation design

The geotechnical engineering scope of services for this project included the advancement of three test borings to depths ranging from approximately 36.5 to 48.3 feet below existing site grades.

Maps showing the site and boring locations are shown in the Site Location and Exploration Plan sections, respectively. The results of the laboratory testing performed on soil and bedrock samples obtained from the site during the field exploration are included on the boring logs and as separate graphs in the Exploration Results section of this report.

SITE CONDITIONS

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The project site is located at 551 West Laurel Street in Fort Collins, Colorado. The approximate Latitude/Longitude of the center of the site is 40.57713° N 105.08561° W (Please refer to Exhibit D).

Item	Description
Existing Improvements	Allison Hall has four separate wings that adjoin a central building. Parking areas are located to the north, south, and west of the existing structure. Sidewalks connect the individual wings.
Current Ground Cover	Maintained landscaping consisting of grasses and shrubs are present around the buildings. Several deciduous trees are located on the perimeter of the site.
Existing Topography	The project site is relatively flat. The site has a slight downward grade to the southeast.

PROJECT DESCRIPTION

Our final understanding of the project conditions is as follows:

Item	Description
Information Provided	The project information described below is based on the following: ■ Communication with PEC (June 20, 2022) ■ Review of building plans Units A and C, Sheet S01, 12/27/4956
Project Description	CSU is considering constructing 1 to 2 additional building levels on the current structure. PEC has been tasked with evaluating the current drilled pier foundation system and structural elements to determine if this project is feasible or if a new foundation system will need to be constructed. If the existing foundation is determined to be inadequate for the proposed development, the project team has been tasked with providing a new foundation and structural design.
Maximum Loads (provided by PEC, October 24, 2022)	■ Interior Columns: 202 kips increasing to 255 kips ■ Exterior Columns: 125 kips increasing to 158 kips

If project information or assumptions vary from what is described above or if location of construction changes, we should be contacted as soon as possible to confirm and/or modify our recommendations accordingly.

GEOTECHNICAL CHARACTERIZATION

Geology

The project area is located within the Colorado Piedmont section of the Great Plains physiographic province. The Colorado Piedmont, formed during Late Tertiary and Early Quaternary time (approximately 2,000,000 years ago), is a broad, erosional trench which separates the Southern Rocky Mountains from the High Plains. Structurally, the site lies along the western flank of the Denver Basin. During the Late Mesozoic and Early Cenozoic Periods (approximately 70,000,000 years ago), intense tectonic activity occurred, causing the uplifting of the Front Range and associated down-warping of the Denver Basin to the east. Relatively flat uplands and broad valleys characterize the present-day topography of the Colorado Piedmont in this region.

Surficial geologic conditions mapped in the vicinity of the site ([1]Colton, 1978), ([2]Tweto, 1979), include older gravels and alluvium (Qa) which has been described as sand gravel deposits associated with the Slocum alluvium. Bedrock units mapped in the vicinity of the site include the lower and upper units of the Pierre Shale. Bedrock was encountered in our borings at depths ranging from about 19 to 31½ feet below existing ground surface. The bedrock formations in the area have been reported to include olive gray marine shale with interbedded sandstone.

The geologic conditions presented in this section were obtained by locating the subject site on available large-scale geologic maps. Because of the scales involved, precise location of the site can be difficult to determine. In addition, the large-scale geologic maps describe only general trends. Local variations are possible and site specific geology may differ from those described above.

Subsurface Profile

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of site preparation and

[1]*Colton, Roger B., 1978* ***Geologic Map of the Boulder-Fort Collins-Greeley Area, Colorado,*** *United States Geological Survey, Map I-855-G.*
[2] *Tweto, Ogden, 1979* ***Geologic Map of Colorado,*** *United States Geological Survey.*

foundation options. Conditions encountered at each exploration point are indicated on the individual logs. The individual logs and the GeoModel can be found in the Exploration Results section this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	General Description	Approximate Depth to Bottom of Stratum
1	Clay	Lean clay with varying sand content, medium plasticity, soft to medium stiff	About 9 to 14 feet below existing site grades.
2	Clay / Sand	Clayey sand with varying amounts of gravel, fine to coarse grained, medium plasticity, loose to dense	About 12 to 31½ feet below existing site grades.
3	Sand	Well to poorly-graded sand with gravel and low plasticity fines, fine to coarse-grained, dense to very dense	About 17 to 19 feet below existing site grades.
4	Bedrock	Claystone with thin sandstone seams and occasional sandstone lenses, highly to slightly weathered, medium hard to very hard, laminated	To the maximum depth of exploration of about 48½ feet below existing site grades.

As noted in General Comments, this characterization is based upon widely spaced exploration points across the site and variations are likely.

Groundwater Conditions

The boreholes were observed while drilling and shortly after completion for the presence and level of groundwater. The water levels observed in the boreholes are noted on the attached boring logs, and are summarized below:

Boring Number	Depth to Groundwater While Drilling, ft.	Depth to Groundwater After Drilling, ft.	Elevation of Groundwater After Drilling, ft.[1]
AH1	23	Borehole destroyed	Backfilled after drilling
AH2	20	18	182.0

Boring Number	Depth to Groundwater While Drilling, ft.	Depth to Groundwater After Drilling, ft.	Elevation of Groundwater After Drilling, ft.[1]
AH3	17.3	Borehole destroyed	Backfilled after drilling

1. Elevation of groundwater is based on the ground surface elevation, obtained by Terracon by using an engineer's level, referencing an on-site benchmark (Manhole on west side of building, assumed elevation 200.0 feet.)

These observations represent short-term groundwater conditions at the time of and shortly after the field exploration and may not be indicative of other times or at other locations. Groundwater levels can be expected to fluctuate with varying seasonal and weather conditions, and other factors.

Groundwater level fluctuations occur due to seasonal variations in the water levels present in nearby water features, amount of rainfall, runoff and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

Fluctuations in groundwater levels can best be determined by implementation of a groundwater monitoring plan. Such a plan would include installation of groundwater piezometers, and periodic measurement of groundwater levels over a sufficient period of time.

DEEP FOUNDATIONS

Drilled Piers Bottomed in Bedrock - Design Recommendations

The caisson schedule provided in the plan set indicated the top of bedrock varied from about 26 to 34 below the finished floor elevation and indicates no piers were bottomed in the weathered claystone. This generally agreed with our findings during the site exploration.

Description	Value
Estimated pier lengths	30 to 46 feet

Description	Value
Estimated pier diameters	18 to 24 inches
Bedrock embedment [1]	4 to 12 feet
Maximum allowable end-bearing pressure	50,000 psf
Allowable skin friction (for portion of pier embedded into bedrock)	2,500 psf
Uplift force (tension due to soil uplift, kips) [2]	28 x Pier diameter (ft.)

1. From caisson schedule, the top of bedrock was listed between elevation 66 and 74 feet corresponding to depths 34 and 26 feet, respectively.
2. For new piers and analysis, the bedrock embedment should be balanced against uplift forces for the portion of the pier in competent bedrock below the embedment depth provide on the plan set to resist axial loads and uplift forces.

To satisfy forces in the horizontal direction using LPILE, piers may be designed for the following lateral load criteria:

Parameters	Clay	Sand and Gravel	Claystone Bedrock
LPILE soil type	Stiff clay w/o free water (Reese)	Sand (Reese)	Stiff clay w/o free water (Reese)
Effective unit weight above groundwater (pcf)	120	-	130
Effective unit weight below groundwater (pcf)	-	62	-
Undrained cohesion (psf)	500	-	5,000
Friction angle, Φ (degrees)	-	30	-
Coefficient of subgrade reaction above groundwater, k (pci)	-	90	-
Coefficient of subgrade reaction below groundwater, k (pci)	-	60	-
Strain factor, ε50 (%)	0.010	-	0.004
For purposes of LPILE analysis, assume a groundwater depth of about 18 feet below existing ground surface.			

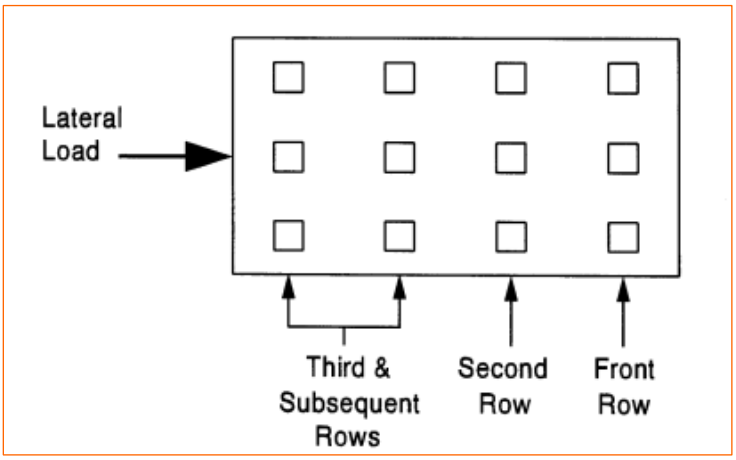
Piers should be considered to work in group action if the center-to-center horizontal spacing is less than three pier diameters. A minimum practical center-to-center horizontal spacing between piers of at least three diameters should be maintained,

and adjacent piers should bottom at the same elevation. The capacity of individual piers must be reduced when considering the effects of group action. Capacity reduction is a function of pier spacing and the number of piers within a group. The following table presents capacity reductions for closely spaced piers.

Description	Value		
Drilled Pier Spacing (Center-to-Center)	>3 diameters	>2 to 3 diameters	1 to 2 diameters
Pier Capacity Reduction	None	30 percent	50 percent

1. End bearing values do not need to be reduced for closely spaced piers, if bottom of piers is at the same elevation.

When piles are used in groups, the lateral capacities of the piles in the second, third, and subsequent rows of the group should be reduced as compared to the capacity of a single, independent pile. Guidance for applying p-multiplier factors to the p values in the p-y curves for each row of pile foundations within a pile group are as follows:



Pier Center-to-Center Spacing (In Direction of Loading)	P-multiplier, P_M Row 1	P-multiplier, P_M Row 2	P-multiplier, P_M Row 3 and Higher
3 x diameter	0.8	0.4	0.3
5 x diameter	1.0	0.85	0.7

Drilled Piers Bottomed in Bedrock - Construction Considerations

If any new foundation elements are installed, drilling to design depth should be possible with conventional single-flight power augers on the majority of the site; however,

specialized drilling equipment may be required for very hard bedrock layers. The means and methods of bedrock penetration should be evaluated and determined by the drilling contractor.

Groundwater/caving soil conditions indicate temporary steel casing will be required to properly drill and clean piers prior to concrete placement. Groundwater should be removed from each pier hole prior to concrete placement. Pier concrete should be placed immediately after completion of drilling and cleaning. If pier concrete cannot be placed in dry conditions, a tremie should be used for concrete placement. Free-fall concrete placement in piers will only be acceptable if provisions are taken to avoid striking the concrete on the sides of the hole or reinforcing steel. The use of a bottom-dump hopper, or an elephant's trunk discharging near the bottom of the hole where concrete segregation will be minimized, is recommended. Due to potential sloughing and raveling, foundation concrete quantities may exceed calculated geometric volumes.

Casing should be withdrawn in a slow continuous manner maintaining a sufficient head of concrete to prevent infiltration of water or caving soils or the creation of voids in pier concrete. Pier concrete should have a relatively high fluidity when placed in cased pier holes or through a tremie. Pier concrete with slump in the range of 5 to 7 inches is recommended.

We recommend the sides of each pier should be mechanically roughened in the claystone bearing strata. This should be accomplished by a roughening tooth placed on the auger. Shaft bearing surfaces must be cleaned prior to concrete placement. A representative of Terracon should observe the bearing surface and shaft configuration.

CORROSIVITY

Results of water-soluble sulfate testing indicate Exposure Class S0 according to ACI 318. ASTM Type I or II, portland cement should be specified for all project concrete on and below grade. Foundation concrete should be designed for low sulfate exposure in accordance with the provisions of the ACI Design Manual, Section 318, Chapter 4.

GENERAL COMMENTS

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client, and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered

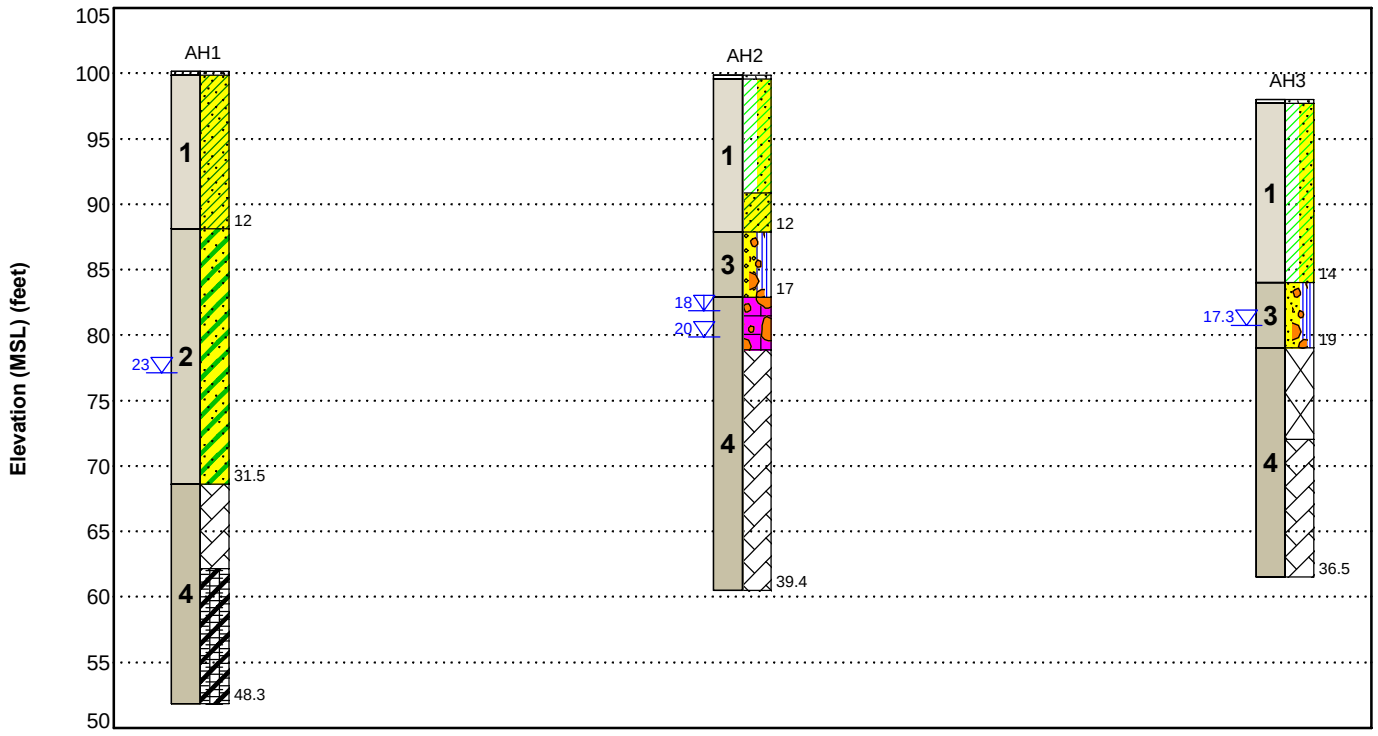
valid unless we review the changes and either verify or modify our conclusions in writing.

FIGURES

Contents:

Terracon
1901 Sharp Point Dr Ste C
Fort Collins, CO

GeoModel



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	Clay	Lean clay with varying sand content, medium plasticity, soft to medium stiff
2	Clay/Sand	Clayey sand with varying amounts of gravel, fine to coarse grained, medium plasticity, loose to dense
3	Sand	Well to poorly-graded sand with gravel and low plasticity fines, fine to coarse-grained, dense to very dense
4	Bedrock	Claystone with thin sandstone seams and occasional sandstone lenses, highly to slightly weathered, medium hard to very hard, laminated

LEGEND

- Vegetative Soil Layer
- Sandy Lean Clay
- Clayey Sand
- Claystone
- Claystone/Sandstone
- Lean Clay with Sand
- Well-graded Sand with Silt and Gravel
- Cemented Layer
- Poorly-graded Sand with Silt and Gravel
- Weathered Rock

▽ First Water Observation
▽ Second Water Observation

The groundwater levels shown are representative of the date and time of our exploration. Significant changes are possible over time.
Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project.
Numbers adjacent to soil column indicate depth below ground surface.

ATTACHMENTS

Contents:

Note: Refer to each individual Attachment for a listing of contents.

EXPLORATION AND TESTING PROCEDURES

Field Exploration

The field exploration program consisted of the following:

Number of Borings	Boring Depth (feet)	Location
3	36½ to 48	Accessible areas west and south of existing building

Boring Layout and Elevations: We used handheld GPS equipment to locate borings with an estimated horizontal accuracy of +/-20 feet. A ground surface elevation at each boring location was obtained by Terracon using an engineer's level, referencing an on-site benchmark.

Subsurface Exploration Procedures: We advanced soil borings with a truck-mounted drill rig using continuous-flight, hollow-stem augers. Three samples were obtained in the upper 10 feet of each boring and at intervals of 5 feet thereafter. Soil sampling was performed using modified California barrel, and/or standard split-barrel sampling procedures. For the standard split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon is driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. For the modified California barrel sampling procedure, a 2½-inch outer diameter split-barrel sampling spoon is used for sampling. Modified California barrel sampling procedures are similar to standard split-barrel sampling procedures; however, blow counts are typically recorded for 6-inch intervals for a total of 12 inches of penetration. The samples were placed in appropriate containers, taken to our soil laboratory for testing, and classified by a geotechnical engineer.

In addition, we observed and recorded groundwater levels during drilling observations.

Our exploration team prepared field boring logs as part of standard drilling operations including sampling depths, penetration distances, and other relevant sampling information. Field logs included visual classifications of materials encountered during drilling, and our interpretation of subsurface conditions between samples. Final boring

logs, prepared from field logs, represent the geotechnical engineer's interpretation, and include modifications based on observations and laboratory test results.

Pressuremeter Testing: Pressuremeter tests were performed at selected depths within a 76 mm test pocket prepared by wet rotary drilling methods in all of the borings. Test depths were selected based on the caisson schedule and attempted to test the estimated caisson depth from the schedule. The testing consists of expanding an inflatable probe laterally into the sidewalls of the test pocket and measuring the volume and corresponding pressure at multiple increments. The data points develop a stress-strain relationship of the material, allowing the interpretation of engineering properties. The tests were performed in general accordance with ASTM D4719-20. Pressuremeter testing results can be found in the Exploration Results section of this report.

Property Disturbance: We backfilled borings with auger cuttings after completion. Our services did not include repair of the site beyond backfilling our boreholes. Excess auger cuttings were removed from the site. Because backfill material often settles below the surface after a period, we recommend checking boreholes periodically and backfilling, if necessary.

Laboratory Testing

The project engineer reviewed field data and assigned various laboratory tests to better understand the engineering properties of various soil and bedrock strata. Laboratory testing was conducted in general accordance with applicable or other locally recognized standards. Procedural standards noted in this report are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgement. Testing was performed under the direction of a geotechnical engineer and included the following:

- Visual classification
- Dry density
- Grain-size analysis
- Water-soluble sulfates
- Moisture content
- Atterberg limits
- One-dimensional swell
- Unconfined compressive strength

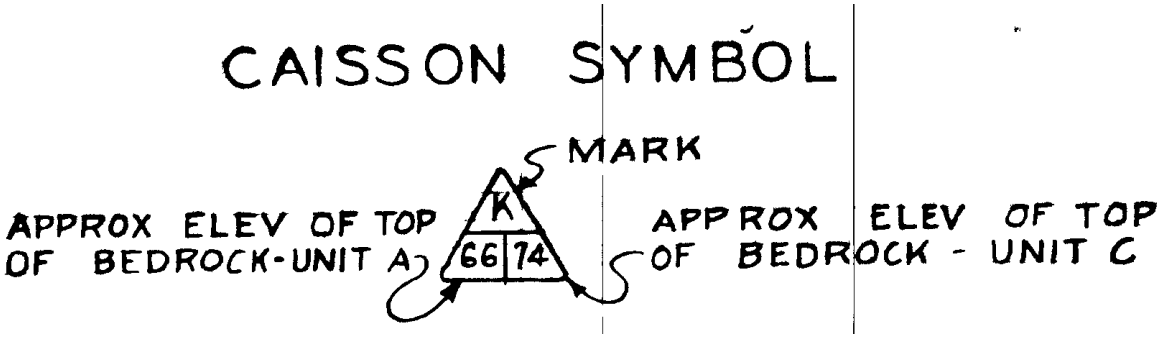
Our laboratory testing program includes examination of soil samples by an engineer. Based on the material's texture and plasticity, we described and classified soil samples in accordance with the Unified Soil Classification System (USCS). Soil and bedrock samples obtained during our field work will be disposed of after laboratory testing is complete unless a specific request is made to temporarily store the samples for a longer period of time.

Bedrock samples obtained had rock classification conducted using locally accepted practices for engineering purposes. Boring log rock classification is determined using the Description of Rock Properties.

CAISSON INFORMATION FROM PLAN SET (DECEMBER 12, 1956)

MARK	DIA.	DEPTH IN SHALE
J	18	4 ft.
K	18	6 ft
L	18"	10 ft
M	24"	10 ft.
N	24'	12 ft.

Caisson schedule



Depth to bedrock, from plans; References FFE = 100.0’

SITE LOCATION AND EXPLORATION PLANS

Contents:

Note: All attachments are one page unless noted above.

SITE LOCATION

CSU Allison Hall Improvements ■ Fort Collins, Colorado
November 1, 2022 ■ Terracon Project No. 20225056

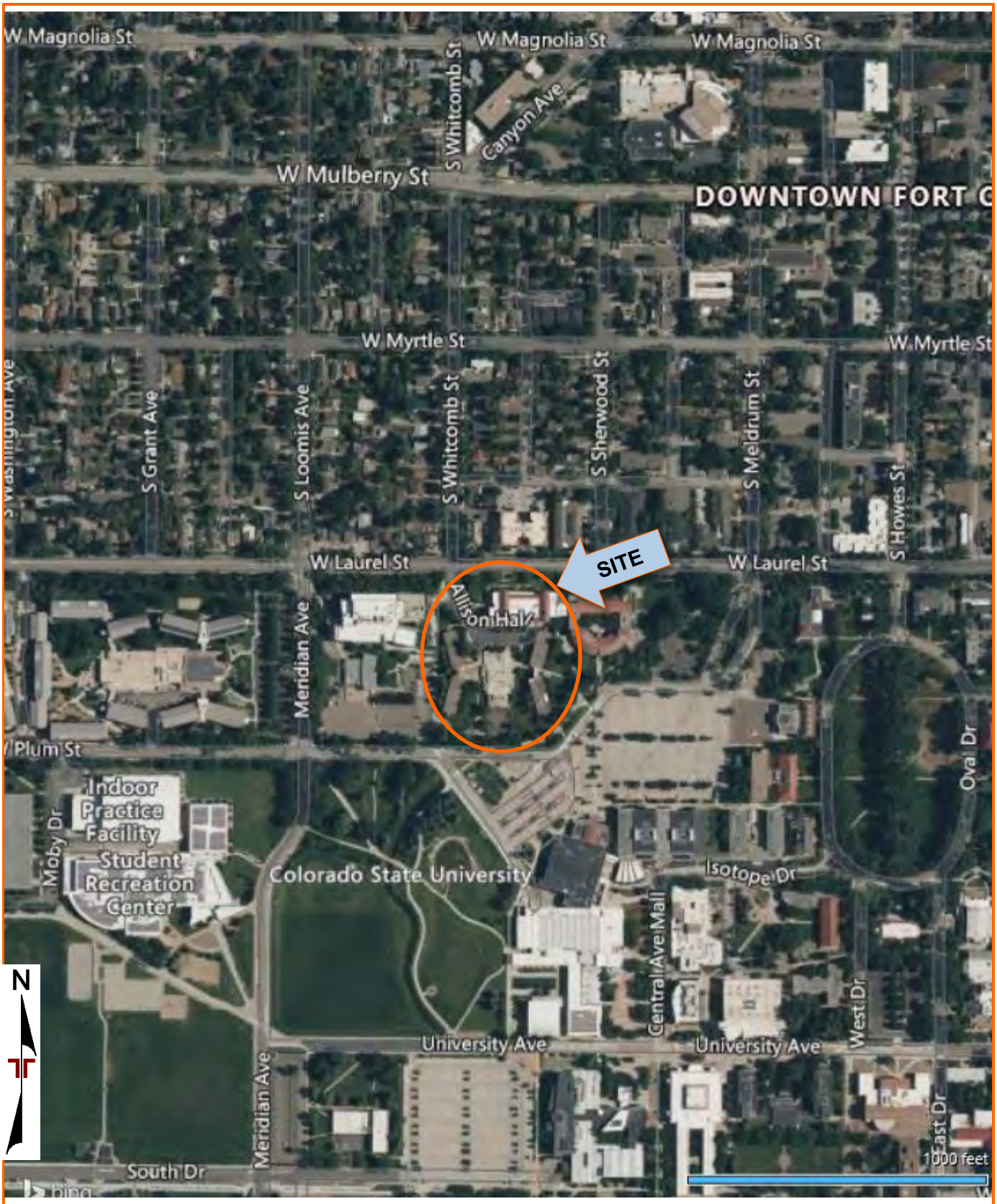


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

EXPLORATION RESULTS

Contents:

Note: All attachments are one page unless noted above.

CSU Allison Hall Improvements
551 West Laurel Street | Fort Collins, CO
Terracon Project No. 20225056

Terracon
1901 Sharp Point Dr Ste C
Fort Collins, CO

Boring Log No. AH1

Location: See Exploration Plan

Latitude: 40.5776° Longitude: -105.0861°

Depth (Ft.) Elevation: 200.15 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1		0.3 VEGETATIVE SOIL LAYER, about 4 inches; grass and sod 199.85 SANDY LEAN CLAY, medium plasticity, light brown to red brown, very soft to medium stiff			2-2-2 N=4	19.4			
					1-1	28.7	94		
					2-3-2 N=5	19.2			
2		12.0 188.15 CLAYEY SAND (SC), trace gravel, fine to coarse grained, subrounded, medium plasticity, red brown, loose to dense, increasing gravel content and relative density with depth			4-6	14.9	116	30-19-11	47
			▽		4-7-9 N=16	7.2			
					6-16	14.0	117	25-15-10	31
					25-50/3"	14.2			
		31.5 168.65 CLAYSTONE, medium to high plasticity, dark gray, very hard, laminated bedding, slightly weathered, weak rock			50/3"	14.2	150		
4		38.0 162.15 INTERBEDDED SANDSTONE AND CLAYSTONE, fine grained, low to medium plasticity, dark gray to light gray, very hard, laminated bedding, unweathered, medium strong			50/4"	8.0			
					50/5"	15.9			
		48.3 151.85 *Boring Terminated at 48.3 Feet*			50/5"	20.1			

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
▽ 23 feet during drilling

Drill Rig
CME 75

Hammer Type
Automatic

Driller
Terracon

Notes
Elevation Reference: Used manhole rim on west side of Allison Hall as TBM: Elevation = 200.0

Advancement Method
0-29.8': 4.25" Hollow-stem auger
29.8-48': 3" Rotary Wash

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Boring Started
08-12-2022

Boring Completed
08-12-2022

CSU Allison Hall Improvements
551 West Laurel Street | Fort Collins, CO
Terracon Project No. 20225056

Terracon
1901 Sharp Point Dr Ste C
Fort Collins, CO

Boring Log No. AH2

Location: See Exploration Plan

Latitude: 40.5772° Longitude: -105.0863°

Depth (Ft.) Elevation: 199.89 (Ft.) +/-

Model Layer	Depth (Ft.)	Material Description	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1	0.3 (199.59)	VEGETATIVE SOIL LAYER, about 4 inches; grass and sod							
1		LEAN CLAY WITH SAND, medium plasticity, brown, soft			2-2-1 N=3	22.1			
1					2-2	26.1	96		
1	9.0 (190.89)								
1		SANDY LEAN CLAY, increasing sand content, medium plasticity, brown to red brown, medium stiff			2-4-3 N=7	15.2			
1	12.0 (187.89)								
3		WELL GRADED SAND WITH SILT AND GRAVEL, trace gravel, fine to coarse grained, subrounded, medium plasticity, red brown, loose			5-5	5.6	103	NP	8
3	17.0 (182.89)								
4		CEMENTED LAYER, very difficult drilling, strong-cemented lens	▽						
4		No recovery	▽		50/3"				
4	21.0 (178.89)								
4		CLAYSTONE, medium to high plasticity, olive to gray, very hard, laminated bedding, slightly weathered, very weak			27-50/4"	17.2	111	40-18-22	92
4					31-50/5"	16.8	113	47-20-27	92
4					50/5"	13.4	112		
4	39.4 (160.49)								
		Boring Terminated at 39.4 Feet			50/5"	20.7			

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
▽ 20 feet during driling
▽ **18 feet at the completion of drilling**

Drill Rig
CME 75

Hammer Type
Automatic

Driller
Terracon

Notes
Elevation Reference: Used manhole rim on west side of Allison Hall as TBM: Elevation = 200.0

Advancement Method
0-19': 4.25" Hollow-stem auger
19-39.4': 3" Rotary Wash

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Boring Started
08-13-2022

Boring Completed
08-13-2022

CSU Allison Hall Improvements
551 West Laurel Street | Fort Collins, CO
Terracon Project No. 20225056

Terracon
1901 Sharp Point Dr Ste C
Fort Collins, CO

Boring Log No. AH3

Location: See Exploration Plan

Latitude: 40.5768° Longitude: -105.0859°

Depth (Ft.) Elevation: 198.03 (Ft.) +/-

Model Layer	Depth (Ft.)	Elevation	Material Description	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1	0.3	197.73	VEGETATIVE SOIL LAYER, about 4 inches; grass and sod							
			LEAN CLAY WITH SAND, medium plasticity, light brown, soft to medium stiff			2-3-4 N=7	20.7			
						4-5	14.2	105	34-15-19	81
						2-2-3 N=5	19.1			
3	14.0	184.03	POORLY GRADED SAND WITH SILT, with gravel, fine to coarse grained, subrounded, low to medium plasticity, red and brown, medium dense to dense			6-9	19.2	111	38-22-16	28
	19.0	179.03	Increased gravel content at about 18 feet (drill response)	▽						
4			WEATHERED CLAYSTONE, fine to medium grained, medium plasticity, olive, medium hard, laminated bedding, moderately weathered, weak rock			9-14-19 N=33	21.3			
	26.0	172.03	CLAYSTONE, with thin sand seams, medium to high plasticity, dark gray, very hard, laminated bedding, slightly weathered			23-50/2"	8.8		41-24-17	90
						34-50/4"	15.8			
	36.5	161.53				50/6"	19.4			
			Boring Terminated at 36.5 Feet							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
▽ 17.3 feet during drilling

Drill Rig
CME 75

Hammer Type
Automatic

Driller
Terracon

Notes
Elevation Reference: Used manhole rim on west side of Allison Hall as TBM: Elevation = 200.0

Advancement Method
0-19': 4.25" Hollow-stem auger
19-36.5': 3" Rotary Wash

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Boring Started
08-10-2022

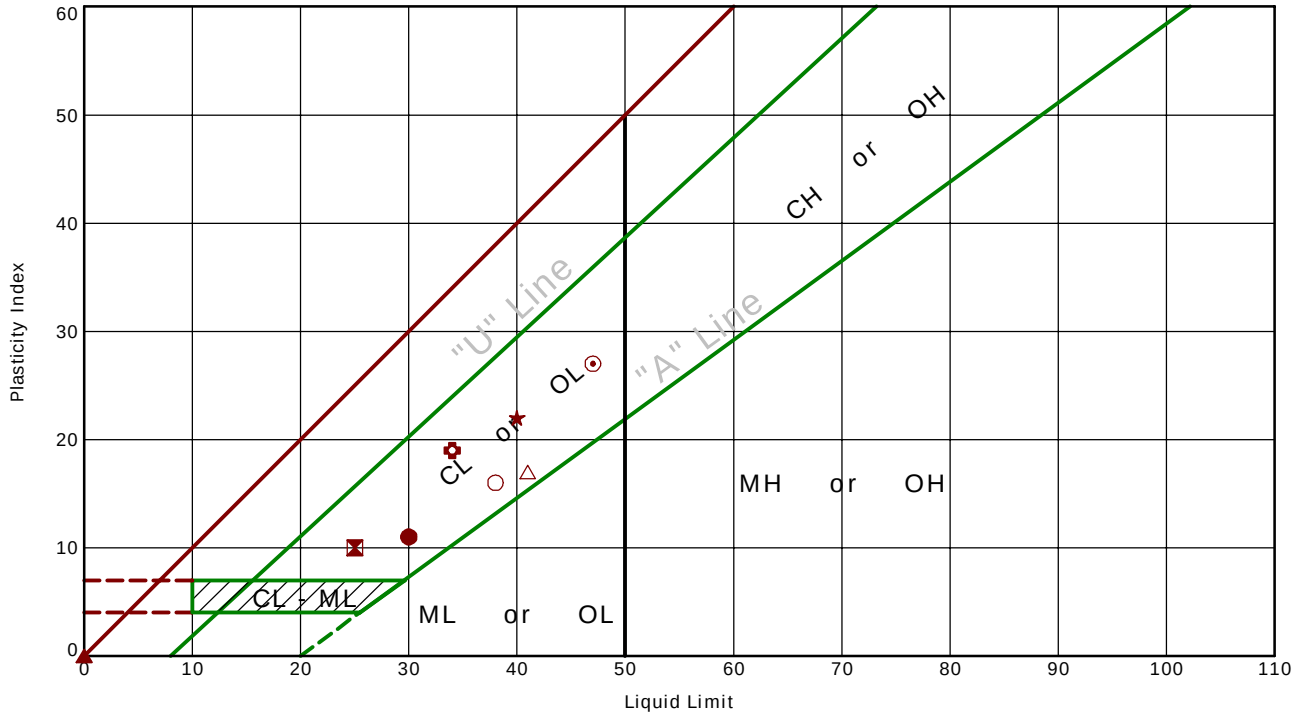
Boring Completed
08-10-2022

CSU Allison Hall Improvements
551 West Laurel Street | Fort Collins, CO
Terracon Project No. 20225056

1901 Sharp Point Dr Ste C
Fort Collins, CO

Atterberg Limit Results

ASTM D4318



	Boring ID	Depth (Ft)	LL	PL	PI	Fines	AASHTO	Description
●	AH1	14 - 15	30	19	11	46.8	A-6 (2)	CLAYEY SAND
⊠	AH1	24 - 25	25	15	10	30.5	A-2-4 (0)	CLAYEY SAND
▲	AH2	14 - 15	NP	NP	NP	8.3	A-1-b (0)	WELL-GRADED SAND with SILT and GRAVEL
★	AH2	24 - 24.8	40	18	22	91.8	CLAYSTONE	CLAYSTONE
⊙	AH2	29 - 29.9	47	20	27	92.1	CLAYSTONE	CLAYSTONE
✿	AH3	4 - 5	34	15	19	80.9	A-6 (14)	LEAN CLAY with SAND
○	AH3	14 - 15	38	22	16	28.4	A-2-6 (1)	CLAYEY SAND with GRAVEL
△	AH3	26 - 26.7	41	24	17	90.1	CLAYSTONE	CLAYSTONE

CSU Allison Hall Improvements
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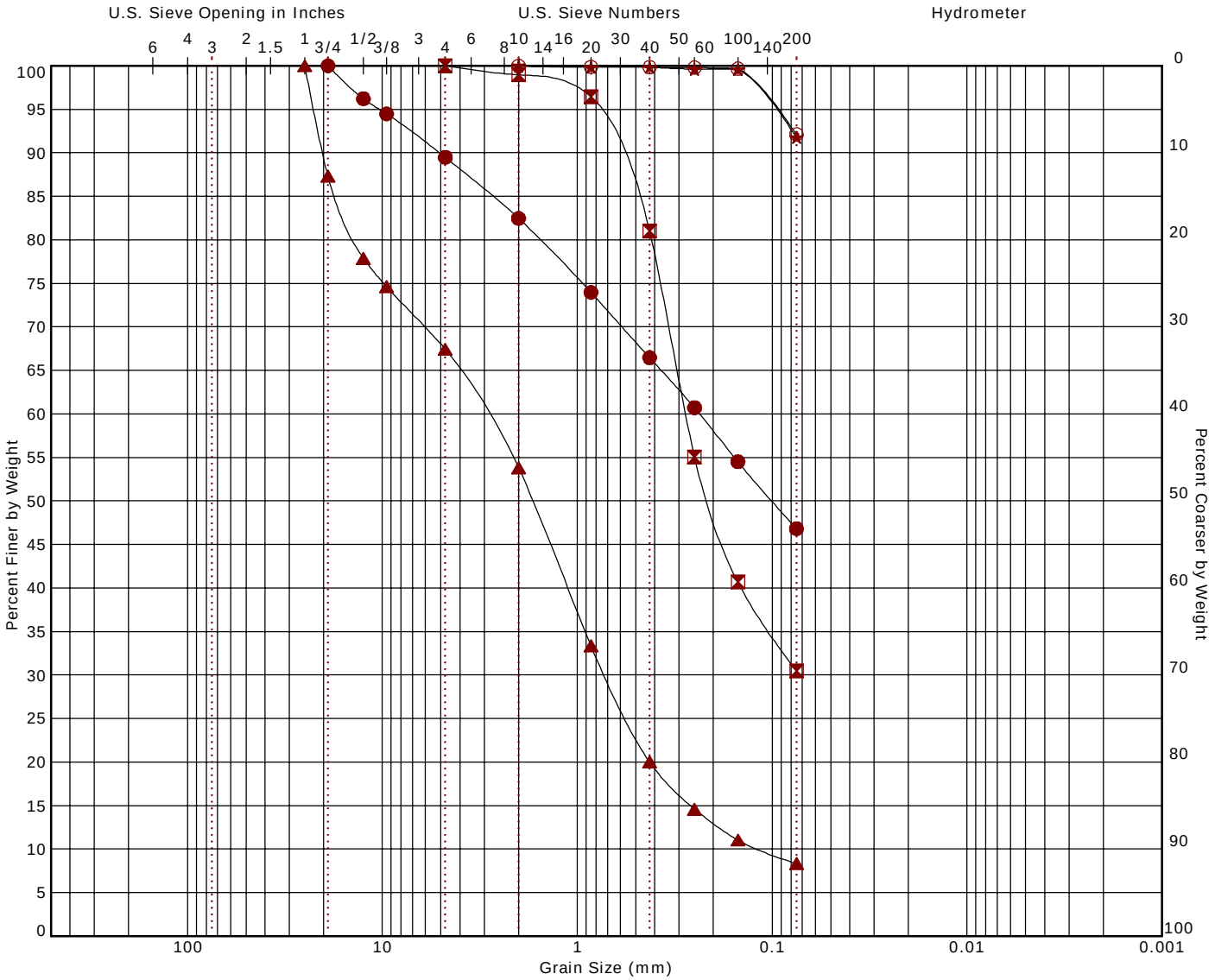
Terracon
1901 Sharp Point Dr Ste C
Fort Collins, CO

Grain Size Distribution

ASTM D422 / ASTM C136



Cobbles	Gravel		Sand			Silt or Clay
	coarse	fine	coarse	medium	fine	

Boring ID		Depth (Ft)	USCS Classification	USCS	AASHTO	LL	PL	PI	Cc	Cu
●	AH1	14 - 15	CLAYEY SAND	SC	A-6 (2)	30	19	11		
⊠	AH1	24 - 25	CLAYEY SAND	SC	A-2-4 (0)	25	15	10		
▲	AH2	14 - 15	WELL-GRADED SAND with SILT and GRAVEL	SW-SM	A-1-b (0)	NP	NP	NP	1.50	25.83
★	AH2	24 - 24.8	CLAYSTONE	CL	CLAYSTONE	40	18	22		
⊙	AH2	29 - 29.9	CLAYSTONE	CL	CLAYSTONE	47	20	27		

Boring ID		Depth (Ft)	D_{100}	D_{60}	D_{30}	D_{10}	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
●	AH1	14 - 15	19	0.236			0.0	10.5	42.7	46.8		
⊠	AH1	24 - 25	4.75	0.277			0.0	0.0	69.5	30.5		
▲	AH2	14 - 15	25	2.962	0.714	0.115	0.0	32.6	59.1	8.3		
★	AH2	24 - 24.8	2				0.0	0.0	8.2	91.8		
⊙	AH2	29 - 29.9	2				0.0	0.0	7.9	92.1		

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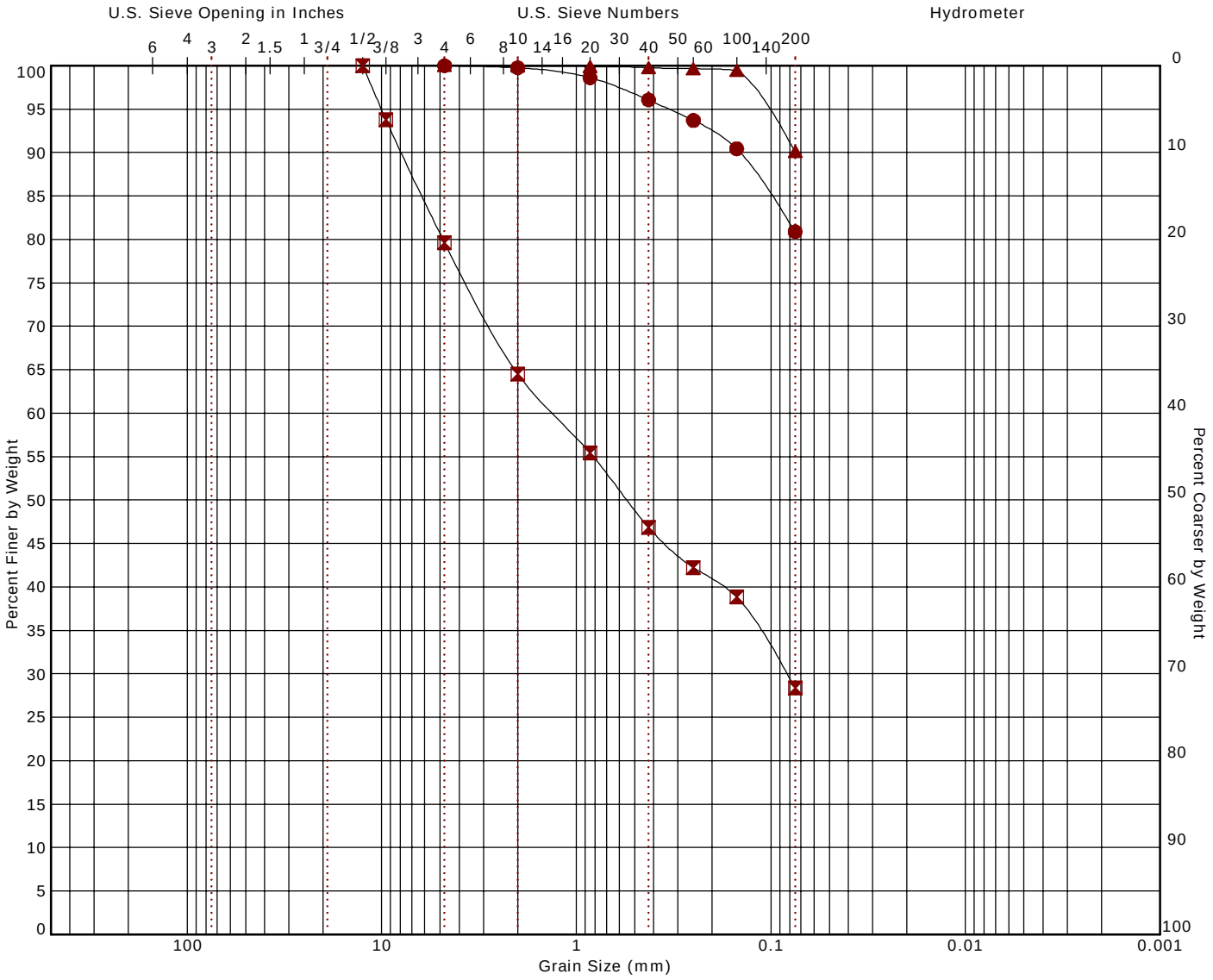
Terracon Project No. 20225056

Terracon
1901 Sharp Point Dr Ste C
Fort Collins, CO

Grain Size Distribution

ASTM D422 / ASTM C136



Cobbles	Gravel		Sand			Silt or Clay
	coarse	fine	coarse	medium	fine	

Boring ID		Depth (Ft)	USCS Classification	USCS	AASHTO	LL	PL	PI	Cc	Cu
●	AH3	4 - 5	LEAN CLAY with SAND	CL	A-6 (14)	34	15	19		
⊠	AH3	14 - 15	CLAYEY SAND with GRAVEL	SC	A-2-6 (1)	38	22	16		
▲	AH3	26 - 26.7	CLAYSTONE	CL	CLAYSTONE	41	24	17		

Boring ID		Depth (Ft)	D_{100}	D_{60}	D_{30}	D_{10}	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
●	AH3	4 - 5	4.75				0.0	0.0	19.1	80.9		
⊠	AH3	14 - 15	12.5	1.306	0.083		0.0	20.4	51.3	28.4		
▲	AH3	26 - 26.7	4.75				0.0	0.0	9.9	90.1		

CSU Allison Hall Improvements
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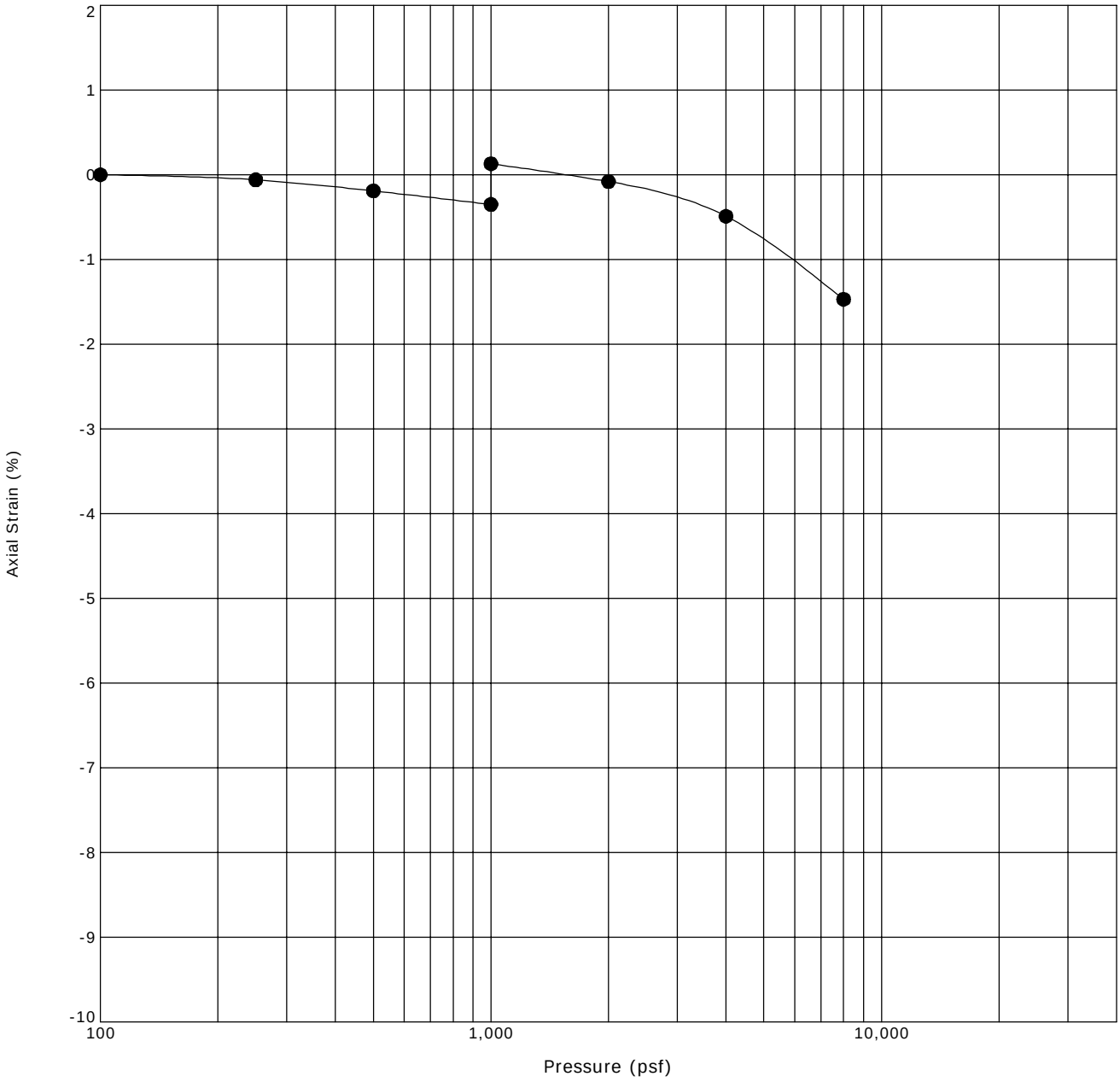
Terracon Project No. 20225056

Terracon
1901 Sharp Point Dr Ste C
Fort Collins, CO

Swell Consolidation Test



Boring ID		Depth (Ft)	Description	USCS	γ_d(pcf)	WC (%)
●	AH2	24 - 24.84	LEAN CLAY	CL	111	17.2

Notes: Sample exhibited 0.5 percent swell upon wetting under an applied pressure of 500 psf.

CSU Allison Hall Improvements
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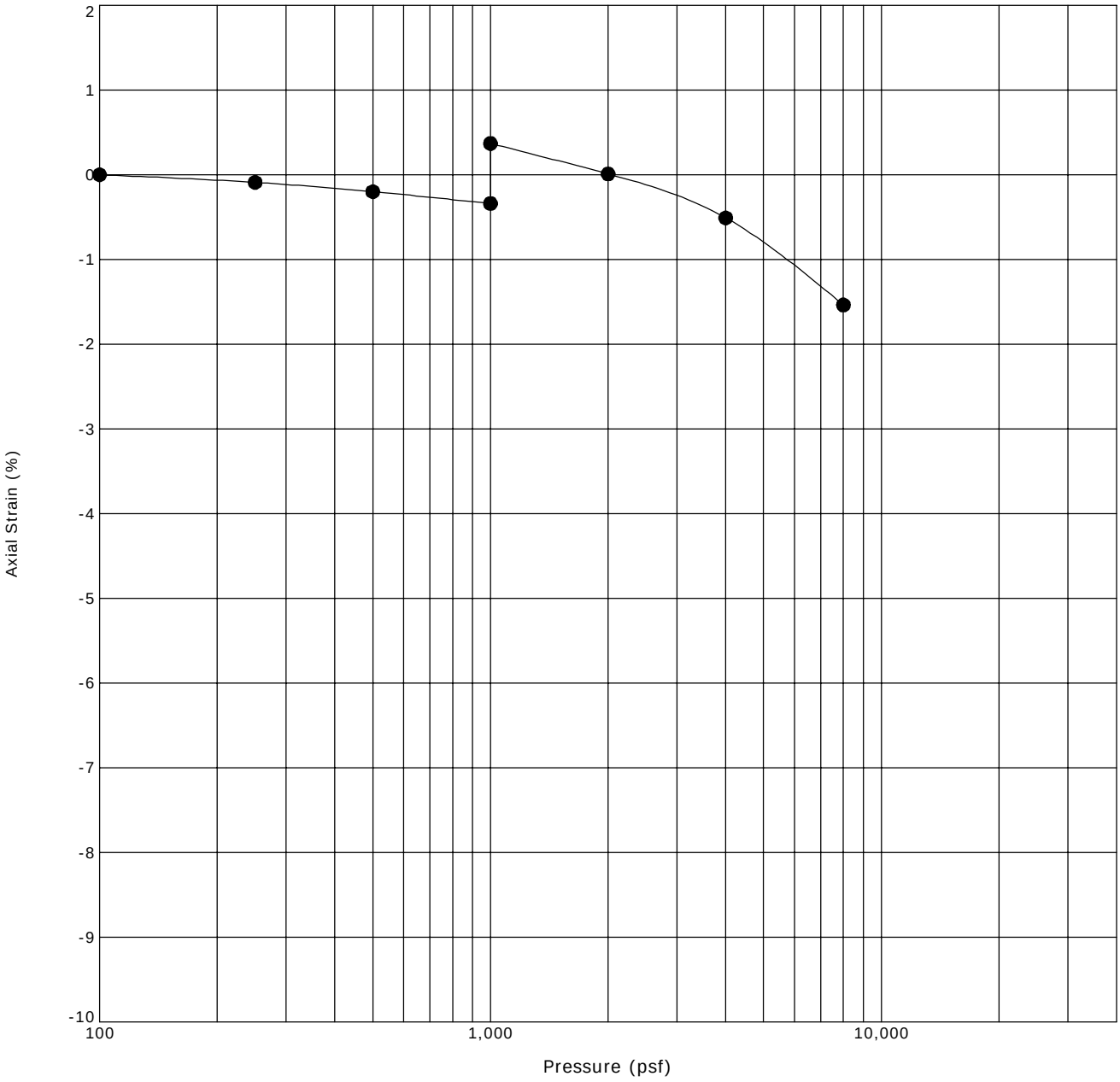
Terracon Project No. 20225056

Terracon
1901 Sharp Point Dr Ste C
Fort Collins, CO

Swell Consolidation Test



Boring ID	Depth (Ft)	Description	USCS	γ_d(pcf)	WC (%)
● AH2	29 - 29.92	LEAN CLAY	CL	110	16.3

Notes: Sample exhibited 0.7 percent swell upon wetting under an applied pressure of 500 psf.

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Terracon Project No. 20225056

Terracon
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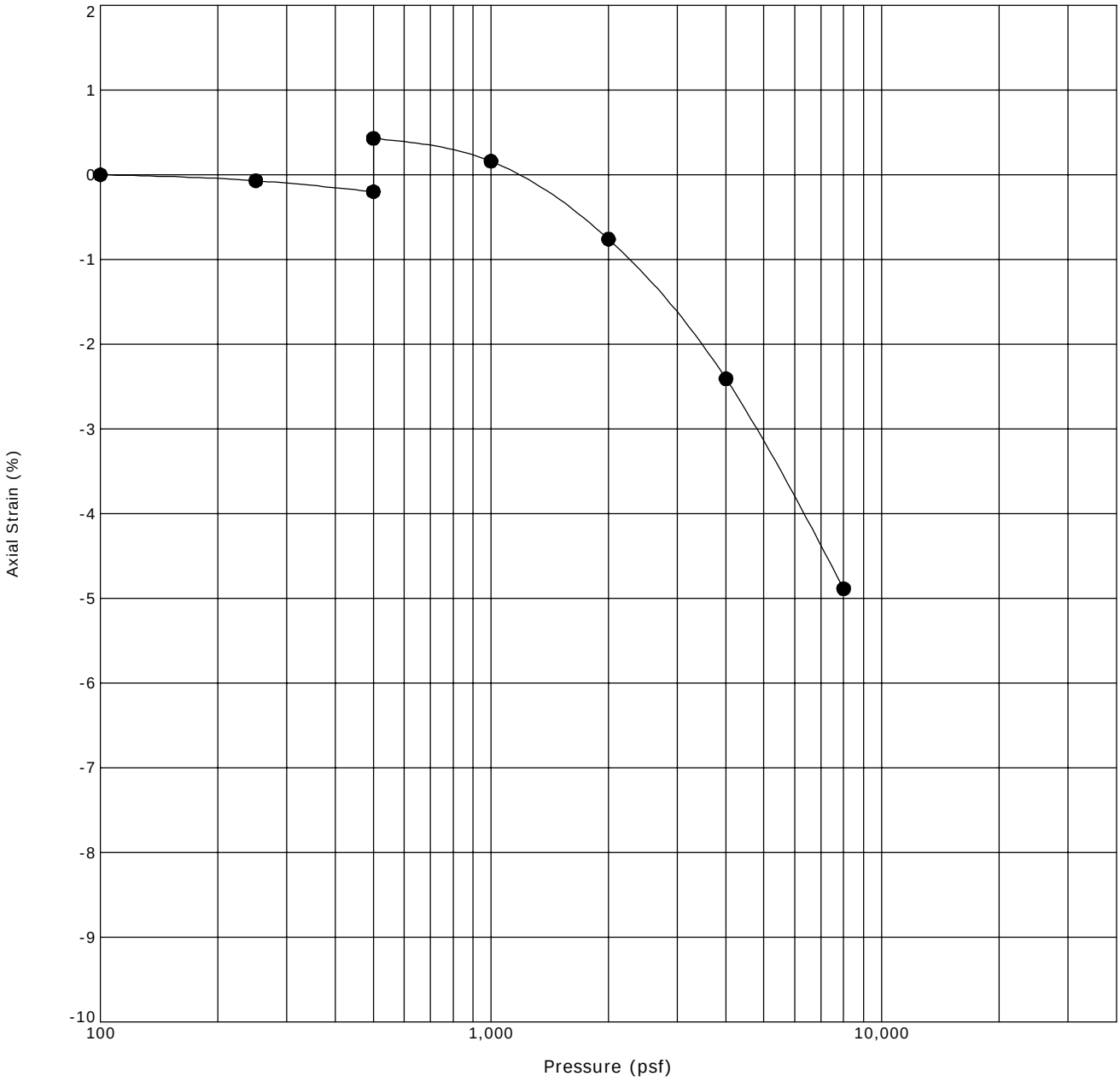
Fort Collins, CO

Swell Consolidation Test



Boring ID	Depth (Ft)	Description	USCS	γ_d(pcf)	WC (%)
● AH3	4 - 5	LEAN CLAY with SAND	CL	105	11.9

Notes: Sample exhibited 0.6 percent swell upon wetting under an applied pressure of 500 psf.

Client
Professional Engineering Consultants, P.A.
Fort Collins, CO

Project
CSU Allison Hall Improvements
20225056

Date Received: 9/28/2022

Results from Sulfates Testing

Sample Location	AH-1	AH-1	AH-3
Sample Depth (ft.)	9.0'-10.5'	38.0'-38.3'	19.0'-20.5'
Water Soluble Sulfate (SO4), ASTM C 1580 (ppm)	26	160	11

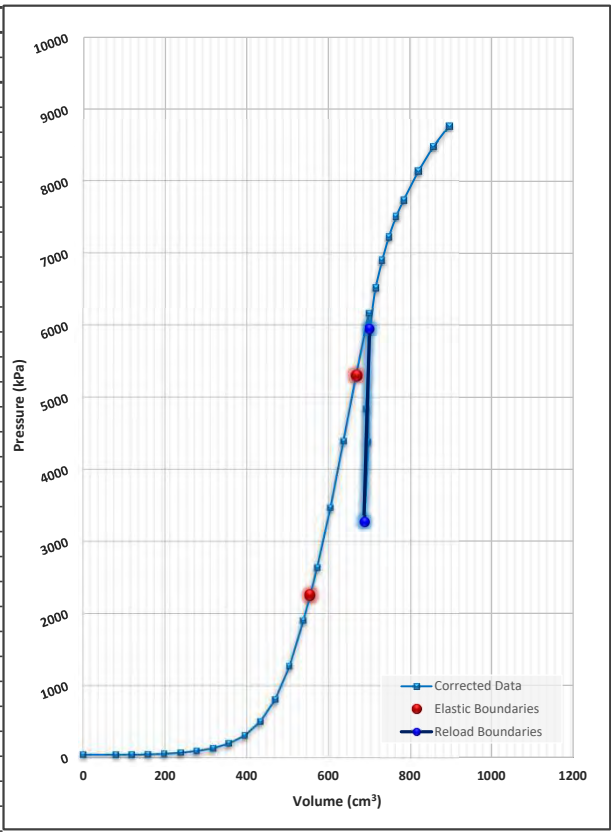
Analyzed By: Kyle Lemcke
Laboratory Supervisor

PRESSUREMETER TEST

Project:	Allison Hall Improvements	**Boring ID:**	AH-1	**Test Depth (ft):**	35.5
City, State:	Fort Collins, CO	**Mapes In-Situ No:**	P2022027	**Client:**	Terracon

Test date:	8/12/22	Calibration date:	8/9/22	Pressure Calibration ID:	CAP - 19 (1)
Pressuremeter SN:	001A17002	Probe body SN:	001A 1900011	Volume Calibration ID:	CAV - 19 (1)
Pressuremeter model:	TEXAM^e	Probe size (mm):	70	Calibration coefficient, a (cm^3/kPa):	0.008962
Test zone drilling method:	Mud/Wash Rotary	Calibration tube I.D. (mm):	76.2	Calibration coefficient, b (cm^3/kPa):	6.67E-05
Poisson's Ratio of soil/rock:	0.4	Calibration tube O.D. (mm):	101.6	Calibration coefficient, c (cm^3/kPa):	0.008895
Method for estimating P_L:	1/V vs. P	Tubing length (m):	50	Initial volume of probe, V_0 (cm^3):	1644

Raw Test Data		Pressure Calibration		Volume Calibration		Corrected Data		
Volume	Pressure	Volume	Pressure	Volume	Pressure	Volume	$\Delta R/R_o$	Pressure
cm^3	kPa	cm^3	kPa	cm^3	kPa	cm^3	%	kPa
0.0	-55	0.0	2	0.0	4	0.0	0.00	41
79.6	-46	77.2	11	403.3	510	80.0	2.40	40
118.0	-43	158.2	16	423.9	1007	118.4	3.54	41
157.9	-36	237.1	20	440.4	1496	158.3	4.70	46
198.0	-25	317.6	23	455.1	2007	198.2	5.86	55
237.9	-9	397.6	25	464.3	2499	237.9	6.99	69
277.3	17	477.2	28	472.7	2996	277.2	8.10	93
317.5	56	557.5	30	487.4	4047	317.0	9.22	131
357.7	124	641.7	32	498.6	5008	356.6	10.31	198
397.3	235	719.0	32	508.6	6007	395.2	11.37	308
436.8	428	799.0	33	517.7	7004	433.0	12.40	499
475.9	736	879.5	34	526.7	8027	469.3	13.38	806
515.3	1201	959.8	35	535.0	9018	504.6	14.32	1270
554.7	1836	1039.5	36	543.3	9997	538.4	15.22	1904
574.5	2184	1119.6	37			555.1	15.66	2251
594.8	2568	1200.4	38			571.9	16.10	2635
634.7	3400	1279.6	39			604.5	16.95	3466
674.6	4322	1359.3	40			636.1	17.77	4388
713.9	5236	1439.6	42			667.1	18.57	5302
753.6	6099					698.3	19.36	6164
735.4	4312					697.0	19.33	4377
715.5	3205					687.0	19.07	3271
734.6	4771					692.2	19.21	4836
754.0	5886					700.8	19.43	5951
773.7	6449					715.3	19.80	6514
793.6	6832					731.7	20.21	6897
813.2	7165					748.3	20.63	7229
833.3	7449					765.9	21.07	7513
853.0	7670					783.7	21.52	7734
893.1	8071					820.3	22.43	8134
933.3	8421					857.6	23.35	8484
973.1	8701					895.1	24.28	8763



Interpreted Test Results

Deformation Modulus, E_P	163,280	kPa	23,682	psi
Reload Modulus, E_R	948,955	kPa	137,634	psi
Yield Pressure, P_F	5,302	kPa	769	psi
Ultimate Pressure, P_L [1]	13,450	kPa	1,951	psi
E_P / P_L	12.1			
P_L / P_F	2.5			

Test Remarks

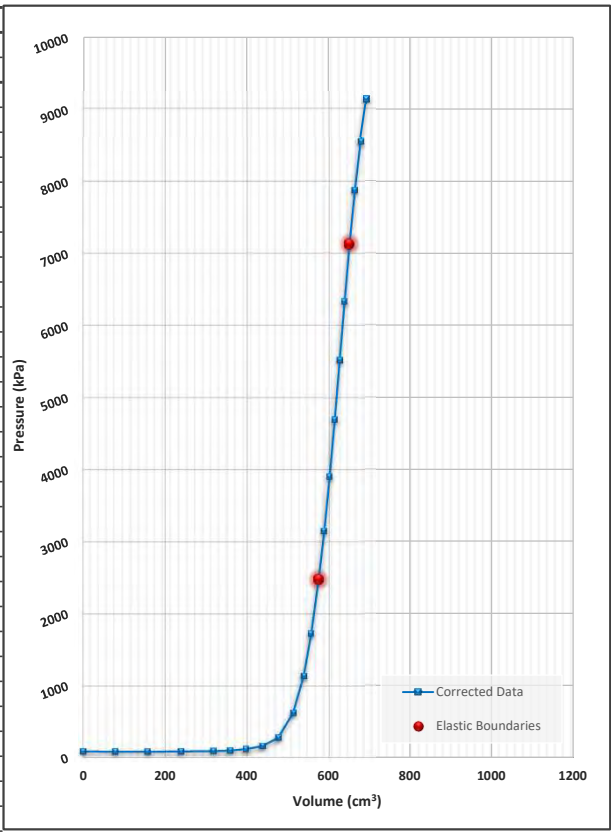
[1] Ultimate Pressure, P_L, is interpreted by extrapolating the data points in the plastic phase of the curve to 2 times the initial volume of the test zone, and reading the corresponding pressure. Accordingly, caution must be used in regards to the use of Ultimate Pressure values, particularly when a small quantity of data points are collected in the plastic phase, or when deformation is minimal due to the stiffness of the material.

PRESSUREMETER TEST

Project:	Allison Hall Improvements	**Boring ID:**	AH-1	**Test Depth (ft):**	40.5
City, State:	Fort Colins, CO	**Mapes In-Situ No:**	P2022027	**Client:**	Terracon

Test date:	8/12/22	Calibration date:	8/9/22	Pressure Calibration ID:	CAP - 19 (1)
Pressuremeter SN:	001A17002	Probe body SN:	001A 1900011	Volume Calibration ID:	CAV - 19 (1)
Pressuremeter model:	TEXAM^{e}	Probe size (mm):	70	Calibration coefficient, a (cm^3/kPa):	0.008962
Test zone drilling method:	Mud/Wash Rotary	Calibration tube I.D. (mm):	76.2	Calibration coefficient, b (cm^3/kPa):	6.67E-05
Poisson's Ratio of soil/rock:	0.4	Calibration tube O.D. (mm):	101.6	Calibration coefficient, c (cm^3/kPa):	0.008895
Method for estimating P_L:	1/V vs. P	Tubing length (m):	50	Initial volume of probe, V_0 (cm^3):	1644

Raw Test Data		Pressure Calibration		Volume Calibration		Corrected Data		
Volume	Pressure	Volume	Pressure	Volume	Pressure	Volume	$\Delta R/R_o$	Pressure
cm^3	kPa	cm^3	kPa	cm^3	kPa	cm^3	%	kPa
0.0	-17	0.0	2	0.0	4	0.0	0.00	94
77.2	-11	77.2	11	403.3	510	77.3	2.32	91
157.7	-5	158.2	16	423.9	1007	157.8	4.69	92
238.1	0	237.1	20	440.4	1496	238.1	7.00	93
317.8	9	317.6	23	455.1	2007	317.7	9.24	99
358.2	17	397.6	25	464.3	2499	358.1	10.35	106
398.2	41	477.2	28	472.7	2996	397.9	11.45	129
437.7	84	557.5	30	487.4	4047	436.9	12.51	170
477.3	200	641.7	32	498.6	5008	475.5	13.55	285
516.6	541	719.0	32	508.6	6007	511.7	14.51	625
547.1	1055	799.0	33	517.7	7004	537.7	15.20	1138
570.7	1644	879.5	34	526.7	8027	556.0	15.68	1726
595.4	2395	959.8	35	535.0	9018	574.1	16.16	2477
615.3	3069	1039.5	36	543.3	9997	588.0	16.52	3150
635.0	3822	1119.6	37			601.0	16.86	3903
654.7	4611	1200.4	38			613.6	17.19	4692
674.4	5435	1279.6	39			625.7	17.50	5516
694.0	6252	1359.3	40			637.4	17.80	6333
713.4	7045	1439.6	42			649.6	18.12	7126
733.0	7794					662.6	18.45	7874
752.6	8470					676.5	18.81	8550
773.5	9066					692.4	19.21	9146



Interpreted Test Results

Deformation Modulus, E_P	369,678	kPa	53,617	psi
Reload Modulus, E_R	n.a.	kPa	n.a.	psi
Yield Pressure, P_F	7,126	kPa	1,033	psi
Ultimate Pressure, P_L [1]	n.a.	kPa	n.a.	psi
E_P / P_L	n.a.			
P_L / P_F	n.a.			

Test Remarks

- Material deformed minimally. Accordingly, Ultimate Pressure could not be interpreted.

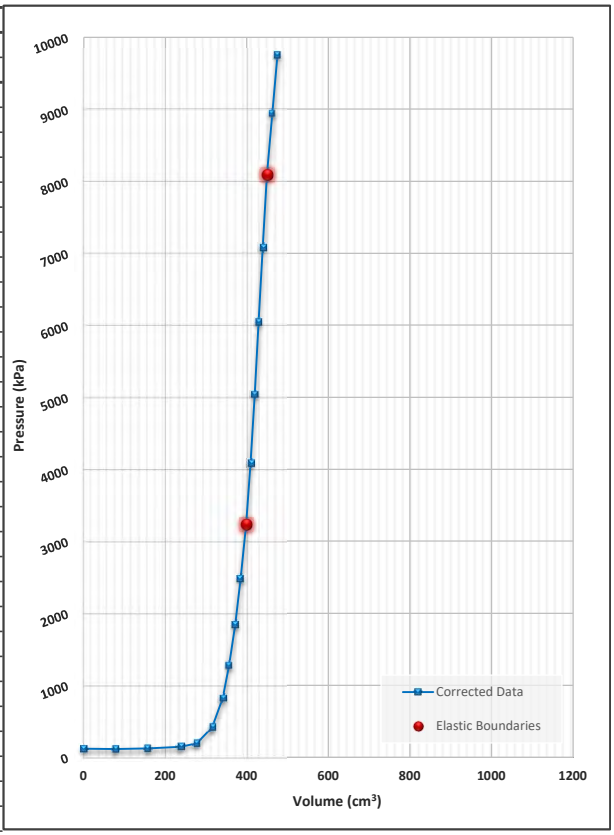
[1] Ultimate Pressure, P_L, is interpreted by extrapolating the data points in the plastic phase of the curve to 2 times the initial volume of the test zone, and reading the corresponding pressure. Accordingly, caution must be used in regards to the use of Ultimate Pressure values, particularly when a small quantity of data points are collected in the plastic phase, or when deformation is minimal due to the stiffness of the material.

PRESSUREMETER TEST

Project:	Allison Hall Improvements	**Boring ID:**	AH-1	**Test Depth (ft):**	45.1
City, State:	Fort Colins, CO	**Mapes In-Situ No:**	P2022027	**Client:**	Terracon

Test date:	8/12/22	Calibration date:	8/9/22	Pressure Calibration ID:	CAP - 19 (1)
Pressuremeter SN:	001A17002	Probe body SN:	001A 1900011	Volume Calibration ID:	CAV - 19 (1)
Pressuremeter model:	TEXAM^{e}	Probe size (mm):	70	Calibration coefficient, a (cm^3/kPa):	0.008962
Test zone drilling method:	Mud/Wash Rotary	Calibration tube I.D. (mm):	76.2	Calibration coefficient, b (cm^3/kPa):	6.67E-05
Poisson's Ratio of soil/rock:	0.4	Calibration tube O.D. (mm):	101.6	Calibration coefficient, c (cm^3/kPa):	0.008895
Method for estimating P_L:	1/V vs. P	Tubing length (m):	50	Initial volume of probe, V_0 (cm^3):	1644

Raw Test Data		Pressure Calibration		Volume Calibration		Corrected Data		
Volume	Pressure	Volume	Pressure	Volume	Pressure	Volume	$\Delta R/R_o$	Pressure
cm^3	kPa	cm^3	kPa	cm^3	kPa	cm^3	%	kPa
0.0	-8	0.0	2	0.0	4	0.0	0.00	116
77.6	0	77.2	11	403.3	510	77.6	2.33	115
158.1	11	158.2	16	423.9	1007	158.0	4.69	121
238.2	39	237.1	20	440.4	1496	237.9	6.99	145
278.1	90	317.6	23	455.1	2007	277.3	8.11	195
317.5	313	397.6	25	464.3	2499	314.7	9.15	416
347.0	721	477.2	28	472.7	2996	340.6	9.87	824
367.2	1176	557.5	30	487.4	4047	356.7	10.32	1278
386.7	1738	641.7	32	498.6	5008	371.2	10.72	1840
406.0	2381	719.0	32	508.6	6007	384.8	11.09	2482
425.4	3127	799.0	33	517.7	7004	397.6	11.44	3227
444.5	3988	879.5	34	526.7	8027	409.0	11.75	4088
463.6	4936	959.8	35	535.0	9018	419.7	12.04	5035
482.7	5941	1039.5	36	543.3	9997	428.9	12.29	6039
502.0	6979	1119.6	37			438.8	12.56	7077
521.3	7985	1200.4	38			449.3	12.84	8082
541.4	8843	1279.6	39			462.2	13.19	8940
561.2	9655	1359.3	40			475.2	13.54	9751
		1439.6	42					



Interpreted Test Results

Deformation Modulus, E_P	517,061	kPa	74,993	psi
Reload Modulus, E_R	n.a.	kPa	n.a.	psi
Yield Pressure, P_F	8,082	kPa	1,172	psi
Ultimate Pressure, P_L [1]	n.a.	kPa	n.a.	psi
E_P / P_L	n.a.			
P_L / P_F	n.a.			

Test Remarks

- Material deformed minimally. Accordingly, Ultimate Pressure could not be interpreted.

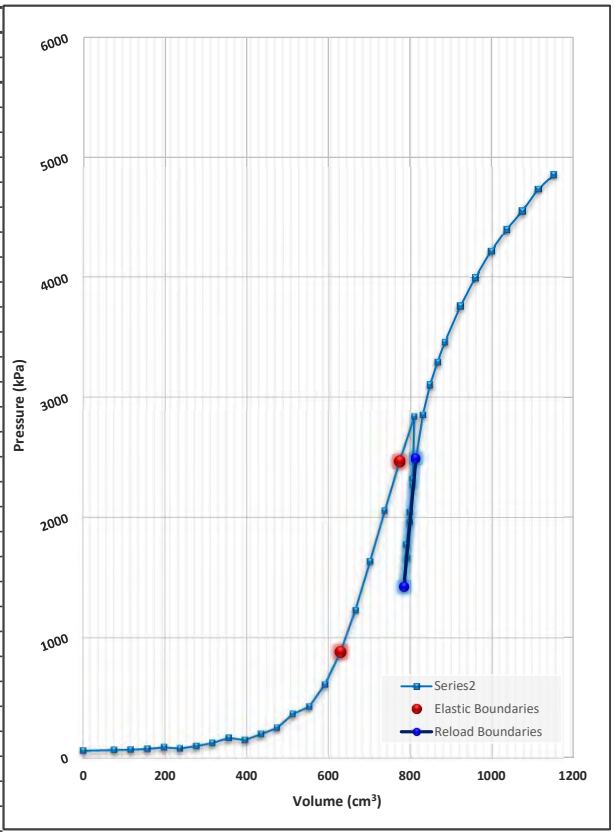
[1] Ultimate Pressure, P_L, is interpreted by extrapolating the data points in the plastic phase of the curve to 2 times the initial volume of the test zone, and reading the corresponding pressure. Accordingly, caution must be used in regards to the use of Ultimate Pressure values, particularly when a small quantity of data points are collected in the plastic phase, or when deformation is minimal due to the stiffness of the material.

PRESSUREMETER TEST

Project:	Allison Hall Improvements	**Boring ID:**	AH-2	**Test Depth (ft):**	27.0
City, State:	Fort Colins, CO	**Mapes In-Situ No:**	P2022027	**Client:**	Terracon

Test date:	8/13/22	Calibration date:	8/9/22	Pressure Calibration ID:	CAP - 19 (1)
Pressuremeter SN:	001A17002	Probe body SN:	001A 1900011	Volume Calibration ID:	CAV - 19 (1)
Pressuremeter model:	TEXAM^e	Probe size (mm):	70	Calibration coefficient, a (cm^3/kPa):	0.008962
Test zone drilling method:	Mud/Wash Rotary	Calibration tube I.D. (mm):	76.2	Calibration coefficient, b (cm^3/kPa):	6.67E-05
Poisson's Ratio of soil/rock:	0.4	Calibration tube O.D. (mm):	101.6	Calibration coefficient, c (cm^3/kPa):	0.008895
Method for estimating P_L:	1/V vs. P	Tubing length (m):	50	Initial volume of probe, V_0 (cm^3):	1644

Raw Test Data		Pressure Calibration		Volume Calibration		Corrected Data		
Volume	Pressure	Volume	Pressure	Volume	Pressure	Volume	$\Delta R/R_o$	Pressure
cm^3	kPa	cm^3	kPa	cm^3	kPa	cm^3	%	kPa
0.0	-9	0.0	2	0.0	4	0.0	0.00	61
76.5	5	77.2	11	403.3	510	76.4	2.30	66
117.1	12	158.2	16	423.9	1007	117.0	3.50	71
157.2	20	237.1	20	440.4	1496	157.1	4.67	76
197.4	35	317.6	23	455.1	2007	197.1	5.82	89
237.1	28	397.6	25	464.3	2499	236.8	6.96	80
277.2	50	477.2	28	472.7	2996	276.8	8.09	101
316.6	76	557.5	30	487.4	4047	315.9	9.19	125
357.3	119	641.7	32	498.6	5008	356.2	10.30	167
396.9	104	719.0	32	508.6	6007	396.0	11.39	151
436.4	153	799.0	33	517.7	7004	435.1	12.46	199
476.2	207	879.5	34	526.7	8027	474.4	13.51	251
515.9	322	959.8	35	535.0	9018	513.1	14.55	365
555.9	383	1039.5	36	543.3	9997	552.5	15.59	425
596.4	568	1119.6	37			591.4	16.61	609
636.4	838	1200.4	38			629.0	17.58	878
676.5	1186	1279.6	39			666.0	18.54	1226
716.2	1593	1359.3	40			702.0	19.46	1633
755.8	2015	1439.6	42			737.9	20.37	2055
795.5	2422					773.9	21.27	2461
835.2	2797					810.4	22.18	2836
826.2	2278					805.9	22.07	2317
816.4	1919					799.3	21.91	1958
806.7	1624					792.3	21.73	1663
797.0	1379					784.8	21.55	1418
806.8	1732					791.4	21.71	1771
816.5	2002					798.7	21.89	2041
826.3	2234					806.4	22.09	2273
836.3	2451					814.5	22.29	2490
856.0	2812					831.0	22.70	2850
876.1	3064					848.9	23.14	3102
896.2	3255					867.3	23.59	3293
916.0	3421					885.5	24.04	3459
955.9	3718					922.8	24.95	3755
995.3	3961					960.1	25.86	3998
1034.9	4180					997.7	26.76	4216
1075.4	4362					1036.6	27.69	4398
1115.3	4512					1075.1	28.61	4547
1155.4	4698					1113.6	29.51	4733
1195.4	4822					1152.5	30.42	4856



Interpreted Test Results

Deformation Modulus, E_P	68,142	kPa	9,883	psi
Reload Modulus, E_R	226,103	kPa	32,793	psi
Yield Pressure, P_F	2,461	kPa	357	psi
Ultimate Pressure, P_L [1]	7,276	kPa	1,055	psi
E_P / P_L	9.4			
P_L / P_F	3.0			

Test Remarks

Test zone was slightly oversized. Accordingly, test was terminated when risk of membrane rupture was high.

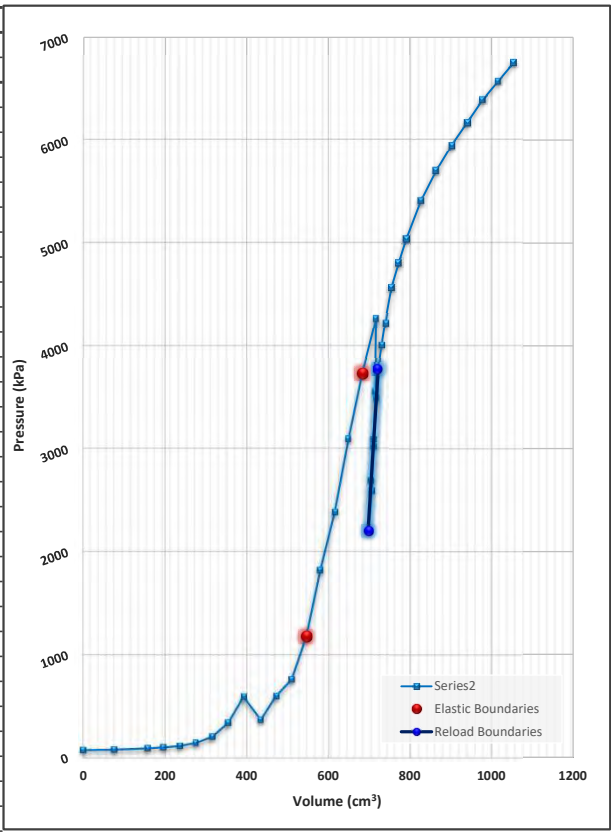
[1] Ultimate Pressure, P_L, is interpreted by extrapolating the data points in the plastic phase of the curve to 2 times the initial volume of the test zone, and reading the corresponding pressure. Accordingly, caution must be used in regards to the use of Ultimate Pressure values, particularly when a small quantity of data points are collected in the plastic phase, or when deformation is minimal due to the stiffness of the material.

PRESSUREMETER TEST

Project:	Allison Hall Improvements	**Boring ID:**	AH-2	**Test Depth (ft):**	32.0
City, State:	Fort Collins, CO	**Mapes In-Situ No:**	P2022027	**Client:**	Terracon

Test date:	8/13/22	Calibration date:	8/9/22	Pressure Calibration ID:	CAP - 19 (1)
Pressuremeter SN:	001A17002	Probe body SN:	001A 1900011	Volume Calibration ID:	CAV - 19 (1)
Pressuremeter model:	TEXAM^{e}	Probe size (mm):	70	Calibration coefficient, a (cm^3/kPa):	0.008962
Test zone drilling method:	Mud/Wash Rotary	Calibration tube I.D. (mm):	76.2	Calibration coefficient, b (cm^3/kPa):	6.67E-05
Poisson's Ratio of soil/rock:	0.4	Calibration tube O.D. (mm):	101.6	Calibration coefficient, c (cm^3/kPa):	0.008895
Method for estimating P_L:	1/V vs. P	Tubing length (m):	50	Initial volume of probe, V_0 (cm^3):	1644

Raw Test Data		Pressure Calibration		Volume Calibration		Corrected Data		
Volume	Pressure	Volume	Pressure	Volume	Pressure	Volume	$\Delta R/R_o$	Pressure
cm^3	kPa	cm^3	kPa	cm^3	kPa	cm^3	%	kPa
0.0	-8	0.0	2	0.0	4	0.0	0.00	77
76.1	5	77.2	11	403.3	510	76.0	2.29	81
156.7	23	158.2	16	423.9	1007	156.5	4.65	94
196.4	34	237.1	20	440.4	1496	196.1	5.80	103
236.6	52	317.6	23	455.1	2007	236.1	6.94	119
276.8	82	397.6	25	464.3	2499	276.1	8.07	148
316.4	143	477.2	28	472.7	2996	315.1	9.16	207
356.7	278	557.5	30	487.4	4047	354.2	10.25	341
396.6	531	641.7	32	498.6	5008	391.9	11.28	593
436.6	309	719.0	32	508.6	6007	433.8	12.42	370
475.6	541	799.0	33	517.7	7004	470.8	13.42	600
515.5	703	879.5	34	526.7	8027	509.2	14.44	761
555.0	1117	959.8	35	535.0	9018	**545.0**	**15.39**	**1174**
594.9	1762	1039.5	36	543.3	9997	579.3	16.29	1818
635.0	2327	1119.6	37			614.3	17.20	2382
675.2	3035	1200.4	38			648.2	18.08	3090
714.5	3672	1279.6	39			**681.8**	**18.94**	**3727**
754.2	4209	1359.3	40			716.8	19.83	4264
745.3	3492	1439.6	42			714.3	19.77	3547
735.7	2962					709.3	19.64	3017
726.5	2533					703.9	19.51	2588
716.4	2142					697.4	19.34	2197
726.1	2632					702.7	19.48	2687
735.8	3032					708.8	19.63	3087
746.6	3429					716.0	19.81	3484
755.5	3718					722.4	19.98	3773
765.2	3950					730.0	20.17	4005
775.3	4165					738.3	20.38	4219
794.8	4510					754.7	20.79	4564
814.7	4753					772.4	21.24	4807
834.4	4980					790.1	21.68	5034
874.7	5353					826.7	22.59	5406
914.6	5647					863.8	23.51	5700
954.6	5893					901.3	24.43	5945
995.3	6113					939.9	25.37	6165
1035.2	6340					977.8	26.28	6391
1075.2	6522					1016.1	27.20	6573
1115.0	6701					1054.3	28.11	6751



Interpreted Test Results

Deformation Modulus, E_P	112,100	kPa	16,259	psi
Reload Modulus, E_R	370,801	kPa	53,780	psi
Yield Pressure, P_F	3,727	kPa	541	psi
Ultimate Pressure, P_L [1]	9,886	kPa	1,434	psi
E_P / P_L	11.3			
P_L / P_F	2.7			

Test Remarks

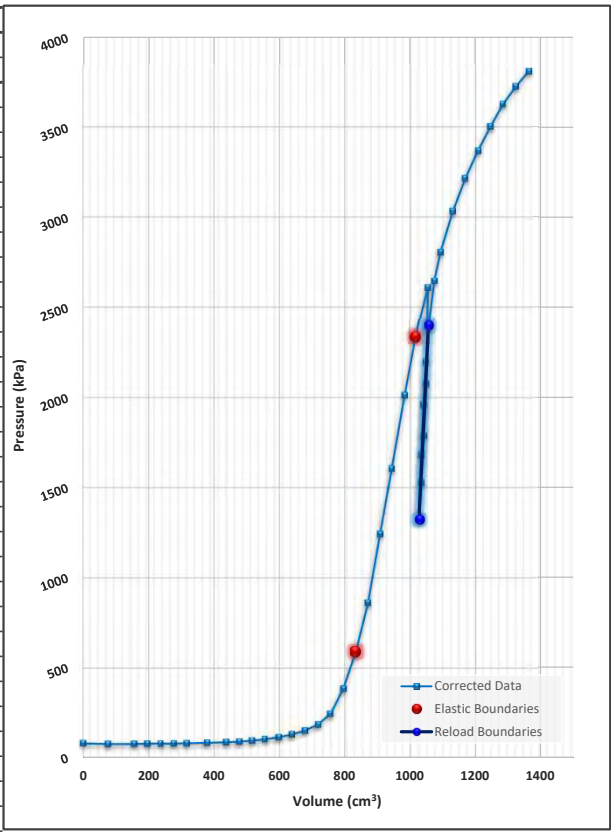
[1] Ultimate Pressure, P_L, is interpreted by extrapolating the data points in the plastic phase of the curve to 2 times the initial volume of the test zone, and reading the corresponding pressure. Accordingly, caution must be used in regards to the use of Ultimate Pressure values, particularly when a small quantity of data points are collected in the plastic phase, or when deformation is minimal due to the stiffness of the material.

PRESSUREMETER TEST

Project:	Allison Hall Improvements	**Boring ID:**	AH-2	**Test Depth (ft):**	36.7
City, State:	Fort Collins, CO	**Mapes In-Situ No:**	P2022027	**Client:**	Terracon

Test date:	8/13/22	Calibration date:	8/9/22	Pressure Calibration ID:	CAP - 19 (1)
Pressuremeter SN:	001A17002	Probe body SN:	001A 1900011	Volume Calibration ID:	CAV - 19 (1)
Pressuremeter model:	TEXAM^e	Probe size (mm):	70	Calibration coefficient, a (cm^3/kPa):	0.008962
Test zone drilling method:	Mud/Wash Rotary	Calibration tube I.D. (mm):	76.2	Calibration coefficient, b (cm^3/kPa):	6.67E-05
Poisson's Ratio of soil/rock:	0.4	Calibration tube O.D. (mm):	101.6	Calibration coefficient, c (cm^3/kPa):	0.008895
Method for estimating P_L:	1/V vs. P	Tubing length (m):	50	Initial volume of probe, V_0 (cm^3):	1644

Raw Test Data		Pressure Calibration		Volume Calibration		Corrected Data		
Volume	Pressure	Volume	Pressure	Volume	Pressure	Volume	$\Delta R/R_o$	Pressure
cm^3	kPa	cm^3	kPa	cm^3	kPa	cm^3	%	kPa
0.0	-17	0.0	2	0.0	4	0.0	0.00	82
76.3	-12	77.2	11	403.3	510	76.4	2.30	78
156.7	-6	158.2	16	423.9	1007	156.8	4.66	79
196.6	-3	237.1	20	440.4	1496	196.7	5.81	80
237.7	0	317.6	23	455.1	2007	237.7	6.99	81
277.3	2	397.6	25	464.3	2499	277.3	8.10	82
317.2	4	477.2	28	472.7	2996	317.1	9.22	82
377.3	9	557.5	30	487.4	4047	377.2	10.88	86
437.1	14	641.7	32	498.6	5008	437.0	12.51	89
476.9	19	719.0	32	508.6	6007	476.7	13.58	92
516.6	25	799.0	33	517.7	7004	516.3	14.63	97
556.4	34	879.5	34	526.7	8027	556.1	15.68	105
597.6	46	959.8	35	535.0	9018	597.2	16.76	116
637.6	62	1039.5	36	543.3	9997	637.0	17.79	131
678.4	84	1119.6	37			677.6	18.83	153
718.0	117	1200.4	38			717.0	19.84	186
758.1	177	1279.6	39			756.5	20.84	246
798.2	317	1359.3	40			795.4	21.81	385
837.8	520	1439.6	42			833.2	22.75	588
878.0	795					870.9	23.68	862
917.7	1176					907.2	24.57	1243
957.2	1539					943.5	25.46	1605
999.8	1947					982.5	26.40	2013
1036.2	2272					1016.0	27.20	2337
1076.3	2544					1053.7	28.10	2609
1066.7	2011					1048.8	27.98	2076
1057.2	1723					1041.9	27.82	1788
1047.2	1463					1034.2	27.63	1528
1038.0	1255					1026.8	27.46	1320
1047.3	1618					1032.9	27.60	1683
1057.2	1896					1040.3	27.78	1961
1067.0	2134					1048.0	27.96	2199
1077.0	2333					1056.2	28.16	2398
1096.3	2582					1073.4	28.56	2646
1116.3	2741					1091.9	29.00	2805
1156.4	2969					1130.0	29.90	3033
1196.4	3152					1168.3	30.79	3215
1236.1	3305					1206.7	31.68	3368
1275.8	3440					1245.2	32.57	3502
1315.5	3565					1283.7	33.45	3627
1355.7	3663					1323.1	34.34	3724
1395.3	3748					1362.0	35.22	3808



Interpreted Test Results

Deformation Modulus, E_P	65,404	kPa	9,486	psi
Reload Modulus, E_R	252,764	kPa	36,660	psi
Yield Pressure, P_F	2,337	kPa	339	psi
Ultimate Pressure, P_L [1]	5,565	kPa	807	psi
E_P / P_L	11.8			
P_L / P_F	2.4			

Test Remarks

- Test zone was significantly oversized.

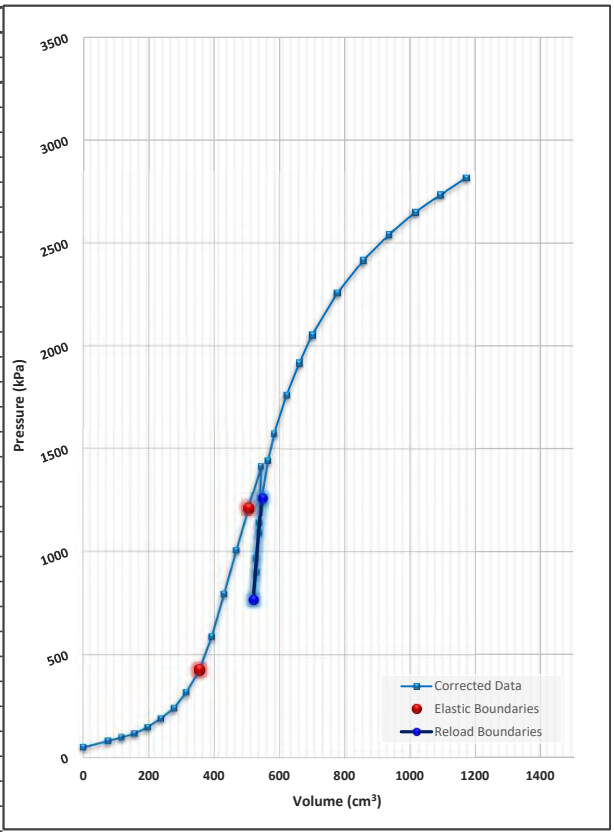
[1] Ultimate Pressure, P_L, is interpreted by extrapolating the data points in the plastic phase of the curve to 2 times the initial volume of the test zone, and reading the corresponding pressure. Accordingly, caution must be used in regards to the use of Ultimate Pressure values, particularly when a small quantity of data points are collected in the plastic phase, or when deformation is minimal due to the stiffness of the material.

PRESSUREMETER TEST

Project:	Allison Hall Improvements	**Boring ID:**	AH-3	**Test Depth (ft):**	22.0
City, State:	Fort Collins, CO	**Mapes In-Situ No:**	P2022027	**Client:**	Terracon

Test date:	8/10/22	Calibration date:	8/9/22	Pressure Calibration ID:	CAP - 19 (1)
Pressuremeter SN:	001A17002	Probe body SN:	001A 1900011	Volume Calibration ID:	CAV - 19 (1)
Pressuremeter model:	TEXAM^{e}	Probe size (mm):	70	Calibration coefficient, a (cm^3/kPa):	0.008962
Test zone drilling method:	Mud/Wash Rotary	Calibration tube I.D. (mm):	76.2	Calibration coefficient, b (cm^3/kPa):	6.67E-05
Poisson's Ratio of soil/rock:	0.4	Calibration tube O.D. (mm):	101.6	Calibration coefficient, c (cm^3/kPa):	0.008895
Method for estimating P_L:	1/V vs. P	Tubing length (m):	50	Initial volume of probe, V_0 (cm^3):	1644

Raw Test Data		Pressure Calibration		Volume Calibration		Corrected Data		
Volume	Pressure	Volume	Pressure	Volume	Pressure	Volume	$\Delta R/R_o$	Pressure
cm^3	kPa	cm^3	kPa	cm^3	kPa	cm^3	%	kPa
0.0	-5	0.0	2	0.0	4	0.0	0.00	50
76.7	35	77.2	11	403.3	510	76.4	2.30	81
118.2	55	158.2	16	423.9	1007	117.7	3.52	99
157.5	76	237.1	20	440.4	1496	156.8	4.66	117
197.4	108	317.6	23	455.1	2007	196.4	5.81	147
237.4	152	397.6	25	464.3	2499	236.1	6.94	189
278.1	203	477.2	28	472.7	2996	276.3	8.08	239
317.1	283	557.5	30	487.4	4047	314.6	9.15	317
356.9	390	641.7	32	498.6	5008	**353.5**	**10.23**	**423**
397.0	554	719.0	32	508.6	6007	392.1	11.29	586
436.2	762	799.0	33	517.7	7004	429.4	12.30	793
475.7	975	879.5	34	526.7	8027	467.0	13.32	1004
515.4	1183	959.8	35	535.0	9018	**504.8**	**14.33**	**1211**
555.2	1384	1039.5	36	543.3	9997	542.9	15.34	1411
545.0	1062	1119.6	37			535.5	15.14	1090
534.8	871	1200.4	38			527.0	14.92	899
525.9	735	1279.6	39			519.3	14.71	763
535.1	939	1359.3	40			526.8	14.91	967
545.9	1110	1439.6	42			536.1	15.15	1138
555.8	1230					544.9	15.39	1257
575.8	1412					563.2	15.87	1439
596.4	1544					582.7	16.38	1570
636.5	1734					621.1	17.38	1759
677.0	1889					660.2	18.39	1914
716.8	2025					698.8	19.38	2050
796.7	2232					776.8	21.35	2256
877.1	2390					855.8	23.31	2413
957.3	2518					934.9	25.25	2540
1037.2	2625					1013.9	27.15	2646
1117.1	2713					1093.0	29.03	2733
1197.2	2797					1172.3	30.88	2816



Interpreted Test Results

Deformation Modulus, E_P	28,706	kPa	4,164	psi
Reload Modulus, E_R	110,101	kPa	15,969	psi
Yield Pressure, P_F	1,211	kPa	176	psi
Ultimate Pressure, P_L [1]	3,306	kPa	479	psi
E_P / P_L	8.7			
P_L / P_F	2.7			

Test Remarks

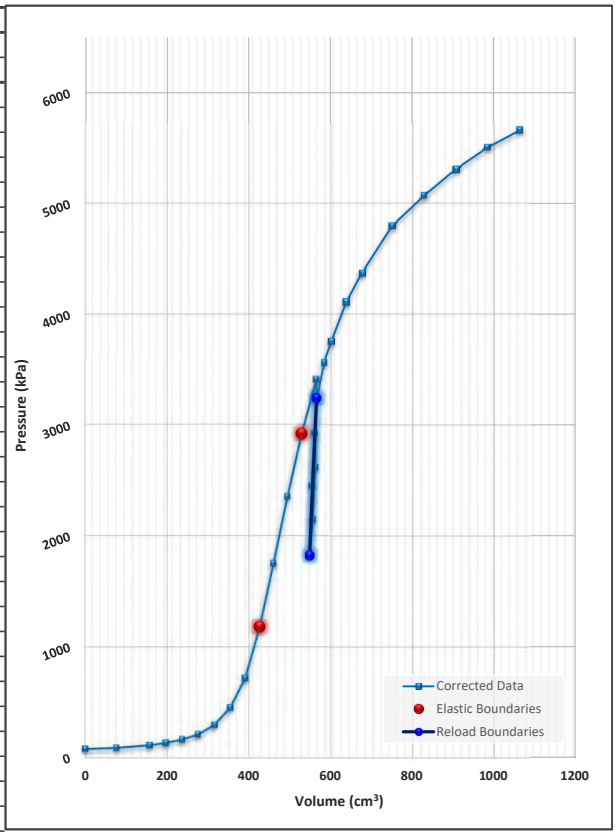
[1] Ultimate Pressure, P_L, is interpreted by extrapolating the data points in the plastic phase of the curve to 2 times the initial volume of the test zone, and reading the corresponding pressure. Accordingly, caution must be used in regards to the use of Ultimate Pressure values, particularly when a small quantity of data points are collected in the plastic phase, or when deformation is minimal due to the stiffness of the material.

PRESSUREMETER TEST

Project:	Allison Hall Improvements	**Boring ID:**	AH-3	**Test Depth (ft):**	28.0
City, State:	Fort Colins, CO	**Mapes In-Situ No:**	P2022027	**Client:**	Terracon

Test date:	8/10/22	Calibration date:	8/9/22	Pressure Calibration ID:	CAP - 19 (1)
Pressuremeter SN:	001A17002	Probe body SN:	001A 1900011	Volume Calibration ID:	CAV - 19 (1)
Pressuremeter model:	TEXAM^{e}	Probe size (mm):	70	Calibration coefficient, a (cm^3/kPa):	0.008962
Test zone drilling method:	Mud/Wash Rotary	Calibration tube I.D. (mm):	76.2	Calibration coefficient, b (cm^3/kPa):	6.67E-05
Poisson's Ratio of soil/rock:	0.4	Calibration tube O.D. (mm):	101.6	Calibration coefficient, c (cm^3/kPa):	0.008895
Method for estimating P_L:	1/V vs. P	Tubing length (m):	50	Initial volume of probe, V_0 (cm^3):	1644

Raw Test Data		Pressure Calibration		Volume Calibration		Corrected Data		
Volume	Pressure	Volume	Pressure	Volume	Pressure	Volume	$\Delta R/R_o$	Pressure
cm^3	kPa	cm^3	kPa	cm^3	kPa	cm^3	%	kPa
0.0	8	0.0	2	0.0	4	0.0	0.00	81
77.3	28	77.2	11	403.3	510	77.1	2.32	92
157.6	56	158.2	16	423.9	1007	157.1	4.67	115
197.6	78	237.1	20	440.4	1496	196.9	5.82	135
238.1	112	317.6	23	455.1	2007	237.1	6.97	167
277.3	158	397.6	25	464.3	2499	275.9	8.07	212
317.4	245	477.2	28	472.7	2996	315.2	9.17	297
357.8	401	557.5	30	487.4	4047	354.2	10.25	452
396.7	669	641.7	32	498.6	5008	390.7	11.25	719
436.1	1126	719.0	32	508.6	6007	426.1	12.21	1175
475.1	1703	799.0	33	517.7	7004	460.0	13.13	1750
514.6	2307	879.5	34	526.7	8027	494.1	14.04	2353
554.2	2872	959.8	35	535.0	9018	528.6	14.96	2917
594.5	3361	1039.5	36	543.3	9997	564.6	15.91	3405
584.5	2570	1119.6	37			561.7	15.83	2615
574.3	2098	1200.4	38			555.6	15.67	2143
564.6	1778	1279.6	39			548.7	15.49	1823
574.6	2404	1359.3	40			553.2	15.61	2449
584.7	2878	1439.6	42			559.1	15.76	2923
594.6	3201					566.1	15.95	3245
614.6	3510					583.3	16.40	3554
634.8	3710					601.8	16.88	3753
675.0	4065					638.8	17.84	4108
714.9	4326					676.4	18.80	4369
794.6	4756					752.2	20.73	4798
874.8	5030					830.0	22.67	5071
955.3	5270					908.2	24.60	5310
1035.2	5467					986.1	26.48	5506
1115.5	5622					1064.9	28.36	5660



Interpreted Test Results

Deformation Modulus, E_P	95,933	kPa	13,914	psi
Reload Modulus, E_R	441,396	kPa	64,019	psi
Yield Pressure, P_F	2,917	kPa	423	psi
Ultimate Pressure, P_L [1]	6,747	kPa	979	psi
E_P / P_L	14.2			
P_L / P_F	2.3			

Test Remarks

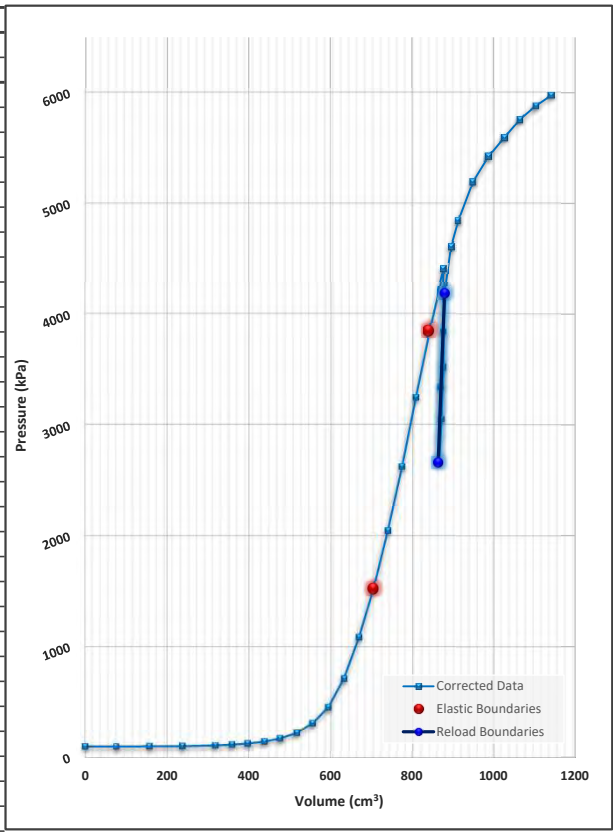
[1] Ultimate Pressure, P_L, is interpreted by extrapolating the data points in the plastic phase of the curve to 2 times the initial volume of the test zone, and reading the corresponding pressure. Accordingly, caution must be used in regards to the use of Ultimate Pressure values, particularly when a small quantity of data points are collected in the plastic phase, or when deformation is minimal due to the stiffness of the material.

PRESSUREMETER TEST

Project:	Allison Hall Improvements	**Boring ID:**	AH-3	**Test Depth (ft):**	34.0
City, State:	Fort Collins, CO	**Mapes In-Situ No:**	P2022027	**Client:**	Terracon

Test date:	8/10/22	Calibration date:	8/9/22	Pressure Calibration ID:	CAP - 19 (1)
Pressuremeter SN:	001A17002	Probe body SN:	001A 1900011	Volume Calibration ID:	CAV - 19 (1)
Pressuremeter model:	TEXAM^e	Probe size (mm):	70	Calibration coefficient, a (cm^3/kPa):	0.008962
Test zone drilling method:	Mud/Wash Rotary	Calibration tube I.D. (mm):	76.2	Calibration coefficient, b (cm^3/kPa):	6.67E-05
Poisson's Ratio of soil/rock:	0.4	Calibration tube O.D. (mm):	101.6	Calibration coefficient, c (cm^3/kPa):	0.008895
Method for estimating P_L:	1/V vs. P	Tubing length (m):	50	Initial volume of probe, V_0 (cm^3):	1644

Raw Test Data		Pressure Calibration		Volume Calibration		Corrected Data		
Volume	Pressure	Volume	Pressure	Volume	Pressure	Volume	$\Delta R/R_o$	Pressure
cm^3	kPa	cm^3	kPa	cm^3	kPa	cm^3	%	kPa
0.0	9	0.0	2	0.0	4	0.0	0.00	100
77.1	18	77.2	11	403.3	510	76.9	2.31	100
158.2	25	158.2	16	423.9	1007	158.0	4.69	102
237.8	30	237.1	20	440.4	1496	237.6	6.98	103
317.7	40	317.6	23	455.1	2007	317.3	9.23	110
358.5	48	397.6	25	464.3	2499	358.1	10.35	117
398.0	59	477.2	28	472.7	2996	397.4	11.43	127
437.6	77	557.5	30	487.4	4047	436.9	12.51	144
477.3	108	641.7	32	498.6	5008	476.3	13.57	173
517.5	159	719.0	32	508.6	6007	516.1	14.63	223
557.1	244	799.0	33	517.7	7004	554.9	15.65	307
597.2	391	879.5	34	526.7	8027	593.7	16.67	453
637.4	648	959.8	35	535.0	9018	631.6	17.65	709
677.5	1022	1039.5	36	543.3	9997	668.4	18.60	1083
717.1	1462	1119.6	37			704.1	19.51	1523
756.6	1982	1200.4	38			739.0	20.39	2043
796.2	2559	1279.6	39			773.5	21.26	2619
835.8	3183	1359.3	40			807.5	22.11	3243
875.7	3796	1439.6	42			841.9	22.97	3855
915.6	4352					876.9	23.83	4411
905.1	3456					874.4	23.77	3515
896.3	2989					869.7	23.65	3048
887.3	2599					864.1	23.52	2658
896.8	3280					867.7	23.60	3339
906.6	3777					873.0	23.74	3836
916.4	4130					879.6	23.90	4189
936.1	4547					895.6	24.29	4605
955.9	4787					913.3	24.72	4845
995.2	5138					949.4	25.60	5196
1035.0	5363					986.9	26.50	5420
1075.1	5535					1025.3	27.42	5592
1115.2	5701					1063.8	28.34	5757
1155.1	5822					1102.5	29.25	5878
1195.4	5921					1141.9	30.17	5976



Interpreted Test Results

Deformation Modulus, E_P	108,744	kPa	15,772	psi
Reload Modulus, E_R	598,937	kPa	86,869	psi
Yield Pressure, P_F	3,855	kPa	559	psi
Ultimate Pressure, P_L [1]	7,884	kPa	1,144	psi
E_P / P_L	13.8			
P_L / P_F	2.0			

Test Remarks

- Test zone was slightly oversized. Test was terminated when risk of membrane rupture was high.

[1] Ultimate Pressure, P_L, is interpreted by extrapolating the data points in the plastic phase of the curve to 2 times the initial volume of the test zone, and reading the corresponding pressure. Accordingly, caution must be used in regards to the use of Ultimate Pressure values, particularly when a small quantity of data points are collected in the plastic phase, or when deformation is minimal due to the stiffness of the material.

SUPPORTING INFORMATION

Contents:

Note: All attachments are one page unless noted above.

Terracon
1901 Sharp Point Dr Ste C
Fort Collins, CO

General Notes

Sampling

- Modified California Ring Sampler
- No Recovery
- Standard Penetration Test

Water Level

- Water Initially Encountered
- Water Level After a Specified Period of Time
- Water Level After a Specified Period of Time
- Cave In Encountered

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

Field Tests

N	Standard Penetration Test Resistance (Blows/Ft.)
(HP)	Hand Penetrometer
(T)	Torvane
(DCP)	Dynamic Cone Penetrometer
UC	Unconfined Compressive Strength
(PID)	Photo-Ionization Detector
(OVA)	Organic Vapor Analyzer

Descriptive Soil Classicification

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

Location And Elevation Notes

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

Strength Terms

Relative Density of Coarse-Grained Soils (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance			Consistency of Fine-Grained Soils (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance				Bedrock		
Relative Density	Standard Penetration or N-Value (Blows/Ft.)	Ring Sampler (Blows/Ft.)	Consistency	Unconfined Compressive Strength Qu (psf)	Standard Penetration or N-Value (Blows/Ft.)	Ring Sampler (Blows/Ft.)	Ring Sampler (Blows/Ft.)	Standard Penetration or N-Value (Blows/Ft.)	Consistency
Very Loose	0 - 3	0 - 6	Very Soft	less than 500	0 - 1	< 3	< 30	< 20	Weathered
Loose	4 - 9	7 - 18	Soft	500 to 1,000	2 - 4	3 - 4	30 - 49	20 - 29	Firm
Medium Dense	10 - 29	19 - 58	Medium Stiff	1,000 to 2,000	4 - 8	5 - 9	50 - 89	30 - 49	Medium Hard
Dense	30 - 50	59 - 98	Stiff	2,000 to 4,000	8 - 15	10 - 18	90 - 119	50 - 79	Hard
Very Dense	> 50	> 99	Very Stiff	4,000 to 8,000	15 - 30	19 - 42	> 119	>79	Very Hard
			Hard	> 8,000	> 30	> 42			

Relevance of Exploration and Laboratory Test Results

Exploration/field results and/or laboratory test data contained within this document are intended for application to the project as described in this document. Use of such exploration/field results and/or laboratory test data should not be used independently of this document.

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	Gravels: More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels: Less than 5% fines [C]	Cu ≥ 4 and 1 ≤ Cc ≤ 3 [E]		GW	Well-graded gravel [F]
			Cu < 4 and/or [Cc<1 or Cc>3.0] [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12%	Fines classify as ML or MH		GM	Silty gravel [F, G, H]
			Fines classify as CL or CH		GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	Clean Sands: Less than 5% fines [D]	Cu ≥ 6 and 1 ≤ Cc ≤ 3 [E]		SW	Well-graded sand [I]
			Cu < 6 and/or [Cc<1 or Cc>3.0] [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G, H, I]
			Fines classify as CL or CH		SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	Silts and Clays: Liquid limit less than 50	Inorganic:	PI > 7 and plots on or above		CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K, L, M]
		Organic:	Liquid limit - oven	< 0.75	OL	Organic clay [K, L, M, N]
			Liquid limit - not			Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	Inorganic:	PI plots on or above "A" line		CH	Fat clay [K, L, M]
			PI plots below "A" line		MH	Elastic Silt [K, L, M]
		Organic:	Liquid limit - oven	< 0.75	OH	Organic clay [K, L, M, P]
			Liquid limit - not			Organic silt [K, L, M, Q]
Highly organic	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

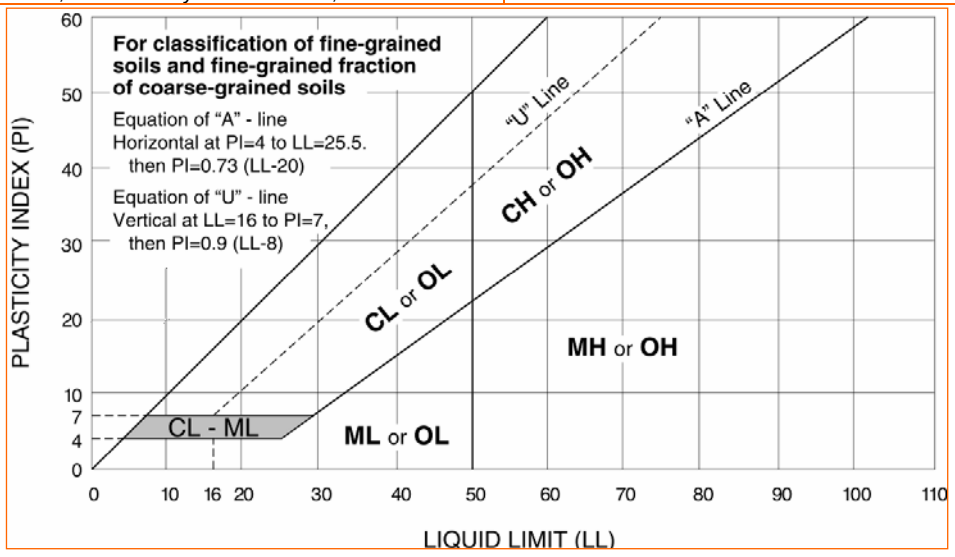
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



DESCRIPTION OF ROCK PROPERTIES

WEATHERING	
Fresh	Rock fresh, crystals bright, few joints may show slight staining. Rock rings under hammer if crystalline.
Very slight	Rock generally fresh, joints stained, some joints may show thin clay coatings, crystals in broken face show bright. Rock rings under hammer if crystalline.
Slight	Rock generally fresh, joints stained, and discoloration extends into rock up to 1 in. Joints may contain clay. In granitoid rocks some occasional feldspar crystals are dull and discolored. Crystalline rocks ring under hammer.
Moderate	Significant portions of rock show discoloration and weathering effects. In granitoid rocks, most feldspars are dull and discolored; some show clayey. Rock has dull sound under hammer and shows significant loss of strength as compared with fresh rock.
Moderately severe	All rock except quartz discolored or stained. In granitoid rocks, all feldspars dull and discolored and majority show kaolinization. Rock shows severe loss of strength and can be excavated with geologist's pick.
Severe	All rock except quartz discolored or stained. Rock "fabric" clear and evident, but reduced in strength to strong soil. In granitoid rocks, all feldspars kaolinized to some extent. Some fragments of strong rock usually left.
Very severe	All rock except quartz discolored or stained. Rock "fabric" discernible, but mass effectively reduced to "soil" with only fragments of strong rock remaining.
Complete	Rock reduced to "soil". Rock "fabric" no discernible or discernible only in small, scattered locations. Quartz may be present as dikes or stringers.

HARDNESS (for engineering description of rock **– not to be confused with Moh's scale for** minerals)	
Very hard	Cannot be scratched with knife or sharp pick. Breaking of hand specimens requires several hard blows of geologist's pick.
Hard	Can be scratched with knife or pick only with difficulty. Hard blow of hammer required to detach hand specimen.
Moderately hard	Can be scratched with knife or pick. Gouges or grooves to ¼ in. deep can be excavated by hard blow of point of a geologist's pick. Hand specimens can be detached by moderate blow.
Medium	Can be grooved or gouged 1/16 in. deep by firm pressure on knife or pick point. Can be excavated in small chips to pieces about 1-in. maximum size by hard blows of the point of a geologist's pick.
Soft	Can be gouged or grooved readily with knife or pick point. Can be excavated in chips to pieces several inches in size by moderate blows of a pick point. Small thin pieces can be broken by finger pressure.
Very soft	Can be carved with knife. Can be excavated readily with point of pick. Pieces 1-in. or more in thickness can be broken with finger pressure. Can be scratched readily by fingernail.

Joint, Bedding, and Foliation Spacing in Rock [1]		
Spacing	Joints	Bedding/Foliation
Less than 2 in.	Very close	Very thin
2 in. – 1 ft.	Close	Thin
1 ft. – 3 ft.	Moderately close	Medium
3 ft. – 10 ft.	Wide	Thick
More than 10 ft.	Very wide	Very thick

1. Spacing refers to the distance normal to the planes, of the described feature, which are parallel to each other or nearly so.

Rock Quality Designator (RQD) [1]	
RQD, as a percentage	Diagnostic description
Exceeding 90	Excellent
90 – 75	Good
75 – 50	Fair
50 – 25	Poor
Less than 25	Very poor

1. RQD (given as a percentage) = length of core in pieces 4 inches and longer / length of run

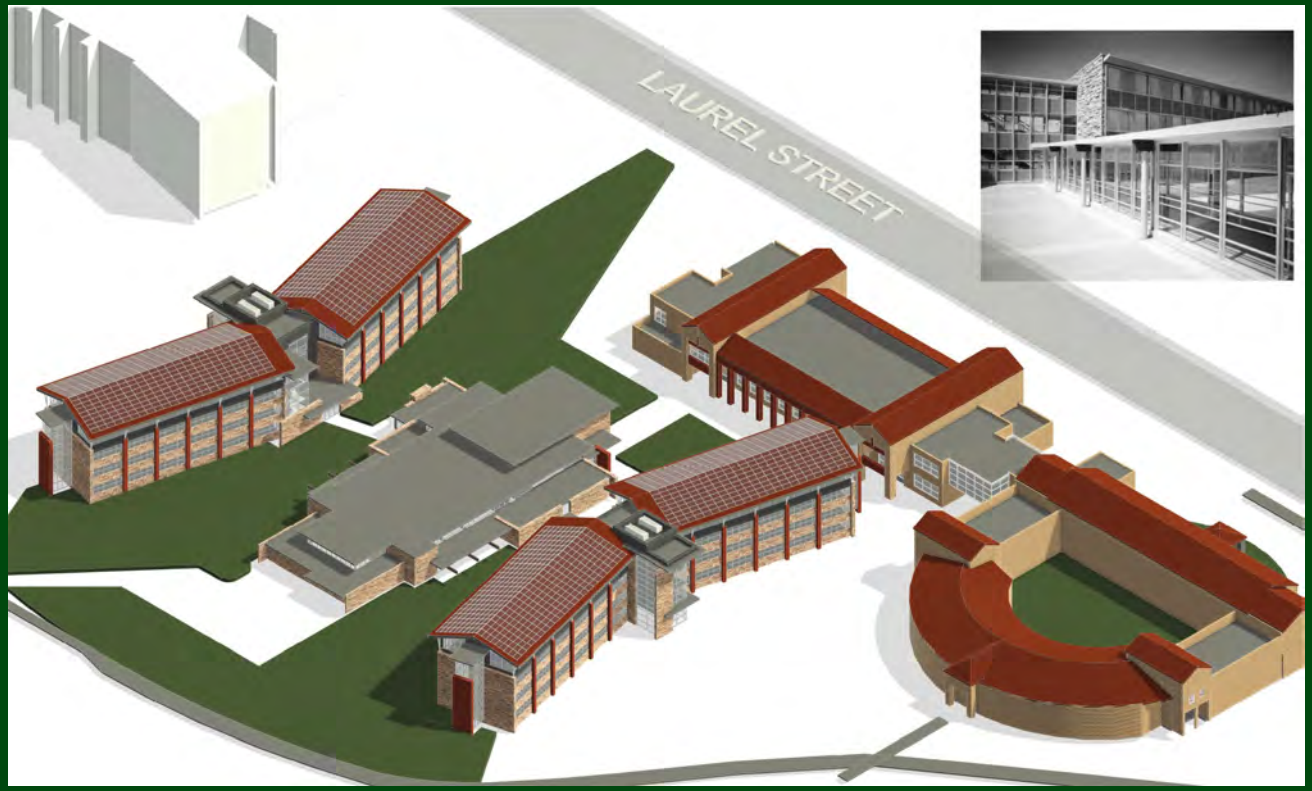
Joint Openness Descriptors	
Openness	Descriptor
No Visible Separation	Tight
Less than 1/32 in.	Slightly Open
1/32 to 1/8 in.	Moderately Open
1/8 to 3/8 in.	Open
3/8 in. to 0.1 ft.	Moderately Wide
Greater than 0.1 ft.	Wide

References: American Society of Civil Engineers. Manuals and Reports on Engineering Practice - No. 56. Subsurface Investigation for Design and Construction of Foundations of Buildings. New York: American Society of Civil Engineers, 1976. U.S. Department of the Interior, Bureau of Reclamation, Engineering Geology Field Manual.

Appendix J – 9/25/2023 Master Plan Committee – Slide Deck

FACILITIES MANAGEMENT
AT COLORADO STATE UNIVERSITY

Allison Hall Additions and Renovations and the College of Business Future Growth Planning



Colorado State University

FACILITIES MANAGEMENT
AT COLORADO STATE UNIVERSITY

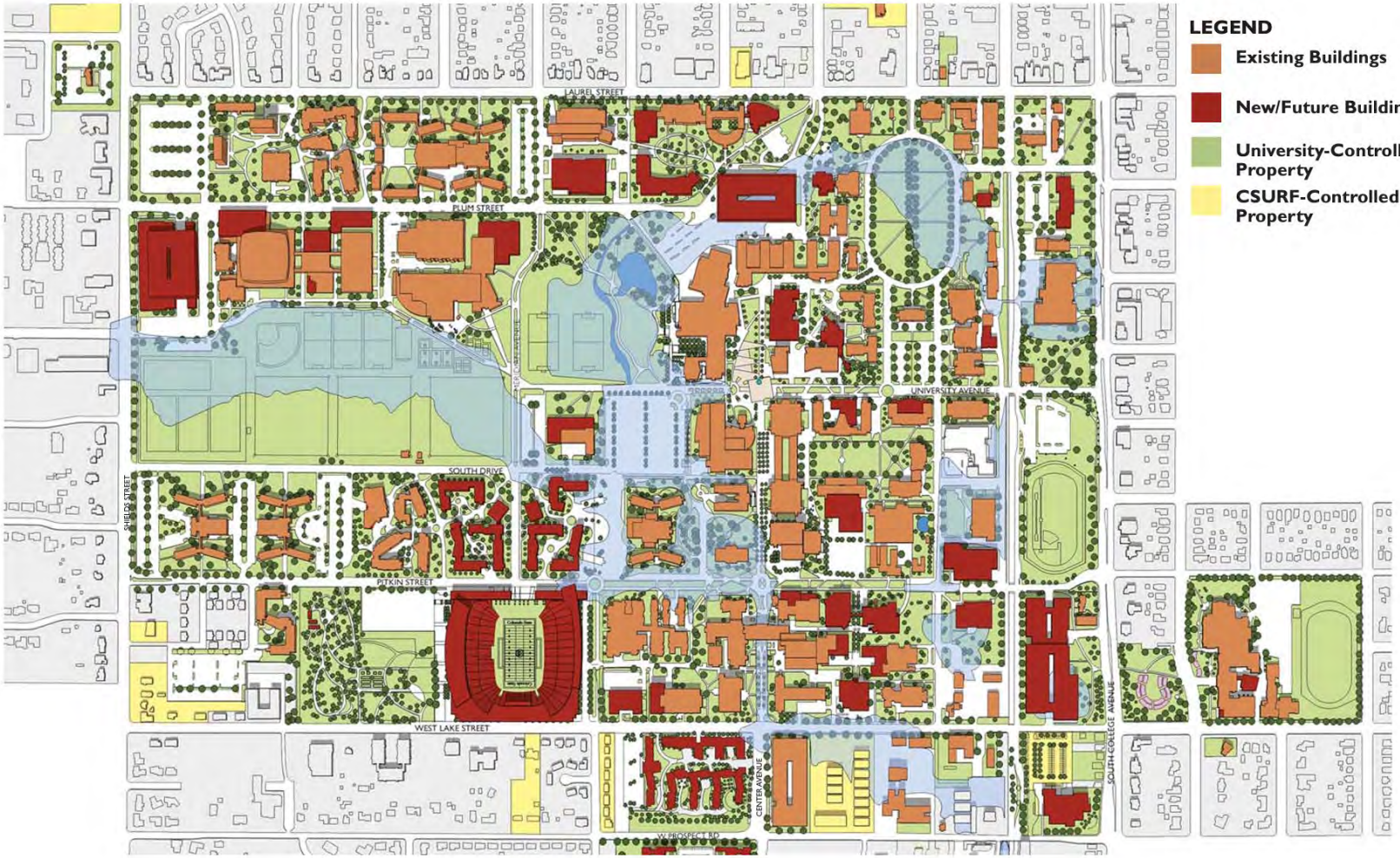
- Agenda:

  - Pre-Pandemic Planning and Pandemic Impacts
    - 2014 CSU AND 2009 HDS MASTER PLANS
    - MERIDIAN VILLAGE – SUSPENSION/CANCELLATION
  - Post Pandemic Planning
    - Allison Hall Additions and Renovations
    - Collaboration on the Center for Entrepreneurship and Innovation
    - Living Learning Center
  - Next Steps
    - Motion to Acknowledge and Approve
    - Allison Additions and Renovations Program Plan and Plan of Finance to the October BOG for Consideration

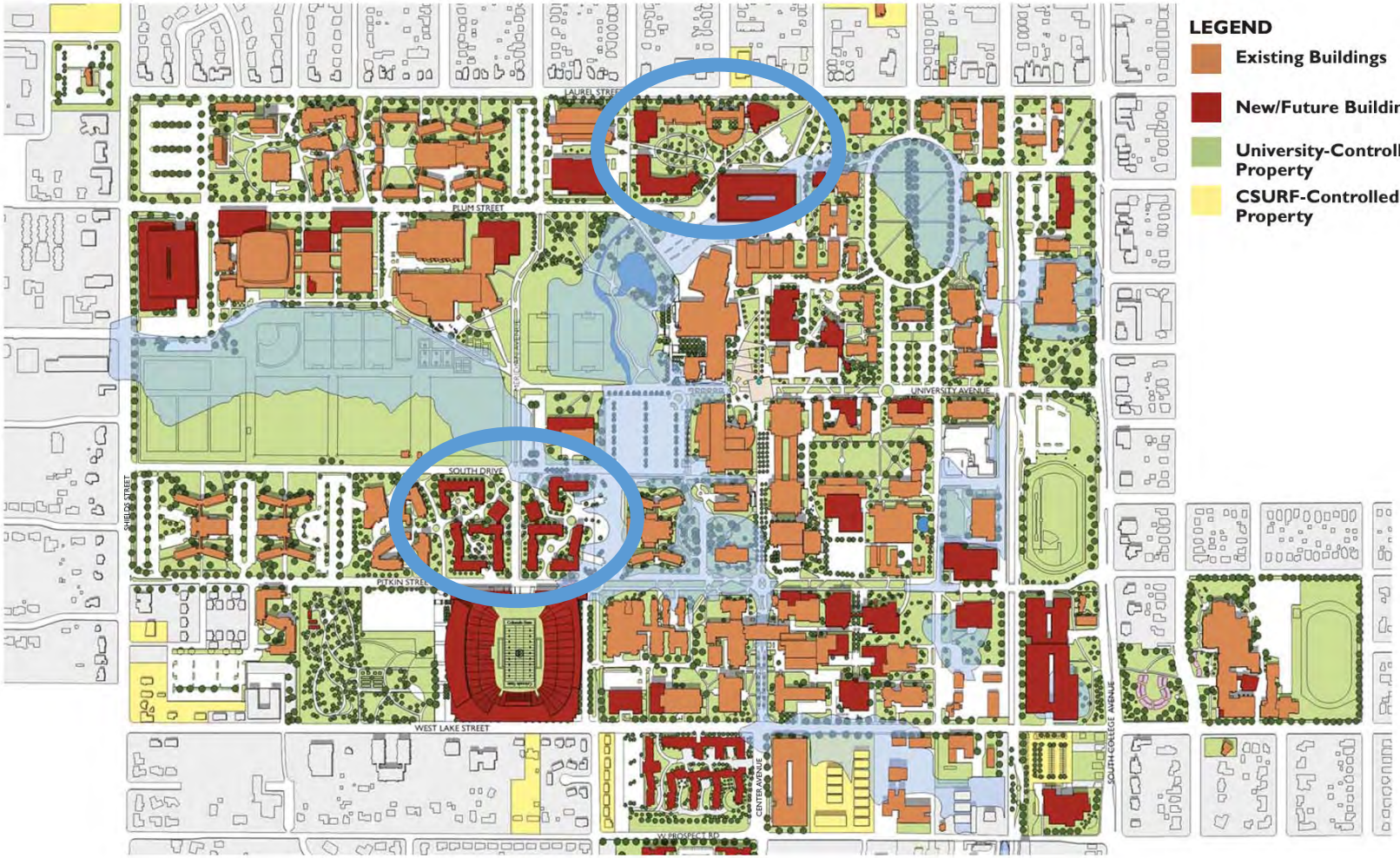
FACILITIES MANAGEMENT
AT COLORADO STATE UNIVERSITY

- IN OTHER WORDS:
  - Pre-pandemic
    WE HAD A PLAN
  - Pandemic Impacts
    CHANGED THE PLAN
  - Post Pandemic - Re Evaluate
    WE HAVE A NEW PLAN

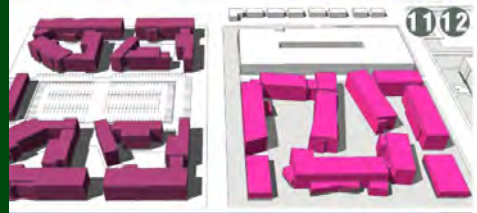
2014 CSU MASTERPLAN

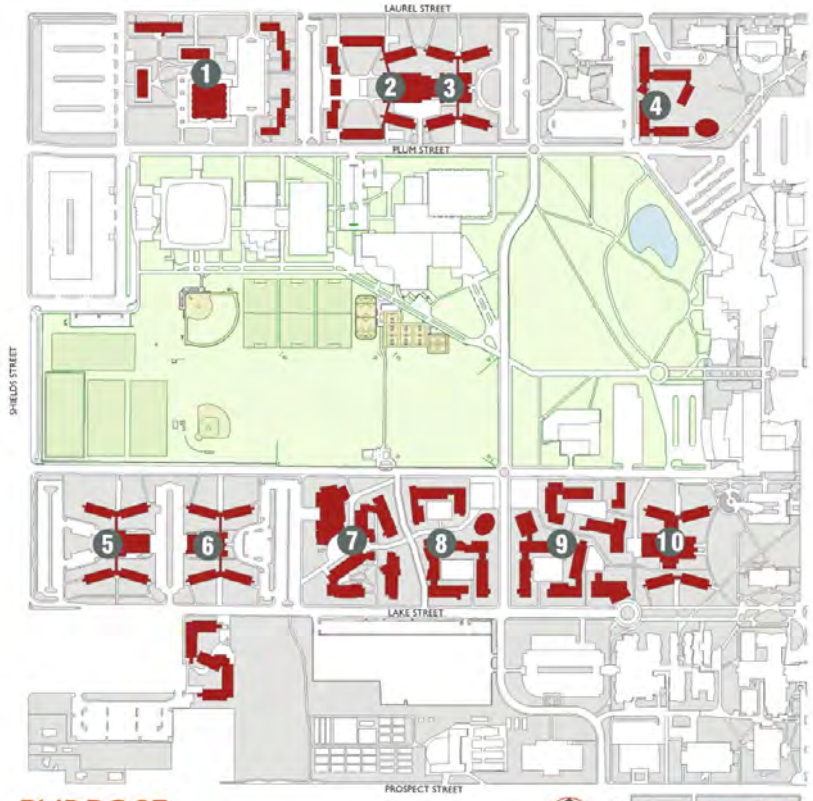


2014 CSU MASTERPLAN



2009 HDS MASTERPLAN





PURPOSE

- EXPAND FRESHMAN HOUSING
- REDEVELOPE MARRIED HOUSING
- REINFORCE ACADEMIC VILLAGE CONCEPT
- REVITALIZE EXISTING BUILDINGS
- IDENTIFY FUTURE SITES

1 DURRELL VILLAGE

2 CORBETT HALL

3 PARMELEE HALL
4TH FLOOR ADDITION

4 ALLISON VILLAGE

5 INGERSOLL HALL

6 EDWARDS HALL

7 ACADEMIC VILLAGE

8 NEWSOM
REDEVELOPMENT

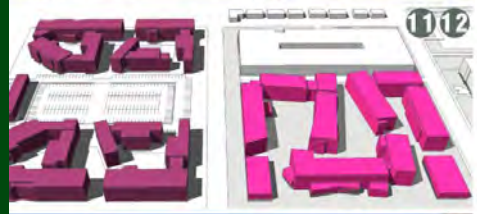
9 AYLESWORTH
REDEVELOPMENT

10 BRAIDEN VILLAGE
4TH FLOOR ADDITION

11 AGGIE VILLAGE NORTH

12 AGGIE VILLAGE SOUTH

2009 HDS MASTERPLAN



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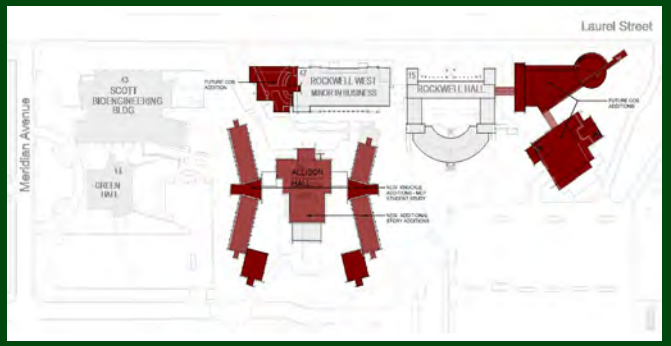
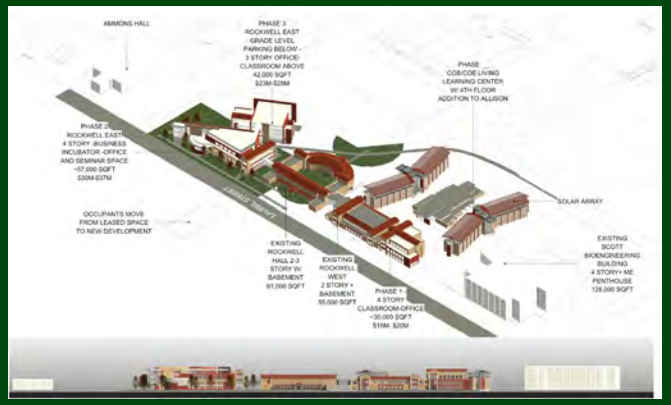
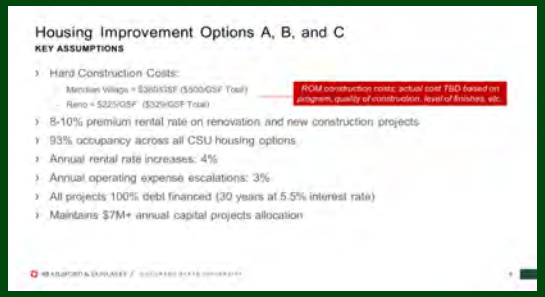
PANDEMIC IMPACTS
MERIDIAN CANCELATION - ALLISON PLANNING

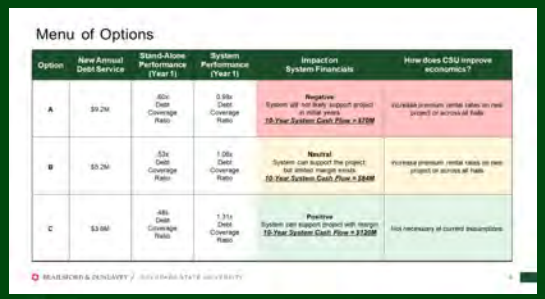
225 NEW + 400 RENOVATED BEDS– 2025 PROJECTED ESTIMATED COSTS = $82.1M
PROFORMA TENABLE AND ADDRESSES DEFERRED MAINTENANCE AND REVITALIZATION
OPPORTUNITIES FOR LIVING LEARNING CENTER

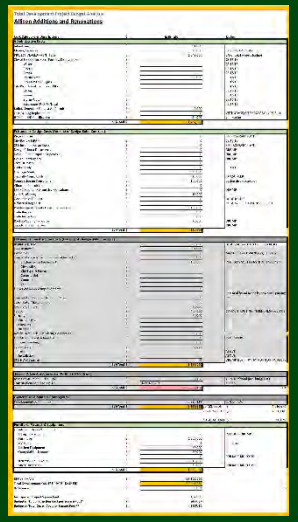
1500-1600 BEDS (-) 400 NEWSOM – 2025 PROJECTED ESTIMATED COSTS - $278M- $307M
CONSTRUCTION COST AND BOND RATE ESCALATION UPDATED PROFORMA UNTENABLE

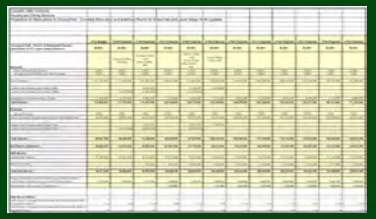










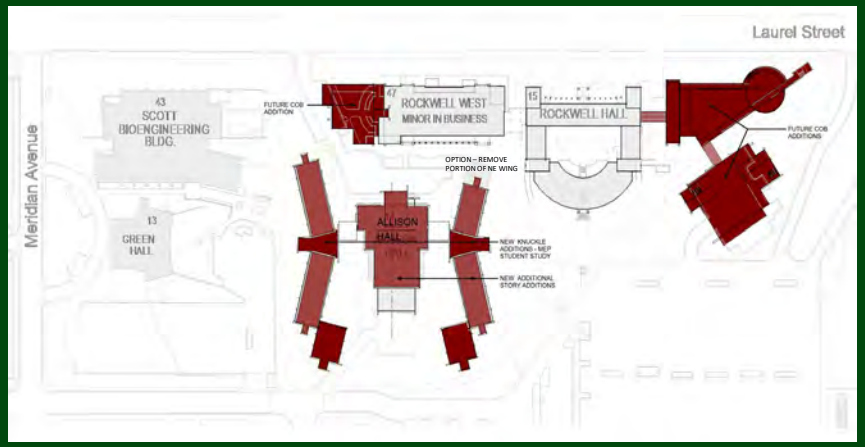


FACILITIES MANAGEMENT
AT COLORADO STATE UNIVERSITY

RENOVATIONS AND ADDITIONS TO ALLISON
COLLEGE OF BUSINESS PLANNING

2014 CSU MASTER PLAN

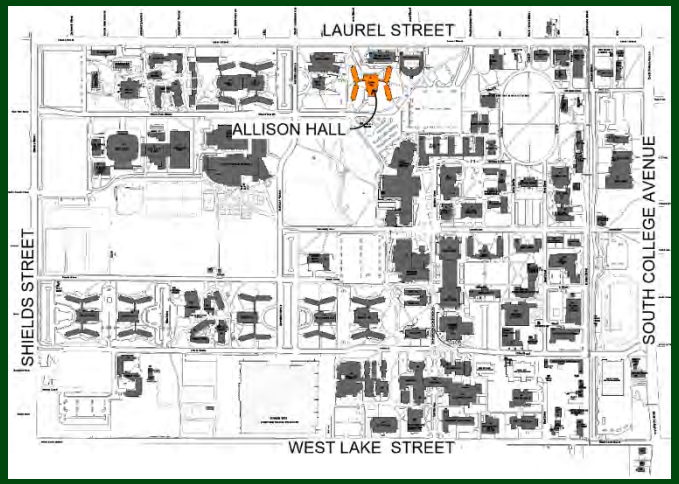
PRE PANDEMIC PLANNING – ALLISON AND COLLEGE OF BUSINESS



2022 PLANNING

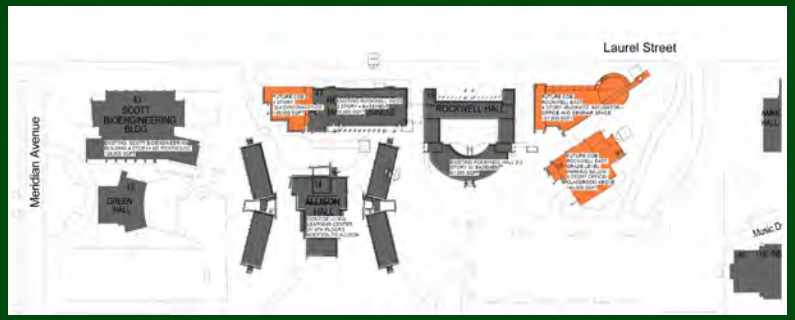
POST PANDEMIC PLANNING – ALLISON AND COLLEGE OF BUSINESS

Colorado State University

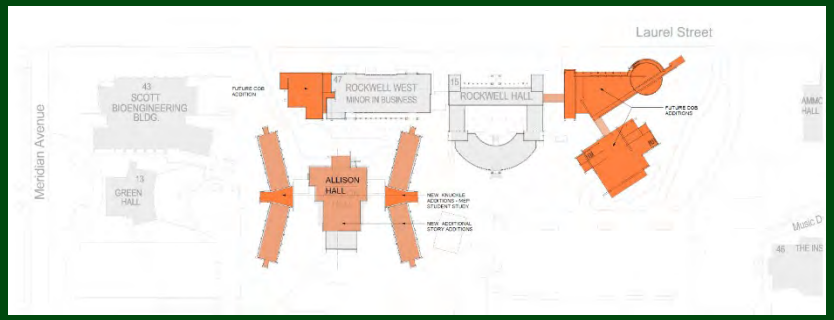


POST PANDEMIC CONCEPT:
RETAIN and REVITALIZE ALLISON,
COLLABORATE WITH THE COLLEGE OF BUSINESS

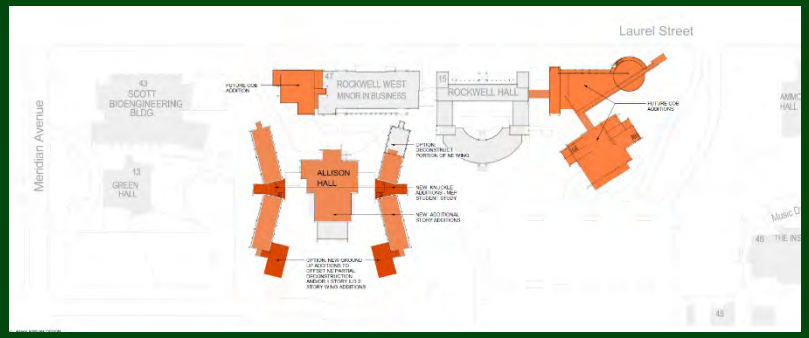
COORDINATION OF ALLISON WITH COLLEGE OF BUSINESS GROWTH PLANNING



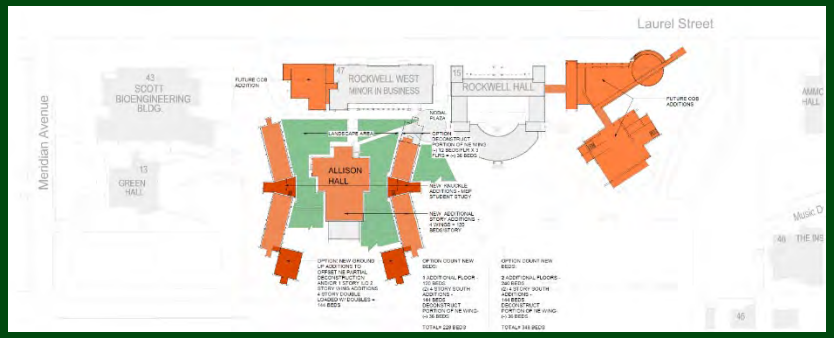
College of Business future growth on the west and east side of existing Rockwell Hall and Rockwell West. Multistory Additions with 130,000 GSF +/- growth potential in addition to the existing 115,000 GSF.



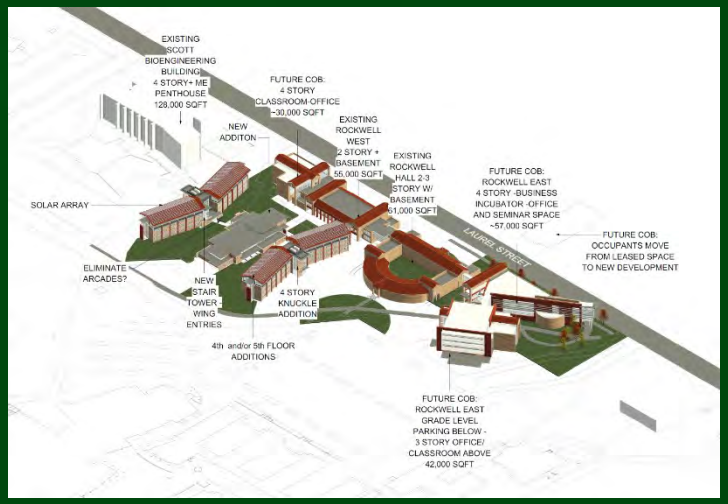
Allison Hall with Future College of Business Additions – One story addition at center section, two additional floors at the existing wings = 240 new beds matching the layout used at Braiden and Parmelee

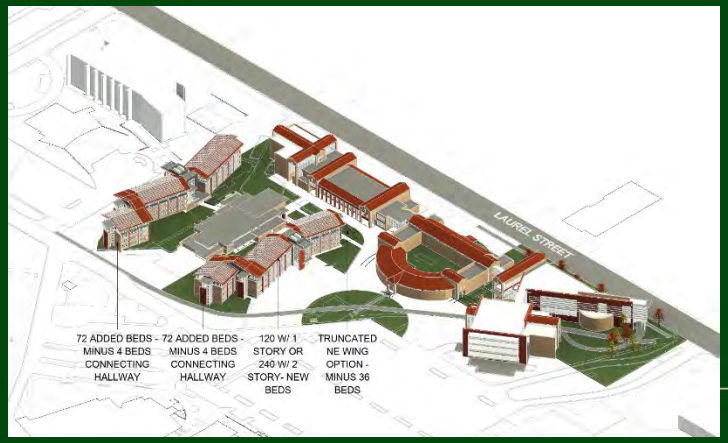


Allison Hall with Future College of Business Additions – One Story addition at Center section, 1 or 2 additional floors at the existing wings, Option for partial deconstruction of the northeast wing with new ground up additions on the south side of the existing site.



College of Business future growth with potential design options for Allison Hall. .





PROJECT OPPORTUNITIES, OPTIONS AND ALTERNATES FOR:

- Additional revenue generating beds, 25 – 100.
- A “pop-top” vertical office and classroom addition or main level additions at the center section of Allison - approximately 15,000 sqft
- An option alternate for removing/deconstructing a portion of the existing northeast wing. NE wing is within 22 feet of Rockwell West. This option includes the potential for associated ground-up resident wing additions to accommodate the lost beds and will allow for better site aspect and new more generous and less constrained plaza at the College of Business main entrance to Rockwell West.
- Enhanced renovation of a portion of the center section of the building for the Center for Entrepreneurship and Innovation.

COORDINATION OF ALLISON WITH COLLEGE OF BUSINESS GROWTH PLANNING

Patterns and Finding a way to Biophilic Design

Reference: Browning, W.D., Ryan, C.O., Clancy, J.O. (2014). 14 Patterns of Biophilic Design. New York: Terrapin Bright Green llc.

14 PATTERNS OF BIOPHILIC DESIGN

Nature in the Space Patterns

1. Visual Connection with Nature
2. Non-Visual Connection with Nature
3. Non-Rhythmic Sensory Stimuli
4. Thermal & Airflow Variability
5. Presence of Water
6. Dynamic & Diffuse Light
7. Connection with Natural Systems

Natural Analogues Patterns

8. Biomorphic Forms & Patterns
9. Material Connection with Nature
10. Complexity & Order

Nature of the Space Patterns

11. Prospect
12. Refuge
13. Mystery
14. Risk/Peril

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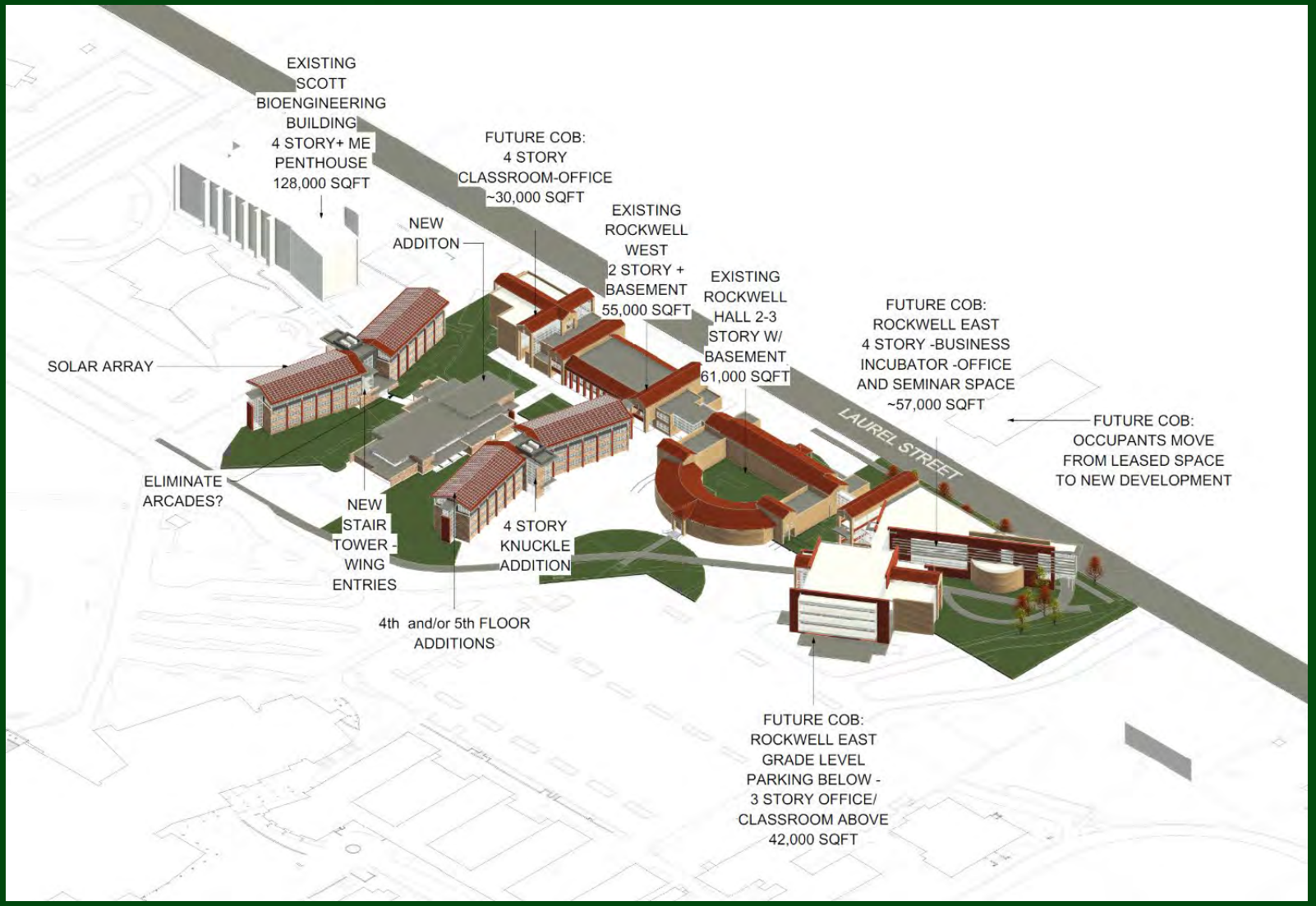
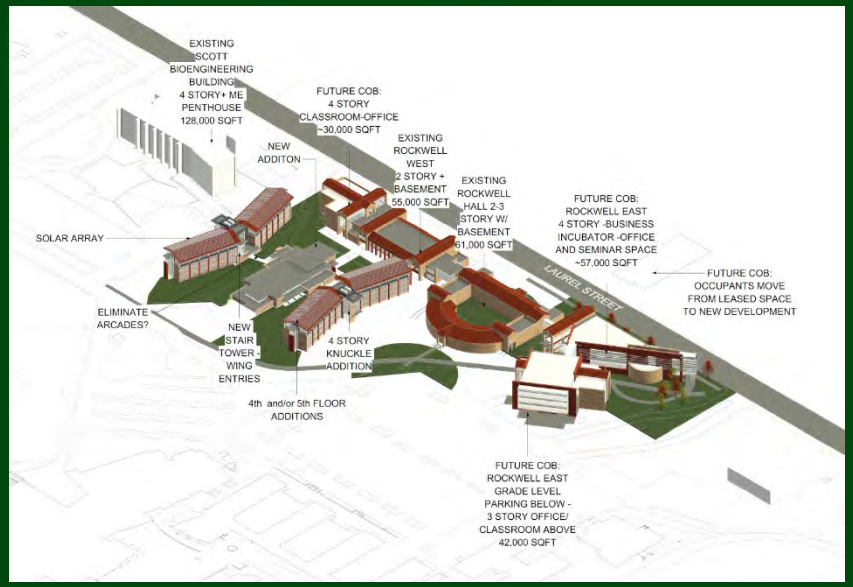
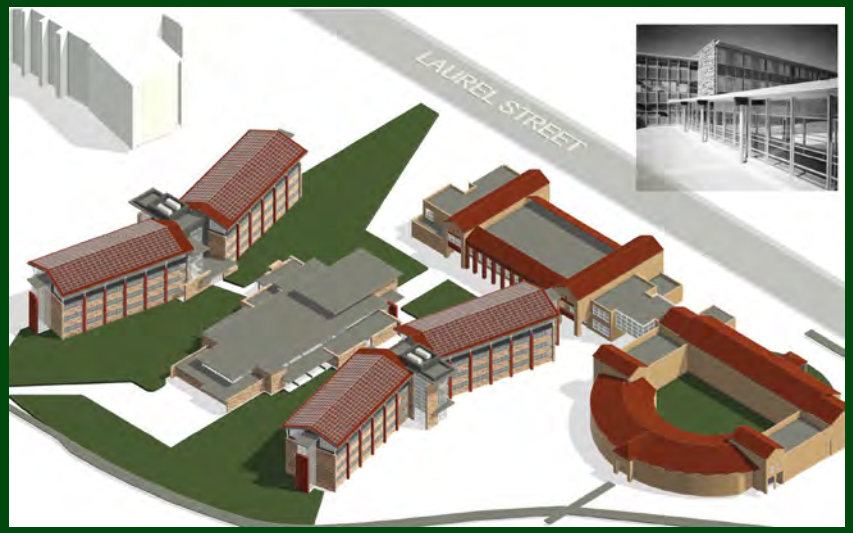
BRAIDEN AND PARMELEE PRECEDENCE IMAGES
ALLISON PROJECT DEVELOPMENT DESIGN CRITERIA

COLLEGE OF BUSINESS PLANNING AND THE CENTER FOR ENTREPRENEURSHIP AND INNOVATION



The College of Business is experiencing tremendous growth in their academic programs and with the proximity of their college to Allison and the timing of this revitalization project, there is an opportunity to alleviate some of that pressure by building out academic space and other programmatic space within the Allison footprint. There is also an opportunity to create a living/learning center promoting programs within the University





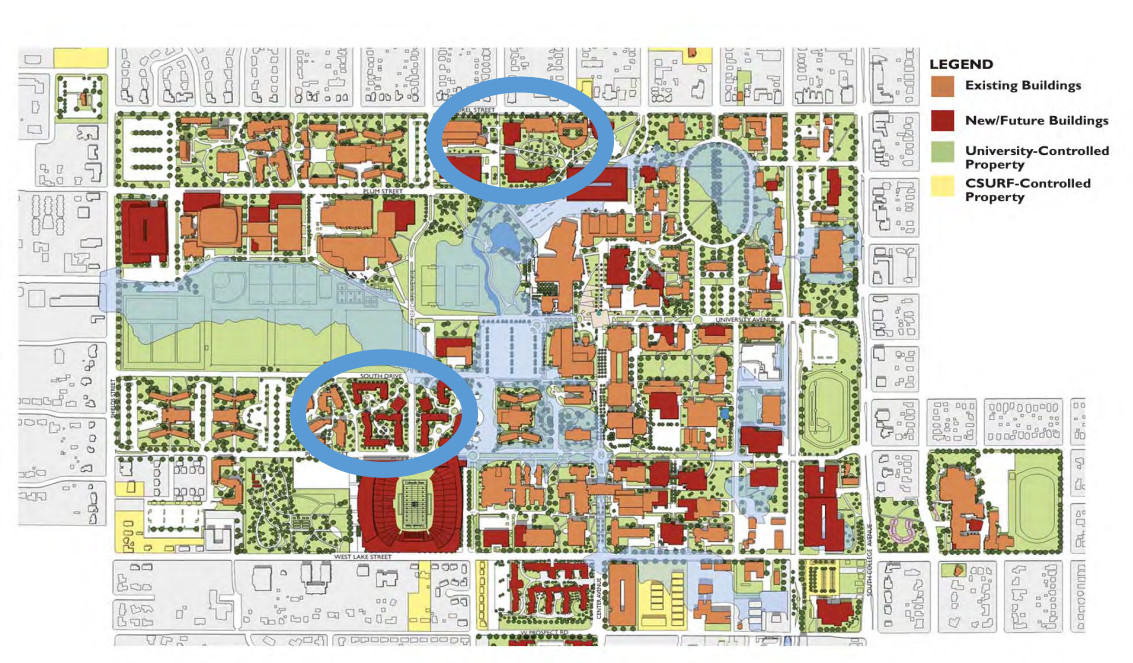
BENEFITS OF THE PROJECT

The conception of this project has been strategic to provide numerous benefits to HDS, campus partners, and the University.

1. Increase housing capacity and provide on-campus housing for all students who wish to live on campus.
2. Address critical deferred maintenance backlog will be addressed.
3. Sustainability- Promotes an adaptive reuse of an existing, structurally sound building to make the facility viable for the next century.
4. The revitalized building will have a thermal envelope four times better than the existing enclosure. Energy use to heat and cool the building will be significantly reduced even with the new space additions.
5. Maintain other campus sites for other development needs - Developing new residence hall bed space on existing sites through additions and renovations
6. The quality and maintainability of the renovated facility will be better than new light wood frame construction.
7. Opportunity to collaborate with campus partners in the creation of community and classroom shared spaces. Strategic benefits of this project include attracting new students to CSU, improving student retention, elevating the CSU profile related to innovation, and elevating our focus on interdisciplinary connection by creating a hub for innovation university wide.
8. New directions being developed for the HDS growth, starting with the Allison Hall site as a potential model for Ingersoll, Edwards, Newsom in the future.

COLLEGE OF BUSINESS PLANNING AND THE CENTER FOR ENTREPRENEURSHIP AND INNOVATION

MOTION



MOTION TO :

ACKNOWLEDGE MERIDIAN VILLAGE PROJECT SUSPENSION, CANCELLATION AND THAT ALLISON HALL REMAINS OPERATIONAL IN CURRENT LOCATION.

RECOMMEND THAT ALLISON HALL BE REVITALIZED WITH ADDITIONS TO ACCOMMODATE ADDITIONAL BEDS AND THE CENTER FOR ENTREPRENEURSHIP AND INNOVATION