100% Schematic Design Deliverable

Task 2

NOVEMBER 22, 2024

Montana PBS

SMA architecture + design

MTPBS 100% SCHEMATIC DESIGN APPROVAL
DATE OF APPROVAL: 2024-11-22

Project: **MTPBS / Visual Communications Building Addition & Renovation** **PPA# 23-0796**
Location: **1051 W. Grant Street** | Bozeman, Montana, 59715
Owner: **State of Montana - Montana State University, University Facilities Management**
Plew Building 6th & Grant Street, PO Box 172760, Bozeman, MT 59717
Architect: **SMA Architecture + Design PC**, 612 E. Main Street, Unit C, Bozeman, MT 59715

Project Phase Submittal: Schematic Design Task 2

Based on the contract for Design Services designated in the 'Contract for Professional Architectural and Engineering Services' between SMA Architecture + Design and Montana State University, the work (designated "100% Schematic Design Level") performed has been reviewed and found to be complete. Task 2 for the addition and renovation is acceptable and consistent with the owners' and users' functional, spatial, and aesthetic needs and desires at '100% Schematic Design Level'. We also understand these aspects will be further developed and refined in the next phase, Design Development. The Date of Approval designated above shall establish the milestone beyond which major changes to the design will be considered additional work.

SMA ARCHITECTURE + DESIGN PC
Architect

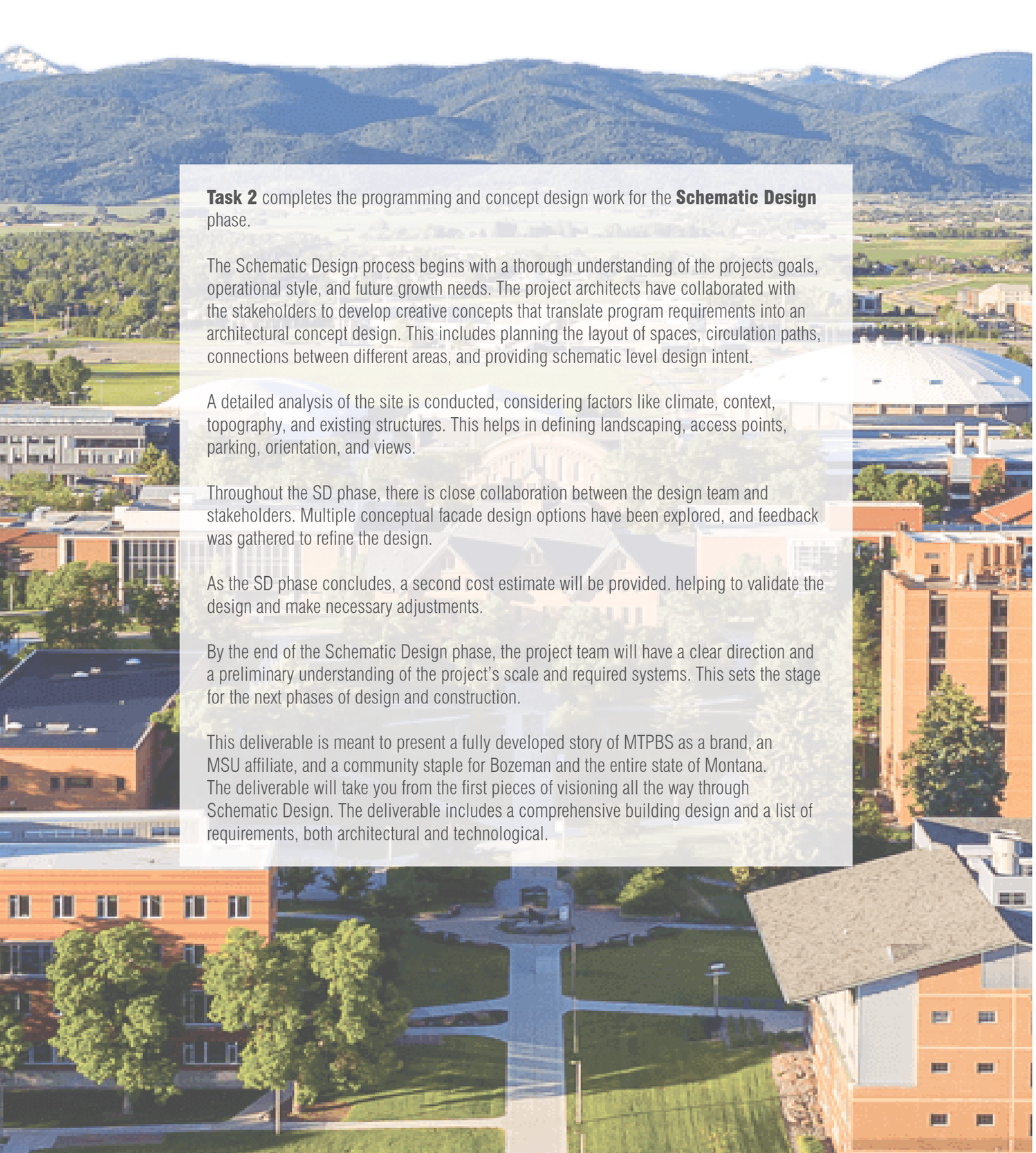
By: _____
Charley Franklin, Principal-in-Charge Date

MONTANA STATE UNIVERSITY
Facilities Management

By: _____
Grant Petersen, Director of Campus Planning, Design, & Construction Date

MONTANA PBS
Representative(s)

By: _____
Aaron Pruitt, Director and General Manager, Montana PBS / KUSM-TV Date



Task 2 completes the programming and concept design work for the **Schematic Design** phase.

The Schematic Design process begins with a thorough understanding of the projects goals, operational style, and future growth needs. The project architects have collaborated with the stakeholders to develop creative concepts that translate program requirements into an architectural concept design. This includes planning the layout of spaces, circulation paths, connections between different areas, and providing schematic level design intent.

A detailed analysis of the site is conducted, considering factors like climate, context, topography, and existing structures. This helps in defining landscaping, access points, parking, orientation, and views.

Throughout the SD phase, there is close collaboration between the design team and stakeholders. Multiple conceptual facade design options have been explored, and feedback was gathered to refine the design.

As the SD phase concludes, a second cost estimate will be provided. helping to validate the design and make necessary adjustments.

By the end of the Schematic Design phase, the project team will have a clear direction and a preliminary understanding of the project's scale and required systems. This sets the stage for the next phases of design and construction.

This deliverable is meant to present a fully developed story of MTPBS as a brand, an MSU affiliate, and a community staple for Bozeman and the entire state of Montana. The deliverable will take you from the first pieces of visioning all the way through Schematic Design. The deliverable includes a comprehensive building design and a list of requirements, both architectural and technological.

TABLE OF CONTENTS

0 EXISTING CONDITIONS & SITE ANALYSIS

0. EXISTING CONDITIONS

EXISTING SITE SURVEY REVIEW

Bozeman Unified Development Code Requirements

Zoning:

PLI zoning designation has no set back requirement except when a lot is adjacent to another district.

“Other” Block Frontage

Setbacks:

PLI designation requires a 10’ min. front setback

Building Entrances:

Must be visible and directly accessible from the street.

Departure A. Building entrances. Block frontages with steep slopes and/or those facing busy arterial streets and very limited pedestrian traffic may warrant some flexibility to this standard.

Facade Transparency:

For buildings designed with ground level non-residential uses, at least 25% of the ground floor between 4’-8’ above the sidewalk.

Weather Protection:

Provide weather protection at least 3’ deep over primary business and residential entries.

Parking Location:

N/A

Landscaping:

The area between the street and building must be landscaped, private porch or patio space, and/or pedestrian-oriented space.

For setbacks adjacent to buildings with windows, provide low level landscaping that maintains views between the building and the street.

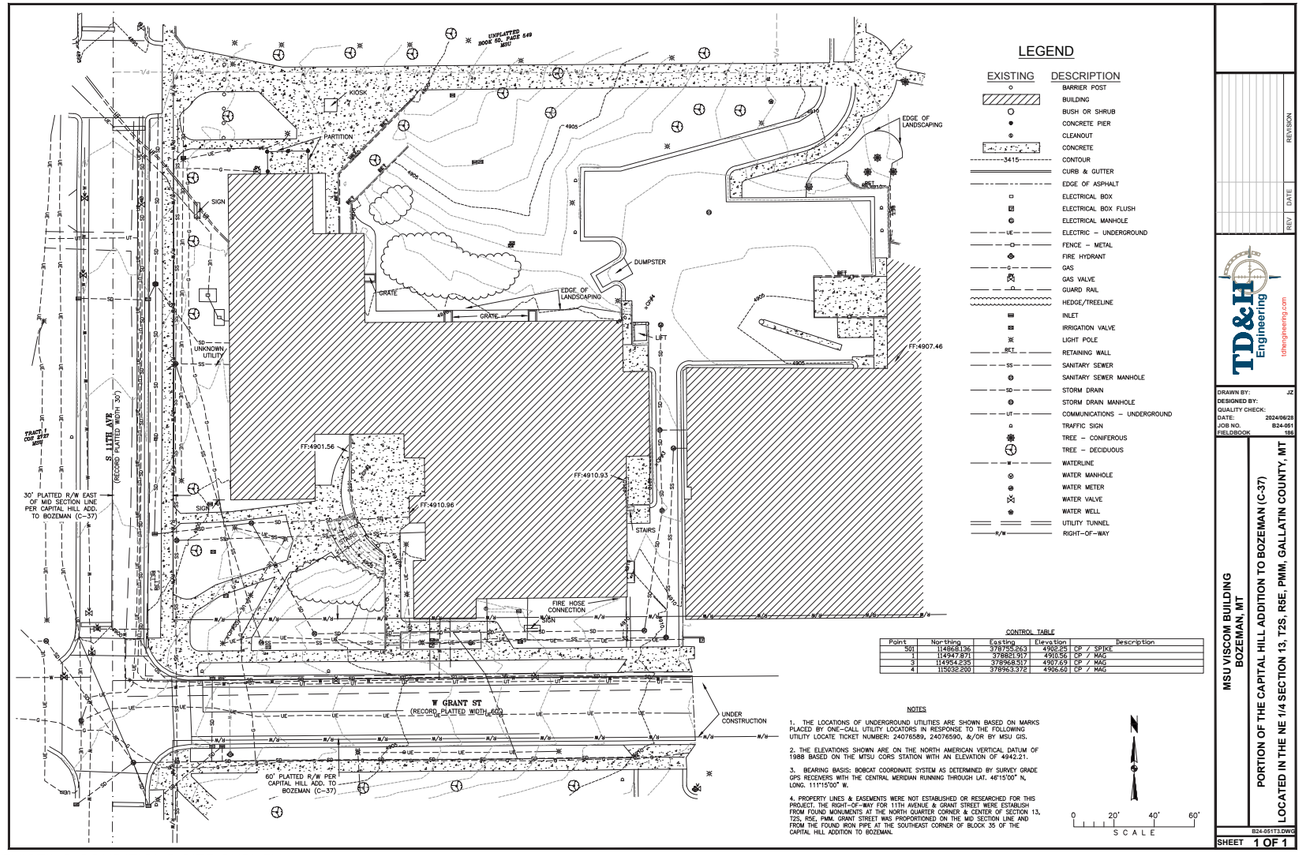
Also provide plant materials that screen any blank walls and add visual interest at both the pedestrian scale and motorist scale. For extended wall areas, provide for a diversity of plant materials and textures to maintain visual interest from a pedestrian scale.

Sidewalk width:

N/A

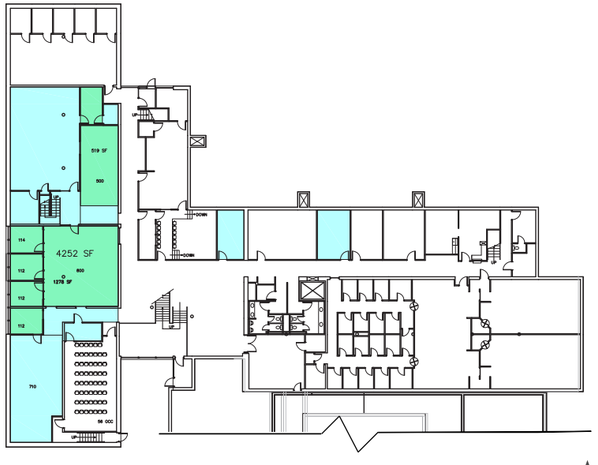
Vision Triangles:

11th Street and Grant Street vision triangle to be eliminated with the Grant Street Walking Mall.

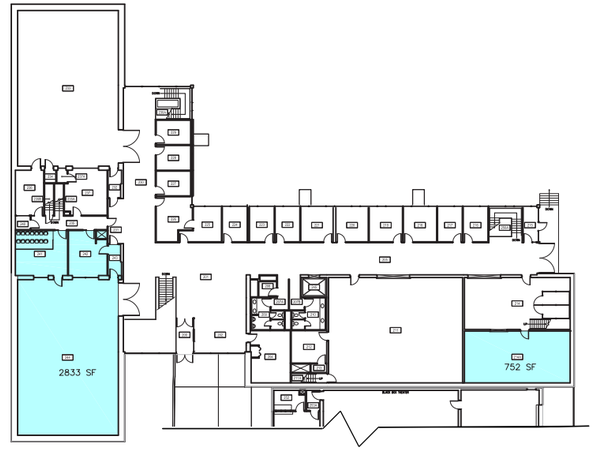


EXISTING CONDITIONS SITE SURVEY

MT PBS EXISTING STUDIOS AND WORK SPACES



LEVEL 0 - EXISTING VISUAL COMMUNICATIONS BUILDING



LEVEL 1 - EXISTING VISUAL COMMUNICATIONS BUILDING

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0. EXISTING CONDITIONS

GEOTECHNICAL REVIEW

Civil Design Considerations

I. Geotechnical

a. A geotechnical field investigation is being scheduled for late 2024 / early 2025 with soil borings at select locations to observe the subsurface conditions. Temporary monitoring wells have also been requested by MSU to allow for monitoring of seasonal groundwater elevations at the site.

b. The subsurface conditions encountered at the MSU School of Nursing Building site located directly to the south consisted of approximately 24 feet of soft, compressible lean clay overlying dense native gravel and sand.

c. Based on our experience in Bozeman and on MSU's campus, the soft, compressible lean clay is not suitable to support loads typical of large multistory buildings without excessive structural settlement.

d. Structural loads should be transferred down to the dense native gravel and sand. This could be accomplished through over excavation of the lean clay and replacement using structural fill, deep foundation elements (micropiles/concrete piers), or engineered aggregate piers (RAP's).

e. Based on recent projects in Bozeman and on the MSU campus, RAP's are generally the most economical solution.

f. RAP's are designed by the installing contractor due to proprietary installation, compaction methods, and equipment. Design allowable bearing pressures typically range from 4,000 to over 6,000 pounds per square foot (psf) depending on acceptable settlement.

g. Depending on the interior slab loads and the owner's acceptable settlement tolerance, slab-on-grade construction is anticipated to be supported by 24 inches of granular fill over a geotextile fabric. The upper six inches of granular fill is commonly crushed ¾" screen rock.

h. Note the above items are commonly encountered design conditions and are based on our experience. These items may change following the field investigation and as project specific lab testing and analysis is completed for the project.

0. EXISTING CONDITIONS

EXISTING MECHANICAL SYSTEMS REPORT

Salas O'Brien

SUMMARY:

Existing PBS/Viscom:

- Based on as-built drawings for existing PBS Viscom, the HVAC system utilizes distributed zone water source heat pumps. The heat pump loop is trimmed with hot water for heat and a cooling tower for cooling. A steam to water heat exchanger in Mech Rm 102 provides heat utilizing steam from the campus steam plant. A thermal storage tank for the heat/cooling system is located under the Black Box theater.
- Per MSU, one valve is being used out of three at the steam heat exchanger. There may be additional heating capacity available with the steam heat exchanger.
- The existing PBS/Viscom system will need to be thoroughly vetted if used for the new PBS/Viscom.
- Consensus is to NOT touch the existing PBS/Viscom building HVAC system. Touching it will inevitably own it. The system is old and has a lot of issues, uses pneumatic controls, and was installed 1982, over 40 years old.
- Per MSU, the existing studio (PBS/Viscom) has big heating issues.
- Per MSU, existing PBS/Viscom RTU serving the studio is old and needs replacing. Intent is a like-for-like replacement. MSU will review with PBS design team to determine if funding for this replacement is under MSU or possibly under PBS project. It may be a good opportunity to replace the unit during the PBS project, regardless.
- The cooling tower for the existing PBS/Viscom is close to end-of-life.
- Per MSU, the emergency generator for the current PBS Viscom only serves the broadcast studio.
- Steam pipe serving existing PBS/Viscom is 4" based on marking on valve. Condensate line is 2" to building.
- Steam pressures from plant are 40-45 psi.

Black Box Theater:

- The Black Box Theater utilizes a similar HVAC system to the existing PBS Viscom. The Black Box Theater also has a radiant hot water snowmelt system for the entrance stair plaza.
- If the snowmelt system in the entry stair plaza goes away additional heating capacity will be available with the Black Box heating system.
- The Black Box snow melt system is a water-to-water heat exchanger.

Geothermal Systems:

- Geothermal wells have been installed for the nearby Romney Building. The new Nursing Building to the south will add additional geothermal wells. The wells were installed for future additional capacity in mind and may be usable for the PBS Viscom project.
- Romney Geothermal field: 100 wells, each 700 feet deep.
- Romney and new nearby Wellness Center utilize are connected and utilize the Romney Geothermal field.
- The Nursing Building project will extend geo piping close to the existing steam tunnel but not all the way. The PBS/Viscom project may be an opportunity to connect the Nursing geothermal field to the Romney geothermal field system.
- If geothermal is used for the new PBS/Viscom, controlling the geothermal system for each building will need to be investigated. If all buildings are connected to the common geo, will the PBS/Viscom need to be isolated for best control?
- Typical geothermal temps for heat pump equipment sizing are 35F to 110 F.

Final Note:

- Design team needs to review and adhere to MSU Design Guidelines on MSU website. Plant steam pressures are included in these guidelines.

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0. EXISTING CONDITIONS

EXISTING ELECTRICAL SYSTEMS REPORT

Salas O'Brien

Electrical

E1. The VCB building is fed from a single pad-mount transformer on the exterior, plan west side of the building. The transformer feeds a 3-section, 120/208V, 3000A Square D switchboard located within the building's 3rd floor mechanical penthouse. The feeder to this switchboard rises through the building in a concrete encased chase.
   a. The main switchboard feeds all equipment within the VCB building as well as all equipment within the adjoining Black Box theater.

   b. Equipment fed from this main switchboard includes, but is not limited to:
      i. Two (2) HVAC chillers on the roof serving Studio A and Studio B
      ii. Two (2) 800A dimming panels serving all studio set lighting within Studio A and Studio B
      iii. One (1) 400A feed to the generator transfer switch (ATS)
      iv. Fifteen (15) 120/208V, 225A branch circuit panelboards located throughout all areas of the VCB building
      v. One (1) 600A feed to the adjoining Black Box workshop panels
      vi. One (1) 800A dimming panel serving the Back Box Theater

E2. There is an existing 120/208V, 125kW natural gas Kohler generator located on the exterior, plan north side of the building. It serves a 400A/3-pole automatic transfer switch (ATS) located within the Network Operations Center (NOC) electrical room.
   a. The ATS feeds a 120/208V, 400A main generator distribution panel "MGB", within the same space. This panel, "MGB", feeds a 120/208V, 200A, panel "GI" downstream. Panel "GI" serves one (1) 20A circuit and receptacle, per network rack within the NOC.

   b. Panel "MGB" feeds a 120/208V, 50kVA Liebert UPS via a 175A breaker and an associated UPS maintenance bypass panel. The output of the maintenance bypass cabinet feeds a 120/208V, 200A panel "UPS". Panel "UPS" serves one (1) 20A circuit and receptacle, per network rack within the NOC.

   c. Existing HVAC equipment serving the NOC is not currently on back-up generator.

   d. There is a single HVAC unit within the adjoining Tape Storage room where three (3) additional network racks are located. It is currently the only HVAC unit serving network operations that is on generator backup.

   e. The current load and available capacity of the existing 125kW generator and 50kVA UPS will need to be further evaluated and confirmed.

E3. Individual branch circuits serving PBS Studio A, production control room, and audio control room were found to be fed from local 120/208V, 225A panel "M".
   a. Existing halogen lamps for Studio A set lighting are controlled by one of the 800A dimmer panels mentioned above that is located in the building's 3rd floor mechanical penthouse.

   b. Neither power nor lighting serving Studio A, production control room, or the audio control room are currently on UPS or generator back-up.

E4. University Information Technology (UTI) has a series of network racks located within the building's 3rd floor mechanical penthouse. Power is fed from a local 120/208V, 225A distribution panel "T".
   a. Power serving the UTI rack is not currently on UPS or generator back-up.

E5. KGLT studios is currently located within a separate building. The current KGLT studio infrastructure is not on generator back-up. A small rack mounted UPS is located within their network room.
   a. The network racks for KGLT studios are fed from a 60A/2P, 208V disconnect switch.

   b. When transferring to the new VCB expansion, the Emergency Messaging System that is currently handled by KGLT will need to be included on generator power.

End of Report

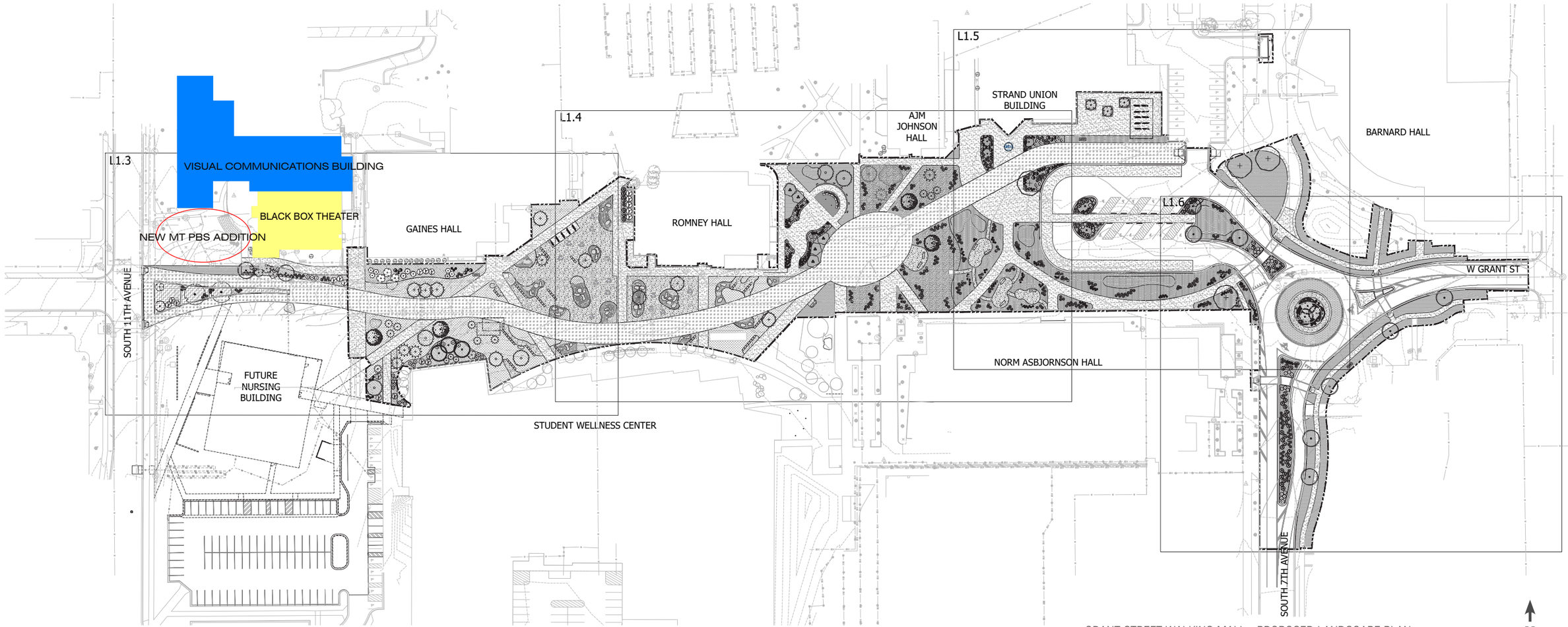
0. EXISTING CONDITIONS

BUILDING ORIENTATION & LOCATION

A primarily south-facing building can pose challenges for technology-focused teams, including increased heat gain, glare, and potential overheating, which can impact both comfort and equipment performance.

To address these concerns, careful planning and design solutions will be necessary to ensure a comfortable and practical work environment.

Additionally, there is a strong intention to seamlessly integrate the new addition with the upcoming Grant Street walking mall, fostering connectivity and community engagement. Intentional consideration and planning will be required to determine how the building and walking mall will interact, ensuring both functionality and aesthetic harmony.



GRANT STREET WALKING MALL - PROPOSED LANDSCAPE PLAN

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0. EXISTING CONDITIONS

EXISTING FLOOR PLAN | MTPBS

While developing the new program, we have been carefully considering impact to the new building—both for project phasing as well as the implications within the Existing Building Code (IEBC). The goal is to reduce intervention into the existing building as much as possible but also focusing on a level of renovation below 50% of the existing space.

Total Existing Space for MTPBS

L1 4,252 SF
L2 2,833 SF

7,085 SF Total

Approximate Addition Site

9,000 SF

Renovation Percentage Calculation

L1 14,874 SF
L2 18,046 SF
L3 3,626 SF

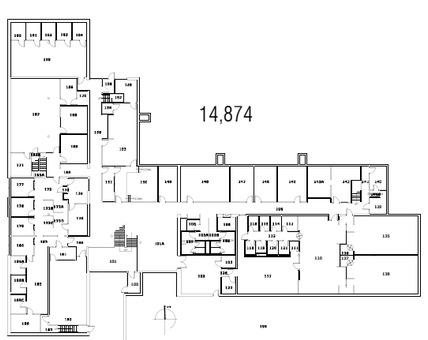
36,546 SF Total

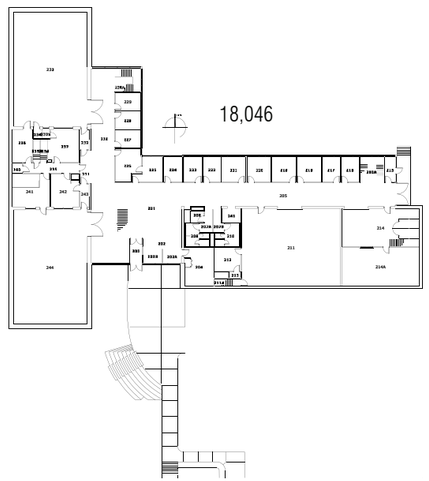
4,114 Level 1 PBS Reno SF
834 VCB Level 1 Lobby
778 VCB Level 2 Lobby

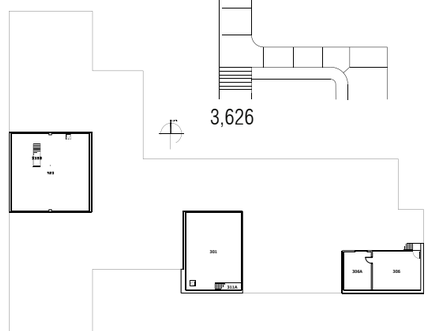
5,726 SF Total

5,726/36,546 = 15%

IEBC Level 2 Renovations triggered by space reconfiguration







0. EXISTING CONDITIONS

EXISTING FLOOR PLAN | KGLT

The current KGLT space occupies a series of rooms on the 3rd floor of the Student Union Building (The SUB) as well as a storage attic located above the Procrastinator Theater. The current program of 3 offices, 2 DJ booths, sound mixing space, a tech engineering room, and the music library have all begun to share space with each other as a result of the function of the station. Donors currently come to an office to collect merchandise and to meet with directors who have no dedicated meeting space.

EXISTING STUDENT UNION BUILDING LEVEL 3 - KGLT STUDIOS

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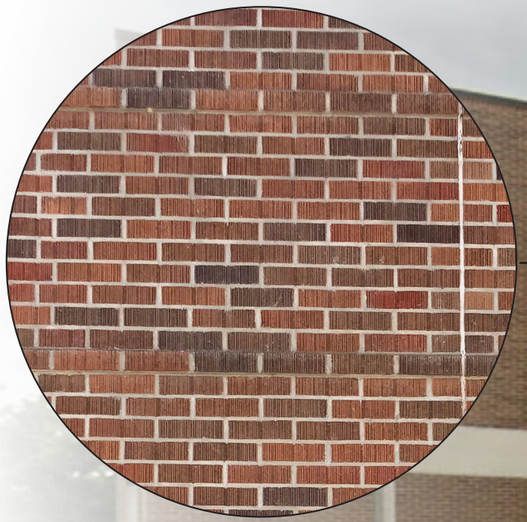
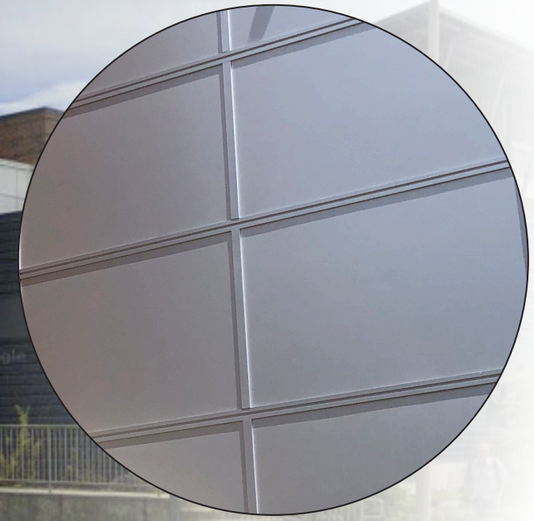
0. EXISTING CONDITIONS

EXISTING MATERIALS

The current building features brick, limestone paneling, tinted glass, metal paneling, and metal siding. This varied palette provides a unique opportunity to either highlight and enhance an existing material or introduce a new element for a pop of something fresh.

Matching some of the existing materials may present challenges such as color consistency. Newer materials that have not yet been exposed to UV will be noticeably different. However, with careful selection and sourcing of materials, as well as innovative application techniques, it could be possible to achieve a cohesive look that compliments the existing facade.





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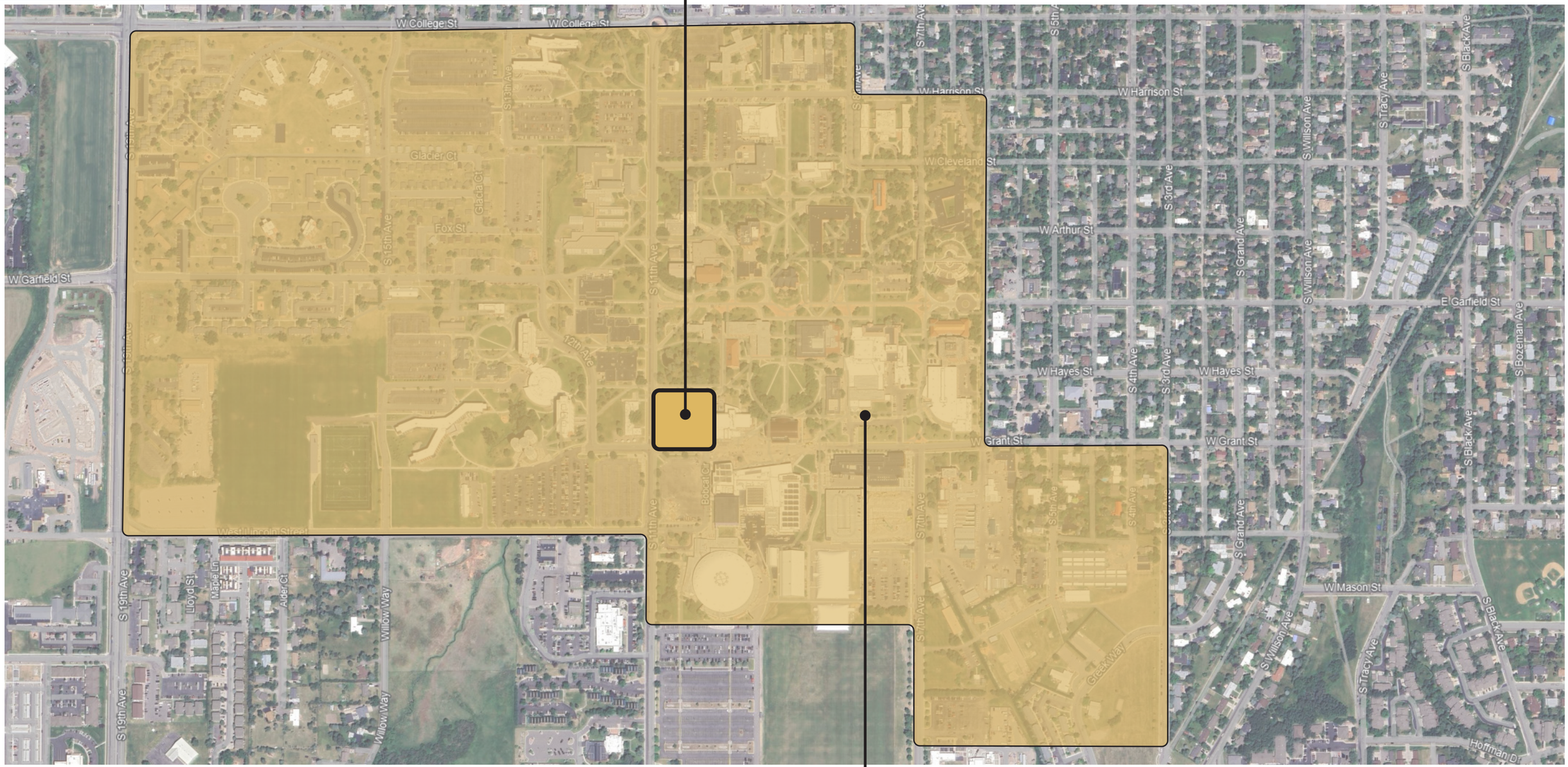
0. SITE ANALYSIS



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0. SITE ANALYSIS

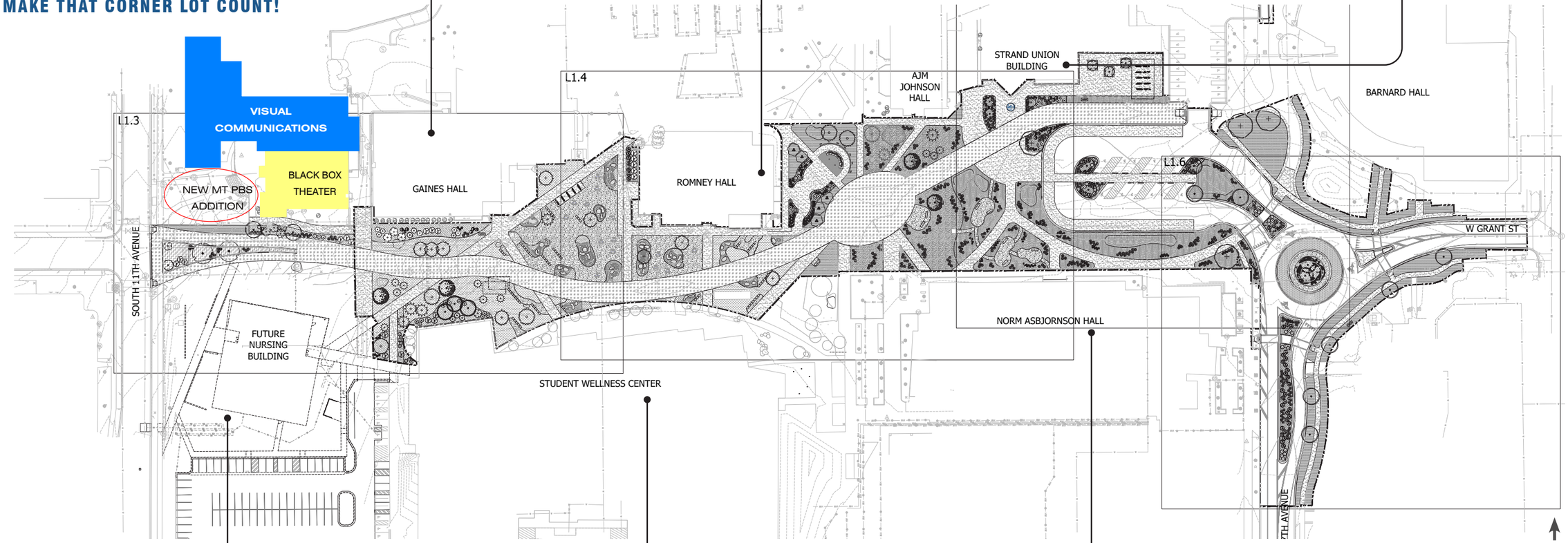
EXISTING ARCHITECTURAL LANDSCAPE

The Visual Communications building, along with the surrounding structures, feature a material palette mainly consisting of varying shades and tones of red brick, metal panels, and wood-look elements.

Despite the consistency in materials, each surrounding building possesses unique design characteristics, contributing to the diverse, architectural richness of MSU's campus.

We have an opportunity to make a striking, engaging impact while seamlessly harmonizing with the surrounding architectural themes.

LET'S MAKE THAT CORNER LOT COUNT!



GRANT STREET WALKING MALL - PROPOSED LANDSCAPE PLAN

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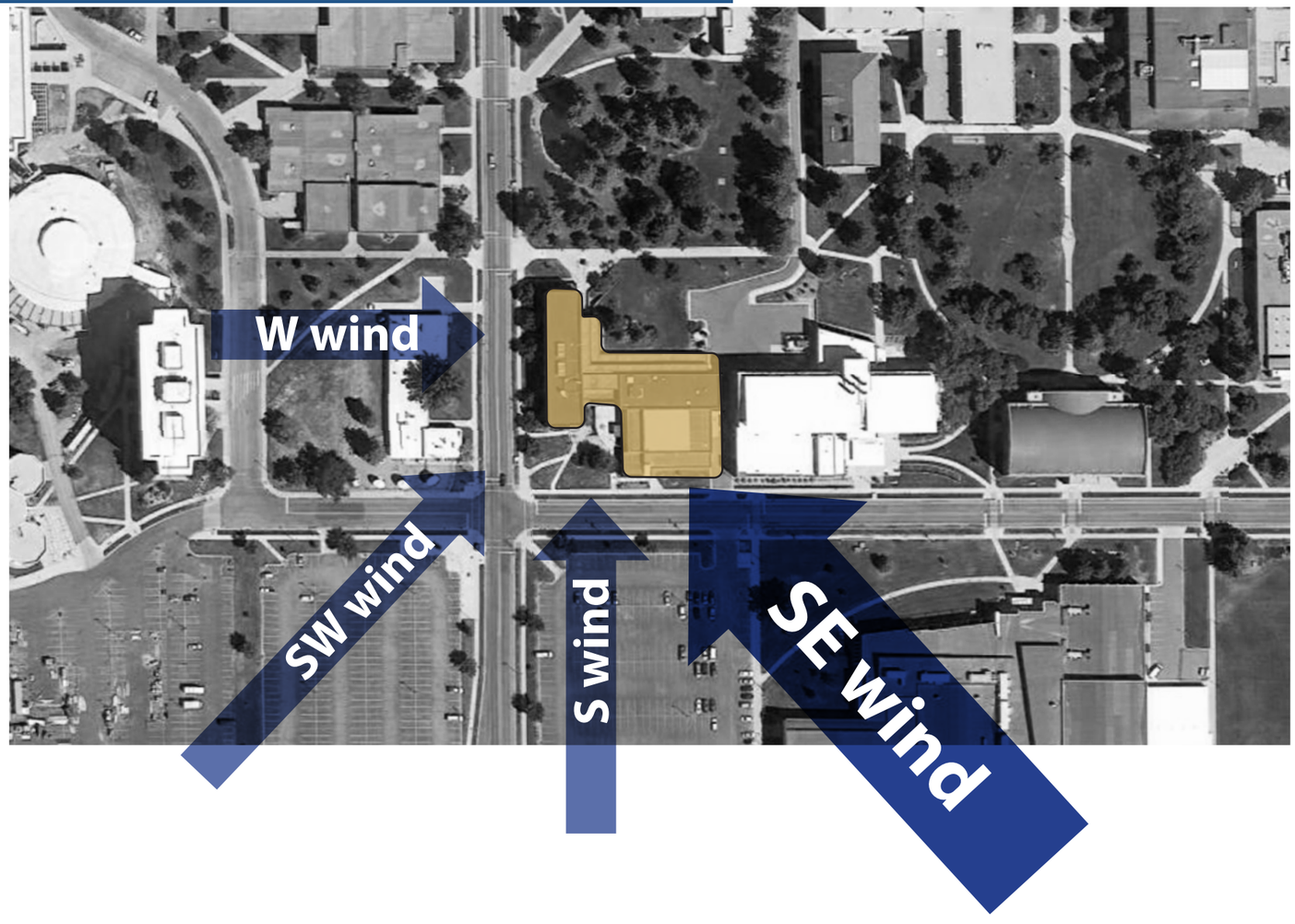
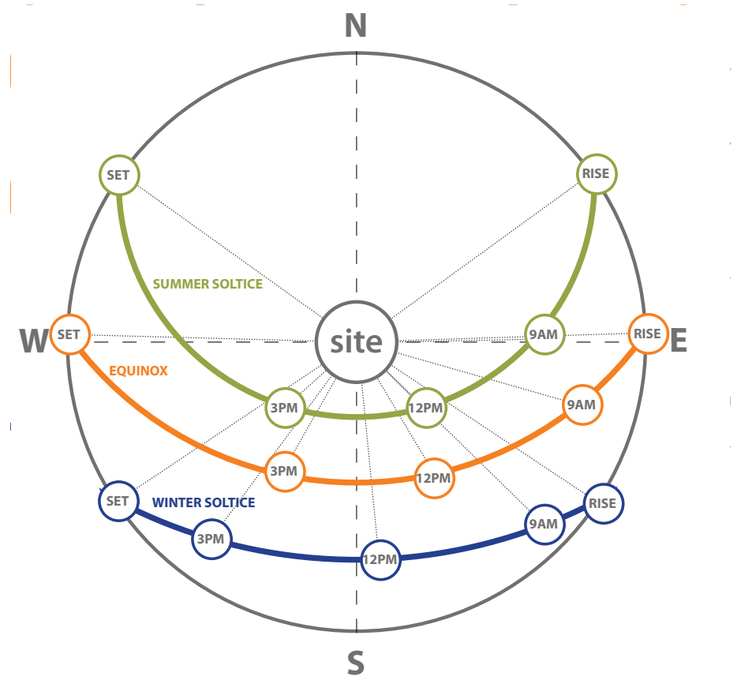
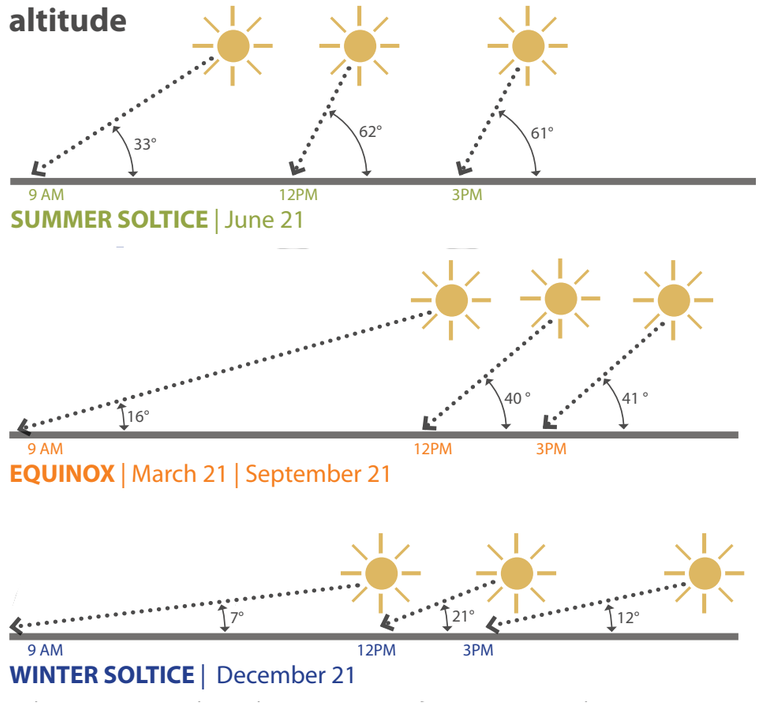
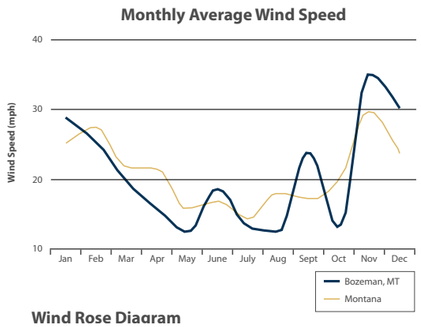
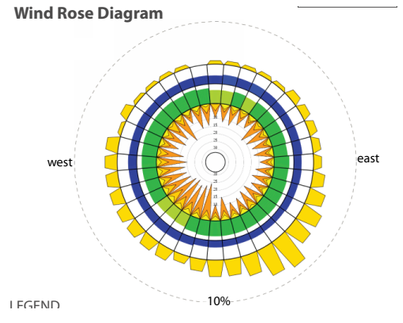
0. SITE ANALYSIS

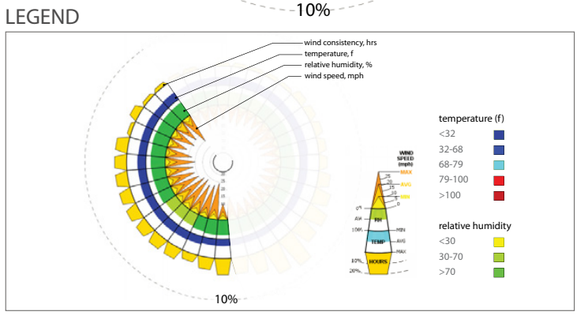












Wind Rose Diagram

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1 PROGRAM PLANNING

VISIONING PROCESS

TASK 1A & 1B

TASK 1C

BENCHMARK TOURS

DEPARTMENT TOURS

VISION & PROGRAM

PROGRAM PLANNING

DESIGN SYNTHESIS

FINAL CONCEPT PACKAGE

- Question and answer with departments
- Check out the existing space

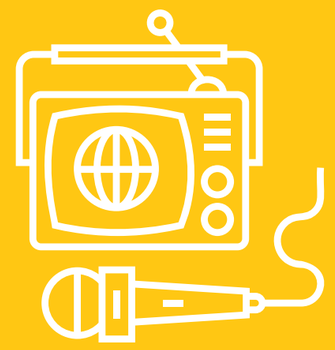
- Meeting to follow to discuss findings and refine program materials

- Review Program
- Space adjacencies
- Look at building massings on site

- Round 01 of building concept designs
- 2 or 3 options for review and refinement

- Refined final design concept and sketch plans.

We opened tasks 1A & 1B
with a series of questions
meant to uncover the vision,
wishes, and fears of MTPBS.



Who is MTPBS?

How would you describe MTPBS?
How does that translate to your office culture?
How do you want people to see MTPBS?

What’s the Workplace Spirit?

How are people expressing themselves creatively?
What is MTPBS “not”?
What are your project wishes/fears?

design. different.

What’s next?

What does the next phase of MTPBS look like?
How can the new facility support new adventures & future endeavors?
What does your new building “do” / how does it “act”?
What are your building’s critical success factors?

THIS WORD CLOUD is a culmination of key words and phrases extracted from the project team's responses to the visioning questions.

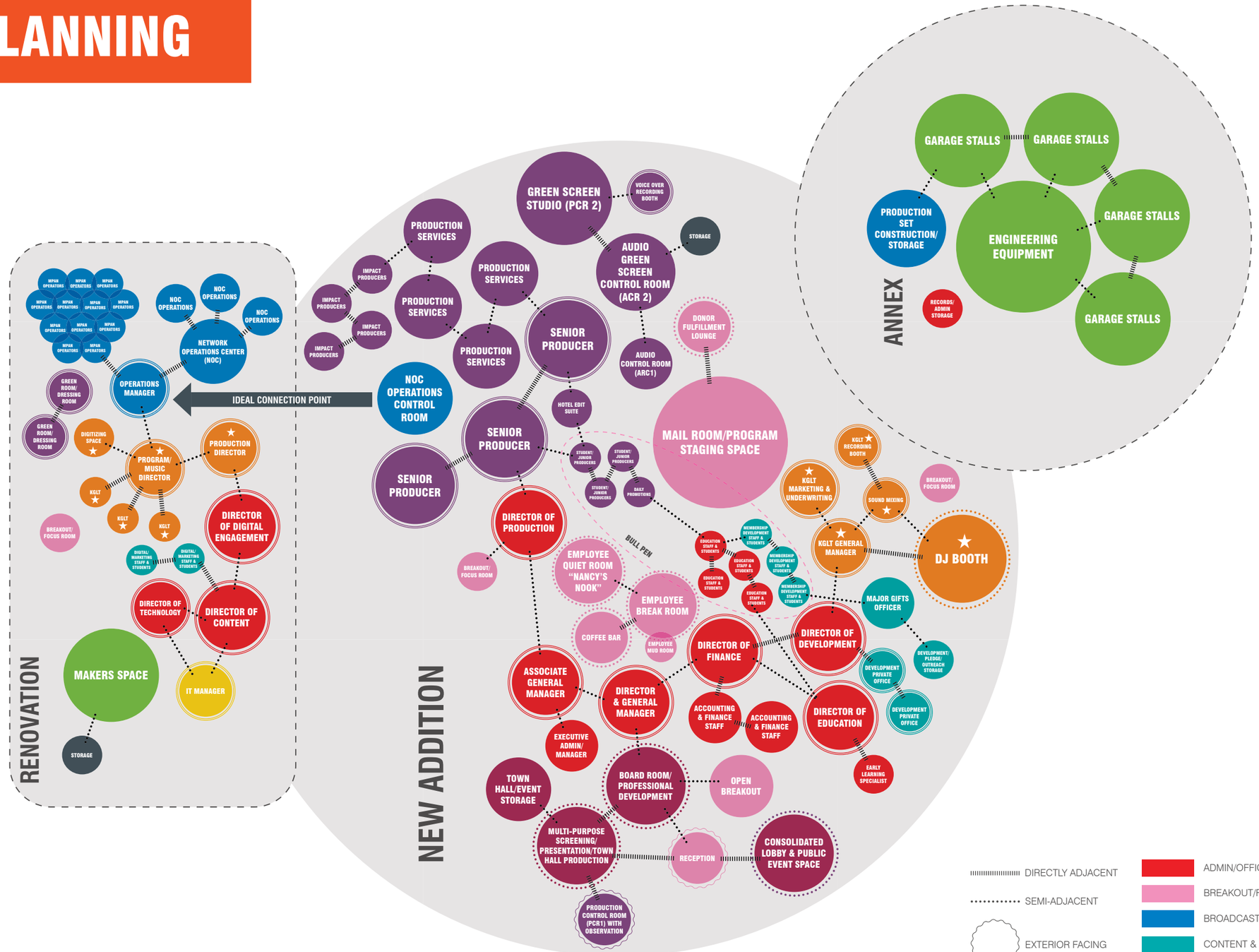
This collection of goals, aspirations, and core values illuminates the standards of Montana PBS and serves as a road map for the creative and strategic efforts of SMA's design team.

By embracing these insights and a spirit of collaboration, we aim to not only meet but exceed the expectations for the addition and renovation of the Visual Communications Building.

1. PROGRAM PLANNING

ADJACENCY DIAGRAM

Including both MTPBS and KGLT spaces, the adjacency bubble diagram evolved through several iterations, shaped by the thoughtful feedback of staff members. Following a series of collaborative meetings, SMA gathered and analyzed each department's program inventory to create a visual representation of their spatial interactions. The goal was to assess current program needs and the available space within both the planned renovated area and the new addition. This is the first step toward creating a layout that promotes efficient collaboration and functionality.



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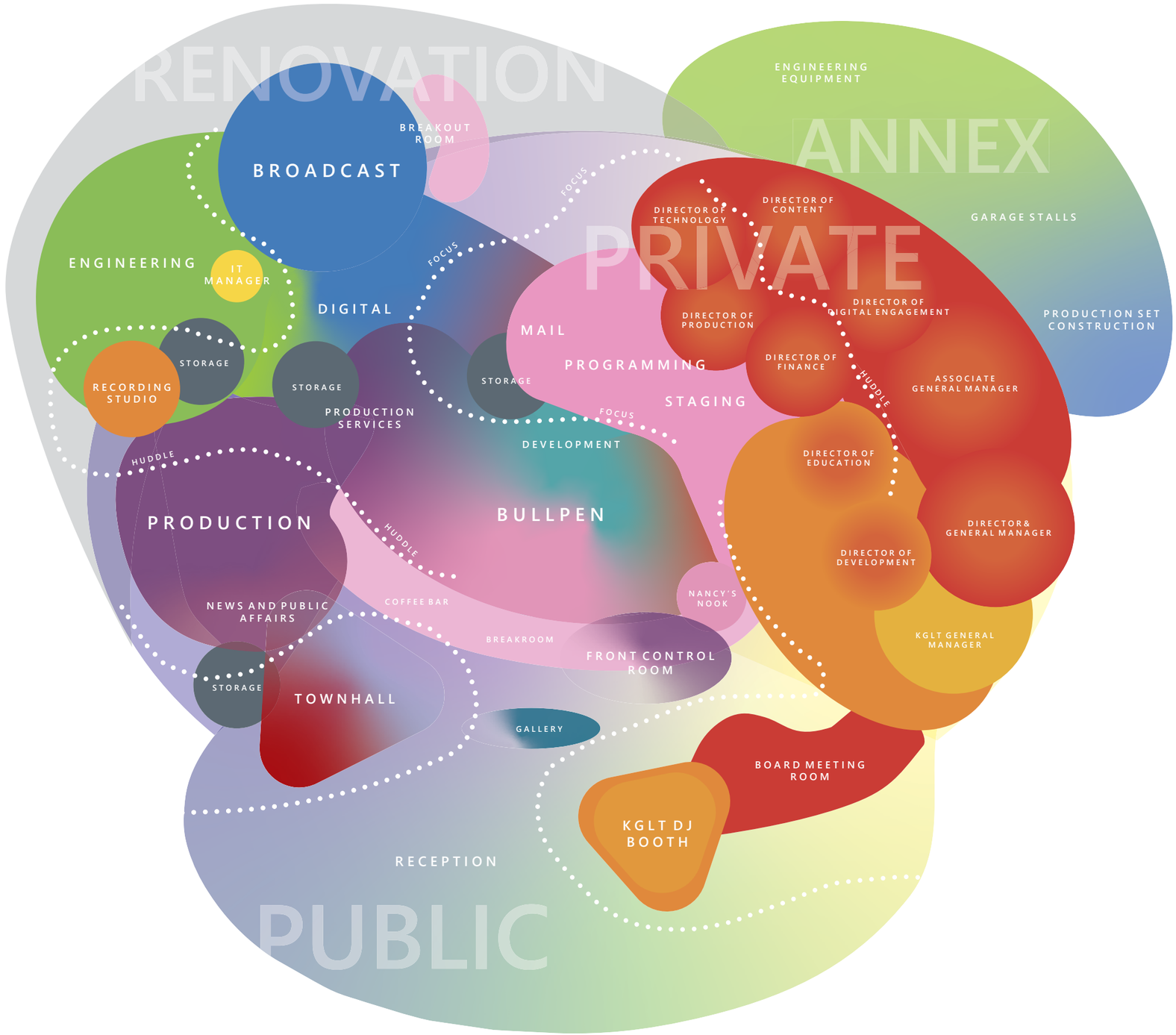
1. PROGRAM PLANNING

ORGANIZATIONAL ORGANISM

The organizational organism takes our adjacency diagram one step further. This was an integral step in uncovering the way users would live within the project. This is a diagrammatic understanding of how the public and MTPBS employees will interact with the functions of a public media station. Through this process we found a story about a brand wanting to participate with the people that it serves and how that is realized through engagement with the process of content creation.



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1. PROGRAM PLANNING

BLOCK PLANS

☆ KGLT

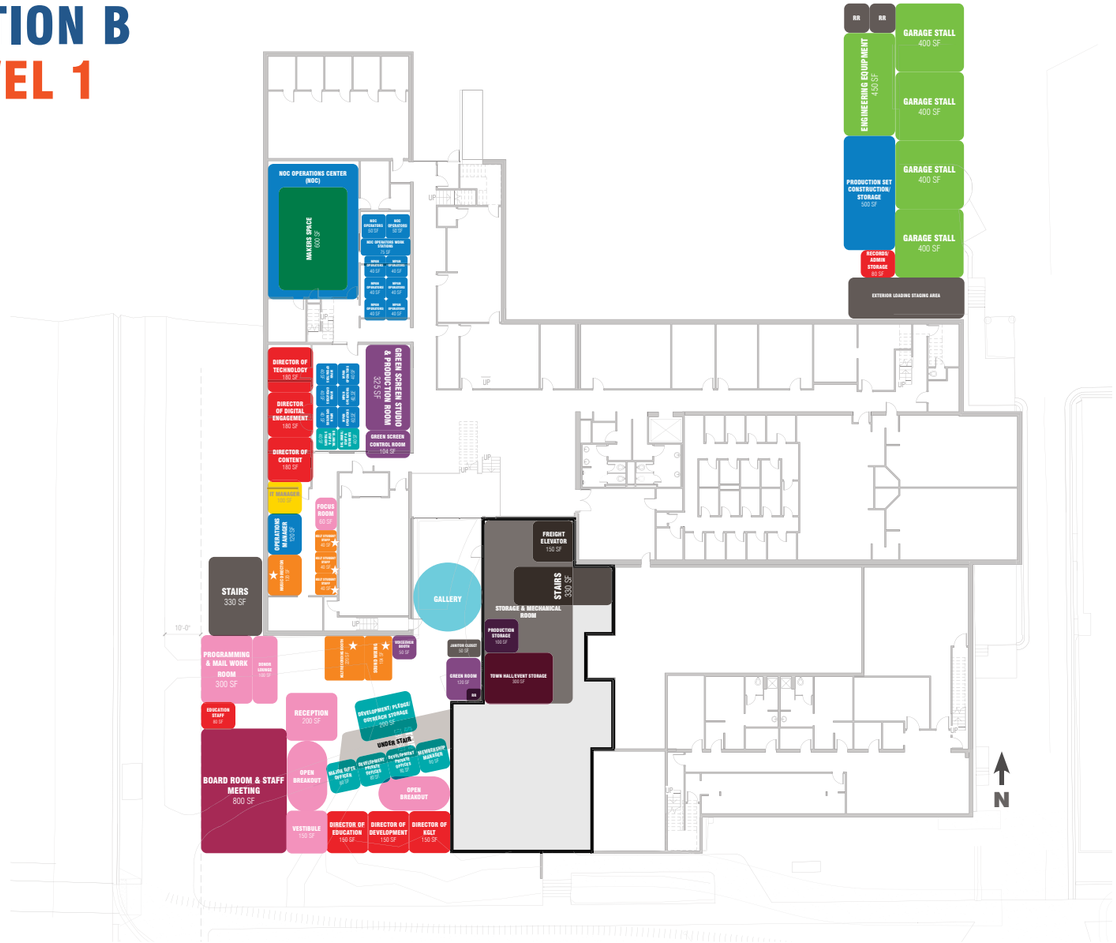
OPTION A
LEVEL 1

- ADMIN/OFFICES
- BREAKOUT/FOCUS/GROUP SPACES
- BROADCASTING & FRIENDS
- CONTENT & DEVELOPMENT
- ENGINEERING
- KGLT
- IT
- MULTI PURPOSE
- PRODUCTION
- STORAGE/MISC

Block Plan Level 1-Option A:

- Ground-level townhall space that extends into the second floor
- Two-story front control room and audio room encircled by a grand staircase
- Gallery space is used as a transition space from MTPBS addition to VisCom and the School of Film & Photography

OPTION B
LEVEL 1



Block Plan Level 1-Option B:

- First floor donor experience with Development staff in close proximity
- Board & staff meeting room adjacent to entry and reception area for easy wayfinding
- Gallery space is used as a transition space from MTPBS addition to VisCom and the School of Film & Photography

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1. PROGRAM PLANNING

BLOCK PLANS

☆ KGLT

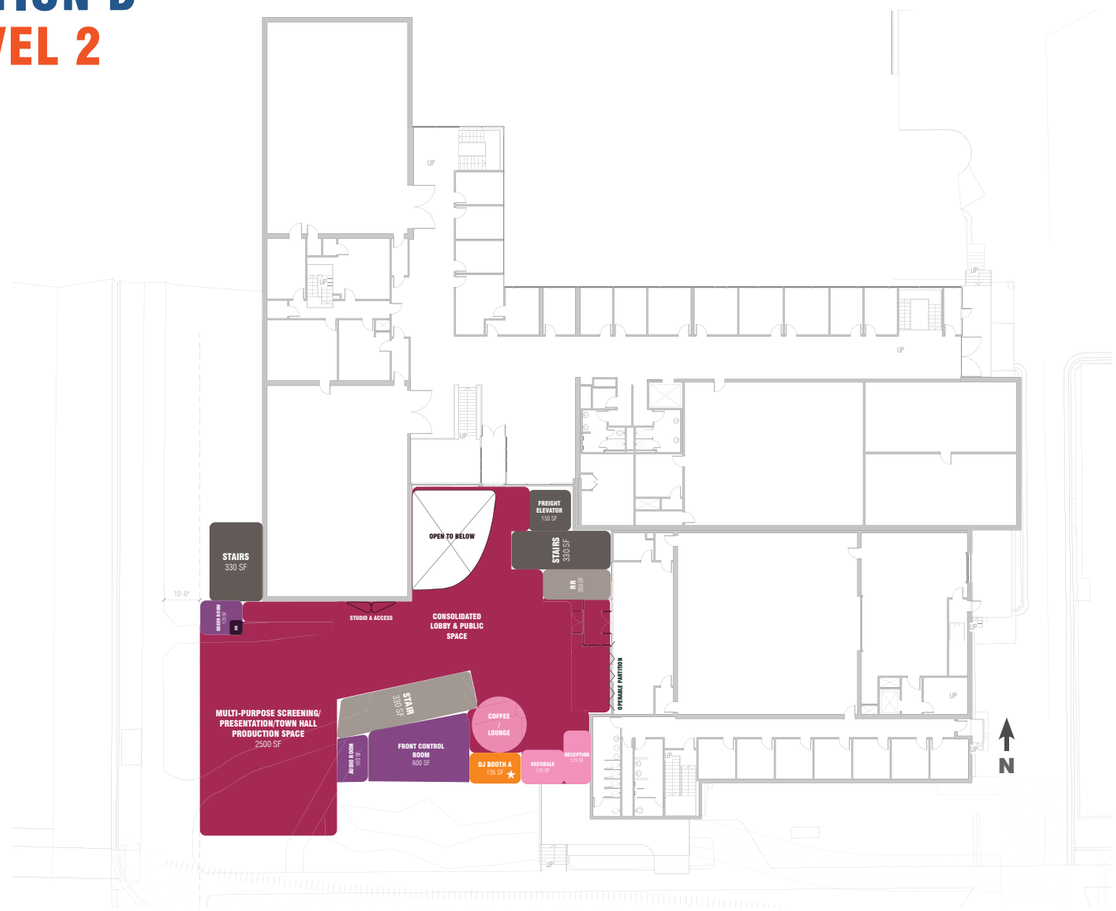
OPTION A
LEVEL 2

- ADMIN/OFFICES
- BREAKOUT/FOCUS/GROUP SPACES
- BROADCASTING & FRIENDS
- CONTENT & DEVELOPMENT
- ENGINEERING
- KGLT
- IT
- MULTI PURPOSE
- PRODUCTION
- STORAGE/MISC.

Block Plan Level 2-Option A:

- Board & staff meeting room adjacency allows for viewing into townhall space from above
- Second level NOC operators space allows for greater visibility to the public and emphasis on the exterior of the building
- Consolidated lobby is located closer to the entry for the Black Box Theater and reception area for the School of Film & Photography

OPTION B
LEVEL 2



Block Plan Level 2-Option B:

- Second floor townhall space that extends into the third level
- Audio and front control room adjacent to KGLT DJ booths for shared technological connections
- Gallery space is used as a transition space from MTPBS addition to Black Box Theater

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1. PROGRAM PLANNING

BLOCK PLANS

☆ KGLT

OPTION A
LEVEL 3

- ADMIN/OFFICES
- BREAKOUT/FOCUS/GROUP SPACES
- BROADCASTING & FRIENDS
- CONTENT & DEVELOPMENT
- ENGINEERING
- KGLT
- IT
- MULTI PURPOSE
- PRODUCTION
- STORAGE/MISC.

Block Plan Level 3-Option A:

- Third floor donor experience Development staff in close proximity
- Flexible, centralized collaboration space that can be used by team members
- Fully integrated MTPBS team all surrounding a newsroom-style set of open offices

OPTION B (1)
LEVEL 3

Block Plan Level 3-Opion B (1):

- Third floor primarily reserved for private offices away from the general public

1. PROGRAM PLANNING

BLOCK PLANS

☆ KGLT

OPTION B (2)
LEVEL 3

- ADMIN/OFFICES
- BREAKOUT/FOCUS/GROUP SPACES
- BROADCASTING & FRIENDS
- CONTENT & DEVELOPMENT
- ENGINEERING
- KGLT
- IT
- MULTI PURPOSE
- PRODUCTION
- STORAGE/MISC.

Block Plan Level 3-Option B (2):

- Third floor primarily reserved for private offices away from the general public
- Clustering of content production suites against town hall space creates a visual connection down into the space

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2

TECHNOLOGY & STUDIO PRODUCTION PROGRAM PLANNING

2. TECHNOLOGY & STUDIO PRODUCTION

Salas O'Brien

TECHNOLOGY PROGRAMMING

What We Heard You Say

Project Success by Montana PBS

- Create a connected and flexible facility.
- Functional space for MT PBS programming and provide university service/engagement.
- Additive approach to new spaces rather than redundancy of existing.
- Provide environments and workspaces staff members will enjoy.
- Make back of house operations more viewable to the public.
- Advance capabilities for elevated and simultaneous productions.

Project Success Interpretation by Salas O'Brien

- Technology and infrastructure rich facility that allows for flexible and comfortable production.
- Provide creative solutions that enhance capabilities without extensive budget increases.
- Space design that is welcoming for the occupants while maintaining production industry standards and functionality.
- Design a facility compliant with campus partners and allows for interoperability for all end users.

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2. TECHNOLOGY & STUDIO PRODUCTION

Salas O'Brien

EXISTING SPACES, CONDITIONS, AND SYSTEMS

Studio

Primary Sound Stage Studio

- Utilized for live and live-to-tape show productions.
- Good Acoustical Isolation, Mechanical Supply, Connectivity, Lighting Grid, Infrastructure, and storage
- The power supporting the lighting grid is a dated dimmer system and does not support new LED technology without adjustments and work arounds.
- This Studio will not be touched as part of the addition/expansion project
    - Will continue to be utilized as the primary sound stage studio for Montana PBS productions.
    - Capability for the Studio space and systems will be available to new control rooms and provide supplemental programming opportunity for the 11th and Grant Addition.

Production Control Room / Audio Control Room

Existing PCR/ACR

- Primarily utilized for MSU Athletics Productions and ESPN+ Steaming.
- Control Room for studio productions and auxiliary recording/production.
    - Production Control Room positions include:
        - Producer, Director, TD, Replay, Graphics, Shading, Recording, Flex, Lighting
        - 1080i base system format
    - Audio Control Room includes
        - Audio Mix, Patch, RF/Wireless
        - Capable of 5.1 Surround
- Will not be updated as part of the 11th and Grant Addition
    - Systems will be integrated into overall facility growth to provide connectivity and control for any studio or campus connectivity location

NOC (Network Operations Center)

Master Control and Equipment Rack Room / Engineering Offices / Workstations

- Multi-use space on the lower level
- Room houses all equipment racks, tape storage, engineering maintenance shop, operator stations, etc.
- 24/7 Operation of multiple PBS channels being distributed across the state from this location.
    - Whole Room 50 KVA UPS System for power backup in the case of service loss
    - Generator Backup Power (Natural Gas)
- Dedicated CRAC Unit for Room Cooling
    - Not on UPS/Generator Backup
- New systems and equipment will be housed in this location for continuity and backup power resources.
    - Capacity/Load of UPS and Backup Generator to be confirmed for available expansion.
- The room should be altered to house only equipment racks with no operator stations.

Offices/Edit Suites

Production Offices

- Existing production offices house in most cases multiple staff members with limited space and less than optimal conditions for high end video production editing, audio mixing and color correction.
- Some offices contain ad-hoc acoustical and lighting upgrades to help achieve production environment industry standards.
- Few offices contain connectivity to the NOC to provide coms, video, audio, and network connectivity directly into core production systems.
- There is no shared NAS storage solution for producers and offices to utilize.
    - Productions occur within an “island” for captured footage and edit files.
    - Sharing resources is done through ad-hoc file transfers and workflows.

2. TECHNOLOGY & STUDIO PRODUCTION

Salas O'Brien

EXISTING SPACES, CONDITIONS, AND SYSTEMS

Campus Facility Connectivity and Operations

Venue Connectivity

- The NOC is directly connected to 4 university venues via dark fiber:
  - Bobcat Football Stadium
  - Brick Breeden Field House
  - Shroyer Gymnasium
  - Strand Union Building
- This connectivity allows for production control to originate out of the existing control room and will expand the capability of the additional control rooms and systems.
- This connectivity is a key component to providing the contracted athletic and university production/content.

KGLT Studios

Radio Recording and Broadcast Studios

- Currently located in the Strand Union Building
- Primary station for Emergency Messaging System within the State.
  - Requires 24/7 operation without disruptions.
- Includes office space for KGLT Staff, DJ Booth/Studio A & B, Recording and Mix Booth, Record Storage.
- Engineering core exists within a closet that is required to remain due to transmission antenna being located on top of the Stand Union Building.
- High importance for redundancy in transmission signal pathing/equipment to ensure 24/7 operation.

Existing Mechanical Systems

Existing System Description:

- The existing PBS/Viscom HVAC system utilizes distributed zone water source heat pumps.
- The heat pump loop is trimmed with hot water from the campus steam plant for heat and a cooling tower for cooling.
- A steam to water heat exchanger in the building provides heat utilizing steam from the campus steam plant.
- A thermal storage tank for the heating/cooling system is under the Black Box theater.
- This mechanical system is over 40 years old with various upgrades to HVAC zone units throughout the years.
- MSU facilities and Design Team agree that expanding this existing system for the new PBS/Viscom building is not feasible or desired.

Existing Electrical Systems

Existing System Description:

- The building is being fed from a single pad mounted transformer on the exterior of the building. The transformer feeds a 120/208V, 3000A switchboard located within the building's roof-top penthouse.
- There is an existing 120/208V, 100kW natural gas generator located on the exterior north side of the building. It serves a 400A/3-pole automatic transfer switch (ATS).
- There is an existing 120/208V, 50KVA UPS and associated UPS bypass switch located within the first-floor electrical closet.

2. TECHNOLOGY & STUDIO PRODUCTION

Salas O'Brien

11TH AND GRANT ADDITION - TECHNOLOGY

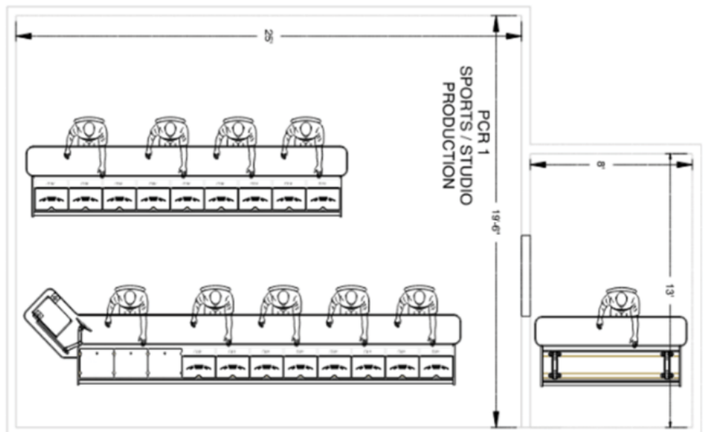
Technology Spaces

Hybrid Event/Studio Space

- Large Classroom – 150 seat, flexible classroom.
  - Campus AV/Classroom Technology Compliant
- Event/Screening Space
  - High-end projection or tight-pitch LED large format display
  - High quality surround sound (7.1 surround sound desired)
  - Space for PBS Functions and Community Events – Dinners/Parties/Gatherings
    - Collapsible theatre seating
- Studio
  - Additive studio for audience-based performances and programming
    - Debates
    - Music Performances
    - Community Events
    - University Events
  - Key infrastructure for lighting, audio, production, connectivity etc.
  - Flexible and adjustable space that provides the most functionality.
  - Adjacent storage and easy pathing for equipment and set pieces.
- Absorptive acoustical treatments on the side/rear walls and ceiling will be important to control the acoustic energy in this space. Wall, door, and floor/ceiling constructions should consider sound isolation to surrounding spaces. Low background noise levels from MEP systems will be required.

Primary Control Room

- Functions as the primary sports control room for contract partnership with Montana State University and ESPN+ programming.
- 1080p base production capabilities.
- Space for standard sports production staffing with room for training and observation.
  - Producer, Director, TD, Graphics, Bug, Replay Op(s), Shading, Flex
- Separate Audio Control Room for ideal mixing conditions.
- Interoperability to control and produce content from any PBS operated space or fiber connected venue.
- Systems connected to the NOC core for resource sharing and redundancy.
- Absorptive acoustical treatments on the walls and ceiling.
- An example layout is included below:



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2. TECHNOLOGY & STUDIO PRODUCTION

Salas O'Brien

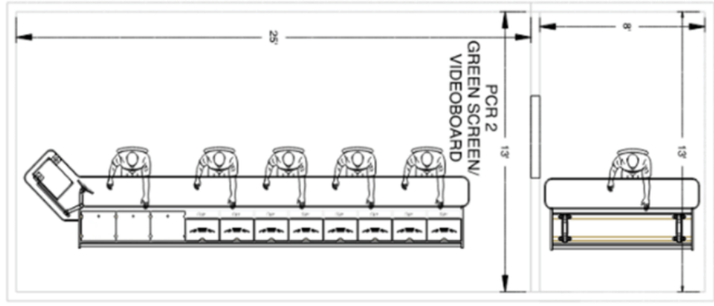
11TH AND GRANT ADDITION - TECHNOLOGY

Green Screen / Secondary Studio

- Additional controlled studio space for small level and green screen productions.
- High level of acoustic isolation (STC-60+) through the use of double-stud wall construction and isolated ceiling systems. STC rated door systems and door vestibules should be considered.
  - Absorptive acoustical treatments on all walls for majority coverage and on the ceiling.
  - Controlled MEP systems for low background noise levels.
- Ideal to have 2 usable areas within the studio
  - Green Screen Cyc Wall
- Permanent small set for talking head or intimate interview productions, as necessary.
- Lighting Grid with power and connectivity for controlling each fixture and pre-set scenes.
  - LED Lighting fixtures with DMX Control
- Connectivity to the NOC core for versatility and redundancy to produce studio content out of any control room.
- Adjacent storage space for production/lighting equipment to keep the small studio as clean and flexible as possible.

Secondary Control Room

- Function as the primary green screen / secondary studio control room for MT PBS programming.
- 1080p base production capabilities.
- Space for standard small scale studio production staffing with room for training and observation
  - Producer, Director/TD, Graphics/Playback, Robo, Shading.
- Separate Audio Control Room for ideal mixing conditions.
- Interoperability to control and produce content from any PBS operated space or fiber connected venue on campus for videoboard and small-scale sporting event streaming.
- Systems connected to the NOC core for resource sharing and redundancy.
- Absorptive acoustical treatments on the walls and ceiling.
- An example layout is included below:



Additional Spaces

- KGLT DJ/Radio Booths
  - Sufficient space for DJ Operations, Playback equipment, programming equipment and area for in studio interviews to occur.
  - Absorptive acoustical treatments on the walls and ceiling. Acoustical isolation (STC-55+) should be considered in construction assemblies to surrounding areas.
    - Low background noise levels from MEP systems will be important.
- KGLT Mix/Recording Booth
  - Acoustical isolation (STC-60+) for high fidelity recording of bands, singers, voice actors or other functions through double-stud wall construction and isolated ceiling systems. STC rated door systems and door vestibules should be considered.
    - Absorptive and diffusive acoustical treatments throughout the walls and ceiling in both spaces.
    - Low background noise levels from MEP systems will be critical.
  - A mixing console and record devices would need space to be operated, ideally with line of sight to the recording booth for verbal and non-verbal communication.
    - Could utilize Secondary Control Room Audio Mix as a shared resource

Montana PBS

SMA architecture + design

2. TECHNOLOGY & STUDIO PRODUCTION

Salas O'Brien

11TH AND GRANT ADDITION - TECHNOLOGY

- Voice Over Booth
  - A small room provided with absorptive treatment for majority coverage throughout walls, floor, and ceiling to provide best quality recordings.
  - Acoustical isolation (STC-55+) should be considered in construction assemblies to surrounding areas.
    - Low background noise levels from MEP systems will be critical.
  - This space would service KGLT and MT PBS and opportunity for campus utilization.
- Finishing Suite
  - High end editing and finishing suite purpose built for audio mix and color correction.
  - Absorptive and diffusive acoustical treatments throughout the walls and ceiling.
  - Acoustical isolation (STC-60+) through double-stud wall construction and isolated ceiling systems. STC rated door systems and door vestibules should be considered.
  - Low background noise levels from MEP systems will be critical for audio mixing.
  - Ideal production environment design to meet industry standards.
- Edit/Office Suites
  - Acoustical isolation (STC-50+) at demising walls to other occupied spaces.
  - Spaces should be welcoming and enjoyable to be within while also incorporating production standards.
- NOC - Network Operations Center (Equipment Rack Room) Renovation
  - Adjustment and re-arrangement of the NOC to accommodate the additional production equipment to support the new studios and control rooms.
  - Relocation of the operator stations from the existing NOC into a new “Master Control Suite.”
- Master Control Suite
  - On-Glass operational stations designed to bring back of house to the front with public view or interior high traffic area exposure.
- IT/AV Rooms
  - Compliant with campus IT requirements.

Montana PBS

SMA architecture + design

2. TECHNOLOGY & STUDIO PRODUCTION

Salas O'Brien

11TH AND GRANT ADDITION – MEP

Mechanical Systems

System Description:

- The intent is to utilize a new distributed zone water source heat pump system for the new 11th and Grant Addition. Water source heat pump units will be provided for each HVAC zone. This type of system is used in the existing PBS/Viscom building and recently built/upgraded campus buildings nearby.
- The heat pump loop will be trimmed with hot water from the campus steam plant for heat and a cooling tower will be provided for cooling trim. A steam to water heat exchanger in the new building will provide the heating hot water trim utilizing steam from the campus steam plant.
    - The design team will also work with MSU to determine if tapping into nearby existing geothermal systems may be feasible to save cooling/heating energy.
- Zoning: Studios, control rooms, and other specialty areas will be provided with dedicated units to provide thermostatic zoning.
- System Redundancy:
    - Critical technical core areas will be provided with dedicated units in a redundancy scheme selected by PBS/MSU.
        - Examples of redundancy include full redundancy (N+1 configuration), or multiple units sized at a reduced capacity that together meet the zone load but if one is lost reduced cooling is still available.
- Mechanical System Acoustic Considerations:
    - Mechanical equipment locations will be outside acoustic sensitive rooms and will utilize features to limit sound and vibration transmission through building structure.
    - Air distribution into those acoustically sensitive rooms will be designed for low velocity airflow and will utilize features such as duct liners and silencers as needed.
- HVAC Controls:
    - A Johnson Controls Building Automation System will be provided for the new PBS/Viscom building with front end graphics and incorporation into MSU campus monitoring.
    - The system will control/monitor the HVAC system and provide alarms per MSU guidelines.

Electrical Systems

System Description:

- The intent is to reuse as much of the existing electrical infrastructure as possible. Evaluation of the existing electrical system is in process to determine adequate electrical capacity to support the new expansion. Additional electrical capacity is likely to be required.
- A new, larger generator and UPS will be necessary to support the function of all critical spaces within the new program.
- Electrical infrastructure will be coordinated to support functionality of all studio set designs.
- Lighting systems will be designed to meet client needs as well as 2018 IECC code minimum requirements.

Plumbing Systems

System Description:

- A new plumbing system will be provided for the building to serve the restrooms, coffee bar, and breakroom.
- The plumbing system will tie into the campus domestic water and sewer systems.
- A water efficient design will be provided per MSU guidelines and project requirements.
- Consideration will be given to plumbing material types such as using cast-iron pipe for waste lines to limit noise.

Montana PBS

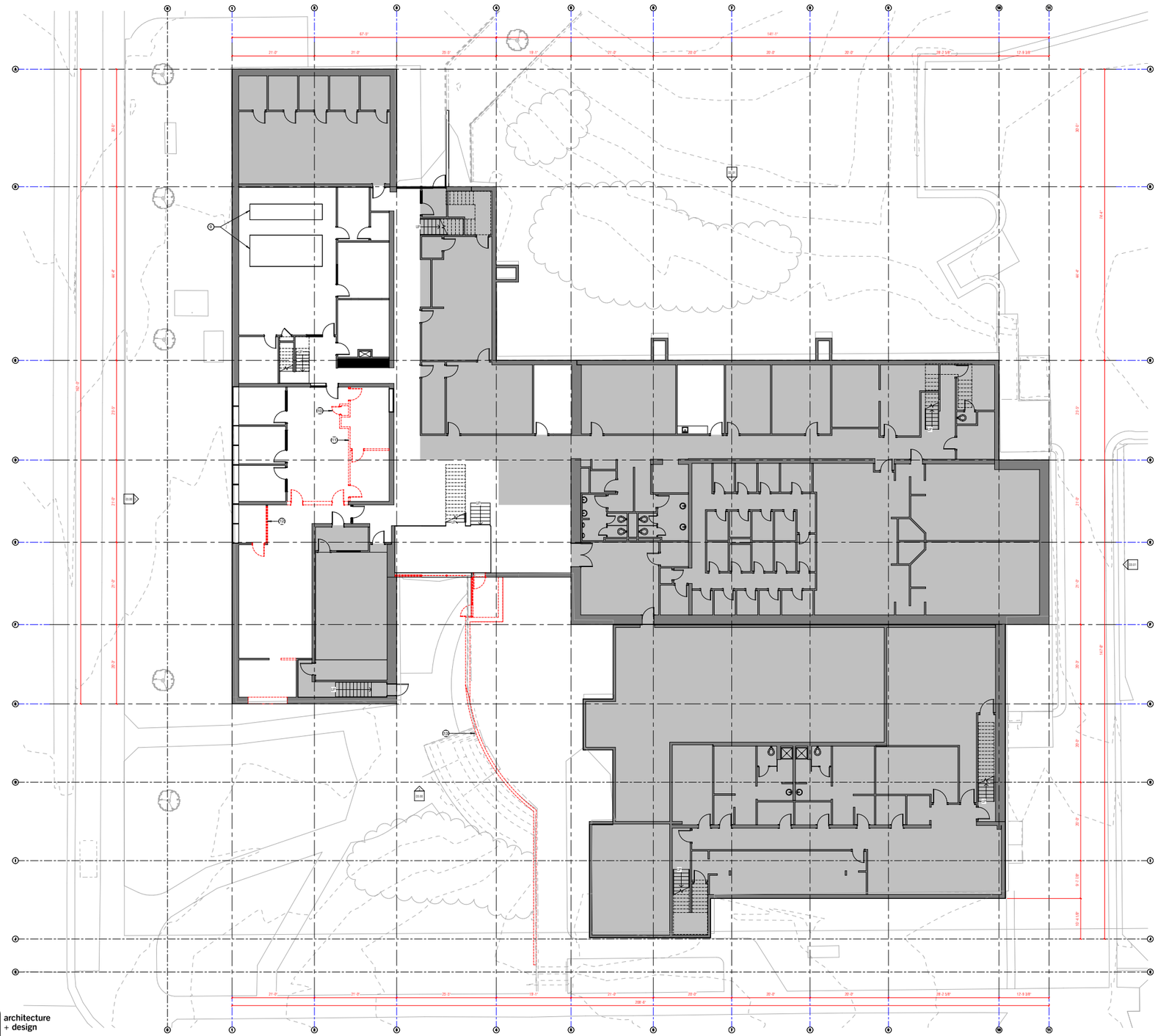
SMA architecture + design

3

SCHEMATIC DESIGN

3. SCHEMATIC DESIGN

SD DEMO PLAN
LEVEL 1



DEMO PLAN LEGEND

- EXISTING ELEMENT TO REMAIN
- CEILINGS TO BE DEMOLISHED
- WALLS TO BE DEMOLISHED
- EXTERIOR CONCRETE TO BE DEMOLISHED
- NO WORK IN THIS AREA

PLAN / ELEVATION KEYNOTE LEGEND	
9	EXISTING ACCESS FLOOR TO REMAIN.
10	DEMO DOOR AND DOOR FRAME. CONTRACTOR TO COORDINATE WITH OWNER FOR DISPOSAL AND/OR SALVAGE, TYP.
11	DEMO WALL AND ALL ASSOCIATED FINISHES & DISPOSE, TYP.
12	DEMO GLAZING SYSTEM & DISPOSE, TYP.
13	DEMO CONCRETE WALL & FOOTINGS & DISPOSE, TYP.

N

Montana PBS

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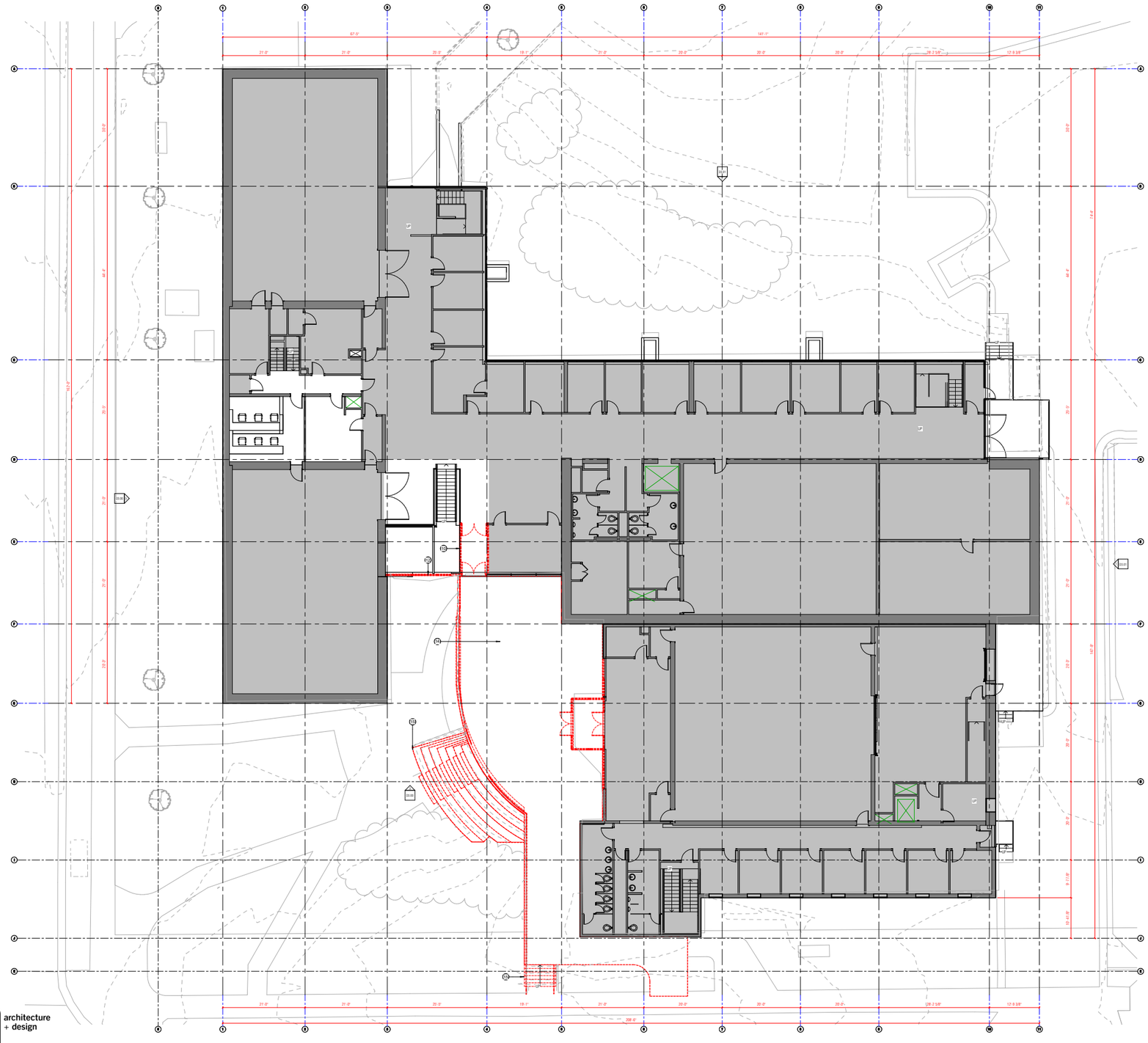
3. SCHEMATIC DESIGN

SD DEMO PLAN
LEVEL 2



DEMO PLAN LEGEND

- EXISTING ELEMENT TO REMAIN
- CEILINGS TO BE DEMOLISHED
- WALLS TO BE DEMOLISHED
- EXTERIOR CONCRETE TO BE DEMOLISHED
- NO WORK IN THIS AREA

PLAN / ELEVATION KEYNOTE LEGEND	
10	DEMO DOOR AND DOOR FRAME. CONTRACTOR TO COORDINATE WITH OWNER FOR DISPOSAL AND/OR SALVAGE, TYP.
12	DEMO GLAZING SYSTEM & DISPOSE, TYP.
14	DEMO CONCRETE SLAB & ASSOCIATED SNOWMELT SYSTEM & DISPOSE, TYP.
15	DEMO CONCRETE STEPS & ASSOCIATED SNOWMELT SYSTEM & DISPOSE, TYP.

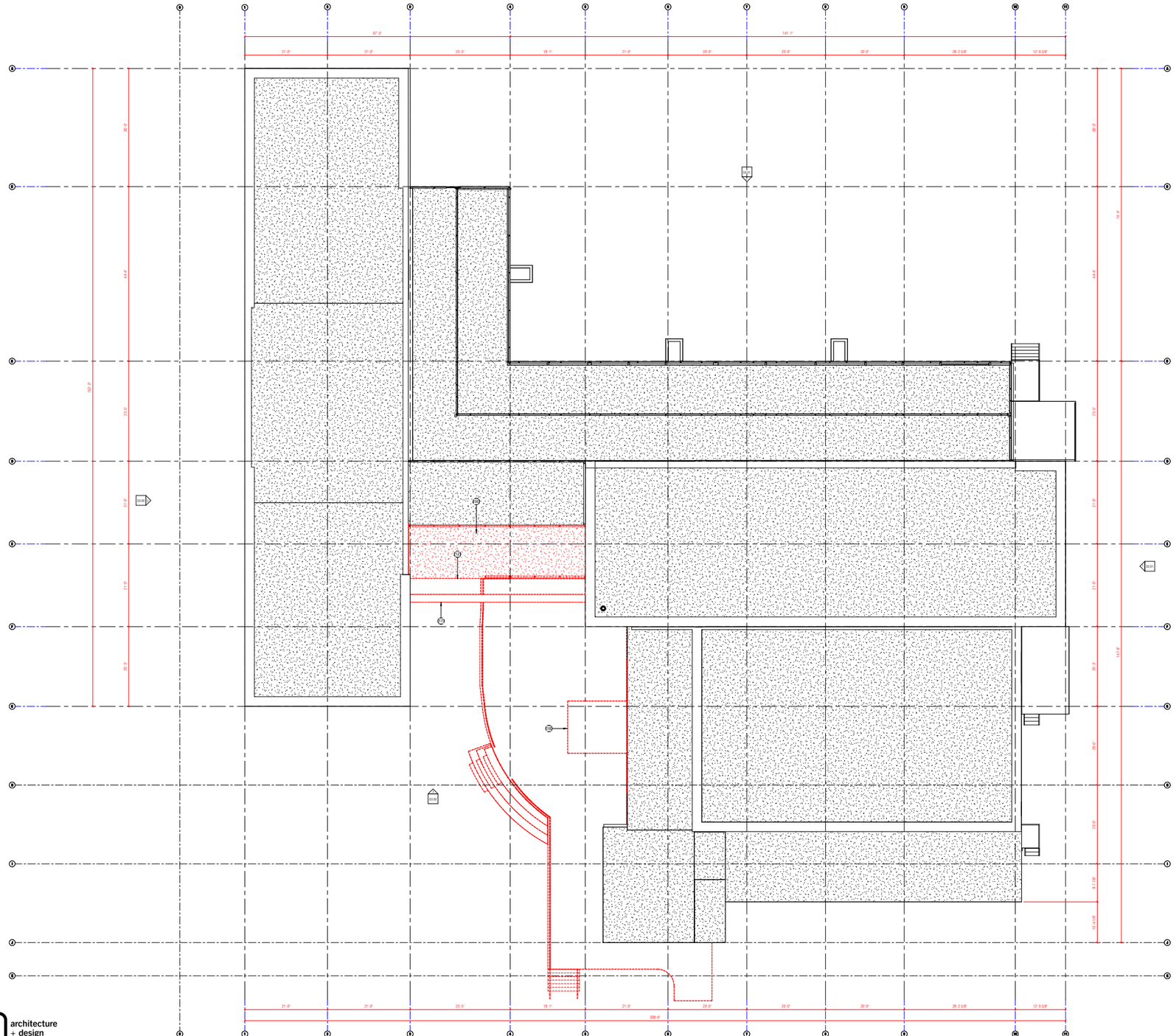
N

Montana PBS

SMA architecture + design

3. SCHEMATIC DESIGN

SD DEMO PLAN
ROOF PLAN



DEMO PLAN LEGEND

- EXISTING ELEMENT TO REMAIN
- CEILINGS TO BE DEMOLISHED
- WALLS TO BE DEMOLISHED
- EXTERIOR CONCRETE TO BE DEMOLISHED
- NO WORK IN THIS AREA

PLAN / ELEVATION KEYNOTE LEGEND	
12	DEMO GLAZING SYSTEM & DISPOSE. TYP.
16	ROOF & DISPOSE. CONTRACTOR TO PROTECT EXPOSED AREAS AND PREP FOR NEW WORK. TYP.
17	DEMO CONCRETE BEAM & ASSOCIATED FINISHES & DISPOSE. TYP.
18	DEMO ENTRY ROOF & STOREFRONT SYSTEM DISPOSE. TYP.

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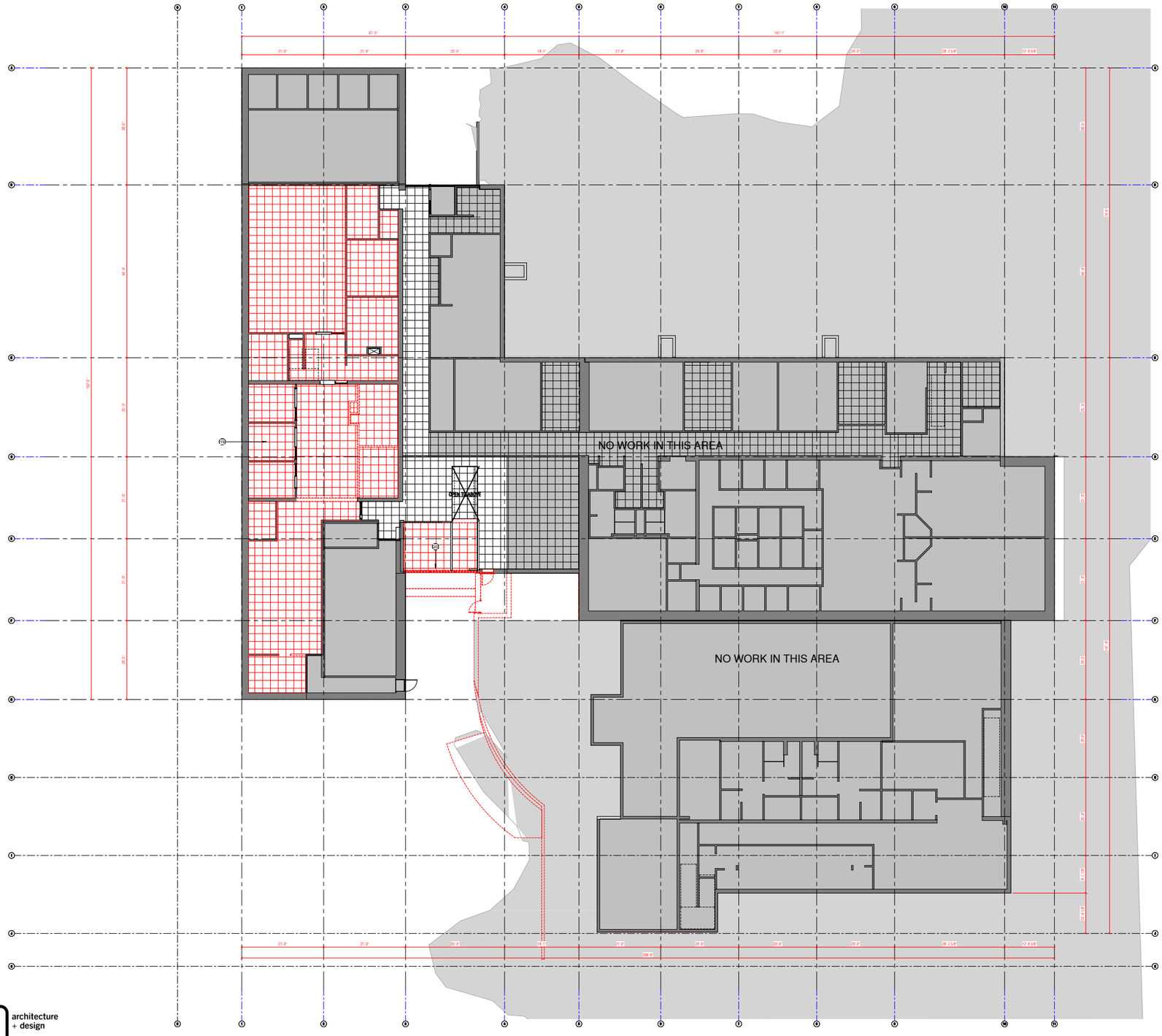
3. SCHEMATIC DESIGN

SD DEMO PLAN
LEVEL 1 RCP



DEMO PLAN LEGEND

- EXISTING ELEMENT TO REMAIN
- CEILINGS TO BE DEMOLISHED
- WALLS TO BE DEMOLISHED
- EXTERIOR CONCRETE TO BE DEMOLISHED
- NO WORK IN THIS AREA

Montana PBS

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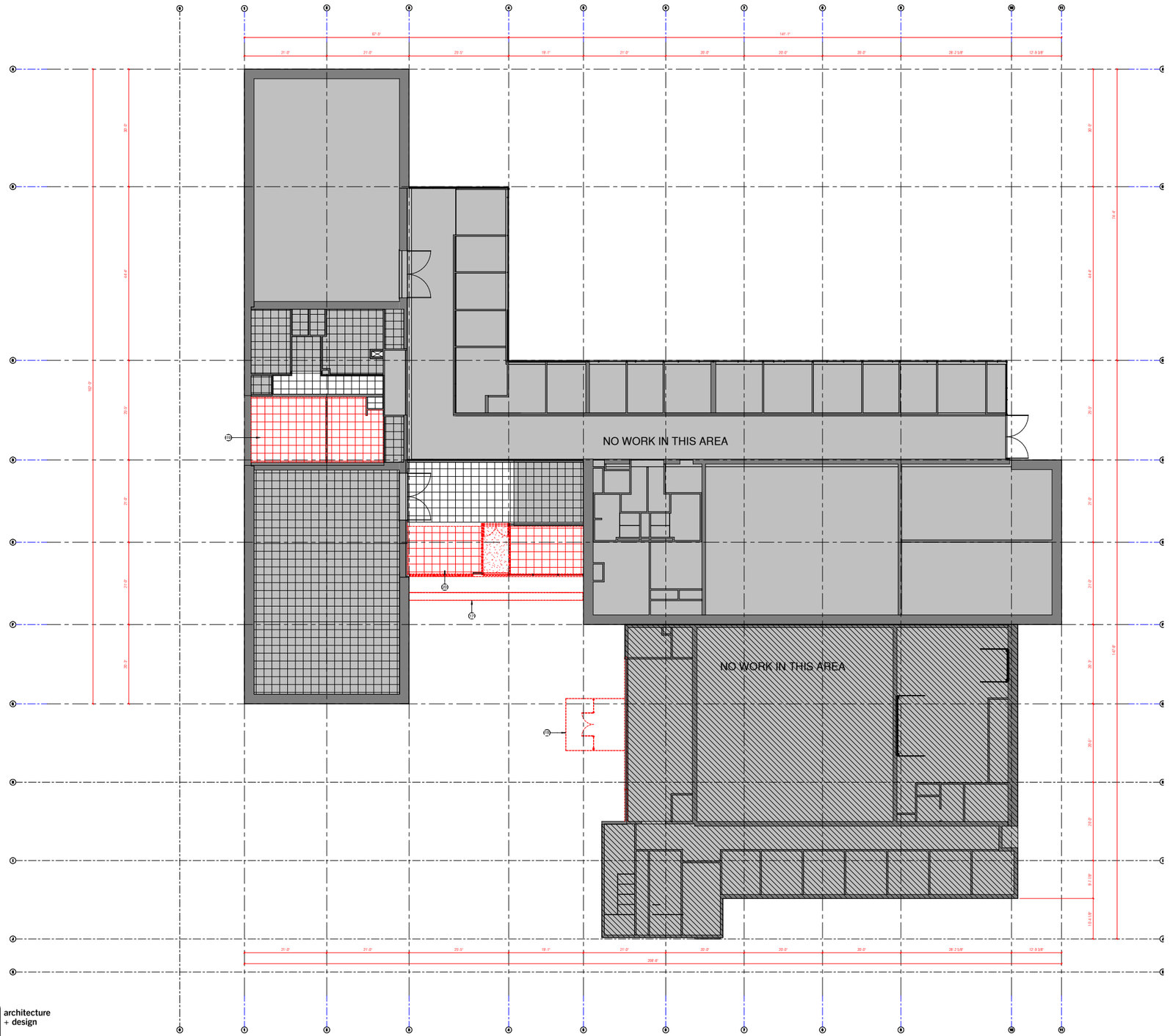
3. SCHEMATIC DESIGN

SD DEMO PLAN
LEVEL 2 RCP



DEMO PLAN LEGEND

- EXISTING ELEMENT TO REMAIN
- CEILINGS TO BE DEMOLISHED
- WALLS TO BE DEMOLISHED
- EXTERIOR CONCRETE TO BE DEMOLISHED
- NO WORK IN THIS AREA

PLAN / ELEVATION KEYNOTE LEGEND	
17	DEMO CONCRETE BEAM & ASSOCIATED FINISHES & DISPOSE, TYP.
18	DEMO ENTRY ROOF & STOREFRONT SYSTEM DISPOSE, TYP.
19	DEMO CEILING TILES & DISPOSE, TYP. CEILING GRID TO REMAIN IF IN GOOD CONDITION, TYP.
20	DEMO CEILING TILES & GRID SYSTEM & DISPOSE.

Montana PBS

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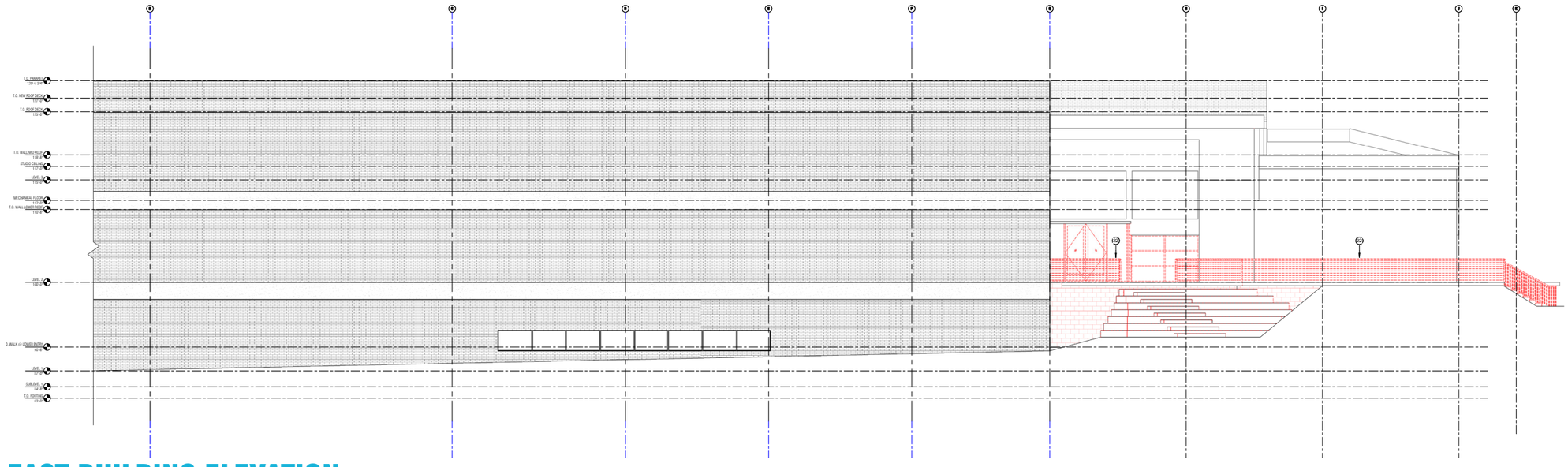
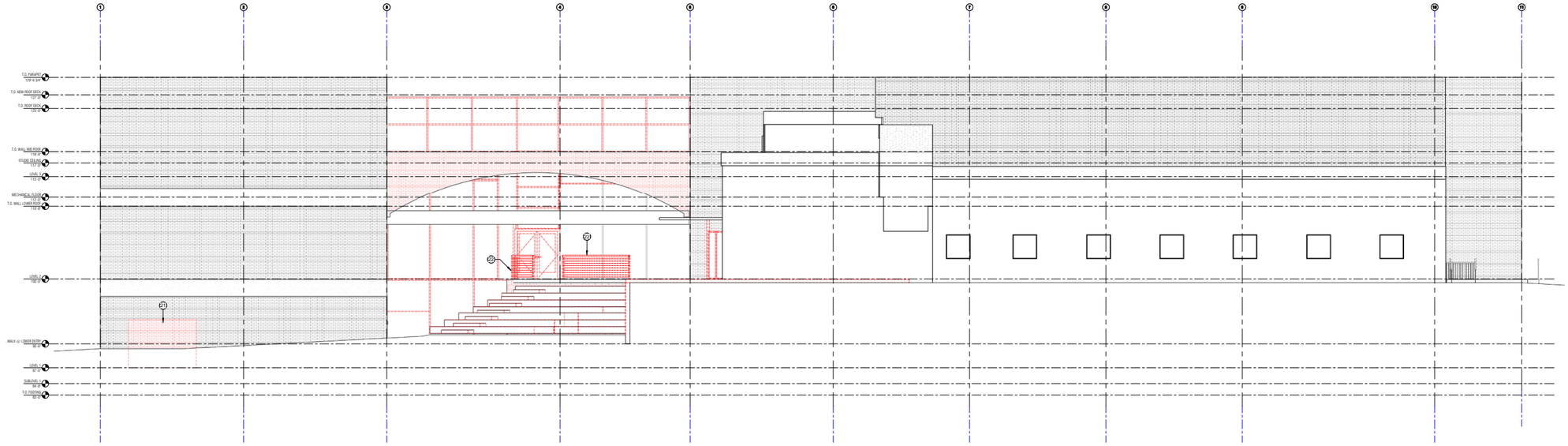
3. SCHEMATIC DESIGN

SD DEMO PLAN ELEVATIONS



EAST BUILDING ELEVATION



SOUTH BUILDING ELEVATION

Montana PBS

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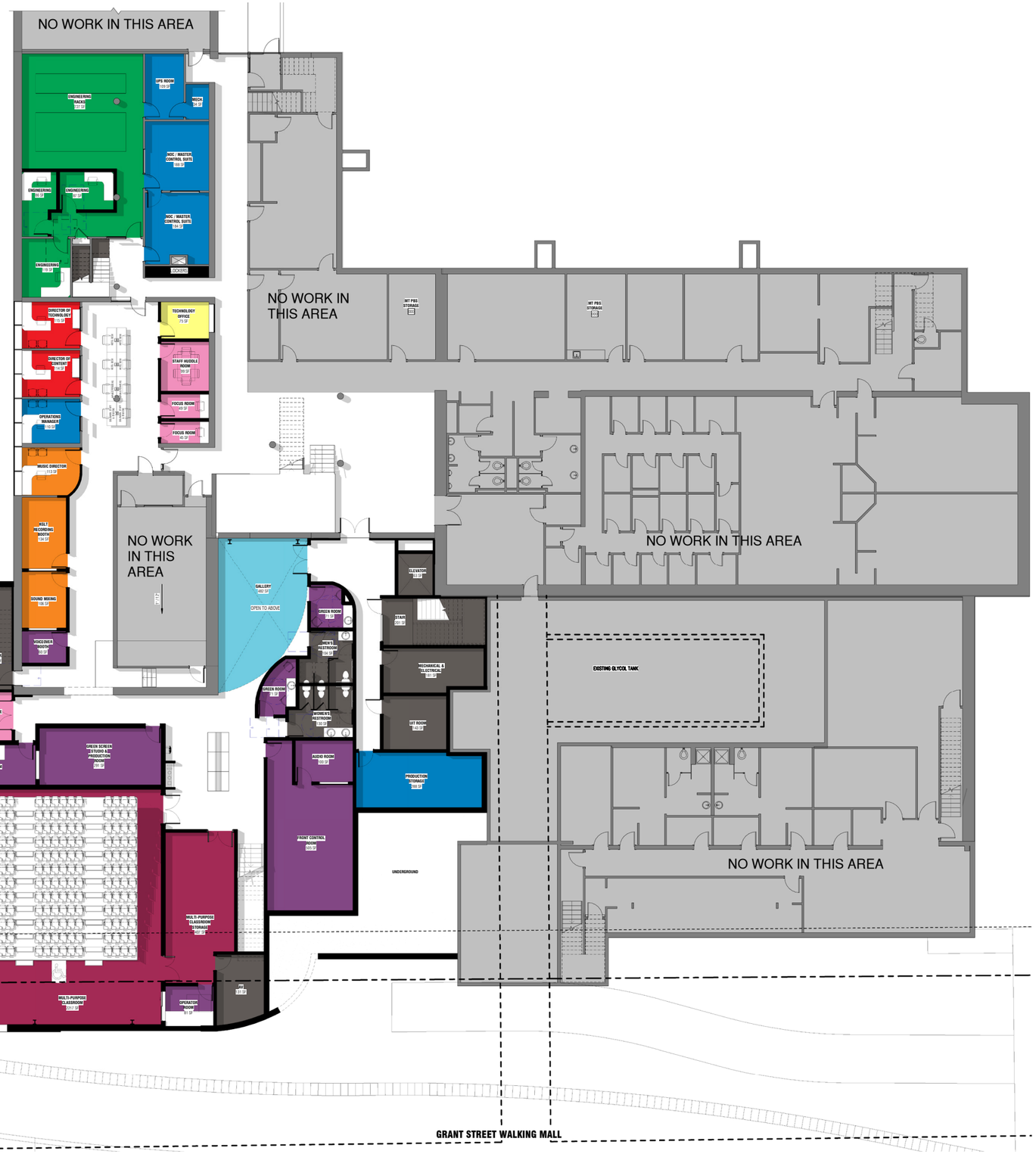
3. SCHEMATIC DESIGN

SD FLOOR PLANS
LEVEL 1



Montana PBS

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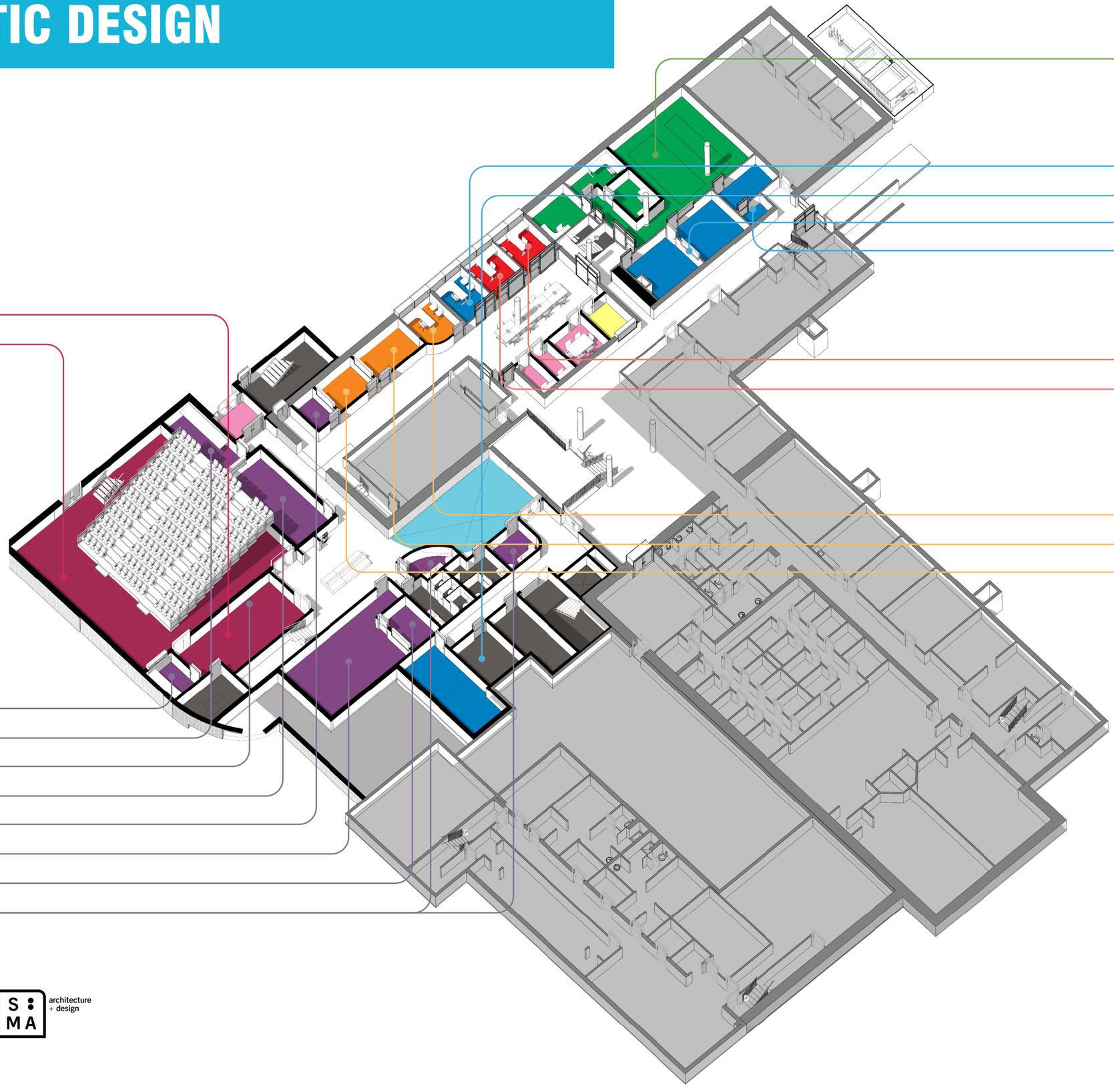
3. SCHEMATIC DESIGN

SD FLOOR PLANS
LEVEL 1



MULTI-PURPOSE
- CLASSROOM STORAGE
- MULTI-PURPOSE CLASSROOM

PRODUCTION
- OPERATOR ROOM
- AUDIO GREEN SCREEN ROOM
- GREEN ROOM
- GREEN SCREEN STUDIO
- VOICEOVER BOOTH
- FRONT CONTROL ROOM
- AUDIO ROOM
- GREEN ROOMS

ENGINEERING OFFICES

BROADCASTING
- OPERATIONS MANAGER
- PRODUCTION STORAGE
- NOC CONTROL SUITES
- UPS ROOM AND MECH

ADMIN
- DIR. OF TECHNOLOGY
- DIR. CONTENT

KGLT
- MUSIC DIRECTOR
- KGLT RECORDING BOOTH
- SOUND MIXING STUDIO

Montana PBS

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3. SCHEMATIC DESIGN

SD FLOOR PLANS
LEVEL 2 AND ANNEX

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3. SCHEMATIC DESIGN

SD FLOOR PLANS
LEVEL 2 AND ANNEX

MULTI-PURPOSE

- INTEGRATED COMMONS
- BOARD ROOM
- CLASSROOM LOBBY
- CRITIQUE SCREENING HALL
- PROJECTOR ROOM
- MULTI-PURPOSE CLASSROOM

BREAKOUT SPACES

- GROUP STUDY
- RECEPTION

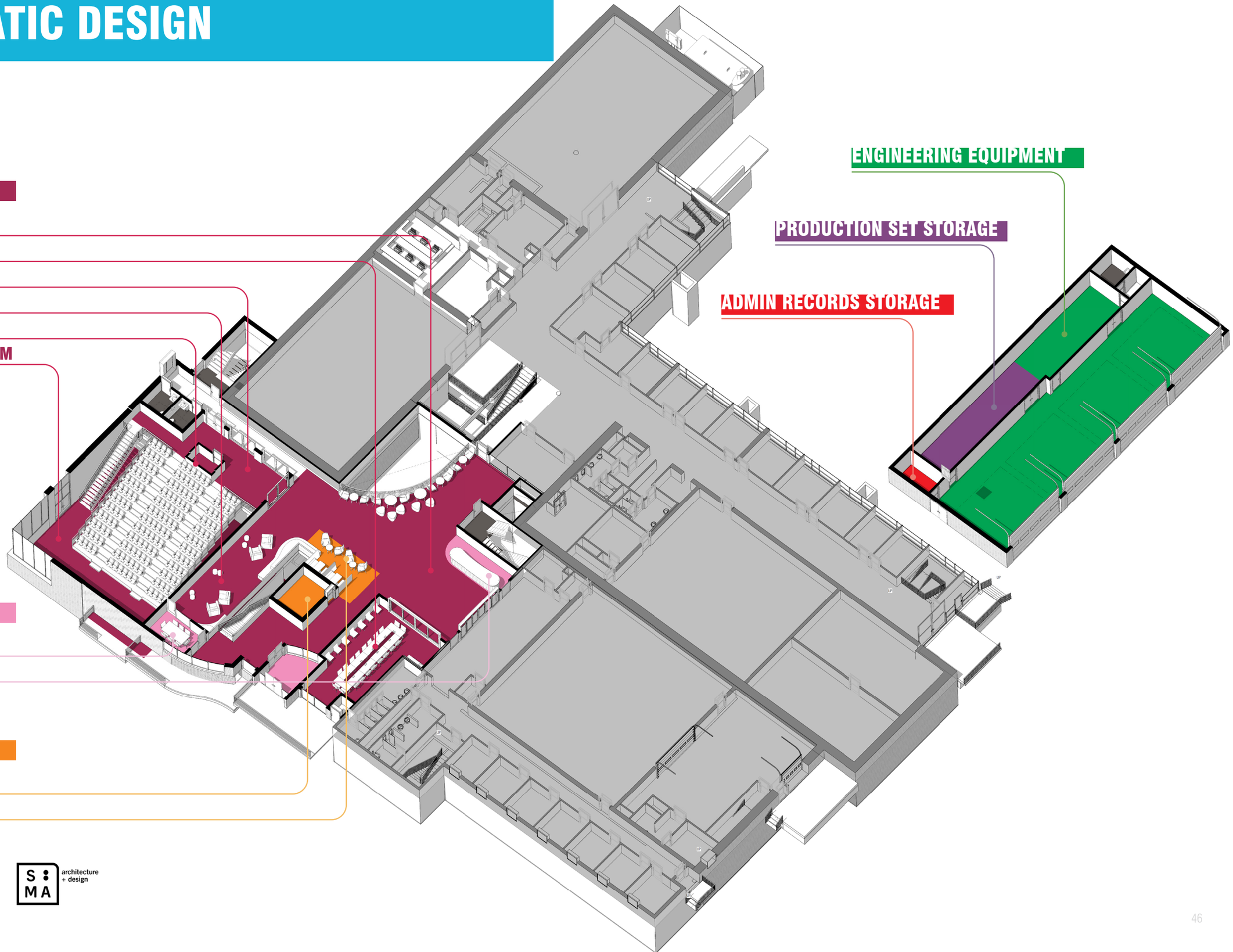
KGLT

- KGLT DJ BOOTH
- LISTENING ROOM

ENGINEERING EQUIPMENT

PRODUCTION SET STORAGE

ADMIN RECORDS STORAGE



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3. SCHEMATIC DESIGN

SCHEMATIC FLOOR PLANS
LEVEL 3

Montana PBS

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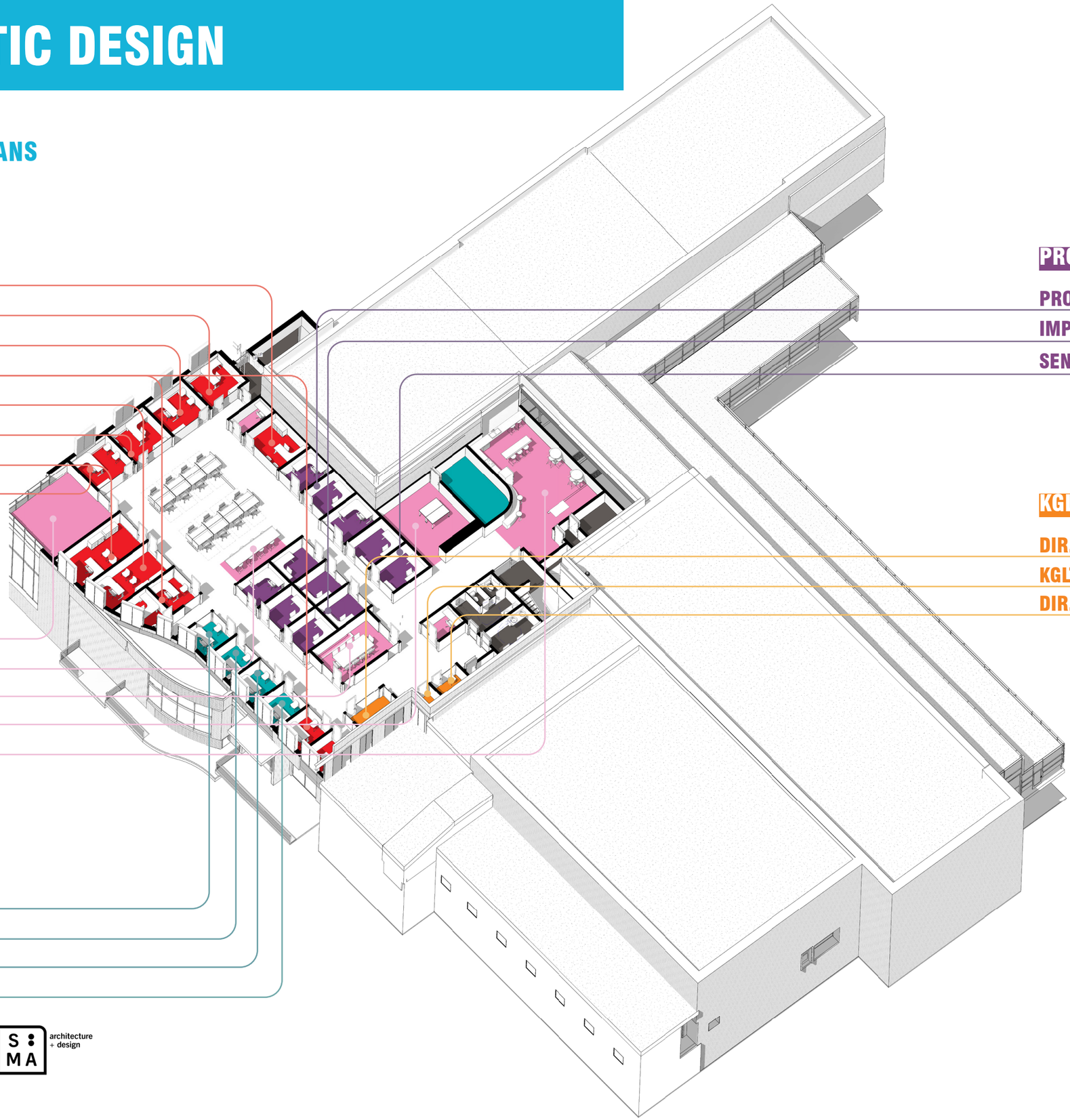
3. SCHEMATIC DESIGN

SCHEMATIC FLOOR PLANS
LEVEL 3



ADMIN

- DIR. OF PRODUCTION
- DIR. OF DIGITAL ENGAGEMENT
- DIR. OF FINANCE
- ADMIN STAFF
- ASSOC. GENERAL MANAGER
- DIR. OF EDUCATION
- DIR. OF DEVELOPMENT
- DIR. AND GENERAL MANAGER

BREAKOUT SPACES

- LIGHTBOX REVIEW SPACE
- COLLABORATION WORK SPACE
- STAFF HUDDLE ROOM
- MAIL WORK ROOM
- EMPLOYEE BREAK ROOM

DEVELOPMENT

- MAJOR GIFTS OFFICER
- MEMBERSHIP MANAGER
- DEV. PRIVATE OFFICES
- OUTREACH STORAGE

PRODUCTION

- PRODUCTION SERVICES
- IMPACT PRODUCERS
- SENIOR PRODUCERS

KGLT

- DIR. OF KGLT
- KGLT MARKETING
- DIR. OF KGLT DEVELOPMENT

Montana PBS

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3. SCHEMATIC DESIGN

SD ARCHITECTURAL NARRATIVE

GENERAL CONSTRUCTION

division 01 - general requirements

Project Summary: The scope of the project consists of the construction of a new approximately 20,000 square foot addition for MT PBS and renovation of the existing MTPBS offices in the Visual Communications Building (VCB) on the campus of Montana State University, Bozeman. The addition includes a 168-seat university classroom, an integrated commons for the four building tenants: The school of Film and Photography, MT PBS, KGLT, and The Black Box Theater. Additional spaces include a new greenscreen studio, new sound and producing edit suites, offices and kitchen/breakroom. Building-wide common spaces include an entry lobby with a reception desk, a large critique/screening hall, a group study room, outdoor plaza areas, and various other support spaces. It is located on the southeast corner of 11th Avenue and Grant Street. It is anticipated that the project will be completed in May of 2027. Construction is expected to start in October of 2025.

Special Requirements: Montana State University is using the General Contractor as Construction Manager project delivery method for this project. A contractor has not been selected as the GC/CM by MSU at this time. The project will comply with Montana State University's sustainable design guidelines but will not seek LEED certification. The project will conform to Montana State University's building standards modified as necessary for commercial construction in conformance with the 2021 IEBC, and 2021 IBC.

division 02 - site work, utilities, and demolition

Existing Site Conditions: A site topographic survey has been provided and includes information about existing physical conditions. It will serve as a reliable and accurate base map for the project. The survey contains information about existing underground utilities, existing street improvements, and on-site features. Generally, the site slopes dramatically down from east to west, in the vicinity of the building. There are mature trees on the west and north sides of the existing Visual Communications Building. The project area is bound to the south by the Grant Street walking mall (currently under construction) and to the west by 11th Ave., to the east by The Black Box Theater and to the north by VCB.

Demolition:

The project will require demolition of the existing exterior concrete stair and slab that serves the level 2 entry to VCB. The Existing roof drain that connects to the storm drain system in the SW corner of the VCB roof will need to be re-routed to accommodate the MT PBS addition. Limited demolition of sidewalks, curb, and concrete will be necessary at connection points to new sidewalks. Limited demolition and repair of the Grant Street walking mall will be required for new foundations at the corner. Numerous stormwater lines in the project area will be re-routed around the footprint of the new addition. Numerous street light posts and underground electric lines will be demolished.

Earthwork:

Site earthwork includes excavation, filling, compaction, and grading for the building, site improvements, and utilities. Imported materials will include materials for subbase, drainage fill, and backfill for slabs, pavements, and improvements. The contractor will remove and legally dispose of excavated materials as required. A geotechnical evaluation is currently underway and will provide further detail on site and foundation prep.

Vehicle Access Control and Circulation Plan: It is important that the project address service and delivery vehicles that access the Visual Communications Building on a daily basis.

Domestic water service will be extended to the addition through the existing service currently serving VCB and the Black Box Theater. The size of this line is 3-4-inches in diameter.

A Fire Department Connection (FDC) exists at the SE corner of the Black Box Theater. This connection may be extended to serve the addition, however, if a new FDC is needed its location will need to be coordinated with consideration for emergency access and distance to the nearest fire hydrant.

A new gravity sewer service line is expected to connect the addition to the sewer main along 11th Avenue. An 8-inch sewer main will need to be re-routed and lowered around the south and west sides of the new addition to accommodate the new footprint. The sewer main re-alignment south of the building will likely need to extend into the Grant Street walking mall. Some walking mall improvements may need to be removed & replaced to allow for installation of the new sewer main.

Storm drainage infrastructure will consist of one existing roof drain and/or underdrain on the inside corner of VCB and Black Box will need to be re-routed through the addition with the MEP design to connect to the relocated storm drain line on the west side of the building. Some foundation drains may exist along the existing VCB / Black Box basements and tunnel that may require coordination with the proposed addition. The storm drain re-alignment south of the building will likely need to extend into the Grant Street walking mall. Some walking mall improvements may need to be removed & replaced to allow for installation of the new storm drain.

3. SCHEMATIC DESIGN

SD ARCHITECTURAL NARRATIVE

Other Site Improvements:

Portland Cement Concrete Paving: Involves 6-inch cast-in-place concrete paving with #3 rebar at 16 inches on-center at walkways and outdoor gathering spaces.

Site Accessories: Bike racks per MSU standards and benches.

Signage: All on-street signage shall be protected and/or replaced with like signage. On-street traffic signage must be maintained or replaced with similar signage. Exterior signs will be consistent with PBS branding and MSU standards.

Landscape Design Objectives & Function:

Utilize the University's Long Range Campus Development Plan (LRCDP) and other existing planning documents such as the Landscape Master Plan (LMP), MSU Design Guidelines, and Wayfinding and Signage Plan to accomplish the mission of the University.

Implement green building practices and consider long-term maintenance and functionality to ensure a sustainable project for future generations.

A cohesive design will be incorporated to tie the exterior spaces of the new addition to the buildings together and match the Grant Street Pedestrian Plaza Design

Connectivity and Wayfinding:

Connections from building entries to surrounding locations will be provided, review of the broader MSU master plan to ensure all potential routes are considered.

Will consider the interaction between pedestrians and bicyclists.

Utilize MSU's wayfinding standards to develop a unified system.

Irrigation:

Use MSU standard specifications and match new system products to those already being used at MSU.

Connect to existing Rain Bird Maxi-Com Central Control System.

Consider bioswales in detention areas to filter run off.

Use non-potable water by connecting to the MSU irrigation reservoir for water source.

Funding| Maintenance Priority for Landscape

Understand the importance of the proposed Landscape Intensity Zones and the effects each zone will have on project funding and the long-term maintenance costs to the University.

Establish development and maintenance costs early in project to ensure long-term sustainability and success of the landscape.

division 03 - Concrete (see additional information on structural systems)

Cast-In-Place Concrete: 4500 psi concrete for footings, foundation walls, and column pilasters. Floor systems will consist of concrete slabs on metal decking.

division 04 - Masonry

Unit Masonry: New brick masonry on metal studs at exterior walls of new construction. Masonry units to be economy sized units, standard nominal size. Consideration will be given to concrete masonry unit shear walls as well as around stairs and elevator shafts.

division 05 - Metals

Metal Fabrications: Metal stairs; steel pipe railings, ladders for elevator pits; floor plate and supports; elevator entrance sills and angles; loose bearing and leveling plates; loose steel lintels; miscellaneous steel trim; shelf and relieving angles; pipe bollards; rough hardware.

Cold-Formed Metal Framing: Load bearing cold-formed steel stud framing at exterior wall construction and other load bearing walls.

Metal decking will be supported by structural steel wide flange beams and steel HSS columns.

Roof framing will consist of light gage steel decking supported by open web steel joists, wide flange girders, and steel HSS columns.

division 06 - wood and plastics

Rough Carpentry: wood grounds, nailers, and blocking; gypsum sheathing.

Interior Architectural Woodwork: Hardwood and hardwood flush paneling interior accent elements; built-in cabinetry in select spaces such as (but not limited to) the employee break room, reception, and boardroom. Cabinetry to primarily be plastic laminate finished; solid surface counter tops; glass-front display cases.

division 07 - thermal and moisture protection

Building Insulation: Foundation walls, board type; thermal roof insulation, board type; continuous insulation at exterior walls, board type; glass fiber blanket/batt insulation in metal stud framing at exterior walls; acoustic insulation at interior partitions, blanket type; firesafing insulation, board or blanket type; sheet vapor retarders. Consideration will be given to spray-in foam insulation in metal stud cavity walls.

3. SCHEMATIC DESIGN

SD ARCHITECTURAL NARRATIVE

Manufactured Wall Panels: Field-assembled, gasketed wall panels with concealed fasteners, panel supports and anchorage.

Aluminum cladding and components: Field assembled, panel supports and anchorage.

Roofing: Single-ply TPO or EPDM Energy Star compliant roof system, 60 mil minimum membrane; 25-year warranty on materials, 5-year warranty on installation and 1 ½" hail warranty.

Roof Specialties: Roof hatches (scuttles); curb and equipment support units.

Flashing and Sheet Metal: Metal counter flashing and base flashing; exterior wall flashing and expansion and seismic joints; sheet metal accessories.

Joint Sealers: Elastomeric joint sealers at interior and exterior vertical and horizontal joints.

division 08 - doors and windows

Standard Steel Doors and Frames: Interior steel frames; interior steel doors at high maintenance areas; exterior steel doors and frames.

Flush Wood Doors: Interior solid core wood doors, clear wood finish.

Access Doors: For walls and ceilings, rated and unrated; at all gypsum drywall ceilings where required for access to valves, equipment, dampers, etc

Special Doors; oversized double doors at the classroom to match the existing studio doors.

Aluminum Entrances and Storefronts: Exterior entrance doors; vestibule doors matching entrance doors; frames for entrances; storefront-type framing systems; transoms; sidelights; power assist at main entrances.

Aluminum Clad Wood Windows: Individual units set in wall construction; awning type operable units will be considered.

Door Hardware: Heavy duty commercial type hardware per MSU standards for swinging, night latches at public entries/exits; deadbolts at service entrances; inter-faced with fire alarm system; office locks at administrative and staff areas; satin or brushed finish; access control systems with card readers at all main entrances and secure areas.

Glass and Glazing: Windows: 1-inch-thick insulating unit, clear glass; entrances: 5/8-inch-thick insulating unit, clear glass; doors: Tempered or fire-rated glass.

division 09 - Finishes

Gypsum Drywall: Interior walls, partitions, and ceilings for tape and joint compound finish; steel framing systems to receive gypsum board; cementitious backer units for application of tile in toilet rooms and custodial closets; shaft wall systems at elevator and mechanical shafts. High strength gyp bd. at high traffic and high maintenance locations.

Tile: Ceramic wall tile over cementitious backer wall board at toilet rooms; ceramic floor tile at toilet rooms; porcelain floor tile over concrete slab at first floor public spaces; 6-inch tile cove per MSU standards

Solid Surface Material: ¼" solid surface material panels at shower room walls.

Vinyl Wallcovering: 20 oz. per square yard minimum, Type II, Class A vinyl applied to gypsum wallboard as a tack surface on selected walls. Consideration of large vinyl graphics in select areas representing a theme or community identity concept.

Acoustic Panel Ceilings: 2' x 4' and 2' x 2' acoustic lay-in panel ceilings, trim, and exposed metal suspension system, un-rated.

Acoustic Wall Panels: Various acoustic wall panels to be incorporated throughout various spaces such as the classroom, recording booth, screening rooms, and select meeting/production rooms. Each space will utilize tailored panel types to optimize sound control, enhancing acoustics and minimizing noise transfer.

Resilient Flooring: Non-asbestos formulated vinyl composition tile; VOC compliant adhesives; floor preparation; 4-inch rubber base typical in all corridors.

Carpet: carpet tile in offices and staff areas; walk-off mats at all entrances; VOC compliant adhesives; floor preparation.

Terrazzo flooring: Durable low maintenance and ideal for high traffic areas. To be considered for the new Integrated Commons.

Vinyl Flooring: Consideration for patterned vinyl floor covering in kitchen/breakroom and back of house storage, mechanical and janitor spaces.

Painting: Compliance with VOC and environmental regulations; painting and surface preparation for interior unfinished surfaces as scheduled; painting and surface preparation for exterior unfinished surfaces as scheduled; field-painting and surface preparation of exposed mechanical and electrical piping, conduit, ductwork, and equipment; repainting and surface preparation at areas of renovation.

3. SCHEMATIC DESIGN

SD ARCHITECTURAL NARRATIVE

division 10 - specialties

Visual Display Boards: White or clear dry erase marker boards in study areas and meeting rooms.

Toilet Compartments: Floor mounted, overhead braced phenolic toilet compartments.

Signage: Unframed plastic panel signs meeting all ADA requirements throughout for door identification; dimensional letters and numbers for building identification. All signage in accordance with MSU standards.

Fire Extinguishers and Cabinets: Fire extinguishers in recessed fire extinguisher cabinets as required by code and per MSU standards.

Toilet and Bath Accessories: Consistent with MSU standards, provide paper towel dispensers; toilet tissue dispensers; grab bars; soap dispensers; mop and broom holders; curtain tracks and hooks; sanitary napkin waste receptacles; utility shelves; purse shelves; metal framed mirrors; electric hand dryers; clothing hooks and folding shower seats at shower stalls; baby changing stations, one per public toilet room.

Miscellaneous Specialties: Projection screens, visual display boards, overhead projector brackets, wall mount brackets for medium and large display monitors.

division 11 - equipment

Residential Appliances: Kitchen appliances include range, range hood, oven, dishwasher, microwave, and refrigerator/freezer.

division 12 - furnishings

Window Treatment: Roll-down window shades at all exterior windows. (Hunter Douglas RB500 basis of design.) Motorized ceiling mounted curtain track systems for the classroom and light box spaces.

division 14 - Conveying Systems

Traction Elevator: Thyssen Krupp Synergy Passenger Elevators sized for a stretcher; 2,500 lb. capacity; designed per ANSI A17.1.

3. SCHEMATIC DESIGN

SD UTILITY PLAN

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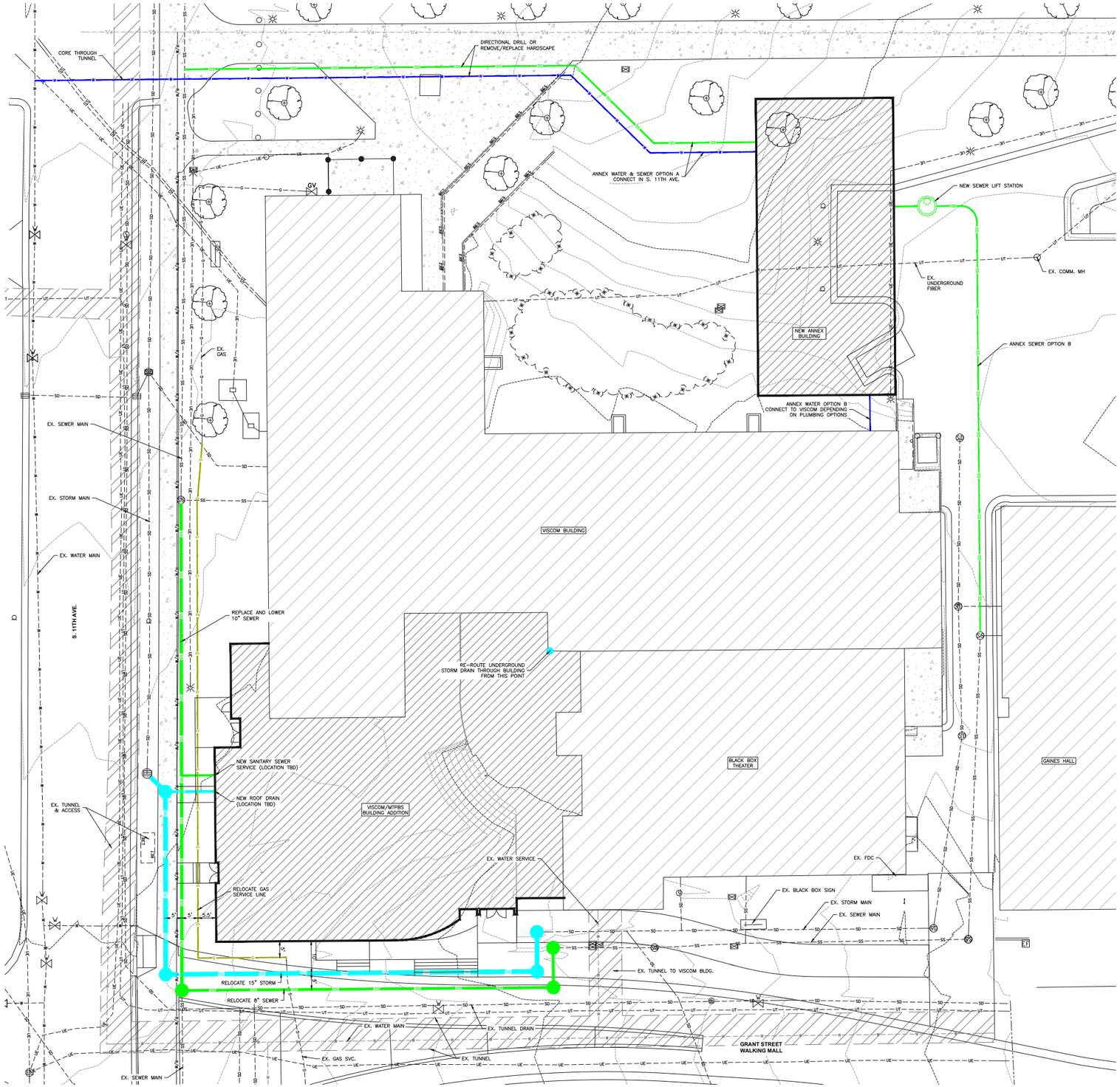

Montana PBS

S M A architecture + design

3. SCHEMATIC DESIGN

SD CIVIL DEMO PLAN

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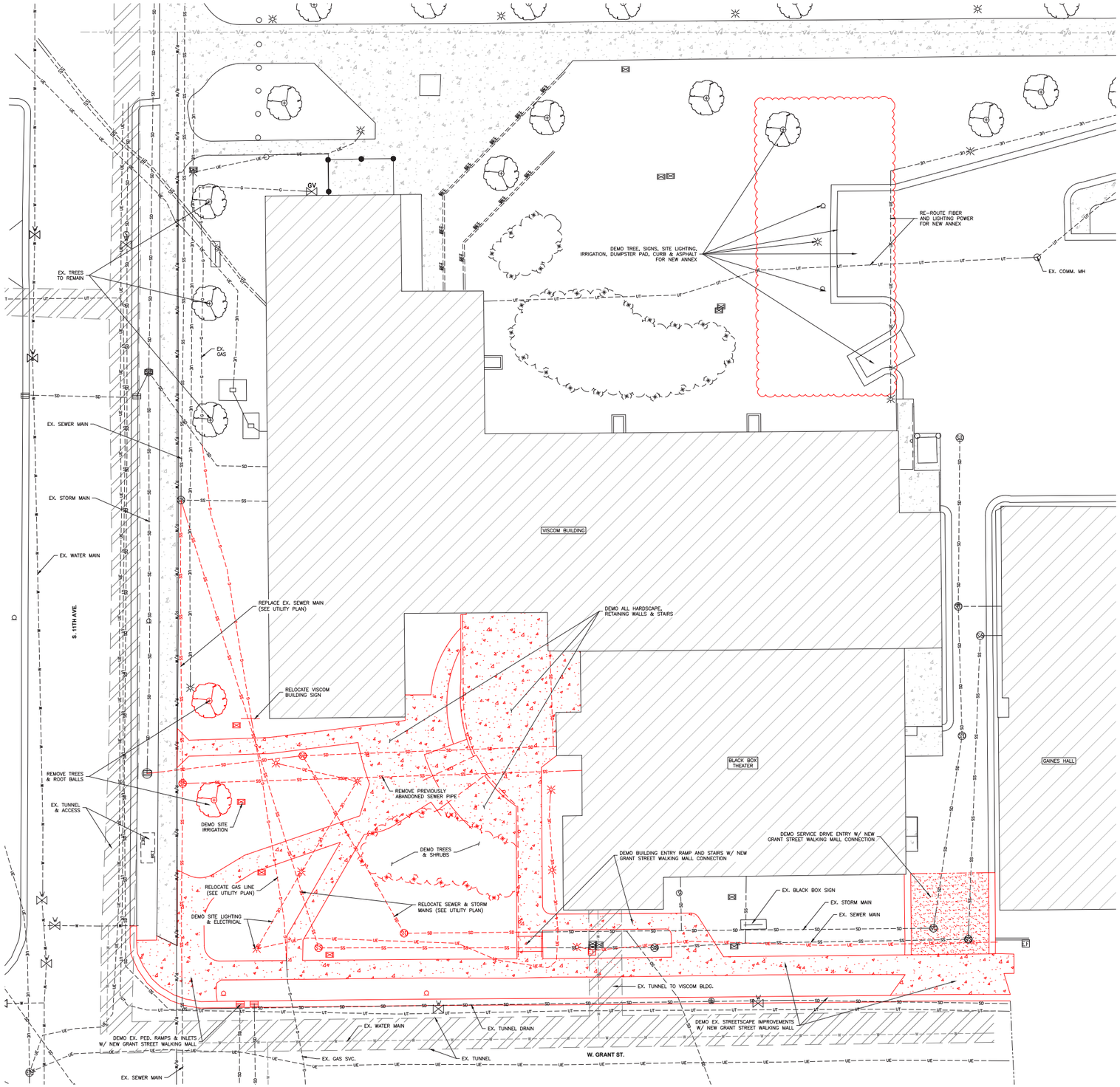

Montana PBS

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3. SCHEMATIC DESIGN

SD CIVIL NARRATIVE

Civil Design Considerations

I. Geotechnical

a. A geotechnical field investigation is scheduled for the week of November 11, 2024 with soil borings at select locations to observe the subsurface conditions. Temporary monitoring wells have also been requested by MSU to allow for monitoring of seasonal groundwater elevations at the site.

b. The subsurface conditions encountered at the MSU School of Nursing Building site located directly to the south consisted of approximately 24 feet of soft, compressible lean clay overlying dense native gravel and sand.

c. Based on our experience in Bozeman and on MSU's campus, the soft, compressible lean clay is not suitable to support loads typical of large multistory buildings without excessive structural settlement.

d. Structural loads should be transferred down to the dense native gravel and sand. This could be accomplished through over excavation of the lean clay and replacement using structural fill, deep foundation elements (micropiles/concrete piers), or engineered aggregate piers (RAP's).

e. Based on recent projects in Bozeman and on the MSU campus, RAP's are generally the most economical solution.

f. RAP's are designed by the installing contractor due to proprietary installation, compaction methods, and equipment. Design allowable bearing pressures typically range from 4,000 to over 6,000 pounds per square foot (psf) depending on acceptable settlement.

g. Depending on the interior slab loads and the owner's acceptable settlement tolerance, slab-on-grade construction is anticipated to be supported by 24 inches of granular fill over a geotextile fabric. The upper six inches of granular fill is commonly crushed ¾" screen rock.

h. Note the above items are commonly encountered design conditions and are based on our experience. These items may change following the field investigation and as project specific lab testing and analysis is completed for the project.

II. Access, Circulation and ADA Accessibility

a. No new vehicle access or parking is proposed with this addition. Existing service and emergency vehicle access will be from 11th Avenue and the service driveway existing NE of Viscom.

b. Grant Street is being converted to a walking mall adjacent to the south side of the project. New building entries on the south side will connect to the new walking mall with sidewalks and plaza spaces.

c. All new sidewalks and building entries will be designed to meet MSU and current ADA standards.

d. New sidewalks will follow the typical MSU construction standard having 6-feet minimum width and consisting of 6-inch thick concrete with fibermesh reinforcement.

III. Fire Access

a. Fire and emergency vehicle access will continue to be from 11th Avenue and the service driveway existing NE of Viscom. The Grant Street walking mall is also being designed for emergency vehicle access.

b. A fire department connection (FDC) exists at the SE corner of the Black Box Theater next to the service drive. It is assumed this FDC will continue to serve the new building addition, however if a new FDC is needed its location will need to be coordinated with consideration for emergency access and distance to the nearest fire hydrant.

IV. Grading, Drainage, & Stormwater

a. The exiting site consists of the Viscom/Black Box building with adjacent hardscape and landscape areas sloping considerably to the west with a gentle grade along 11thy Avenue to the north.

b. The current building has entrances at level 1 and level 2 and incorporates concrete stairs and retaining walls to work with the existing site slopes.

c. The new addition is also expected to have level 1 & 2 entrances and will utilize site grading features as needed to maintain ADA accessibility to all entrances and tie into surrounding site conditions.

d. The existing building has roof drain connections to a storm drain that wraps around the south and west sides of the site. This storm drain line will need to be re-aligned around the new addition, and roof drains from the existing building and addition are expected to connect to this line.

e. The storm drain line flows north along 11th Ave and eventually passes through a stormwater treatment unit before entering Mandeville Creek. Due to existing utilities, space limitations, and high groundwater concerns, no new on-site stormwater management facilities are proposed with this addition.

f. One existing roof drain and/or underdrain on the inside corner of Viscom and Black Box will need to be re-routed through the addition with the MEP design to connect to the relocated storm drain line on the west side of the building.

SD CIVIL NARRATIVE

g. Some foundation drains may exist along the existing viscom / Black Box basements and tunnel that may require coordination with the proposed addition.

h. The storm drain re-alignment south of the building will likely need to extend into the Grant Street walking mall. Some walking mall improvements may need to be removed & replaced to allow for installation of the new storm drain.

V. Water & Sewer (MTPBS Addition)

a. An existing 3 or 4-inch water service line currently serves the Viscom / Black Box building through the tunnel from Grant Street. It is assumed that the water supply for the new addition will be fed through the existing building and no new water services lines are currently anticipated.

b. A new gravity sewer service line is expected to connect the building addition to the sewer main along 11th Avenue.

c. An 8-inch sewer main will need to be re-routed and lowered around the south and west sides of the new addition to accommodate the new footprint.

d. The sewer main re-alignment south of the building will likely need to extend into the Grant Street walking mall. Some walking mall improvements may need to be removed & replaced to allow for installation of the new sewer main.

VI. Water & Sewer (Annex Building)

a. Water and sewer service connections will be needed to serve new bathrooms in the proposed annex building NE of Viscom. There are not currently water and sewer connections readily available to this area, so a couple potential options are proposed for each utility:

- Water Service Option 1 - Connect to the water main in 11th Avenue: Would require ~235 l.f. of water service pipe, directional drilling beneath or trenching through hardscape north of Viscom, and coring/crossing through the 11th Avenue steam tunnel.
- Water Service Option 2 - Connect to Viscom building: Would require plumbing designer to see if a connection route is feasible from the Viscom water system.
- Sewer Service Option 1 - Connect to the sewer main in 11th Avenue: Would require ~190 l.f. of gravity sewer service pipe and directional drilling beneath or trenching through hardscape north of Viscom.
- Sewer Service Option 2 - Connect to the sewer between Gaines Hall and Viscom: Would require ~150 l.f. of pressure sewer service pipe and installation of a small on-site lift station. Lift stations can range from $15k to $160k depending on model plus power and ongoing operations & maintenance. Note, this option would likely only be considered if water could be connected from Viscom and it proved beneficial to avoid an extensive run beneath hardscape to 11th avenue.

VII. Power & Gas Service

a. It is assumed that power and gas service for the new addition will be extended through the existing building. No new power or gas services or pad-mounted equipment are currently anticipated.

VIII. Fiber/Internet Service

a. It is assumed that fiber/internet service for the new addition will be extended through the existing building. No new communication services are currently anticipated.

b. An existing communication duct bank and manhole exists NE of Viscom where the new annex building is proposed. It is unclear if live services exist within this duct bank and MSU is currently verifying. Any live lines would likely need to be relocated to accommodate the new annex.

IX. Mechanical Site Equipment

a. It is assumed that heating and cooling systems for the new addition will be extended through the existing building or will be located in new equipment rooms or installed as rooftop units. No new on-site ground-mounted equipment is currently anticipated.

3. SCHEMATIC DESIGN

SD LANDSCAPE PLAN

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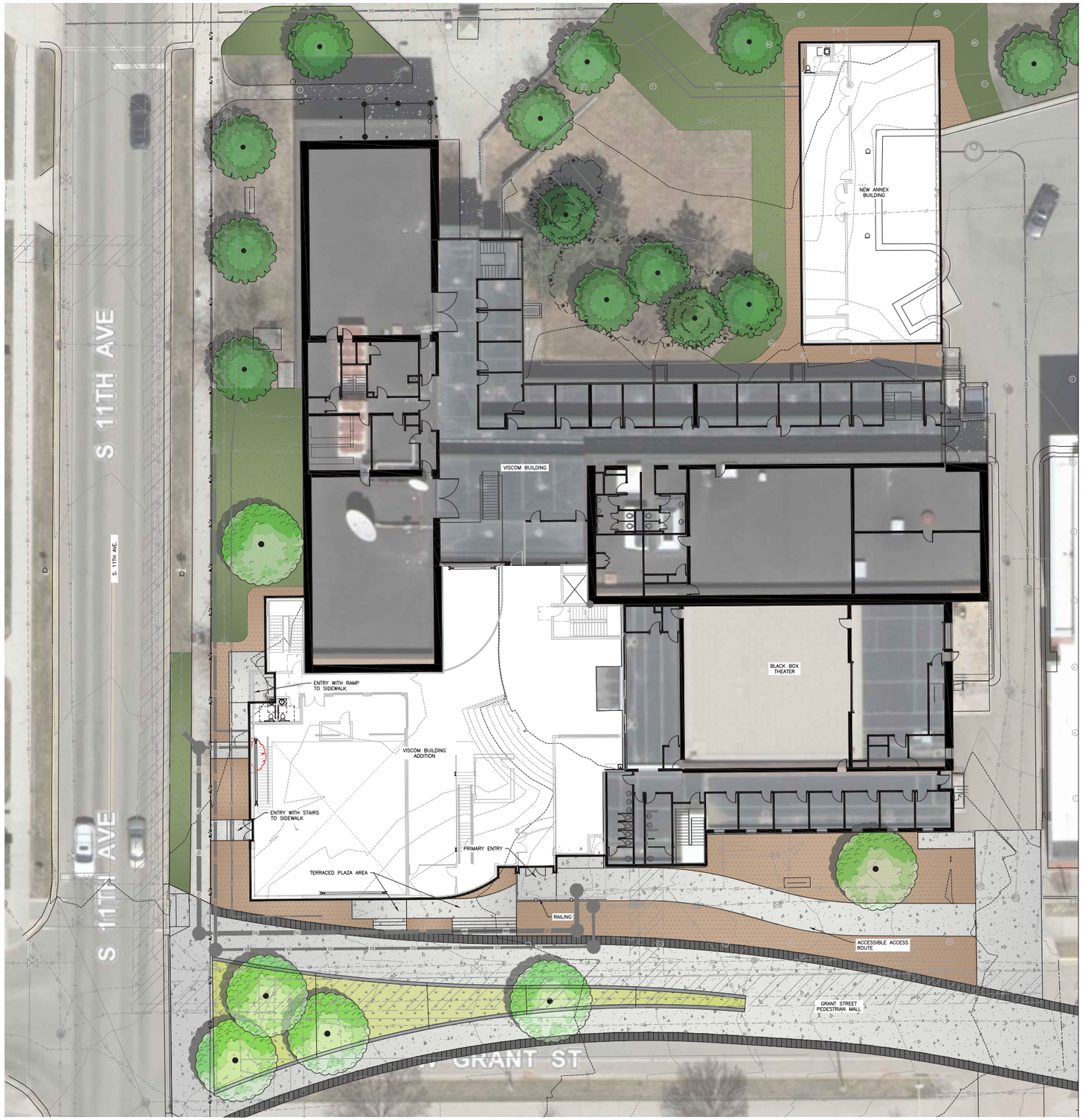

LEGEND	
SYMBOL	DESCRIPTION
	SOD
	PLANTING BED
	NEW CONCRETE
	STORMWATER AREA
	STAMPED CONCRETE
	WALL
	SEAT WALL
	METAL EDGING
	EXISTING TREES
	NEW TREES
	DEMOLISHED TREES

NOTE: SEE CIVIL AND ARCHITECTURAL FOR ADDITIONAL LEGEND ITEMS

0 10' 20' 30'
SCALE

Montana PBS

SMA architecture + design

3. SCHEMATIC DESIGN

SD LANDSCAPE NARRATIVE

Landscape Design Considerations

I. Landscape Design Objectives & Function
   a. Exterior spaces at new addition area should be flexible and adaptive for current and future needs.
   b. Utilize the University's Long Range Campus Development Plan (LRCDP) and other existing planning documents such as the Landscape Master Plan (LMP), MSU Design Guidelines, and Wayfinding and Signage Plan to accomplish the mission of the University.
   c. Develop a consistent design theme that relates to the previously approved Grant Street Pedestrian Plaza Design.
   d. Implement green building practices and LEED design techniques as much as possible, project will not be LEED certified.
   e. Consider long-term maintenance and functionality to ensure a sustainable project for future generations.

II. Landscape Areas
   a. Cohesive Design: A cohesive design will be incorporated to tie the exterior spaces of the new addition to the buildings together and match the Grant Street Pedestrian Plaza Design. T

   b. Landscape Spaces: The landscape may be broken down into several areas, which all have unique functions and interrelationships. The areas include:
      a. Public Entry/Grant Street Pedestrian Plaza (South)
         - The area includes an urban design and context, there is an accessible sidewalk connection that leads from the Grant Street Pedestrian Plaza to the building entry. This area and side of the building, while smaller in area, will be the primary entry and require the most design, landscape cost and future maintenance. A terraced plaza space along the south side of the building is planned and will provide an opportunity for student gathering and/or small space for a DJ or concert setup. Connection to the Grant Street Pedestrian Plaza will be a part of this project, the design will primarily continue the previously design Plaza westerly to 11th Avenue. Site furniture and amenities will be included in the space. Planting type and location due to utility and tunnel conflicts are to be considered with the landscape design. Grading will also be a consideration due to some steeper slopes from the entry westerly around the building.
      b. Secondary Entry (West)
         - A secondary entrance is located on the west side of the new addition off of 11th Avenue. Due to the grading and finished floor of the building there will likely be a ramp to make this entry accessible. The landscape along the west side of the building will be simple and function with boulevard type landscaping and foundation planting along the building. Site amenities such as benches or bike parking may occur along this side of the building.
      c. Annex Parking Lot & Service Area
         - An annex building is proposed on the north side of the building adjacent to the existing parking areas, landscaping in this area will primarily be restoration of any disturbed landscape and irrigation to bring it back to existing conditions.

III. Connectivity & Wayfinding
   a. Connections from building entries to surrounding locations will be provided, review of the broader MSU master plan to ensure all potential routes are considered.
   b. Will consider the interaction between pedestrians and bicyclists.
   c. Utilize MSU's wayfinding standards to develop a unified system.

IV. Planting
   a. Develop hierarchy of open spaces utilizing form, scale, and texture of plant materials.
   b. Utilize MSU standard Plant Palette and native species appropriately to enhance the overall design.
   c. Design planting beds for user safety and security.

V. Irrigation
   a. Use MSU standard specifications and match new system products to those already being used at MSU.
   b. Connect to existing Rain Bird Maxi-Com Central Control System.
   c. Consider bioswales in detention areas to filter run off.
   d. Use non-potable water by connecting to the MSU irrigation reservoir for water source.

3. SCHEMATIC DESIGN

SD LANDSCAPE NARRATIVE

VI. Funding/Maintenance Priority of Landscape

a. Understand the importance of the proposed landscape areas and the effects each area will have on project funding and the long-term maintenance costs to the University.
b. Establish development and maintenance costs early in project to ensure long term sustainability and success of the landscape.

3. SCHEMATIC DESIGN

SD STRUCTURAL NARRATIVE

MSU VisCom Building – Structural Schematic Design Deliverable

The following is a narrative of the structural systems being considered at the Schematic Design level. This includes the new building addition and minor retrofits to the existing buildings. As we move into Design Development, these systems will be further refined along with the other consultants' design documents and narratives.

Building Code

- 2021 International Building Code (IBC) and Amendments
- 2021 International Existing Building Code (IEBC) and Amendments
- American Society of Civil Engineers (ASCE) 7-16 Minimum Design Loads for Buildings and Other Structures

Loading and Design Criteria

Roof Snow Load:

- Design Roof Snow Load = 41 psf (plus drifts as applicable)
- Ground Snow Load = 40 psf
- Importance Factor (I) = 1.10

Design Loads:

- Dead Load = Weight of the Structure
- Roof Live Load = 20 psf (reduced as applicable)
- Floor Live Load:
  - Offices & Classrooms = 40 psf (plus partition loading)
  - First Floor Corridors = 100 psf
  - Second Floor Corridors = 80 psf
  - Lobbies = 100 psf

Wind Criteria:

- Basic Wind Speed = 114 mph
- Risk Category III
- Exposure Category C
- Importance Factor (I) = 1.0

Seismic Criteria:

- Risk Category III
- Importance Factor (I) = 1.25
- Design Spectral Response Accelerations:
- S_{DS} = 0.569 g
- S_{D1} = 0.310 g
- Site Class = D (assumed)
- Seismic Design Category D

Structural Systems – MSU VisCom Building

New Addition to VisCom & Black Box

Gravity Framing

Gravity resisting systems at the floors will consist of concrete slab on metal deck supported by structural steel wide flange beams and steel HSS columns. Roof framing will consist of light gage steel decking and will be supported with open web steel joists, wide flange girders, and steel HSS columns. Where economical, the steel beams at the floors will be reinforced with composite welded studs and may be cambered to reduce tonnage of steel required. Note that currently the project team has not coordinated potential column locations, so the recommendations below for sizes are preliminary. For the time being we have assumed a 20' x 30' column grid for estimating purposes.

At steel framed areas, exterior walls are anticipated to be cold formed metal studs. Where possible, exterior walls will be balloon framed with the steel structure inset from the wall framing which is typically more economical. In locations where the steel structure cannot be inset, walls will be platform framed with the structural steel beams and columns within the stud wall pack.

Recent renderings show a large, potentially curved, cantilever at the upper roof area above the studio space. This will pose additional challenges and will require additional structure and coordination. At first glance, this will likely require cantilevered structural steel, either in plane with the roof framing or above the roof deck, depending on the desired aesthetic. For pricing purposes, Assume an HSS8x8 cantilever at 10'-0" OC with a backspan equal to 1.5 times the proposed overhang. As noted, this is a placeholder and will be refined as the scope becomes more apparent.

At the new studio space, we understand that additional measures will be taken to acoustically isolate the space from the surrounding area. Depending on level of service, this could potentially involve an isolated box inside the exterior structure that may include additional structure and a secondary floating structural slab. At this time the direction is not fully known, but we understand the intention will be to be a slight step down from a full box-in-box structure. We may still require isolated floor and vibration isolators hanging from the structure above.

The following can be used for estimating purposes:

- Elevated floor slabs above the first floor to consist of 3.5" normal weight concrete topping on a 1.5", 18 gage, Type VLI composite metal decking (5" total thickness to achieve a 1-hr fire rating with unprotected deck) reinforced with welded wire mesh or #3 rebar at 18" spacing at a minimum, or tighter if needed for floor finishes.
- If required, the elevated floor slab at the first floor could consist of 5.5" of normal weight concrete on a similar deck to achieve a 3-hour fire rating.
- Anticipated floor girder size will be between W18 and W24 with joists spaced at 8' on center ranging from W10 to W18. Roof girder sizes will be between W14 and W18 with 18K joists spaced at 6' on center. At larger spans and atypical bay layouts beam and joist sizes will vary.
- Roof deck to consist of 1.5", 20 gage, Type B metal roof decking at typical areas.
- Typical exterior wall framing to consist of 600S162-43 metal studs at 16" on center spacing.
- For three-story areas, interior columns anticipated to be HSS6x6 and perimeter columns anticipated to be HSS5x5.

3. SCHEMATIC DESIGN

SD STRUCTURAL NARRATIVE

Lateral Systems

As the building lies in a seismically active area, the Main Lateral Force Resisting System (MLFRS) will be a structural steel system detailed per the requirements of the current American Institute of Steel Construction (AISC) Seismic Design Manual. We anticipate the MLFRS to be comprised of Steel Special Concentrically Braced frames with a one or two-story 'X' configuration (braces form an inverted 'V' on the first floor and a 'V' on the second floor). Braced frames will consist of steel wide flange beams, HSS columns, and round HSS or pipe braces. Alternately, we could explore the use of Buckling Restrained Braced frames which would utilize a single diagonal brace between levels while still maintaining HSS columns and steel wide flange beams.

Wind loads will be resisted by the same MLFRS elements as seismic loads. Out of plane loads are resisted by the exterior steel stud walls, curtain wall systems, or structural mullion systems at storefront areas.

To account for building movement during a design event, a seismic separation will be provided at all interfaces between the (N) addition and the (E) Black Box and VisCom buildings. This gap is anticipated to be around 4'-0" to allow movement of both buildings and will be refined as design progresses.

The following can be used for estimating purposes:

- Approximately one braced frame per 2,400-sf of floor or roof area.
- Minimum of one braced frame bay at each side of the (N) addition
- Diagonal brace sizing anticipated to be Pipe 4 Std at roof levels and Pipe 5 Std at floor levels.

Foundation System

For all new construction outside of the footprint of the existing building, a conventional reinforced concrete shallow foundation system on rammed aggregate pier (RAP) ground improvement is anticipated based on recommendations on similar buildings in close proximity. This will include continuous strip footings with a concrete frost wall at typical exterior non-bearing walls. Exterior column locations will require a spread footing and concrete pilasters, while interior column locations will only require a dropped spread footing. Bottom of exterior footings will be a minimum 42" below grade to meet frost protection requirements. In areas of below grade basement construction, concrete walls with concrete footings will be used to retain the exterior soil. The main floor will be a conventional concrete slab-on-grade with sub-grade preparations as recommended by the Geotechnical Report.

At the interface between the new and existing foundations at Black Box and VisCom, care will be taken to prevent overburden to the existing adjacent foundation system. Per the existing drawings it appears that the existing foundations are founded on drilled concrete piers. It will also be prudent to ensure the foundations at the new structure are located as to not interrupt these existing piers. This will require an offset from new foundations to existing foundation line. Due to the elevation difference, care will need to be taken during excavation to not only provide support/stability for these existing piles but also to safely retain the existing soil at the interface. It is likely that new foundations at this interface (and inside the footprint of the existing building) will utilize a system of helical piers with concrete pier caps and grade beams. The geotechnical engineer will want to weigh in on these assumed systems and what effects these may have on the existing foundation system.

DCI is also aware of the existing steam tunnel that exists adjacent to the building where some new work will be taking place. DCI will be mindful of these existing elements and will take additional precautions (helical piers, grade beams, etc) to avoid impacting these elements.

The following can be used for estimating purposes:

- f'c = 4,500 psi for footings, foundation walls, and column pilasters.
- Bottom of all exterior footings to be located 42" below adjacent finished grade
- Typical perimeter walls to be 8" concrete foundation walls with #4 rebar at 16" spacing each way with a continuous 2' wide by 10" deep strip footing. (Wall thickness may increase to support veneer where applicable)
- At two-story areas, spread footings beneath interior columns anticipated to be 8' square by 12" deep, while spread footings beneath exterior columns anticipated to be 5' square by 12" deep.
- At three-story areas, spread footings beneath interior columns anticipated to be 10' square by 12" deep, while spread footings beneath exterior columns anticipated to be 7' square by 12" deep. Larger footings may be required at brace frame or atypical locations.
- Typical interior slab-on-grade thickness anticipated to be 5" and reinforced with welded wire mesh or #4 rebar at 18" on center spacing.
- Typical exterior slab-on-grade thickness to be 4" or 6" for pedestrian and vehicular locations respectively. Additional guidance and requirements included in the geotechnical report.
- Typical interior non-bearing walls will not require footings, however where heavier wall finishes or veneer is used at interior locations a thickened slab footing may be warranted.
- Ground improvement with the use of rammed aggregate piers.
- Foundations at interface with existing building to be helical piers with concrete pier caps and concrete grade beams.

It is important to note that no geotechnical report or foundation recommendations were available at the time of this Schematic Design Deliverable. The recommendations in this narrative will be revised as necessary as new information is presented. If ground improvement techniques are used, a specialty consultant may need to be engaged to evaluate this solution.

New Annex

Gravity Framing

The gravity (vertical) force resisting system would consist of interior and exterior wood bearing walls framed with 2x6 studs at 16" on center (oc). The roof system would be framed using pre-manufactured wood spanning between the wood bearing walls. At his point we don't anticipate large expanses of glazing on any of the annex walls. If they are required, glulam or steel beams may be required to achieve larger spans and open layouts. The first floor will be concrete slab on grade construction.

Lateral System

The lateral force resisting system for this project is anticipated to be exterior and interior wood shear walls with ½" OSB sheathing. Based on the current layout, we assume there is sufficient shear wall length opportunities to avoid the use of steel moment frames or any other supplementary lateral systems.

3. SCHEMATIC DESIGN

SD STRUCTURAL NARRATIVE

Foundation System

Similar to the assumptions listed above for the main addition, a conventional reinforced concrete shallow foundation system on rammed aggregate pier (RAP) ground improvement is anticipated at this time. Concrete strip footings along the perimeter with 8” wide concrete frost walls will be used at the exterior. At column locations, an isolated spread footing can be utilized. The bottom of all exterior footings will be located a minimum of 42” below finished grade to meet local frost protection requirements. Slabs on grade are expected to be 5” thick with #4 rebar at 18” oc. Over-excavation and soil reinforcing may be required and shall be in accordance with the recommendations within the geotechnical report.

Existing Building

DCI currently has a proposal out to perform an existing building assessment of the surrounding structures. Pending approval (and extent of scope), further information can be provided on any additional retrofits that may be required for existing spaces.

At this point, it is DCI’s understanding that the programming impacts on the (E) structure will be minimal. From early programming concepts, it appears that a few openings will be added to (E) structural walls, but otherwise impacts will be limited. DCI will plan to reinforce these (N) openings with miscellaneous steel as required. If any of these openings are in existing lateral elements, DCI will analyze the modified performance to determine if lateral retrofits are required. At this point, it appears the goals of the retrofit are to limit lateral impacts so DCI is assuming that additional lateral force resisting members will not be required. However, if the scope impacts increase, DCI will design these items as necessary.

Please note that if new building spaces are designed such that their roofs or parapets are higher than the existing building roofs, this may impact snow movements and lead to additional drifts being supported by existing roof framing. Existing structural roof elements are not designed for this new loading, so this will require retrofits of the existing roof structure. These retrofits could involve welded reinforcing to the chords and web members of the existing roof joists, additional new joists in between existing joists, or a full overbuild structure on top of the roof.

3. SCHEMATIC DESIGN

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MECHANICAL

SYSTEM DESCRIPTION:

- The new 11th and Grand Montana PBS Addition has a preliminary estimated cooling load of 74 tons. The heating load is estimated at 330 MBH.
- The proposed design will utilize a new 90-ton nominal air-cooled packaged variable volume rooftop air handling unit with a direct expansion coil for cooling and a hot water coil for heating. The AHU will have 100% outside air economizer capability and will also provide required ventilation levels to the zones.
    - The air handling unit will have the following features:
        - Variable speed direct drive plenum supply fans
        - Variable speed direct drive powered exhaust fan
        - DX cooling coil
        - Hot water coil
        - 100% outside air economizer
        - Pre air filters and final air filters.
- Variable Air Volume (VAV) fan powered, or single duct boxes will be provided for each HVAC zone. A hot water coil will be provided in each VAV box where required for heat.
- The heating hot water system will utilize a steam-to-water heat exchanger in the new building mechanical room to provide hot water from the campus steam plant system. The water will contain 40% propylene glycol for freeze protection.
- The current Addition design proposes to incorporate a portion of the existing VCB entry roof into the design of the Addition's third floor. The existing HVAC at the VCB entry will be re-routed or removed and replaced as needed. The existing adjacent mechanical equipment room and associated HVAC equipment (e.g. cooling tower) will not be affected by this design.
- The design team will also work with MSU to determine if connecting into nearby existing geothermal systems may be feasible to save cooling/heating energy.
- Zoning: Studios, control rooms, and other specialty areas will be provided with dedicated VAV boxes to provide thermostatic zoning. Any zones with substantially different schedule requirements will consider using dedicated HVAC units with heat rejection located on the roof, instead of VAV boxes off the central system.
- Critical technical core areas will be provided with dedicated units in a redundancy scheme selected by PBS/MSU. At this point, the addition does not have rooms that require a dedicated HVAC unit or cooling redundancy.
- Mechanical System Acoustic Considerations:
    - Mechanical equipment locations will be outside acoustic sensitive rooms and will utilize features to limit sound and vibration transmission through building structure.
    - Air distribution into those acoustically sensitive rooms will be designed for low velocity airflow and will utilize features such as duct liners and silencers as needed.
- HVAC Controls
    - A Johnson Controls Building Automation System will be provided for the new PBS/Viscom building with front end graphics and incorporation into MSU campus monitoring.
    - The system will control/monitor the HVAC system and provide alarms per MSU guidelines. CO2 sensors will be provided in Code required rooms to maintain adequate ventilation in those rooms.

END OF MECHANICAL NARRATIVE

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3. SCHEMATIC DESIGN

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ELECTRICAL

GENERAL

The basic electrical and lighting power distribution systems shall consist of the elements outlined below configured to provide complete, operational, and effective electrical systems. All systems shall consist of new, first quality components and appurtenances, installed in strict compliance with all applicable codes, standards, manufacturer's recommendations, and the construction documents.

The design of the electrical system will be per all relevant NFPA Standards, Latest Editions and Local Codes. The 2020 National Electrical Code shall be viewed as the minimum requirements for this project.

EXISTING ELECTRICAL SYSTEMS

The existing Visual Communications Building (VCB) is fed from a single pad-mount transformer on the exterior, plan west side of the building. The transformer feeds a 3-section, 120/208V, 3000A Square D switchboard located within the building's 3rd floor mechanical penthouse. The feeder to this switchboard rises through the building in a concrete encased chase. The switchboard serves all areas of the VCB as well as the adjoining Black Box Theater.

Based on two-year historical load data, the peak kW electrical demand is 216 kW, which equates to 600A at 120/208V, 3-phase. Equipment and panels fed from this switchboard include the following:

- Two (2) 225A HVAC chillers on the roof serving Studio A and Studio B
- Two (2) 800A dimming panels serving all studio set lighting within Studio A and Studio B
- One (1) 400A feed to the generator automatic transfer switch (ATS)
- One (1) 600A feed to the adjoining Black Box workshop panels
- One (1) 800A dimming panel serving the Back Box Theater
- Fifteen (15) 225A branch circuit panelboards within VCB

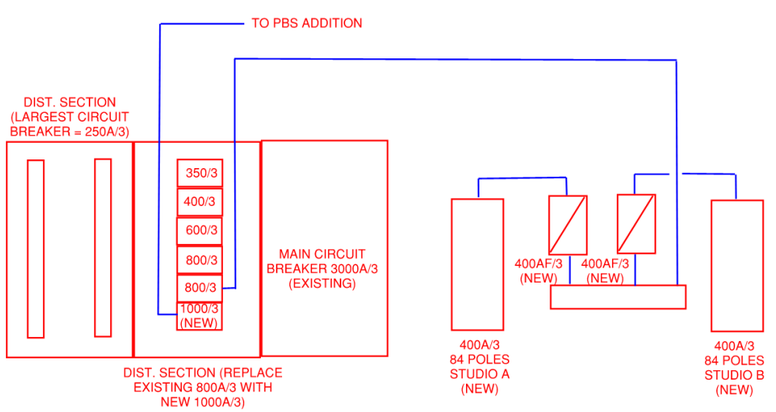
There is an existing 120/208V, 125kW natural gas Kohler generator on the exterior, plan north side of the building. It serves a 400A/3-pole automatic transfer switch (ATS) located within the Network Operations Center (NOC) electrical room. The primary function of the existing generator is to provide back-up power to all network operations racks and cooling systems within the NOC. The existing generator system is not designed to support building life-safety components.

There is an existing 120/208V, 50kVA Liebert UPS and associated UPS maintenance bypass panel also located within the NOC electrical room. The output of the maintenance bypass cabinet feeds a 120/208V, 200A, 42-pole panel. This UPS panelboard provides one (1) 20A/1-pole dedicated circuit to each network operations rack within the NOC.

NEW ELECTRICAL SYSTEMS

The PBS addition will require a new 1000-amp, 3-phase, 120/208V electrical service. This will provide approximately 18 watts per square foot to the PBS addition. The new electrical service will need to be supplied in one of the following three ways:

- Solution #1: Provide space for a new 1000A circuit breaker in the existing switchboard serving the Visual Communications Building. Modifications and/or upgrades of existing electrical and lighting systems will be necessary to accommodate a new 1000A circuit breaker. These potential modifications and upgrades include the following:
  - Removal of the two (2) 800A Strand dimming panels and all associated halogen lighting currently serving Studio A and Studio B. Provide a new LED studio set lighting solution throughout both Studios.
  - Provide a single 800A, 3-pole feed from the existing switchboard to a new 120/208V distribution wireway that includes two (2) 400A fused disconnect switches. Each 400A disconnect switch would feed a single section, 84-pole panel.
  - Each 84-pole panel would supply power to individual branch circuits currently serving studio set lighting in Studio A and Studio B.
  - Replace the left-over, spare 800A circuit breaker in the existing switchboard with a new 1000A circuit breaker to serve the new PBS addition. Refer to sketch below for clarification.



Montana PBS

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- If determined full replacement of the existing dimming panels and halogen fixtures is cost prohibitive, an alternative solution may be to refeed the two (2) dimming panels from a single 800A circuit breaker. This will effectively reduce the output of the existing dimming panels to 400A each. To help determine feasibility of this alternate solution, the University will conduct a 30-day monitoring exercise, with real-world simulation of a live studio recording event. This monitoring exercise should provide maximum kVA peak demand loads for lighting in both Studio A & Studio B.

- Solution #2: Provide a new service to the PBS addition from the existing pad-mount transformer currently serving the Visual Communications Building.
  - This solution has been investigated further by the University. It has been determined the existing transformer does not have the physical space or available terminal connections needed for the addition of a new 1,000A feeder to serve the PBS addition. Full replacement of the existing transformer would be required. Therefore, this solution is no longer being considered.
- Solution #3: Within the existing switchboard, the far left-hand distribution section has space for the addition of six (6) new 250A circuit breakers. We could utilize four of the six available spaces for power required to the new PBS addition. This solution will require four (4) individual 2-1/2" conduits and feeders to be run overhead to the new PBS addition, from the existing switchboard in the Visual Communications Building.

The new Annex Building will require a new 250A, 3-phase, 120/208V panel. We will provide power from a new 250A breaker in the far left-hand distribution section of the existing 3,000A switchboard.

WIRING SYSTEMS

All new feeders and branch circuit wiring shall be routed in conduit, either rigid steel, or EMT depending on where each circuit is routed. All conductors shall be copper of 98% conductivity, type THHN/THWN for branch circuits and type XHHW for feeders. All conductors smaller than #8 AWG shall be solid copper, while those #8 AWG and larger shall be stranded copper. The minimum size conductor used for branch circuits shall be #12 AWG. Minimum size conduit utilized shall be 3/4" for all raceways. MC cable for branch circuits may be used after the first homerun junction box, and where allowed by code.

The contractor shall be responsible for all new branch circuit work for lighting and receptacle loads, including hardwired connections to systems furniture. A maximum of three offices will be served by each 20A circuit. All breakroom equipment receptacles shall be served from dedicated circuits and be GFCI protected.

For any areas throughout the new addition that will feature open ceilings with exposed mechanical and electrical systems, it is expected that all overhead conduit in these areas will be type EMT and routed at right angles, racked together in a neat, workmanlike manner.

In all conference and meeting room spaces, provide quantity of floor core and wall outlet devices per NEC 210.65 meeting room requirements.

LIGHTING

Lighting levels throughout all areas shall be designed in accordance with the Illuminating Engineering Society of North America Recommended Practices. Lighting design shall meet the power and controls requirements of the 2021 or 2024 IECC (dependent on the time of permitting) and the PBS and MSU Engineering Guidelines.

New LED lighting shall be provided throughout all areas of the PBS addition with fixture types to be determined by architect/lighting designer for all front of house spaces. Lighting color temperatures shall vary throughout based on the room type and usage. Consideration for color temperature shall be taken from MSU Engineering Guidelines, PBS recommendations and IES standards. All back of house spaces will be selected to match the MSU Engineering Guidelines. Dimming switches (0-10V) shall be provided in all areas except for restrooms and utility/storage areas.

All new lighting control devices shall be wireless Lutron Vive System and capable of interfacing with existing MSU facilities via campus network protocol.

Automatic controls (as required by Energy Code) will be accomplished via ceiling and wall-mounted occupancy sensors throughout. Daylight harvesting will be required for all perimeter light fixtures within the measured daylight zones for all open office and enclosed spaces, including conference and huddle rooms.

Emergency lighting throughout all areas of the PBS addition will be served by a 120/208V, 3-phase, 4.8kVA central inverter system, with integral output circuit breakers. Provide university standard, edge-lit red LED exit signs with directional arrows as required to support path of egress. In the back of house spaces, die-cast aluminum exit signs are to be provided. Emergency lighting shall provide an average of 1.0fc on all paths of egress exiting the building.

3. SCHEMATIC DESIGN

Salas O'Brien

ELECTRICAL

MECHANICAL EQUIPMENT

All major HVAC equipment will be served at 208 volts, 3-phase. In some cases, equipment may be served at 208V, single-phase depending on its availability. Starters and disconnect switches will be provided by division 16 as required and coordinated with equipment services. Provide 120-volt convenience outlets within 25' of all outdoor or rooftop mechanical equipment.

FIRE ALARM SYSTEM

The existing Visual Communications Building has an Edwards iO series fire alarm system and shall be utilized for the addition of pull stations, audio/visual strobes, smoke detectors, heat detectors, duct detectors, and horn and/or speaker devices required by this addition. Additional power modules shall be required as necessary to accommodate all devices. All devices throughout the PBS addition shall be addressable and installed in accordance with NFPA and local code requirements. In areas with an occupant load of 1,000+ there shall be an emergency voice/alarm communications system.

LOW VOLTAGE/TELECOM/SECURITY

All low-voltage, data, security, and communication outlets shall consist of an in-wall backbox and 3/4" conduit with pull-string, routed to nearest accessible ceiling location for access by tenant's vendor services.

ADDITIONAL DISCUSSION POINTS

- The current load and available capacity of the existing 125kW generator and 50kVA UPS are currently unknown. Our recommendation is that a kVA load analysis is completed over a minimum of a 30-day period, utilizing a Fluke 1750 power recorder or similar device. This will provide us with a good indication of the existing load and available capacity of both the generator and existing UPS system.
- A list of loads desired to be on generator and/or UPS power within the new PBS addition.
- A list of loads desired to be added to the existing generator and/or UPS within the renovation area of the existing Visual Communications Building.
- Having a future-ready photovoltaic system for the building and what is required to be installed day one vs. future installation.

END OF ELECTRICAL NARRATIVE

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3. SCHEMATIC DESIGN

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PLUMBING

SYSTEM DESCRIPTION:

- A new plumbing system will be provided for the building to serve the restrooms on the second and third floors, and third floor employee breakroom and janitor's closet.
- The plumbing system will tie into the campus domestic water and sewer systems.
- A water efficient design will be provided per MSU guidelines and project requirements to include low flow efficient fixtures.
- Consideration will be given to plumbing material types such as using cast-iron pipe for waste lines to limit noise.

END OF PLUMBING NARRATIVE

3. SCHEMATIC DESIGN

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FIRE PROTECTION / SPRINKLER

SYSTEM DESCRIPTION:

- The existing building is fully sprinkled. The existing sprinkler system shall be adjusted and modified to suit the needs of the space addition. The new space and renovation shall be provided a full NFPA 13 compliant sprinkler system for light hazard occupancy. All spaces shall be protected by automatic sprinklers and all products shall be used in compliance with their listings. Sprinklers shall be quick response, ordinary temperature (155-165 degrees F) type, unless higher temperature is required by NFPA for specific areas.
- Sprinklers shall be concealed type in all locations unless noted otherwise. Sprinkler heads within custodial closets shall be upright type with cages. Exposed piping within front of house spaces is not allowed.
- Piping shall be new, designed for 175 PSI working pressure conforming to ASTM specifications and approved for fire sprinkler specifications. Schedule 40 black steel piping may be used for piping 2" and smaller with threaded, roll grooved, or welded fittings. Schedule 10 black steel piping may be used in all sizes for above ground piping with roll grooved or welded fittings only, i.e. no piping thinner than Schedule 40 wall thickness can be threaded.

END OF FIRE SPRINKLER NARRATIVE

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3. SCHEMATIC DESIGN

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TECHNOLOGY

FACILITY AUDIO / VIDEO SYSTEMS

ANCILLARY AV SYSTEMS

Ancillary AV will provide sound, video, and control to the classroom, boardroom, conference rooms, lobbies, common areas, galleries, green rooms, offices and other enclosed public circulation spaces. Work will be specified in:

- 27 41 34 AV Systems
- 27 41 38 Televisions

TECHNICAL SYSTEMS NETWORK

- A dedicated IP network will be provided for audio distribution, IPTV, and technical systems controls.
- The network will be enterprise grade and fully managed.
- Redundant network core will be installed in the Network Operations Center (NOC) and connect to redundant edge switches in each telecommunications/AV equipment room via fiber optic cable.
- Technical network will be provided by 27 41 34 contractor but suppose all AV scope throughout the project.

AV CONTROL & DISTRIBUTION SYSTEM

- Comprehensive control of Ancillary AV systems, digital signage playback, and lighting systems throughout the facility.
    - Secondarily, campus/classroom AV standards will be included within the Classroom/Screening/Multipurpose Room.
- AV control system central processor will be integrated as part of the audio distribution headend. Equipment will be installed in the video production rack room and will interface primarily over IP on the technical systems network and facility network.

DISPLAYS

- TVs are to be commercial grade, 4k TVs with System on a chip (SOC) for IPTV, and Lan connections for control. TVs will be driven and controlled by the IPTV system.

DISPLAYS

- TVs are to be commercial grade, 4k TVs with System on a chip (SOC) for IPTV, and Lan connections for control. TVs will be driven and controlled by the IPTV system.
- TVs to be wall or ceiling mounted to meet ADA clearance requirements.
- TVs will require a duplex power outlet and single data drop to nearest AV Equipment room.

IPTV / DIGITAL SIGNAGE

- An IPTV system will distribute local, cable/satellite, signage content, and environmental/hall of fame content to TVs throughout the facility.
- IPTV System will include the following channels:
    - (8) 1080p SDI inputs for local content.
    - (24) Satellite or cable TV channels.
- IPTV system will control power and source for all connected TVs, include control via TV handheld remote, and be controllable by 3rd party control systems.
- IPTV headend will connect to technical systems network for control and facility network for distribution. IPTV displays will be connected to the facility network.

LEVEL 1

CLASSROOM

- Distributed overhead speakers provide background music, paging, four channels of wireless microphone, and presentation audio.
- Large Format Projector and Projection Screen to be retractable to be stowed away when not in use.
    - 16000 lumen Digital Cinema Projector with 164" or lager diagonal motorized screen.
        - Projector will be located in Projection Room Enclosure in back of room or be installed inside noise reducing housing on telescoping motorized ceiling arm.
    - The projector will be driven by a presentation switcher, sources include HDMI input at front of room, wireless presentation, and IPTV.

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3. SCHEMATIC DESIGN

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TECHNOLOGY

- Diffuse and Blackout Curtain systems to provide variant window/light adjustment within the space
- Campus AV/Classroom Technology Compliant.
  - Infrastructure will be provided to meet Montana State University Classroom Technology standards and requirements. The Equipment will be university furnished and university installed.
- A 7" wall mounted touchscreen controls audio, video, and lighting.

GALLERY

- Digital Hall of Fame and Interactive Environmental Display Area.
- Distributed overhead speakers provide background music, paging, and local TV audio. Audio will be controlled via central software interface.
- Multiple 65" or 75" TVs will be wall mounted inside the space for digital signage and environmental display. TV will be controlled by the IPTV/digital signage system as well as interactive displays controlled by visitors and patrons.

GREEN ROOMS

- Distributed, overhead speakers provide background music, local Bluetooth input, TV audio, and paging.
- One (1) 65" TV will be wall mounted in the room.
- A 7" wall mounted touchscreen controls audio and TVs.

HUDDLE/FOCUS ROOMS

- One (1) 65" TV will be wall mounted in each Huddle/Focus Room. Sources include IPTV and wall mounted HDMI input below the TV.

KEY OFFICES (Dir. Of Technology, Dir. Of Content, Operations Manager)

- One (1) 65" TV will be wall mounted in each office. Sources include IPTV, wireless presentation, and HDMI input at desk.
- TVs controlled via handheld remotes.

MPAN OPERATORS ROOM

- Four (4) 65" TVs will be wall mounted throughout. Sources include IPTV, wireless presentation.
- TVs controlled with handheld remotes.

NOC (NETWORK OPERATIONS CENTER) – RACK ROOM

- Headend location for all AV, IPTV, Digital Signage systems for distribution throughout the facility.

NOC / MASTER CONTROL SUITES

- Distributed, overhead speakers provide background music, local Bluetooth input, paging, local TV audio, and Broadcast monitoring outputs.
- Monitors will be provided by 27 41 30 Video Production for operator stations and Multiview
- Additional TV sources include (Qty: 2) IPTV feeds, wireless presentation and (Qty: 2) local HDMI inputs at desk.
- A 10" tabletop touchscreen controls audio, video, conferencing, and lighting.

AV ROOM (OPTION TO BE LOCATED ON LEVEL 02)

- AV room to support the technical systems network, distributed audio, Classroom and Board Room. Room should have easy access from the common space as well as the classroom to provide troubleshooting support with minimum interruption to ongoing programming in other spaces.
- Minimum Sizing: 9'-0" by 10'-0"
- AV Racks: (Qty. 3) 45RU cabinets with integrated cable management for AV and Lighting Control Systems.
- Power: 8kW feeds (Qty. 5) 20A, 120V dedicated circuits, two circuits at each AV rack and one at the Lighting Control rack.
- Cooling: Equipment will generate a maximum of 16,000 BTU/hr. Cooling should be available 24/7.
- Cable Tray: 12" Cable raceway over equipment racks.
- Bonding: Provide TGB with #3 bonding conductor to MTGB or adjacent Secondary Bonding Busbar (SBB) and building steel. Cable trays and racks should all be grounded to the local busbar within the room.

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3. SCHEMATIC DESIGN

Salas O'Brien

TECHNOLOGY

LEVEL 2

BOARD ROOM & STAFF MEETING ROOM

- Distributed overhead speakers support TV and conferencing audio.
- Two (2) Wall mounted PTZ cameras on the front and back wall (1 on each) and overhead, in-ceiling microphones support conferencing via wireless presentation device and USB-C connection at table.
- Two (2) 100" TV will be wall mounted on the front and back wall (1 on each). TVs will be driven by AVoIP matrix. Sources include IPTV, wireless presentation device, and USB-C connections on the conference table.
    - When the room is not in use, TV will be used for digital signage.
- A 10" tabletop touchscreen controls audio, video, conferencing, and lighting.

CLASSROOM LOBBY

- Distributed overhead speakers provide background music, paging, and local TV audio. Audio will be controlled via central software interface.
- One (2) 75" TV will be wall mounted inside the space for digital signage. TV will be controlled by the digital signage system.

INTEGRATED COMMONS

- Distributed overhead speakers provide background music, paging, and local TV audio. Audio will be controlled via central software interface.
- Multiple 75" TV will be wall mounted inside the space for digital signage. TV will be controlled by the IPTV/digital signage system.
- Tight Pitch Vertically oriented LED wall to be provided on feature wall adjacent to curved opening. Sources include multiple local IPTV inputs, digital signage and local HDMI hookups. LED to be controlled via IPTV/Digital signage system.

KGLT BOOTHS

- Areas include DJ Booth, Sound Mixing, Recording Booth
- One (1) 65" TV will be wall mounted in each Booth. Sources include IPTV and HDMI input at desk.
- TVs controlled with handheld remotes.

RESTROOMS

- Distributed overhead speakers provide background music, paging, and local TV audio. Audio will be controlled via central software interface.

SCREENING ROOM/GALLERY

- Distributed, overhead speakers provide background music, local Bluetooth input, paging, and local projection audio.
- Four (4) 75" TVs will be wall mounted above the gallery space on the plan east wall. TVs will be driven by AVoIP matrix, Sources include IPTV, wireless presentation device, USB-C Connections and local HDMI inputs.
- Surround sound system for presentation/screening audio
- A 7" wall mounted touchscreen controls audio, video, and lighting.

LEVEL 3

EMPLOYEE BREAK ROOM

- Distributed, overhead speakers provide background music, local Bluetooth input, paging, and local TV audio.
- One (1) 75" TV will be wall mounted on the wall.
- A 5" wall mounted touchscreen control audio and TVs.

3. SCHEMATIC DESIGN

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TECHNOLOGY

KEY OFFICES

- Include:
  - Director & General Manager
  - Assoc. General Manager
  - Dir. Of Production
- One (1) 65" TV with will be wall mounted in each office. Sources include IPTV, wireless presentation, and HDMI input at desk.
- TV controlled via handheld remotes.

HUDDLE/FOCUS ROOMS

- One (1) 65" TV will be wall mounted in each Huddle/Focus Room. Sources include IPTV and wall mounted HDMI input below the TV.
- TVs controlled with handheld remotes

LARGE GLASS HUDDLE ROOM

- One (1) 164" Tight Pitch LED screen will be wall mounted in the room. Sources include IPTV, digital signage, and wall mounted HDMI input below the TV.
- A 7" wall mounted touchscreen controls audio, video, and lighting.
- Curtains to be included in the design of the room in order to block out intrusive light when room is in use during meetings.

FACILITY AUDIO VIDEO INFRASTRUCTURE

Work will be specified in:

- 27 05 29 Pathways for AV Systems

PATHWAYS

- Provide EMT conduit vertically in all walls, and above all hard-lid ceilings.
- Install stainless BCP (Broadcast Connection Panel) boxes.
- Provide either EMT conduit or cable tray in any ceiling where cables would be visible (exposed structure, clouds, or open-grill ceilings).
- J-Hooks are acceptable in accessible ceiling areas where low voltage cable counts are less than 24. If more than 24, cable tray or conduit shall be used.
- All fire-rated walls where low voltage cables need to pass, provide 4" sleeves. Install fire-rated sealant after all cables have been pulled.

BROADCAST / PRODUCTION

Work will be specified in:

27 41 30 Video Production Systems

11 61 00 Theatrical Lighting

11 61 33 Theatrical Rigging

27 41 33 LED Systems

CLASSROOM / EVENT / STUDIO SPACE

- Large Classroom – 150-175 seat, flexible classroom.
  - AV Components covered in Facility Audio Video Section.
- Event/Screening Space
  - Motorized High-end projection system
  - High quality surround sound (7.1 surround sound desired)
  - Space for PBS Functions and Community Events – Dinners/Parties/Gatherings
    - Collapsible theatre seating

3. SCHEMATIC DESIGN

Salas O'Brien

TECHNOLOGY

- Studio
  - Additive studio for audience-based performances and programming
    - Debates
    - Music Performances
    - Community Events
    - University Events
  - Key infrastructure for lighting, audio, production, connectivity etc.
    - 4'x4' Lighting Pipe Grid
    - DMX, Audio/Video, and broadcast system connectivity
    - Power distribution throughout the Lighting Grid
    - 100A, 3-phase, 120/208V, 24 Circuit, DMX Controlled Relay Panel.
    - DMX Control Surface capable of handling both production lighting and architectural lighting in the space
    - Theatrical lighting fixtures will produce an estimated 20,000 BTU/hr with typical use 30-50%.
  - Fixed and variable head LED lighting fixtures with DMX control for various setups including broadcast production sets, general event coverage and classroom layouts.
  - Flexible and adjustable space that provides the most functionality.
  - Adjacent storage and easy pathing for equipment and set pieces.
- Absorptive acoustical treatments on the side/rear walls and ceiling will be important to control the acoustic energy in this space. Wall, door, and floor/ceiling constructions should consider sound isolation to surrounding spaces. Low background noise levels from MEP systems will be required.

PRIMARY CONTROL ROOM

- Functions as the primary sports control room for contract partnership with Montana State University and ESPN+ programming.
- 1080p base production capabilities.
- Space for standard sports production staffing with room for training and observation.
  - Producer, Director, TD, Graphics, Bug, Replay Op(s), Shading, Flex
- Separate Audio Control Room for ideal mixing conditions.
- Interoperability to control and produce content from any PBS operated space or fiber connected venue.
- Systems connected to the NOC core for resource sharing and redundancy.
  - Systems include but are not limited to:
    - (1) Production Router – capable of capacity for all new control rooms and tie-lines into the existing PBS Broadcast/Transmission routing system.
    - (1) Switcher – 32 in x 16 out minimum
    - (2) 3-Channel Character Generators
    - (2) 6 in x 2 out replay system capable of being networked together to share content and recording angles
    - (4) SMPTE 1080p Broadcast Quality Camera Chains for remote production, inclusive of SMPTE to SMFO converters.
      - (2) with 55x or better BOX style lenses
      - (2) with 22x ENG style Lenses
    - (1) Broadcast Quality Audio Mixer – 96 inputs minimum.
    - (3) Dante Announce Boxes for Sports Production.
    - Digital Record Decks.
    - Broadcast Furniture/Production Consoles.
    - Expanded Intercom Matrix.
    - KVM System for resource sharing and flexibility between multiple spaces.
    - Remote Connectivity Kits for venue interconnects back to NOC.

3. SCHEMATIC DESIGN

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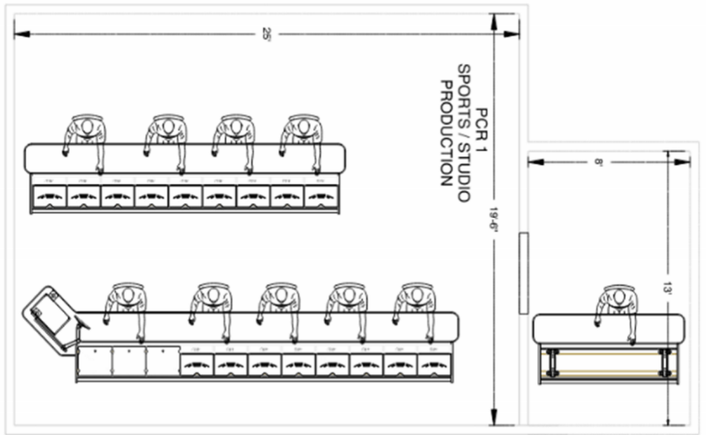
TECHNOLOGY

- Absorptive acoustical treatments on the walls and ceiling.
- An example layout is included below:



GREEN SCREEN / SECONDARY STUDIO

- Additional controlled studio space for small level and green screen productions.
- High level of acoustic isolation (STC-60+) through the use of double-stud wall construction and isolated ceiling systems. STC rated door systems and door vestibules should be considered.
  - Absorptive acoustical treatments on all walls for majority coverage and on the ceiling.
  - Controlled MEP systems for low background noise levels.
- Ideal to have 2 usable areas within the studio
  - Green Screen Cyc Wall or Tight Pitch LED Backdrop
    - Custom Cyc Wall – Curved Corner 16' W x 12' H.
    - LED Wall to be at a minimum, 2.5mm pixel pitch and 8' W x 9' H.
  - Permanent small set for talking head or intimate interview productions, as necessary.
- Lighting Grid with power and connectivity for controlling each fixture and pre-set scenes.
  - 4'x4' Lighting Pipe Grid, assume 10PSF inclusive of grid weight.
  - LED Lighting fixtures color variable and RGB capable with DMX Control
  - Theatrical lighting fixtures will produce an estimated 10,000 BTU/hr with typical use 30-50%.
  - (12) 20A Circuits will be allotted.
- Broadcast and AV Connectivity to the NOC core for versatility and redundancy to produce studio content out of any control room.
- Adjacent storage space for production/lighting equipment to keep the small studio as clean and flexible as possible.

SECONDARY CONTROL ROOM

- Function as the primary green screen / secondary studio control room for MT PBS programming.
  - Space could also function as a secondary sports production control room servicing videoboard production.
- 1080p base production capabilities.
- Space for standard small scale studio production staffing with room for training and observation
  - Producer, Director/TD, Graphics/Playback, Robo, Shading.
- Separate Audio Control Room for ideal mixing conditions.
- Interoperability to control and produce content from any PBS operated space or fiber connected venue on campus for videoboard and small-scale sporting event streaming.
- Systems connected to the NOC core for resource sharing and redundancy.
  - Systems include but are not limited to:
    - (1) Switcher – 32 in x 16 out minimum
    - (1) 3-Channel Character Generator
    - (1) 6 in x 2 out replay system capable of being networked with primary control room to share content and recording angles
    - (2) SMPTE 1080p Broadcast Quality Camera Chains for studio and remote production, inclusive of SMPTE to SMFO converters.
    - (3) Robotic Cameras mounted on tripods for studio use.

3. SCHEMATIC DESIGN

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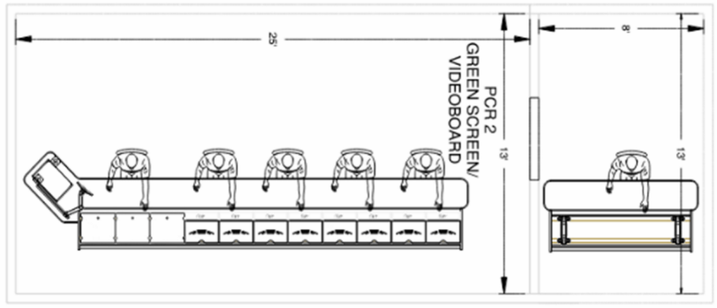
TECHNOLOGY

- (1) Robotic Camera controller
- (1) Broadcast Quality Audio Mixer – 48 inputs minimum.
- (4) Wireless Microphones
- Digital Record Decks.
- Broadcast Furniture/Production Consoles.
- Intercom Stations
- KVM stations.

- Absorptive acoustical treatments on the walls and ceiling.
- An example layout is included below:



ADDITIONAL SPACES

- KGLT DJ/Radio Booths
  - Sufficient space for DJ Operations, Playback equipment, programming equipment and area for in studio interviews to occur.
    - Infrastructure and Consoles to be provided as part of the project.
    - Equipment to be Owner Furnished, Owner Installed.
  - Absorptive acoustical treatments on the walls and ceiling. Acoustical isolation (STC-55+) should be considered in construction assemblies to surrounding areas.
    - Low background noise levels from MEP systems will be important.
- KGLT Mix/Recording Booth
  - Acoustical isolation (STC-60+) for high fidelity recording of bands, singers, voice actors or other functions through double-stud wall construction and isolated ceiling systems. STC rated door systems and door vestibules should be considered.
    - Absorptive and diffusive acoustical treatments throughout the walls and ceiling in both spaces.
    - Low background noise levels from MEP systems will be critical.
  - A mixing console and record devices would need space to be operated, ideally with line of sight to the recording booth for verbal and non-verbal communication.
- Voice Over Booth
  - A small room provided with absorptive treatment for majority coverage throughout walls, floor, and ceiling to provide best quality recordings.
    - High End microphone and windscreen setup for optimal recording quality.
    - Connection to Audio Mix Room through direct analog connections as well as Dante Connectivity for flexibility.
  - Acoustical isolation (STC-55+) should be considered in construction assemblies to surrounding areas.
    - Low background noise levels from MEP systems will be critical.
  - This space would service KGLT and MT PBS and opportunity for campus utilization.
- Edit/Office Suites (Director of Production, Production Services, Senior Producer, Impact Producer)
  - Acoustical isolation (STC-50+) at demising walls to other occupied spaces.
  - Spaces should be welcoming and enjoyable to be within while also incorporating production standards.

3. SCHEMATIC DESIGN

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TECHNOLOGY

- Connectivity to NOC to include but not limited to:
  - Intercom
  - Router Control
  - Monitoring/Multiview
  - Signal Transport – Bi-Directional (Audio/Video)
  - Fiber
  - KVM
- NOC - Network Operations Center (Equipment Rack Room) Renovation
  - Adjustment and re-arrangement of the NOC to accommodate the additional production equipment to support the new studios and control rooms.
    - 24/7 operation to be maintained during renovation and update process.
    - New Equipment Racks, Cabling, Cable Management, Cable Trays, equipment layout and sufficient space for future expansion
      - Upgraded systems per owner conversations to meet advancing television standards and distribution expectations.
      - Removal of outdated or abandoned in place equipment within the racks and adjoining spaces.
  - Relocation of the operator stations from the existing NOC into a new "Master Control Suite."
- Master Control Operator Rooms – Adjacent to NOC
  - Inclusion of NOC Control within the new space
    - KVM, Routing, Intercom, Monitoring, Playback, Ingest, Archive Access, Emergency Messaging/Alert systems, etc. all need to be virtually extended to within the new space.
    - High End finishes with production consoles/equipment and Multiview monitor walls to create a "show piece" for visitors to the building and space.
- IT/AV Room
  - 1st floor and 3rd floor locations.
  - Compliant with campus IT requirements.
  - High Bandwidth throughput expected from campus systems.
  - Dedicated fiber and broadcast cable systems to traverse through the IT/AV Room as a demarcation point.
  - Security and Access Control Systems to run directly to these rooms

BROADCAST CABLING

Work will be specified in:

- 27 41 32 Broadcast Cabling

The design intent for the Broadcast A/V cabling infrastructure will include interconnect cabling for new spaces within the 11th and Grant Addition. Broadcast Cabling will route to the NOC from BCP (Broadcast Connection Panel) locations throughout the facility. Locations will include those requested and expected through owner conversations, approximately 12 locations.

- Classroom / Multipurpose (3)
- Green Screen Studio (2)
- KGLT Recording Booth
- Gallery
- Integrated Commons (2)
- Board Room & Staff Meeting Room
- Screening Room / Gallery
- 3rd Floor Glass Huddle Room
- 3rd Floor Break Room (Future Kitchen Show Opportunities)
- Exterior of the Building.

The BCPs (Broadcast Connection Panels) will include connectivity for Audio, Video, Sync, Fiber and SMPTE. This will allow for broadcast and recording operations to expand beyond the typical studio environments, broadening the capabilities and flexibility of the new facility.

3. SCHEMATIC DESIGN

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TECHNOLOGY

In addition to the cable pull, 27 41 32 will provide the stainless BCP (Broadcast Connection Panel) boxes to 27 05 29 for installation.

DATA / NETWORK INFRASTRUCTURE

GENERAL

- Provide a structured cabling system to support network, Wi-Fi, and security for the facility.
- Provide a telecommunications distribution system for the transmission of data signals over an IP network.
- Provide backbone cabling to connect telecom and AV Rooms to Main Telecom Room.
- Provide cabling to workstations, offices, TVs, Wi-Fi access points, AV equipment, and general-purpose data drops.
- All telecommunications work shall be performed in accordance with the current edition of the BICSI Telecommunications Distribution Methods Manual, the current edition of the BICSI Cabling Installation Manual, the latest edition of the TIA/EIA Telecommunications Building Standards, in coordination with Montana State University practices and procedures.

TELECOM ROOMS

Two (2) Telecom rooms will be provided within the 11th and Grant Addition to provide coverage for horizontal cabling in all areas. One telecom room can cover approx. 20,000 square feet per floor. Telecom Rooms will house network and security equipment.

- Telecom Racks: (Qty. 2) 4-Post & (Qty. 1) 2-Post Racks with 10" Vertical cabling manager between racks and 6" vertical cabling managers on the ends.
- Power: 15kW feeds circuits. Rack mounted UPS as required.
- Cooling: Equipment will generate 30,000 BTU/hr . Cooling should be available 24/7.
- Fire Protection: Wet pipe system with high temperature heads and protective baskets installed over heads.
- Cable Tray: 12" Cable raceway around entire perimeter of room and over equipment racks.
- Bonding: Provide TGB with #3 bonding conductor to MTGB or adjacent Secondary Bonding Bussbar (SBB) and building steel.

For additional requirements and practices please reference the Montana State University Telecommunications Standards document

MAIN TELECOM ROOM

- The Main Telecom Room will remain and continue to house the network core for the physical network. PBS and KGLT systems will tie into the University IT systems.
  - Additional power and backup power is recommended for the Main telecommunications racks that exist within the MEP mezzanine level within the existing building.

PATHWAYS

- Horizontal Pathways:
  - Provide (2) 4" and (1) 1" conduits from the existing Main Telecom Room to new Telecom Room.
  - Provide (2) 4" and (1) 1" conduits from the existing Main Telecom Room to new Telecom Cabinet.
  - 24" Cable tray runs the full length from the NOC into and throughout the new addition at Level 1
  - 12" Cable tray runs around the perimeter and cross section of the 3rd floor office space
  - (4) 4" conduits connect new telecom room to cable tray
- Vertical Pathways:
  - (6) 4" and (1) 1" conduits connect Level 1 cable tray to TR/AV on Level 3.
  - (6) 4" and (1) 1" conduits connect Level 3 cable tray to TR/AV on Level 2.
  - Provide (2) 2" conduits from upper-level cable tray to the roof.

BACKBONE CABLING (VERTICAL CABLING)

- Optical fiber backbone cabling will be OS2 single-mode and will be armored. Copper backbone cabling will be Cat 6 rated multi-pair.

3. SCHEMATIC DESIGN

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TECHNOLOGY

- (Qty. 1) 24 strand fiber and (1) 4-pair copper cable from the existing main telecom room to the level 01 telecom room.
- (Qty. 1) 24 strand fiber and (1) 4-pair copper cable from the existing main telecom room to the level 03 telecom room.
- (Qty. 1) 12 strand fiber and (1) 4-pair copper cable from the existing main telecom room to the new Annex telecom cabinet.
- (Qty. 1) 24 strand fiber cable from existing main telecom room to NOC.
- (Qty: 1) 48 strand fiber cable from existing main telecom to AV room.

DATA DROPS (HORIZONTAL CABLING)

- Horizontal cabling will be a certified system with lifetime warranty.
- Data drop cabling for Wireless Access Points will be Cat 6A and CMP rated. All other data drop cabling will be Cat6 and CMP rated.
  - Wireless Access Points: Single data drop at each WAP location.
    - Wireless system design by Montana State University.
  - Workstation (Qty. 2) cables per data drop in each office and at each individual workstation location.
  - Offices and Huddle Rooms: (Qty. 2) cables in backbox behind each TV and (Qty. 2) cables per data drop in floor box under conference table.
  - Green Rooms: (Qty. 2) cables in backbox behind each TV and (Qty. 2) cables per data drop in wall box within space.
  - MPAN Operators Room: (Qty. 2) cables per data drop in floor box under cubicles
  - Open Work Area: (Qty. 2) cables per data drop in floor box under cubicles
  - Control Rooms: (Qty. 2) cables per data drop in wall box adjacent to production console rows
  - Audio Control Rooms: (Qty. 2) cables per data drop in wall box at production console.
  - TVs: Single data at each TV location.
  - Copiers and Printers: Dual data drop at each device
  - BCP: (Qty. 4) data drop within BCP
  - AV Data Drops: (Qty. 4) data drops at any AV equipment rack locations.
  - Security Cameras: Single data drop at each camera location. See security narrative for locations.
  - General Purpose: A limited number of dual data drops in public areas.
- Provide a 4-11/16" square box with 1" conduit stubbed to accessible ceiling for each drop listed above. Cabling will be in conduit in open and non-accessible ceilings.

Montana PBS

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SECURITY SYSTEMS

SECURITY EQUIPMENT IN TELECOM ROOMS

- Video Surveillance System recording servers will be housed off site within the university security/police operations center.
- Electronic Access Control to be in coordination with "CatCard" office and any required systems to be installed within the telecom rooms per specifications at a minimum of below.
  - One 120V, 20A electrical power circuit dedicated to the security equipment in the room. This circuit will be terminated in two quad receptacles mounted at 4'-0" AFF and/or hardwired into the EAC enclosures.
  - Four LAN data drops.

ELECTRONIC ACCESS CONTROL SYSTEMS (EAC)

GENERAL

- The purpose of the EAC System is to allow facility staff and other authorized personnel the ability to enter the building, or controlled interior areas or rooms, during times when the doors are locked using a proximity card, key fob or university ID, rather than a physical key.
- A secondary purpose of the EAC System is to allow the locked/unlocked status of doors to be scheduled via software.
- EAC Door Control Panels and Lock Power Supplies will be located in the Telecom Rooms. (Local 120V, 20A electrical power will not be required at access-controlled doors for EAC equipment.)
- All conduit and cabling from EAC devices at controlled doors will be run to the nearest Telecom Room.

3. SCHEMATIC DESIGN

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TECHNOLOGY

CARD READER CONTROLLED DOORS

- The initial intent is to electrify all main exterior perimeter doors that would be used as public entrances so that these doors can be scheduled as to when they are locked / unlocked via the EAC system.
- Other exterior perimeter doors that will likely be used by staff for building entry, as well as interior areas or rooms that are considered non-public spaces, will be equipped with electronic access control.
- Areas / Doors that will be equipped with electronic access control will include at a minimum of:
  - All entrance doors.
  - TR Rooms (MPOE, MDF, IDF).
  - AV Rooms.
  - MEP & Electrical Rooms.
  - Multipurpose Classroom.
  - Entry to Office Suites.
  - Control Rooms.
  - KGLT DJ, Recording, Mixing, VO Booths.
  - Elevator.
  - Green Rooms.
  - Network Operations Center
  - Studios.

VIDEO SURVEILLANCE SYSTEM

GENERAL

- The system is designed around real-time, digital recording of all security cameras.
- The purpose of the Video Surveillance System (VSS) is to monitor assets and activity within the facility.
- Assume 30 days of full resolution recording time for each camera.
- All conduit and cabling from Video Surveillance cameras will be run to the nearest Telecom Room.
- Cameras will connect to existing University Police Video Management System (VMS) recording servers which will be installed off site.
- Cameras will utilize category cabling (by the Data Contractor) routed to the Nearest Telecom Room. Fiber will be utilized where cabling distances exceed category cabling limitations.

CAMERA LOCATIONS

- Cameras will be installed on the exterior of the building to service University Police security purposes for exterior pathways and building entrances.
- Unless surveillance needs dictate otherwise, compact dome cameras (single-sensor or multi-sensor) will be used throughout so that the video surveillance is as discreet as possible without sacrificing functionality.
- If required, PBS shall install and manage a Video Surveillance System to monitor the areas that are controlled and accessed by them.

END OF TECHNOLOGY NARRATIVE

Montana PBS

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3. SCHEMATIC DESIGN

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ACOUSTICS

Walls at identified spaces below should extend full height and seal to the structure above. Wall cavities should include a minimum of 3" batt insulation. Recommendations assume steel stud construction is used. All penetrations should be fully caulked and sealed with non-hardening elastomeric sealant.

MULTI-PURPOSE CLASSROOM

- Large areas of glazing will be challenging both from a noise transmission standpoint and from a room acoustic standpoint (excessive liveliness).
- Absorptive acoustical treatments on the side/rear walls (min. NRC 0.90) will be important to control the acoustic energy in this space, reduce undesirable reflections, and improve speech intelligibility/clarity.
- A continuous sound-absorbing ceiling tile (min. NRC 0.80) is recommended.
- Carpet should be provided.
- Wall, door, and floor/ceiling constructions should consider sound isolation to surrounding spaces. This includes, but is not limited to, providing double stud construction with multiple layers of drywall (STC 60+) to adjacent sensitive spaces, a continuous ceiling in the space to reduce noise transmission to above, and a door vestibule with full perimeter compression seals at each door for the entrance(s) into the space. Note that sliding/folding glass door systems will provide little to no sound isolation between spaces.
- Low background noise levels from MEP systems will be required. HVAC background noise levels should not exceed NC-30.

GREEN SCREEN STUDIO

- High level of acoustic isolation (STC-60+) with double-stud wall construction and isolated ceiling systems should be provided. STC-rated door systems or door vestibules should be provided.
- Provide absorptive acoustical treatments on the rear wall and one side wall and on the ceiling (min NRC 0.80 rating).
- Carpet should be provided.
- Controlled MEP systems for low background noise levels will be required. HVAC background noise levels should not exceed NC-20.

CONTROL ROOMS

- Provide absorptive acoustical treatments on the walls and ceiling (min. NRC 0.80).
- Carpet should be provided.
- A high level of sound isolation (STC 55-60, depending on the adjacency) should be provided.
- HVAC background noise levels should not exceed NC-30.

GREEN ROOMS

- Provide a sound-absorbing ceiling finish (min. NRC 0.80).
- Increased wall construction to surrounding areas should be provided at critical adjacencies that will be used concurrently, such as the Classroom-MPR space.
- Avoid toilet plumbing walls on walls shared with noise-sensitive spaces, such as Focus Rooms.
- HVAC background noise levels should not exceed NC-35.

AUDIO ROOM & SOUND MIXING

- Acoustical isolation (STC-55+) should be considered at construction assemblies to surrounding areas. Higher isolation levels (STC-60) will be needed where adjacent to other noise-critical spaces. STC rated door systems or door vestibules should be provided for isolation. Consider providing buffer spaces to these spaces where possible. For example, we recommend relocating the L1 Audio Room located within the Front Control Room to avoid sharing a wall with the adjacent KGLT Recording Booth.
- Provide absorptive and diffusive acoustical treatments throughout the walls and ceiling in these spaces.
- Provide hard floor finish with provision for area rugs.
- HVAC background noise levels should not exceed NC-20.

VOICEOVER

- Provide absorptive treatment for majority coverage throughout walls and ceiling (min. NRC 0.85).
- Carpet should be provided.

3. SCHEMATIC DESIGN

Salas O'Brien

ACOUSTICS

- Acoustical isolation (STC-60) should be considered at construction assemblies to surrounding areas. An STC rated door system should be provided for isolation.
- Low background noise levels from MEP systems will be critical. HVAC background noise levels should not exceed NC-20.

KGLT DJ BOOTH

- Absorptive acoustical treatments on the walls and ceiling (min. NRC 0.80). Glazing area should be largely reduced surrounding DJ Booths as acoustic treatments will be required on the interior of the room to control liveliness of the space.
- Acoustical isolation (STC-55+) should be considered at construction assemblies to surrounding areas. An STC rated door system should be provided for isolation.
- Low background noise levels from MEP systems will be important. HVAC background noise levels should not exceed NC-20.

KGLT RECORDING BOOTH

- Acoustical isolation (STC-60+) for high fidelity recording of bands, singers, voice actors or other functions through double-stud wall construction and isolated ceiling systems. STC rated door systems or door vestibules should be provided.
- Absorptive and diffusive acoustical treatments throughout the walls and ceiling.
- Low background noise levels from MEP systems will be critical. HVAC background noise levels should not exceed NC-20.

GALLERY & INTEGRATED COMMONS

- Acoustic absorption (min. NRC 0.80) should be provided on the ceiling to control the liveliness and reduce the build-up of noise in these spaces.
- HVAC background noise levels should not exceed NC-40.

EDITING ROOMS

- Acoustical isolation (STC-50+) at demising walls to other occupied spaces considering rooms are primarily used for video editing. At spaces used for Audio editing, such as at the Director of Production Edit Bay, STC-60+ (double-stud wall construction) should be provided and STC door systems should be provided. At Mini Edit Bays, provide STC-55 isolation (staggered-stud wall construction) and STC door systems. At remaining Editing Rooms, provide STC-50 isolation.
- Provide absorptive acoustical treatments throughout the walls and ceiling.
- HVAC background noise levels should not exceed NC-35. If these spaces would be used for Audio editing, maximum NC-20 noise levels would be required.

PRIVATE OFFICES, HUDDLE & FOCUS ROOMS

- Provide acoustical isolation (STC-50+) at demising walls to other occupied spaces. Full perimeter door seals should be provided at doors into spaces where speech privacy is important.
- If Huddle or Focus rooms will be used for video-conferencing, provide absorptive wall treatments on two adjacent walls.
- HVAC background noise levels should not exceed NC-35.

VIDEO-CONFERENCING ROOMS

- Includes: Level 2 Board Room and Level 3 spaces where video-conferencing is anticipated.
- Acoustical isolation (STC-50+) at demising walls to other occupied spaces. Full perimeter door seals should be provided at doors into these spaces.
- Note: Sliding/folding glass door systems will provide little to no sound isolation. Larger areas of glass will also result in a livelier space and video-conferencing/speech intelligibility will be difficult. Absorptive acoustic treatment (such as a stretched fabric system) should be provided on at least two adjacent walls for ~50% evenly distributed coverage.
- Provide absorptive acoustical treatment (distributed evenly) on two adjacent walls equivalent to roughly 60% of the floor area.
- HVAC background noise levels should not exceed NC-30.

3. SCHEMATIC DESIGN

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ACOUSTICS

OPEN OFFICE AREAS

- Provide an absorptive ceiling finish throughout (min. NRC 0.80).
- HVAC background noise levels should not exceed NC-40.

EVENT CATERING KITCHEN

- Provide an absorptive ceiling finish throughout (min. NRC 0.80).
- As video-production/recording is anticipated in this space, sound isolation to surrounding areas will be critical. Provide a vestibule to acoustically separate the Kitchen from the adjacent Elevator.
- HVAC background noise levels should not exceed NC-35.

IMPACT NOISE TRANSMISSION (LEVELS 2-3)

- Footfall impact noise transmission from spaces on Levels 2-3 to noise-sensitive spaces below will require further review. In any spaces on Levels 2-3 with hard floor finishes (tile, LVT, wood, etc.) above noise-sensitive spaces, plan to provide a 1/4" thick acoustic underlayment below the floor finish.

MECHANICAL NOISE & VIBRATION CONTROL

- Equipment Selection
  - Noise control requirements depend heavily on the noise produced by the fan itself. Significant savings in noise control costs can be realized simply by selecting quiet and efficient fan equipment.
- Location
  - Locate the main mechanical equipment a minimum 25ft away from the noise sensitive spaces.
  - Avoid unnecessary duct or pipe penetrations in sound isolating constructions.
  - Locate any FPBs or WSHPs over corridors or non-noise sensitive spaces.
  - Do not route hot water, chilled water, domestic water, steam and waste pipes through spaces NC-35 or less. Where this is unavoidable, additional measures may be needed, such as lagging.
- Mechanical Ductwork Notes
  - Penetrate the building envelope through a buffer zone (non-critical space) prior to entering a noise-sensitive space (NC-30 or less).
  - Use rectangular ductwork with high aspect ratio but avoid ratios above 4:1. External stiffeners may be required for wide ducts.
  - Use full-radius elbows or small radius elbows. Do not use turning vanes except where required within mechanical rooms.
  - Diffusers should not have integral dampers. Locate volume dampers no less than 7 duct diameters away from the terminal unit.
  - Provide 1" thick internal acoustical lining for the following where the unit(s) serve occupied spaces:
    - First 25ft downstream RTU or AHU supply and return ductwork
    - First 15ft downstream FPB or WSHPs supply and return ductwork
    - First 10ft downstream of VAV supply ductwork
    - All branch and terminal ductwork serving NC 20-25 spaces. Provide a minimum 6-7 feet of lined duct between the terminal unit and first take-off at NC 20-25 spaces.
  - Provide acoustically-lined boots with at least two 90 degree turns on all return air transfer openings into plenum spaces. Note that fully ducted (and internally lined) return should be provided into spaces with high levels of sound isolation (STC-55+), such as Audio Mixing and Studio Rooms.
  - A combination of lining, duct silencers and lined plenums will be recommended based on design goals and sound data provided to attenuate fan noise to appropriate levels. We recommend budgeting for 5ft silencers at supply and return of large rooftop equipment serving occupied spaces and 3ft silencers at supply and return of FPBs/WSHPs serving NC 20-30 spaces at this time.

3. SCHEMATIC DESIGN

Salas O'Brien

ACOUSTICS

- Ducts should be sized to accommodate the air velocities (fpm) in the chart shown below:

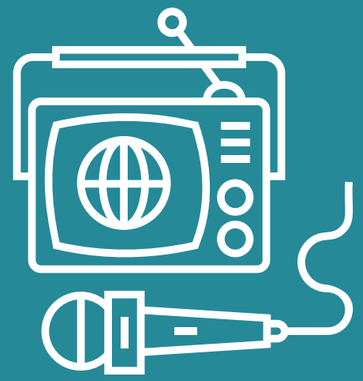
LOCATION	NC 20	NC 25	NC 30	NC 35	NC 40
Main ducts outside of space	1200	1300	1400	1500	1800
Main ducts within occupied space *(including above ceilings)*	800	900	1000	1100	1200
Branch Supply & Return ducts *(<25-ft of terminal diffuser)*	700	800	900	950	1000
Terminal ducts up to 5 duct diameters from inlet/outlet	450	500	550	600	650

- Plumbing and Electrical Notes
  - Support all HVAC and plumbing pipes with spring-and-neoprene isolators having the same static deflection as the equipment to which the pipes are connected, within 10 pipe diameters of rotation equipment or throughout the Mechanical Room (whichever is longer).
  - Support chilled water piping on neoprene hangers for its entire run.
  - Size pipes with active flow for velocities no greater than 4fps for pipes 2" and smaller and 10fps for larger pipes. The pressure drop should not be greater than 4ft of water per 100ft of pipe length.
  - Make electrical connections to all vibration isolated equipment including pumps, fans and transformers with flexible conduit, not less than 3ft in length, and installed in a complete 360 degree loop or slack U-shape as approved and detailed.

END OF ACOUSTICS NARRATIVE

4

DESIGN PROCESS



What is Our Vibe?

An inspiring space where our transformative productions meet the spirit of Montana. It connects students, visitors, and natural materials in a uniquely PBS way. This project boldly says: we are PBS, and we are Montana!

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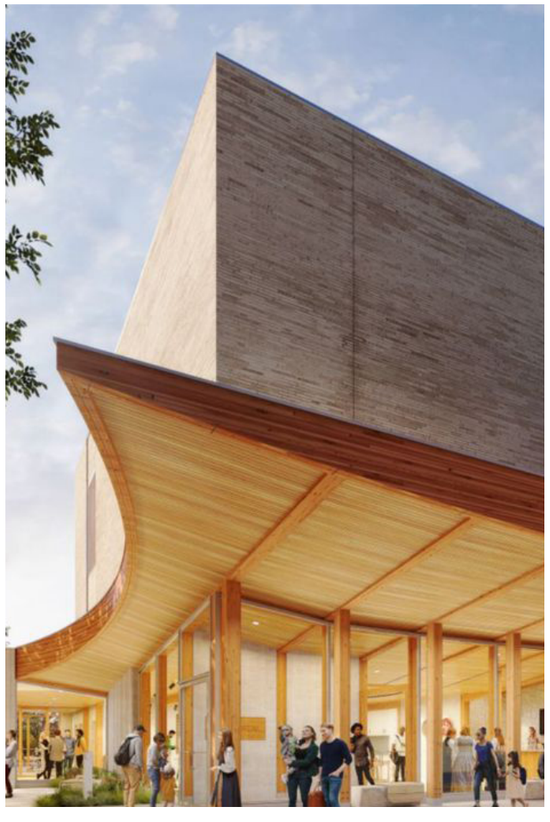
BRICK

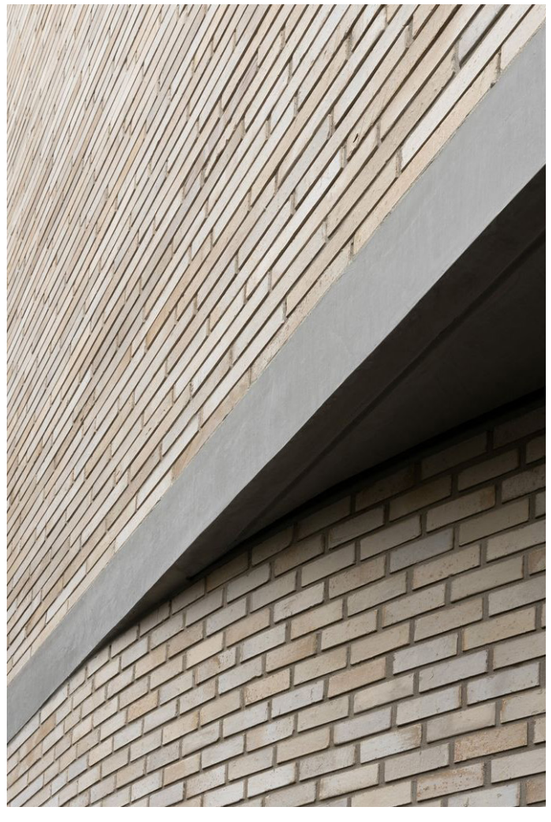
Drawing inspiration from the existing brickwork will create a seamless and unified extension that successfully ties the new addition to the original structure.

By incorporating similar brick tones and introducing elements such as glass, dynamic forms, or a fun pop of color, the addition will introduce a fresh, modern aesthetic to 11th and Grant, adding both visual interest and architectural cohesion.

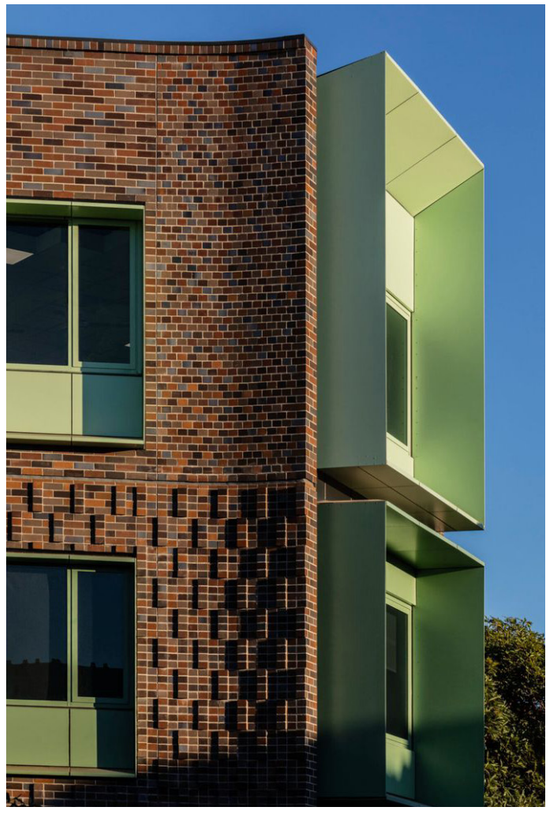
BRICK & GLASS



EXPRESSIVE FORM



POP OF COLOR



COORDINATING BRICK

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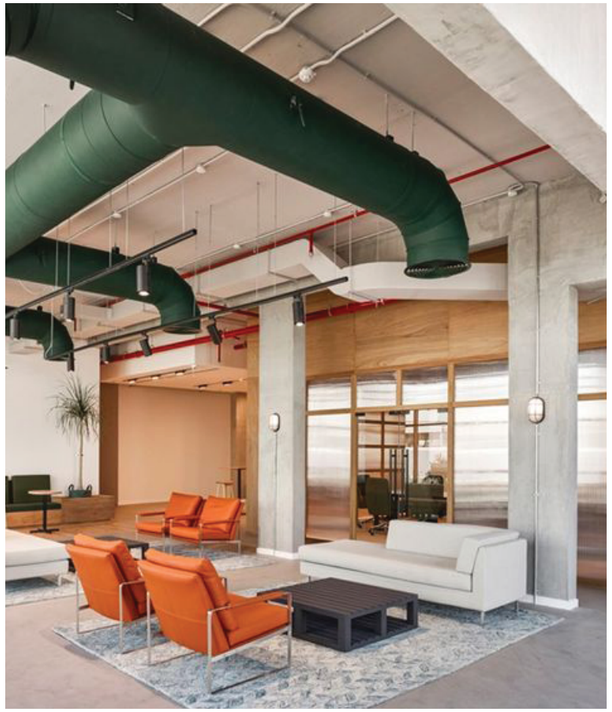

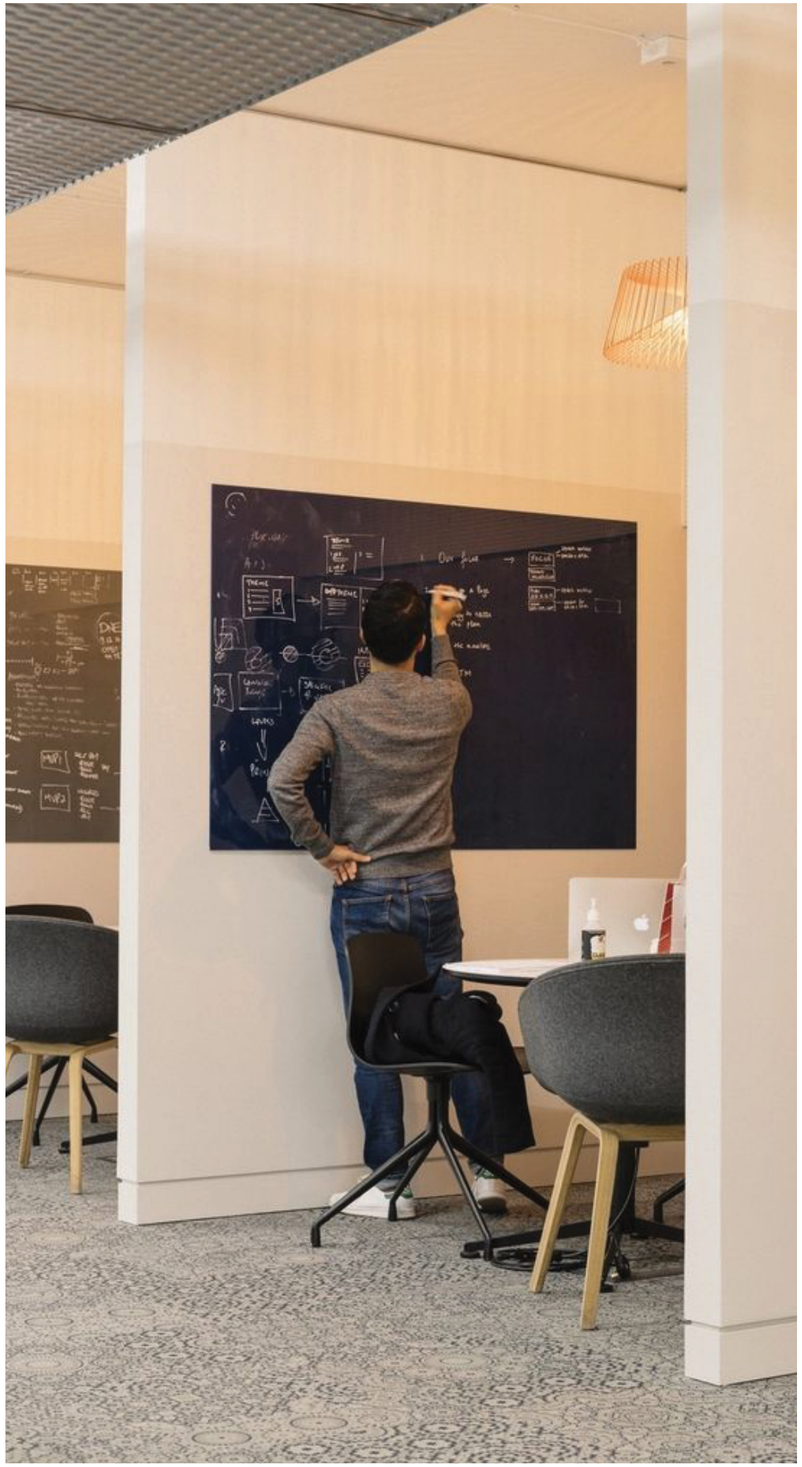

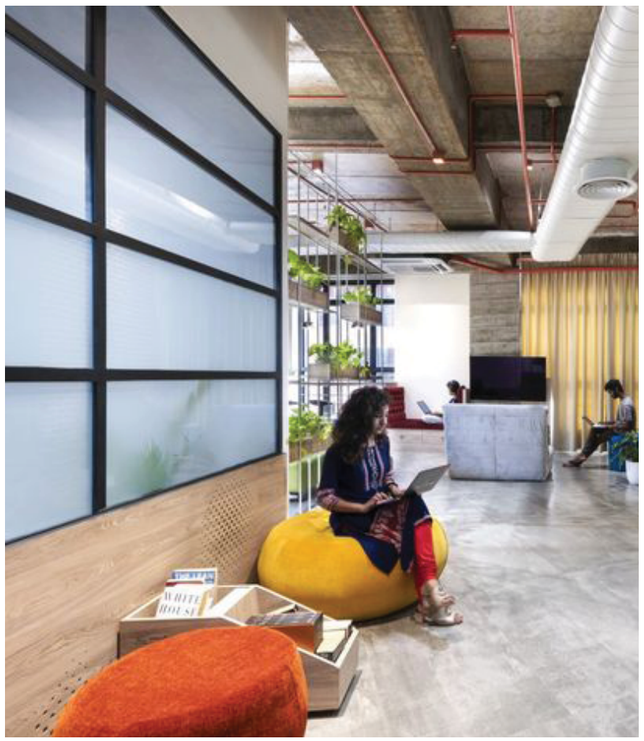

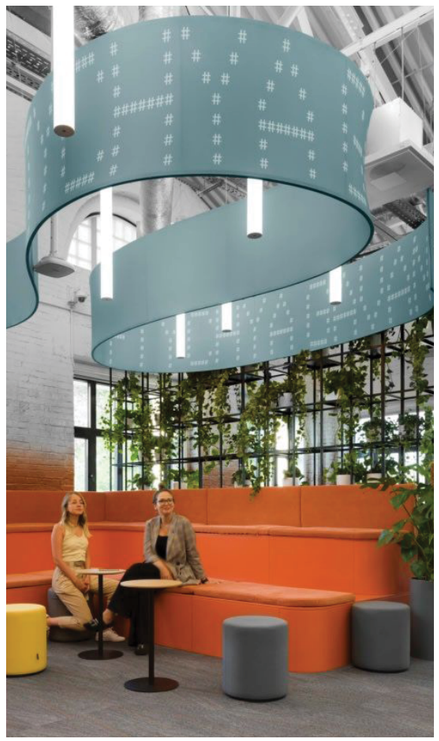

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EXIT
ENGAGE
INSPIRE
TRANSFORM

MASSING PROCESS

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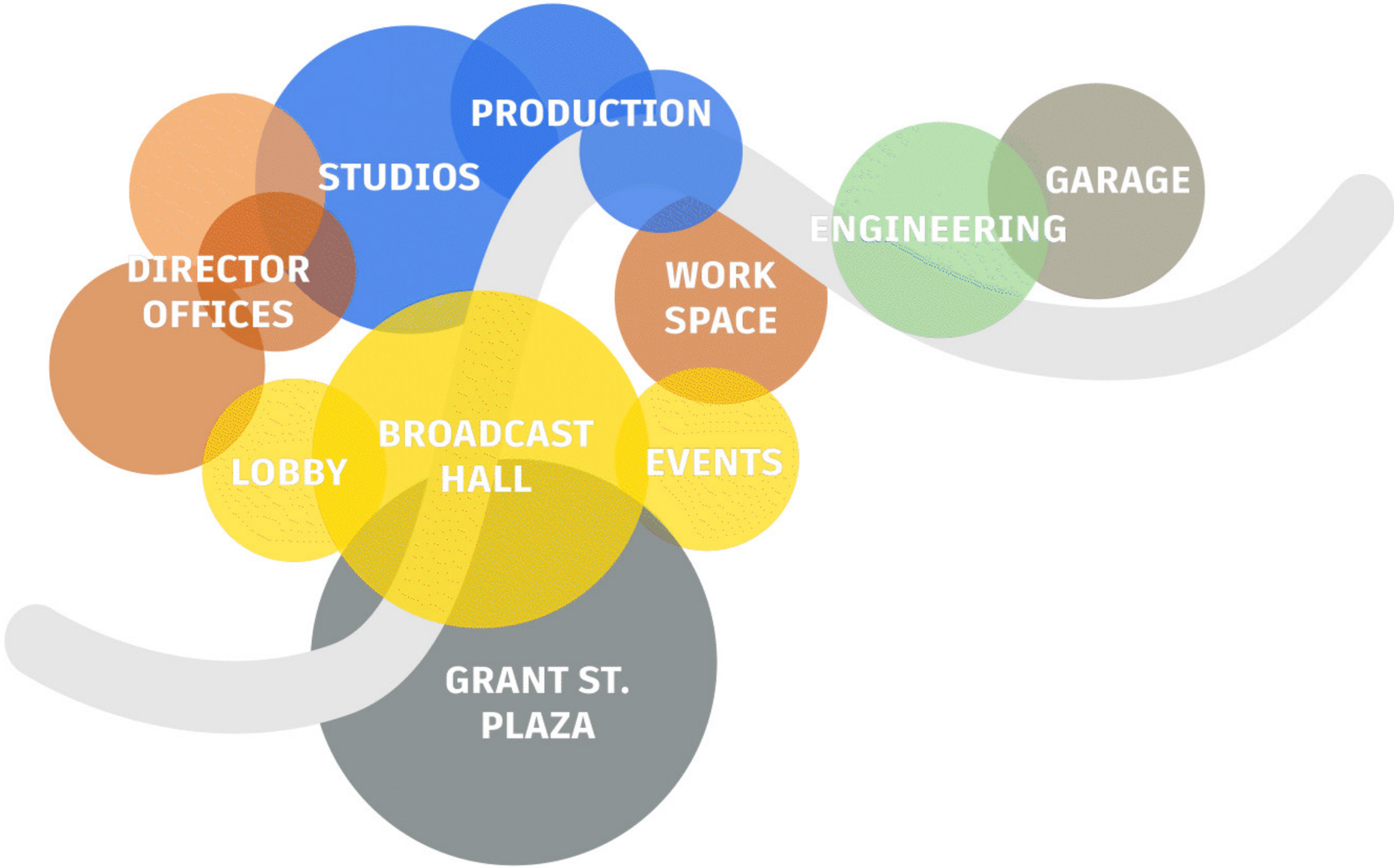
MASSING PROCESS



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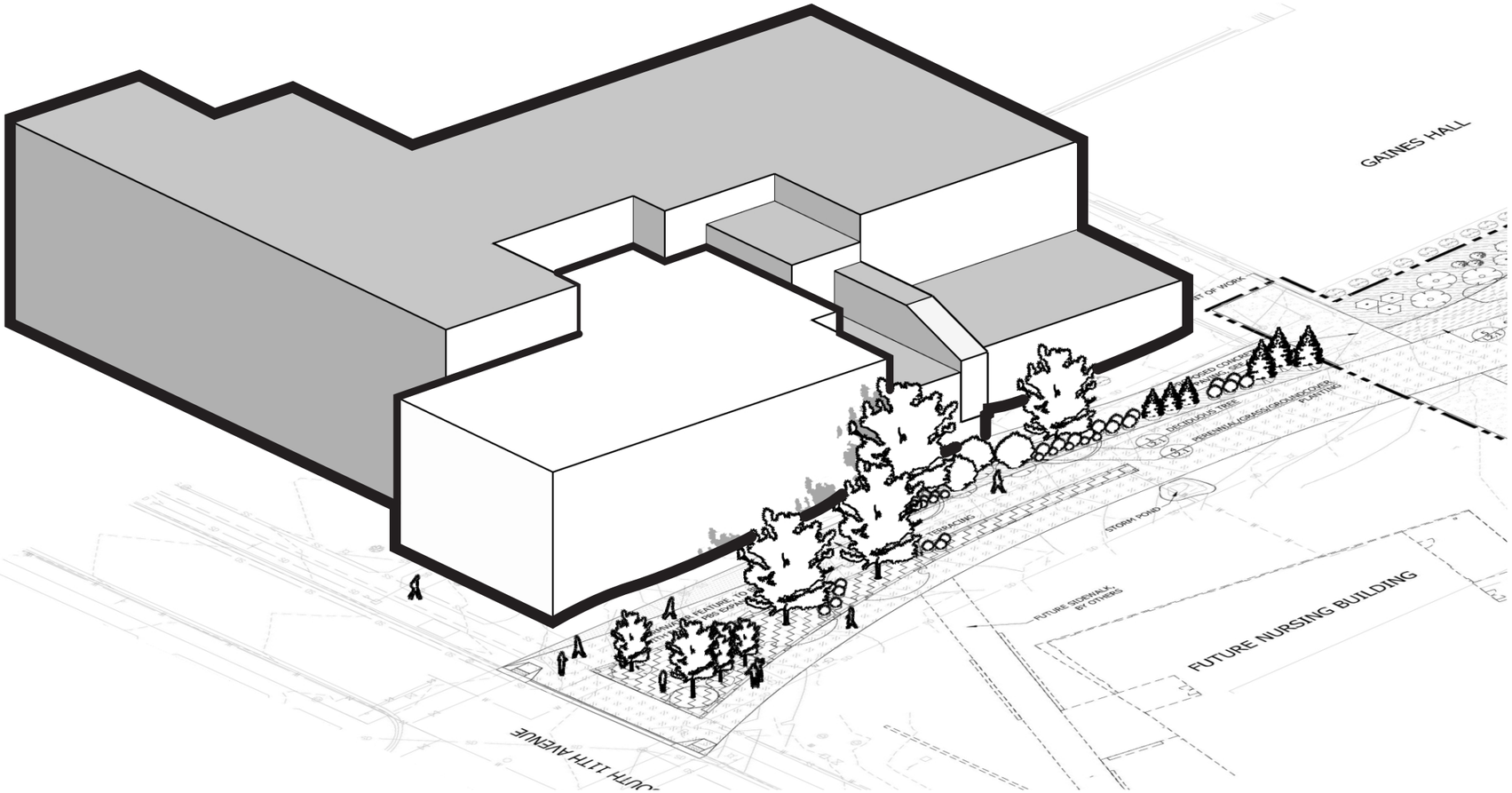
MASSING PROCESS

HOW DO WE TAKE OUR CORNER AND

TRANSFORM IT TO ENGAGE AND INSPIRE?



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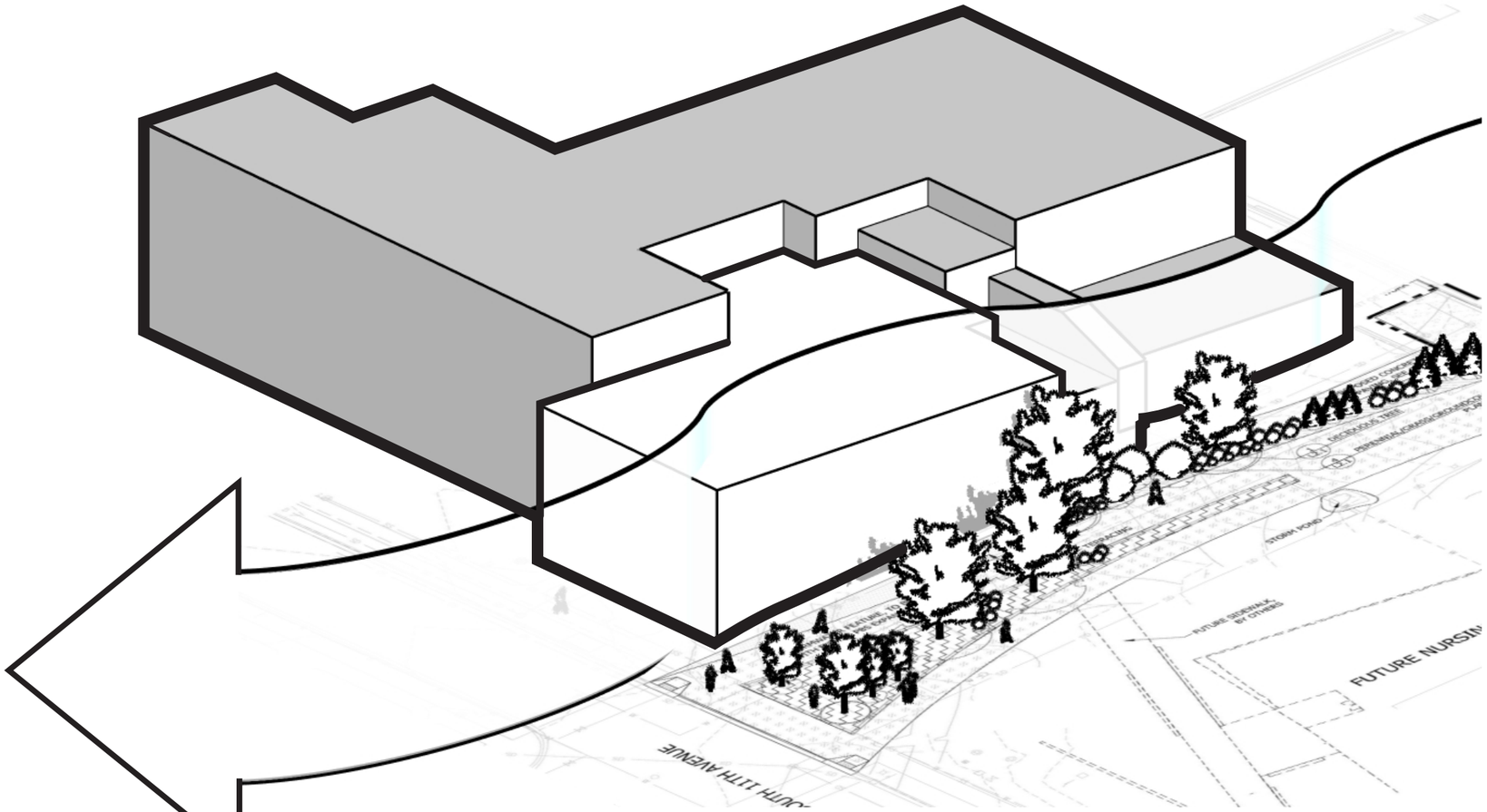
MASSING PROCESS

WE ARE A STOPPING POINT ALONG THE AIRWAVE.

information is always weaving it's way in and out of the MTPBS production spaces. Our building is simply a conduit for engaging content.



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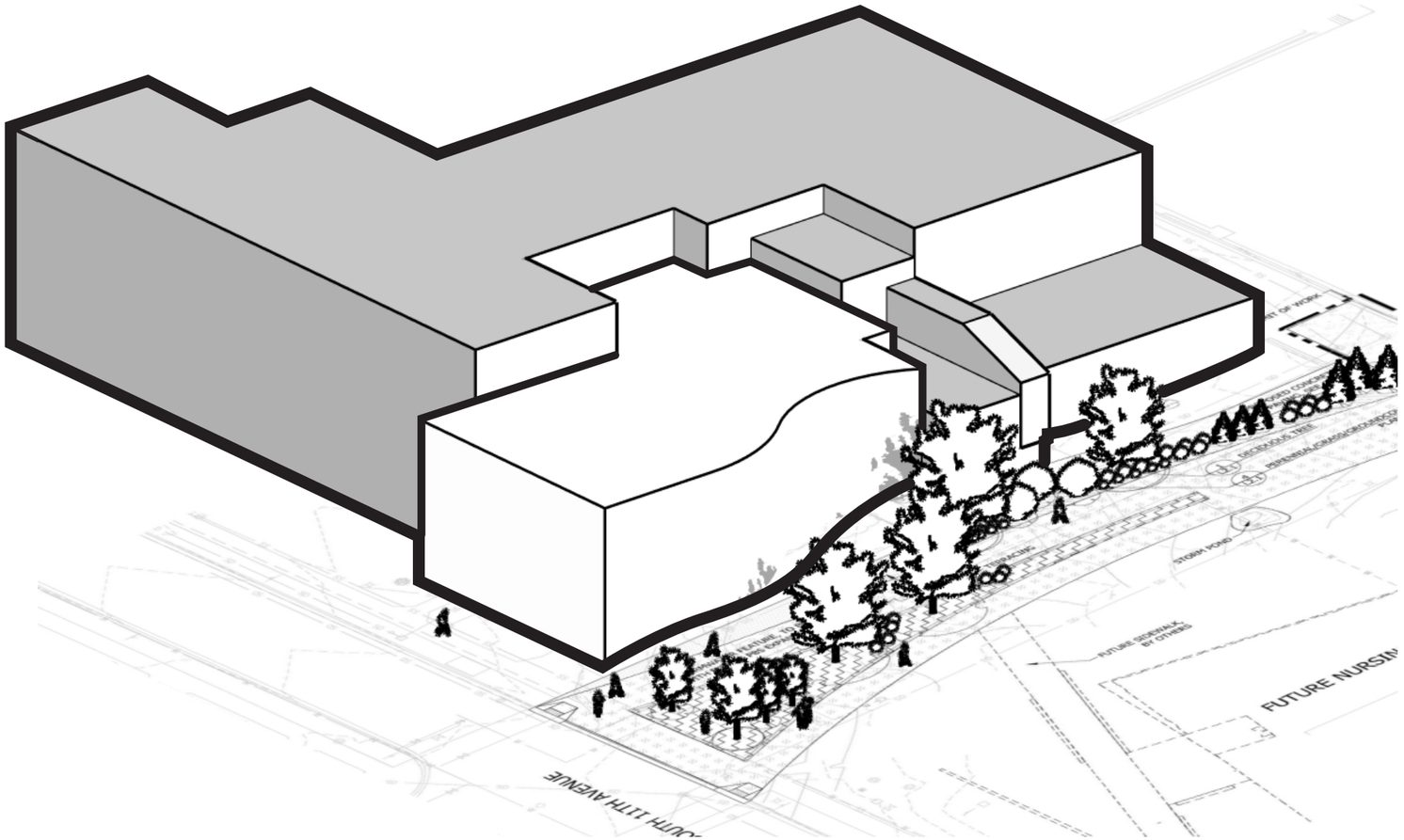
MASSING PROCESS

THE AIRWAVE TRANSFORMS OUR BLOCK AND MOLDS HOW WE ENGAGE

in the same way as information, students and community member should be ushered into the space by a welcoming form



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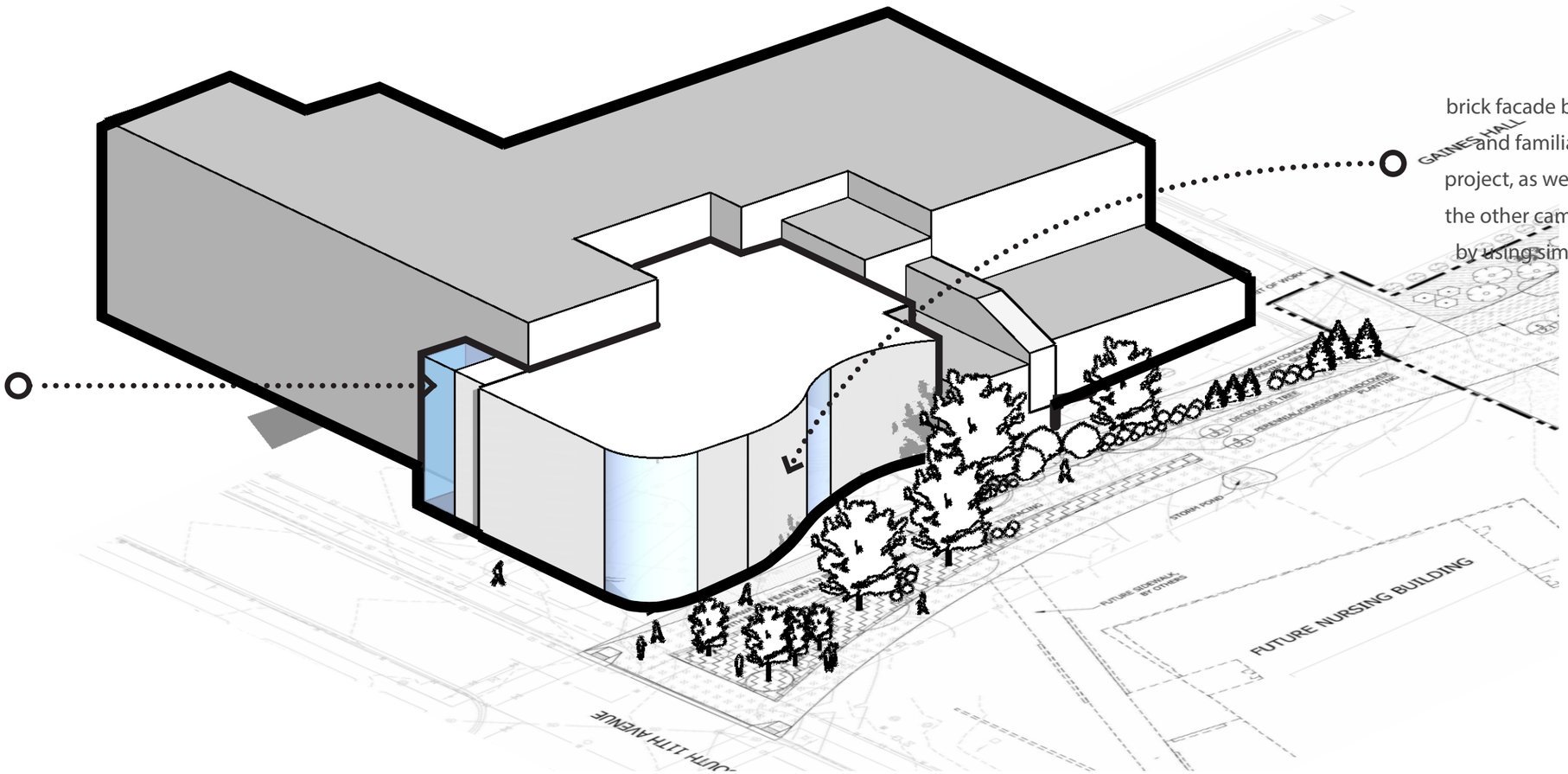
MASSING PROCESS

OUR MATERIALS SUPPORT CONTEXT AND ALLOW THE PROJECT TO TRANSFORM

Creatively using materials can give you a new perspective of our project as you move both around it and through it.



brick facade brings warmth and familiarity to the project, as well as tying into the other campus buildings by using similar materials

glass pulls away from the existing building and creates moments of transparency and connectivity

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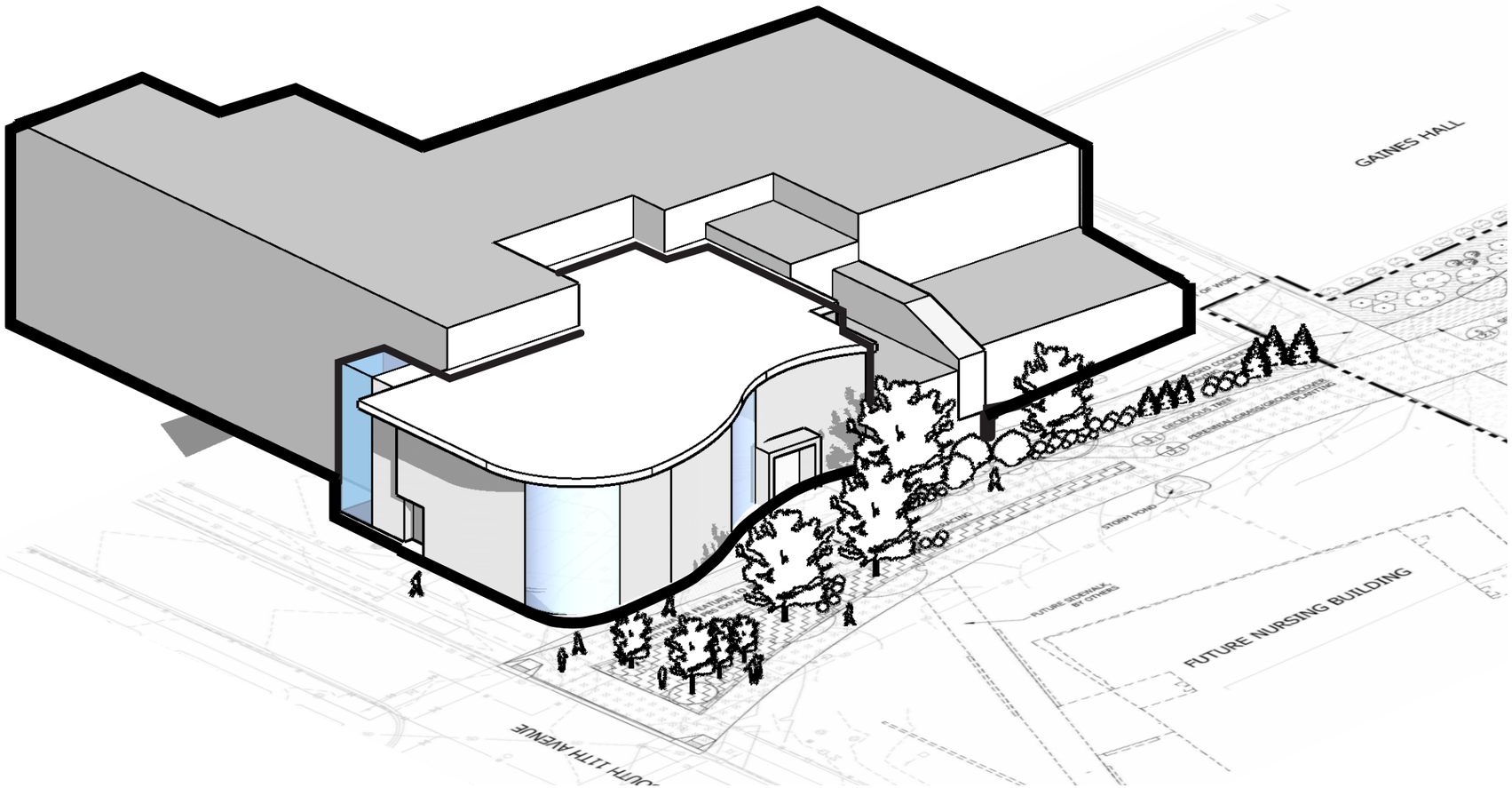
MASSING PROCESS

STRATEGIC LAYERS & OPENINGS ENGAGE THE INTERIOR & EXTERIOR AND REVEAL BRAND

it's the way we use transparency and layers that create intrigue and reveal the MTPBS brand to even the briefest passerby.



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So what the heck does it look like!?

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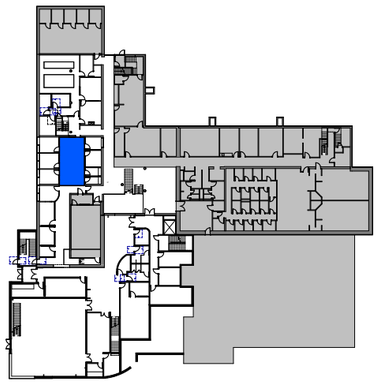
INTERIOR RENDER | LEVEL 1 RENOVATION



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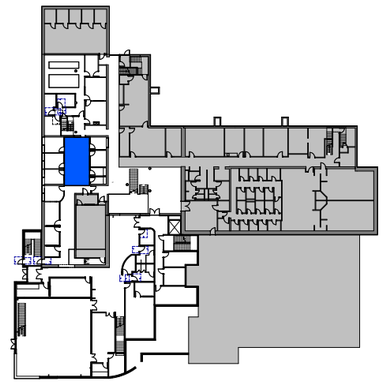
INTERIOR RENDER | LEVEL 1 RENOVATION



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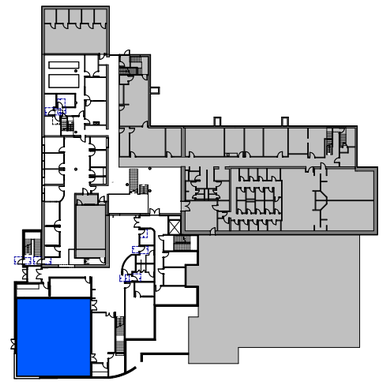
INTERIOR RENDER | CLASSROOM



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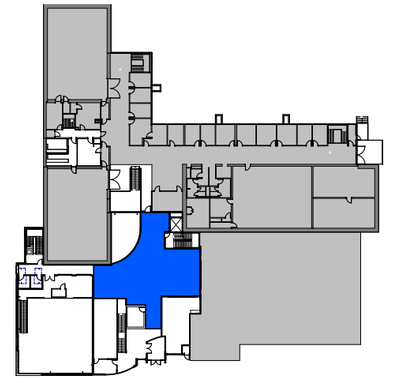
INTERIOR RENDER | INTEGRATED COMMONS



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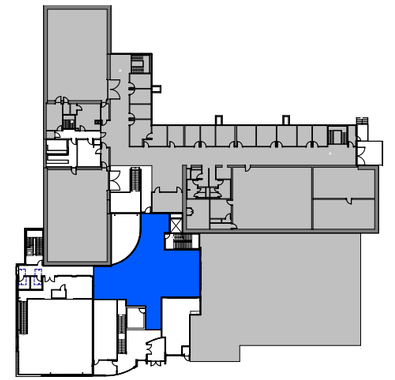
INTERIOR RENDER | INTEGRATED COMMONS



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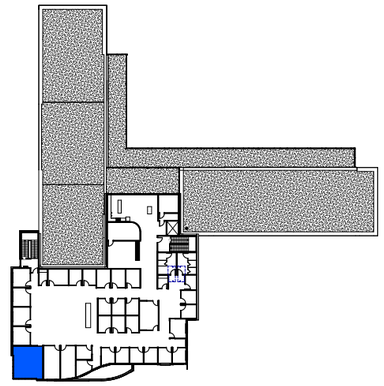
INTERIOR RENDER | THE LIGHT BOX



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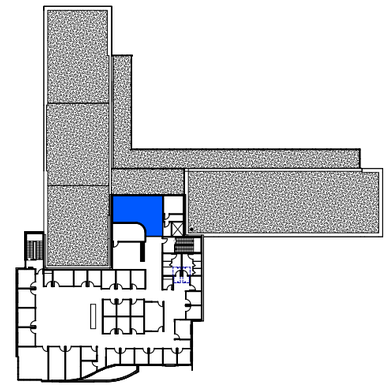
INTERIOR RENDER | BREAK ROOM



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5

BUDGET BREAKDOWN

5. BUDGET BREAKDOWN

INSIGHTS AND COMPREHENSIVE PROGRAM ADJUSTMENTS

MONTANA PBS ADDITION AND RENOVATION				
Fundraising Budget Campaign	$	16,000,000	Cost/SF	
ADDITION + ANNEX		11,200	$	1,381
RENOVATION		4,505	$	160
TOTAL SQUARE FEET:		15,705		
7/11/2024 PROGRAMMING START				
SMA Cost Estimate	$	16,733,001	Cost/SF	
ADDITION + ANNEX		15,020	$	1,078
RENOVATION		1,600	$	341
TOTAL SQUARE FEET:		16,620		
11/22/2024 100% SCHEMATIC DESIGN				
SMA Cost Estimate	$	22,696,821	Cost/SF	
ADDITION		22,247	$	931
RENOVATION		4,892	$	179
ANNEX		3,765	$	292
TOTAL SQUARE FEET:		30,904		
8/13/2024 OWNER'S PROJECT COST ESTIMATE				
MSU Approved Budget	$	16,800,000		
GENERAL CONTRACTOR	$	16,750,000		
MOVING COMPANY	$	50,000		
TOTAL:	$	16,800,000		
DIFFERENCE:	$	(5,896,821)		

BREAKDOWN OF INCREASED COST/SF				
ADDITION	22,247	Cost/SF	TOTALS	
ANNEX	3,765	$ 298	$	1,122,384
MULTIPURPOSE CLASSROOM	2,714	$ 913	$	2,479,103
INTEGRATED COMMONS	2,541	$ 913	$	2,321,076
KGLT (NEW CONSTRUCTION & RENNOVATION COST AVE.)	955	$ 536	$	511,880
TOTAL SQUARE FEET INCORPORATED INTO PROGRAM:	**6,210**		**$**	**6,434,443.90**

Insights and Comprehensive Program Adjustments:

As a television station, content producer, and statewide broadcast service, Montana PBS has unique needs and is fully committed to Montana State University's mission as a partner and university entity on the Bozeman campus. Montana PBS produces live coverage for over 65 live sporting events per year for MSU, along with live events like Commencement, Convocation, and Board of Regents meetings.
After reviewing the square footage proposed in the fundraising campaign totaling 11,200 square feet, it became clear that significant elements of the PBS organization and station management had been undervalued. SMA determined that critical parts of daily workflow were not being met in that program.

SMA began investigating to better understand the storage and equipment requirements that would satisfy the core needs of MTPBS now and for the next 20-30 years of growth and development of the station.
For example, The MTPBS field producers are responsible for preparing, loading, and transporting production equipment on a regular basis. It is common for a public television station to maintain large production vehicles along with scene shops and large staging areas. Rapid temperature changes or extreme environments put a lot of stress on sensitive equipment, causing excessive replacement or repair. The engineers are responsible for maintaining a statewide network of transmitters. This includes the Emergency Alert System (EAS) for broadcast of severe weather, Amber Alerts, and other communications during emergencies, and serves as a backup system for the Wireless Emergency Alerts system. Vehicle readiness and proximity to tools and staff play an essential role in the daily inner workings of the engineering and production departments within MTPBS.
This understanding culminated into justification for the Annex to be constructed providing an additional 3,765 square feet of space for storage, equipment demands, and future growth.

5. BUDGET BREAKDOWN

INSIGHTS AND COMPREHENSIVE PROGRAM ADJUSTMENTS

To sum up the Programming phase, it was critical to fulfill both the essential needs of MTPBS while meeting the expectations set forth by Montana State University. This exercise led to the incorporation of KGLT (995 SF), the size of The Annex (3,765 SF), an integrated student commons connecting the three institutions of VCB (2,541 SF) and an increase in the size of the classroom to meet an educational need for MSU (168 seats - 2,714 SF).

During the Schematic Design phase, it became clear that the success of the addition would hinge upon the other building partners being included in some way. The design team landed on an integrated commons concept that connects the School of Film and Photography and the Black Box Theater to the MTPBS addition. These partners are intrinsic to the overall vision that the MTPBS staff and organization has for their new home. The Integrated Commons is designed to be 2,541 square feet and incorporates student-centric space along with the relocated KGLT radio station. The School of Film and Photography and Black Box theater are directly adjacent with warm and welcoming space for shared gatherings and events to occur.

The partnership with Montana State University and Montana PBS is fundamental to the campus community. The Multipurpose classroom functionality became a focal point in the addition's design. After understanding the successes and failures of the existing lecture halls on MSU's campus, the design team has made every effort to provide the university with a space that evokes the student engagement and environmental components desired by Montana State University and aligns with their mission for excellence in education. The classroom is designed with 168 retractable seats at 2,714 square feet including the mezzanine. This size will accommodate the students and faculty comfortably with 16sf per person.

Insights and Comprehensive Program Adjustments:

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5. BUDGET BREAKDOWN

COST CONTROL STRATEGIES

Cost Control Strategies for Design Development:

Technology:
The current technology budget is $5,655,600, this is up from the initial cost estimate of $3,750,000, this is a $1.9M increase. The design team is working with the client to achieve a reduction of $1-2M. The client is currently analyzing technological equipment that they want to be included in the initial build-out and items that could be purchased and installed in the future. They will also identify equipment that they already have and can be eliminated from the current budgeted items.

Annex:
The design team anticipates a reduction in square footage planned for the annex to satisfy Montana State University needs. The program is currently being evaluated and substantiated by the MTPBS directors. The number of stalls is likely to be reduced by half. The current design is 3,765sf with a reduction of 25% or more expected during the design development phase.

GCCM:
Montana State University is preparing for the onboarding of a general contractor. The design team plans to collaborate with the contractor for efficiency in construction. This will include sitework, foundations, and the coordination of construction details. Ultimately eliminating the 10% contingency that is built into the current cost estimate totaling $1,822,881.

SMA Architecture + Design is committed to being within 10% of the project budget before entering the Construction Document phase of the project.

5. BUDGET BREAKDOWN

SMA PROGRAM COST ESTIMATE BUILDING ADDITION

100% Schematic Design

MSU - Visual Communications Building - Addition
Site Area: 55,151 SF
Building Area: 22,247 GSF

Construction Cost Estimate
Design Phase: 90% Schematic Design
MACC: $16,800,000

Element	Description	Cost	Cost/SqFt	Percent
A10	Foundations	$724,764	$32.58	4.21%
A20	Basement Construction	$180,077	$8.09	1.05%
B10	Superstructure	$1,519,360	$68.30	8.84%
B20	Exterior Enclosure	$1,263,896	$56.81	7.35%
B30	Roofing	$511,485	$22.99	2.97%
C10	Interior Construction	$1,137,767	$51.14	6.62%
C20	Stairs	$257,570	$11.58	1.50%
C30	Interior Finishes	$1,052,560	$47.31	6.12%
D10	Conveying Systems	$156,000	$7.01	0.91%
D20	Plumbing	$110,000	$4.94	0.64%
D30	HVAC	$1,235,000	$55.51	7.18%
D40	Fire Protection	$123,560	$5.55	0.72%
D50	Electrical	$1,748,188	$78.58	10.17%
E10	Equipment	$4,555,900	$204.79	26.49%
E20	Furnishings	$229,010	$10.29	1.33%
F10	Special Construction	$0	$0.00	0.00%
F20	Selective Building Demolition	$97,551	$4.38	0.57%
	Building Construction Cost	$14,902,687	$669.87	86.66%
G10	Site Preparation	$156,545	$7.04	0.91%
G20	Site Improvements	$239,657	$10.77	1.39%
G30	Site Mechanical Utilities	$74,420	$3.35	0.43%
G40	Site Electrical Utilities	$50,000	$2.25	0.29%
G90	Other Site Construction	$0	$0.00	0.00%
	Sitework Cost	$520,622	$23.40	3.03%
Z10	General Requirements (11.5%)	$1,773,681	$79.73	10.31%
	Subtotal of Estimated Construction Cost	**$17,196,990**	**$773.00**	**100.00%**
	CONTRACTOR FEES			
	Bonds and Insurance (1.50%)	$257,955	$11.60	1.50%
	Overhead and Profit (4.50%)	$773,865	$34.79	4.50%
	Total Estimated Construction Cost	**$18,228,809**	**$819.38**	**106.00%**
	90% SCHEMATIC DESIGN PHASE ADJUSTMENTS			
	Contingency to 100% CD's (10.00%)	$1,822,881	$81.94	10.60%
	Cost Index to Q4 '25 (3.68%)	$670,820	$30.15	3.90%
	Total Estimated Bid Amount	**$20,722,510**	**$931.47**	**120.50%**

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5. BUDGET BREAKDOWN

SMA PROGRAM COST ESTIMATE BUILDING ADDITION

100% Schematic Design

Montana PBS

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MSU Visual Communications - Addition
Site Area: 51,151 SF
Building Area: 22,247 SF

Construction Cost Estimate
Design Phase: 90% Schematic Design
MACC: $16,800,000

Code	Item Description	Quan	Unit	Unit Price	Total
A10	**Foundations**				
A1010	Continuous Footings	123	cuyd	1,500.00	184,500.00
A1010	Braced Frame Footings	67	cuyd	1,500.00	100,500.00
A1010	Spread Footings, all types	112	cuyd	850.00	95,200.00
A1010	Stem Walls	9	cuyd	1,628.90	14,660.10
A1010	Plinths, all types	45	each	2,000.00	90,000.00
A1010	Grout Baseplates	45	each	50.00	2,250.00
A1010	Cold-Applied Asphalt Damproofing	650	sqft	2.25	1,462.50
A1010	Excavation and Backfill for Continuous Footings	369	cuyd	25.00	9,225.00
A1010	Excavation and Backfill for Spread Footings	62	cuyd	75.00	4,650.00
A1020	Rammed Aggregate Piers, 10' depth	170	each	750.00	127,500.00
A1030	Doweling	271	lnft	4.00	1,084.00
A1030	Slab on Grade, 5" thick, with #3 @ 16"OC EW reinforcement	8,441	sqft	7.75	65,417.75
A1030	Mat Slab, 10" thick, with #5 T&B @ 12"OC EW reinforcement	160	sqft	16.00	2,560.00
A1030	Rigid Polystyrene Insulation, 2" thick, R10	530	sqft	4.25	2,252.50
A1030	Underslab Vapor Barrier, 15mil, taped seams	7,860	sqft	0.90	7,042.38
A1030	Subgrade Preparation under Slab on Grade	8,441	sqft	0.45	3,798.45
A1030	Gravel Fill,compacted, under 4" floor slabs, 6" deep	8,441	sqft	1.50	12,661.50
	Foundations Total				**724,764.18**
A20	**Basement Construction**				
A2010	Basement Excavation, 42" incl. haul off and disposal	939	cuyd	17.25	16,197.75
A2020	Concrete Walls, 8"	136	cuyd	1,205.00	163,879.39
	Basement Construction Total				**180,077.14**
B10	**Superstructure**				
B1010	Slab on Metal Deck, 5" total thickness, welded wire fabric reinforced	15,588	sqft	8.50	132,474.62
B1010	Floor Construction, by sqft of floor area	15,588	sqft	65.50	1,021,014.00
B1020	Roof Construction, by sqft of roof area	11,087	sqft	33.00	365,871.00
	Superstructure Total				**1,519,359.62**
B20	**Exterior Enclosure**				
B2010	Brick Veneer	7,065	sqft	66.00	466,290.00
B2010	Metal Stud Framed Backup Wall Construction, cost per sqft of exterior wall	9,149	sqft	28.00	256,172.00
B2010	Foamed-In-Place Insulation	1	lsum	2,500.00	2,500.00
B2010	Exterior Soffits, composite wood	1,271	sqft	55.00	69,898.79
B2010	Vertical Aluminum Plank Siding	1,500	sqft	40.00	60,000.00
B2010	Textured Aluminum Cladding, small qty.	31	sqft	150.00	4,650.00
B2010	Exterior Painting, misc. and/or unknown	1	lsum	15,000.00	15,000.00
B2010	Exterior Building Signage	1	lsum	30,000.00	30,000.00
B2020	Exterior Aluminum Storefront	2,734	sqft	110.00	300,740.00
B2030	Insulated Hollow Metal Door, 3'-0" x 7'-0"	1	each	900.00	900.00
B2030	Hollow Metal Door Frame, 3'-0" x 7'-0", single	1	each	575.00	575.00
B2030	Sectional Insulated Overhead Door, 8'x7', incl. single row of lites	1	each	5,400.00	5,400.00
B2030	Aluminum Storefront Door, 3'-0" x 7'-0"	7	each	3,800.00	26,600.00
B2030	Exterior Door Hardware, average cost per opening	8	set	3,100.00	24,800.00
B2030	Paint Exterior Hollow Metal Door Frames	1	each	185.00	185.00
B2030	Paint Exterior Hollow Metal Doors	1	each	185.00	185.00
	Exterior Enclosure Total				**1,263,895.79**
B30	**Roofing**				
B3010	Rough Carpentry, misc. and/or unknown, by sqft of roof	11,087	sqft	0.80	8,869.60
B3010	4-Ply BUR, R-30, incl. full taper insulation	11,087	sqft	45.00	498,915.00
B3020	Roof Hatch, incl. ladder assist post	1	each	3,700.00	3,700.00
	Roofing Total				**511,484.60**
C10	**Interior Construction**				
C1010	Blocking and Backing in Partition Walls, by sqft of finished area	22,247	sqft	1.25	27,808.75
C1010	Interior Storefront, 8' tall	3,192	sqft	105.00	335,144.04
C1010	Non-Structural Metal Stud Framing	29,869	sqft	6.25	186,681.25
C1010	Gypsum Board, on walls, 5/8" thick, taped and finished (level 4 finish)	56,090	sqft	2.05	115,096.68
C1010	Sound Attenuation Blankets in walls	26,221	sqft	1.60	41,953.60
C1020	Hollow Metal Door Frame, 3'-0" x 7'-0", single	35	each	575.00	20,125.00
C1020	Flush Wood Door, 3'-0" x 7'-0"	33	each	675.00	22,275.00
C1020	Flush Wood Door, 2'-0" x 7'-0"	2	each	525.00	1,050.00
C1020	Access Doors and Frames	1	lsum	2,500.00	2,500.00
C1020	Glass Slider Door, 6'-0" x 7'-0"	1	each	1,000.00	1,000.00
C1020	Glass Slider Door. 15'-8" x 7'-0"	1	each	8,800.00	8,800.00

5. BUDGET BREAKDOWN

SMA PROGRAM COST ESTIMATE BUILDING ADDITION

100% Schematic Design

Montana PBS

S M A architecture + design

MSU Visual Communications - Addition
Site Area: 51,151 SF
Building Area: 22,247 SF

Construction Cost Estimate
Design Phase: 90% Schematic Design
MACC: $16,800,000

Code	Item Description	Quan	Unit	Unit Price	Total
C1020	Glass Slider Door, 18'-0" x 7'-0"	1	each	10,000.00	10,000.00
C1020	Aluminum Storefront Door, 3'-0" x 7'-0"	49	each	3,600.00	176,400.00
C1020	Interior Door Hardware, average cost per opening	84	set	1,200.00	100,800.00
C1020	Paint Interior Hollow Metal Door Frames	35	each	185.00	6,475.00
C1030	Miscellaneous Steel Allowance	1	lsum	25,000.00	25,000.00
C1030	Interior Room Signage	166	each	150.00	24,900.00
C1030	Toilet Compartment, regular unit	3	each	2,700.00	8,100.00
C1030	Toilet Compartment, handicap unit	2	each	3,220.00	6,440.00
C1030	Urinal Partition	2	each	600.00	1,200.00
C1030	Shower Curtains and Track	3	lnft	25.00	75.00
C1030	Grab Bar, 18" long	6	each	150.00	900.00
C1030	Grab Bar, 18" long	1	each	150.00	150.00
C1030	Grab Bar, 36" long	1	each	160.00	160.00
C1030	Grab Bar, 36" long	6	each	160.00	960.00
C1030	Grab Bar, 42" long	6	each	175.00	1,050.00
C1030	Grab Bar, 42" long	1	each	175.00	175.00
C1030	Mirror, 18"W x 36"H	7	each	345.00	2,415.00
C1030	Toilet Paper Dispenser	8	each	145.00	1,160.02
C1030	Soap Dispenser	8	each	110.00	880.03
C1030	Paper Towel Dispenser	8	each	250.00	2,000.00
C1030	Fold Down Shower Seat	1	each	650.00	650.00
C1030	Robe Hook	2	each	71.25	142.50
C1030	Toilet Paper Dispenser	1	each	145.00	145.00
C1030	Mirror, 18"W x 36"H	1	each	345.00	345.00
C1030	Soap Dispenser	1	each	110.00	110.00
C1030	Paper Towel Dispenser	1	each	250.00	250.00
C1030	Sanitary Napkin Receptacle	6	each	225.00	1,350.00
C1030	Sanitary Napkin Receptacle	1	each	225.00	225.00
C1030	Changing Table	2	each	747.50	1,495.00
C1030	Toilet Seat Cover Dispenser	8	each	120.00	959.96
C1030	Toilet Seat Cover Dispenser	1	each	120.00	120.00
C1030	Mop and Broom Holder	1	each	300.00	300.00
	Interior Construction Total				**1,137,766.83**

C20 Stairs

C2010	Steel Stairs, single story, incl. handrails	2	each	20,000.00	40,000.00
C2010	Roof Ladders	1	each	2,500.00	2,500.00
C2010	Steel Stairs, three story incl. landings and handrails	2	each	70,000.00	140,000.00
C2010	Metal Guardrails	46	lnft	250.00	11,500.00
C2020	Interior Glass Guardrail	94	sqft	350.00	32,900.00
C2020	Interior Relites	54	sqft	105.00	5,670.00
C2020	Stair Finishes	1	lsum	25,000.00	25,000.00
	Stairs Total				**257,570.00**

C30 Interior Finishes

C3010	Wood Wall Finishes	6,500	sqft	45.00	292,500.00
C3010	Vinyl Wall Coverings	2,700	sqft	7.00	18,900.00
C3010	Paint Gypsum Board Walls	66,519	sqft	0.90	59,867.10
C3020	Sealed Concrete Floors	21,665	sqft	1.75	37,913.75
C3020	Floor Finishes, by sqft of building area	23,448	sqft	6.00	140,688.00
C3030	Framing and Suspension Systems for Gypsum Board Ceilings	9,691	sqft	7.75	75,105.25
C3030	Framing and Suspension Systems for Gypsum Board Soffit Sides	1,280	sqft	8.50	10,880.00
C3030	Gypsum Board Ceilings & Soffits	9,691	sqft	9.75	94,487.25
C3030	Acoustical Panel Ceilings, 2'x2'	6,669	sqft	11.00	73,359.00
C3030	Acoustical Panel Ceilings, 2'x2' black	3,300	sqft	12.50	41,250.00
C3030	Suspended Wood Ceilings, incl. fasciae	1,362	sqft	120.25	163,774.08
C3030	Acoustical Baffle Ceiling	660	lnft	45.00	29,701.27
C3030	Paint Exposed Roof Structure, structural steel, bar joists or metal deck	1,497	sqft	1.35	2,020.95
C3030	Paint Gypsum Board Ceilings	9,691	sqft	1.25	12,113.75
	Interior Finishes Total				**1,052,560.40**

D10 Conveying

D1010	Elevator, 3 stop single sided	1	lsum	156,000.00	156,000.00
	Conveying Total				**156,000.00**

D20 Plumbing

D2000	Plumbing	22,247	gsf	4.94	110,000.00
	Plumbing Total				**110,000.00**

5. BUDGET BREAKDOWN

SMA PROGRAM COST ESTIMATE BUILDING ADDITION

100% Schematic Design

Montana PBS

S M A architecture + design

MSU Visual Communications - Addition
Site Area: 51,151 SF
Building Area: 22,247 SF

Construction Cost Estimate
Design Phase: 90% Schematic Design
MACC: $16,800,000

Code	Item Description	Quan	Unit	Unit Price	Total
D30	**HVAC**				
D3000	HVAC	22,247	sqft	53.94	1,200,000.00
D3000	Commissioning	1	lsum	15,000.00	15,000.00
D3000	Air/Hydronic Balancing	22,247	gsf	0.90	20,000.00
	HVAC Total				**1,235,000.00**
D40	**Fire Protection**				
D4000	Fire Sprinkler Piping/Heads - Wet	22,247	gsf	5.39	120,000.00
D4030	Emergency Key Cabinet	1	each	635.00	635.00
D4030	Fire Extinguisher & Semi-Recessed Cabinet	5	each	585.00	2,925.00
	Fire Protection Total				**123,560.00**
D50	**Electrical**				
D5000	Electrical, incl. fire alarm expansion and security, AV and low voltage rough-in	22,247	gsf	61.13	1,360,000.00
D5000	Specialty Lighting Allowance	1	lsum	40,000.00	40,000.00
D5000	Security System, incl. cameras, access control and head-end control	22,247	gsf	15.65	348,187.50
	Electrical Total				**1,748,187.50**
E10	**Equipment**				
E1020	Large Studio, Flex, Classroom AV Tech and Lighting	1	lsum	610,000.00	610,000.00
E1020	Large Studio Tight Pitch LED Lighting	1	lsum	710,000.00	710,000.00
E1020	Large Studio Control Room Production System	1	lsum	1,960,000.00	1,960,000.00
E1020	Small Green Screen Studio AV Tech and Lighting	1	lsum	360,000.00	360,000.00
E1020	Small Studio Control Room Production System	1	lsum	910,000.00	910,000.00
E1090	Refrigerator	2	each	1,850.00	3,700.00
E1090	Dishwasher	1	each	1,200.00	1,200.00
E1090	Microwave	2	each	500.00	1,000.00
	Equipment Total				**4,555,900.00**
E20	**Furnishings**				
E2010	Window Coverings, roller shades at all exterior glazing	5,506	sqft	25.00	68,825.00
E2010	Automated Track Curtain (allowance)	1,290	sqft	30.00	19,350.00
E2010	Reception Casework Allowance, incl. solid surface countertops	1	lsum	10,000.00	10,000.00
E2010	Base Cabinets	55	lnft	350.00	19,250.00
E2010	Casework Benches, incl. cushions	20	lnft	450.00	9,000.00
E2010	Casework Archways	6	each	5,000.00	30,000.00
E2010	Structural Counter Subtops	32	lnft	35.00	1,120.00
E2010	Solid Surface Countertops	149	sqft	85.00	12,665.00
E2010	MPR Screening Retractable Seating	168	seats	350.00	58,800.00
	Furnishings Total				**229,010.00**
F20	**Selective Building Demolition**				
F2010	Select Demolition, facade	1	lsum	10,000.00	10,000.00
F2010	Demolish and Remove Concrete Walls	750	sqft	11.75	8,810.00
F2010	Demolish and Remove Concrete Foundations	75	lnft	48.00	3,600.02
F2010	Demolish and Remove Concrete Staircases, incl. disposal	1	lsum	13,000.00	13,000.00
F2010	Shore and Demolish Concrete Beam	1	lsum	14,400.00	14,400.00
F2010	Demolish Metal Guardrails	126	lnft	14.00	1,763.86
F2010	Roofing Demolition	816	sqft	8.75	7,140.00
F2010	Demolish Interior Storefront Vestibule	358	sqft	23.00	8,235.65
F2010	Demolish Exterior Storefront Vestibule and Exterior Glazing	1,200	sqft	23.50	28,201.85
F2010	Demolish Exterior Storefront Doors	4	each	300.00	1,200.00
F2010	Demolish Interior Storefront Doors	4	each	300.00	1,200.00
	Selective Building Demolition Total				**97,551.38**
G10	**Site Preparation**				
G1000	Mobilization	1	lsum	20,000.00	20,000.00
G1000	Survey and Staking	1	lsum	18,000.00	18,000.00
G1020	Sawcut Concrete Pavement	215	lnft	6.00	1,290.00
G1020	Sawcut Asphalt Pavement	348	lnft	4.50	1,566.00
G1020	Removal Concrete Pavement	6,989	sqft	2.00	13,978.00
G1020	Demo Curb	178	lnft	4.00	712.04
G1020	Removal Asphalt Pavement	4,885	sqft	2.00	9,770.00
G1020	Remove Landscaped Areas, incl disposal	2,015	sqyd	2.25	4,533.75
G1020	Tree Removal	9	each	1,200.00	10,800.00
G1030	Site Grading Excavation	2,050	cuyd	10.00	20,500.00
G1030	Export Material, incl. disposal	2,350	cuyd	18.00	42,300.00
G1030	Export Spoils from Rammed Aggregate Piers	200	cuyd	18.00	3,600.00

5. BUDGET BREAKDOWN

SMA PROGRAM COST ESTIMATE BUILDING ADDITION

100% Schematic Design

Montana PBS

S M A architecture + design

MSU Visual Communications - Addition
Site Area: 51,151 SF
Building Area: 22,247 SF

Construction Cost Estimate
Design Phase: 90% Schematic Design
MACC: $16,800,000

Code	Item Description	Quan	Unit	Unit Price	Total
G1030	Inlet Protection	1	lsum	1,800.00	1,800.00
G1030	Silt Fence, incl. maintenance	710	lnft	4.50	3,195.00
G1030	Rock Construction Entrance	1	each	4,500.00	4,500.00
	Site Preparation Total				**156,544.79**
G20	**Site Improvements**				
G2020	Asphalt Pavement 3" incl. 6" CSTC	475	sqyd	46.00	21,850.00
G2030	Concrete Stairs, ground cast	16	sqft	75.00	1,200.00
G2030	ADA Ramps	1	each	2,500.00	2,500.00
G2030	Sidewalks, standard	5,386	sqft	8.00	43,088.00
G2040	Concrete Seat Walls, incl. footings	416	lnft	275.00	114,400.00
G2050	Bicycle Racks	5	each	1,155.00	5,775.00
G2050	Irrigation	11,808	sqft	1.50	17,712.00
G2050	Trees, 2" caliper	2	each	700.00	1,400.00
G2050	Plantings	5,608	sqft	4.00	22,432.00
G2050	Sodded Lawn	6,200	sqft	1.50	9,300.00
	Site Improvements Total				**239,657.00**
G30	**Site Mechanical Utilities**				
G3020	Sanitary Sewer Tap	1	each	250.00	250.00
G3020	Sanitary Sewer Piping, 6" SDR35, Option B	158	lnft	115.00	18,170.00
G3030	Storm Sewer, by gsf of building area	21,665	gsf	2.58	56,000.00
	Site Mechanical Utilities Total				**74,420.00**
G40	**Site Electrical Utilities**				
G4000	Site Electrical Modifications	1	lsum	50,000.00	50,000.00
	Site Electrical Utilities Total				**50,000.00**
	Grand Total	**22,247**	**gsf**	**693.28**	**15,423,309.22**

5. BUDGET BREAKDOWN

SMA PROGRAM COST ESTIMATE BUILDING RENOVATION

100% Schematic Design

MSU - Visual Communications Building - Renovation
Site Area: 55,151 SF
Building Area: 4,892 GSF

Construction Cost Estimate
Design Phase: 90% Schematic Design
MACC: $16,800,000

Element	Description	Cost	Cost/SqFt	Percent
A10	Foundations	$0	$0.00	0.00%
A20	Basement Construction	$0	$0.00	0.00%
B10	Superstructure	$0	$0.00	0.00%
B20	Exterior Enclosure	$0	$0.00	0.00%
B30	Roofing	$0	$0.00	0.00%
C10	Interior Construction	$35,321	$7.22	5.12%
C20	Stairs	$0	$0.00	0.00%
C30	Interior Finishes	$234,466	$47.93	34.00%
D10	Conveying Systems	$0	$0.00	0.00%
D20	Plumbing	$0	$0.00	0.00%
D30	HVAC	$41,500	$8.48	6.02%
D40	Fire Protection	$0	$0.00	0.00%
D50	Electrical	$64,000	$13.08	9.28%
E10	Equipment	$0	$0.00	0.00%
E20	Furnishings	$0	$0.00	0.00%
F10	Special Construction	$0	$0.00	0.00%
F20	Selective Building Demolition	$147,143	$30.08	21.34%
	Building Construction Cost	$522,429	$106.79	75.76%
G10	Site Preparation	$0	$0.00	0.00%
G20	Site Improvements	$0	$0.00	0.00%
G30	Site Mechanical Utilities	$0	$0.00	0.00%
G40	Site Electrical Utilities	$0	$0.00	0.00%
G90	Other Site Construction	$0	$0.00	0.00%
	Sitework Cost	$0	$0.00	0.00%
Z10	General Requirements (32%)	$167,177	$34.17	24.24%
	Subtotal of Estimated Construction Cost	**$689,606**	**$140.97**	**100.00%**
	CONTRACTOR FEES			
	Bonds and Insurance (1.50%)	$10,344	$2.11	1.50%
	Overhead and Profit (10.00%)	$68,961	$14.10	10.00%
	Total Estimated Construction Cost	**$768,911**	**$157.18**	**111.50%**
	90% SCHEMATIC DESIGN PHASE ADJUSTMENTS			
	Contingency to 100% CD's (10.00%)	$76,891	$15.72	11.15%
	Cost Index to Q4 '25 (3.68%)	$28,296	$5.78	4.10%
	Total Estimated Bid Amount	**$874,098**	**$178.68**	**126.75%**

Montana PBS

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5. BUDGET BREAKDOWN

SMA PROGRAM COST ESTIMATE BUILDING RENOVATION

100% Schematic Design

MSU Visual Communications - Renovation
Site Area: 51,151 SF
Building Area: 4,892 SF

Construction Cost Estimate
Design Phase: 90% Schematic Design
MACC: $16,800,000

Code	Item Description	Quan	Unit	Unit Price	Total
C10	**Interior Construction**				
C1010	Blocking and Backing in Partition Walls, by sqft of finished area	4,892	sqft	1.25	6,115.00
C1010	Non-Structural Metal Stud Framing	1,755	sqft	7.00	12,285.00
C1010	Gypsum Board, on walls, 5/8" thick, taped and finished (level 4 finish)	3,510	sqft	2.05	7,202.52
C1010	Sound Attenuation Blankets in walls	1,755	sqft	1.60	2,808.00
C1020	Access Doors and Frames	1	lsum	500.00	500.00
C1020	Paint Existing Interior Hollow Metal Door Frames	16	each	185.00	2,960.00
C1030	Interior Room Signage	23	each	150.00	3,450.00
	Interior Construction Total				**35,320.52**
C30	**Interior Finishes**				
C3010	Wood Wall Finishes	1,800	sqft	45.00	81,000.00
C3010	Paint Gypsum Board Walls	15,040	sqft	0.90	13,536.00
C3020	Floor Finishes, by sqft of building area	4,892	sqft	6.00	29,352.00
C3030	Framing and Suspension Systems for Gypsum Board Ceilings	917	sqft	12.00	11,004.00
C3030	Gypsum Board Ceilings	917	sqft	11.00	10,087.00
C3030	Acoustical Panel Ceilings, 2'x2'	4,300	sqft	11.00	47,300.00
C3030	Suspended Wood Ceilings, incl. fasciae	350	sqft	80.00	28,000.00
C3030	Acoustical Baffle Ceiling, varying widths	230	lnft	55.00	12,650.44
C3030	Paint Gypsum Board Ceilings, incl. some existing GWB areas	1,229	sqft	1.25	1,536.25
	Interior Finishes Total				**234,465.69**
D30	**HVAC**				
D3000	HVAC Modifications, renovation	4,892	sqft	8.18	40,000.00
D3000	Air/Hydronic Balancing	4,892	gsf	0.31	1,500.00
	HVAC Total				**41,500.00**
D50	**Electrical**				
D5000	Electrical Modifications	4,892	gsf	13.08	64,000.00
	Electrical Total				**64,000.00**
F20	**Selective Building Demolition**				
F2010	Select Demolition, interior	4,892	sqft	6.00	29,352.00
F2010	Selective Demolition Disposal	1	lsum	15,000.00	15,000.00
F2010	Demolish Acoustical Ceilings	4,892	sqft	0.93	4,550.73
F2010	Demolish Drywall Ceilings	93	sqft	4.30	400.00
F2020	Asbestos Abatement Allowance	4,892	sqft	20.00	97,840.00
	Selective Building Demolition Total				**147,142.73**
	Grand Total	**4,892**	**gsf**	**106.79**	**522,428.95**

Montana PBS

S M A architecture + design

5. BUDGET BREAKDOWN

SMA PROGRAM COST ESTIMATE BUILDING ANNEX

100% Schematic Design

MSU - Visual Communications Building - Annex
Site Area: 55,151 SF
Building Area: 3,765 GSF

Construction Cost Estimate
Design Phase: 90% Schematic Design
MACC: $16,800,000

Element	Description	Cost	Cost/SqFt	Percent
A10	Foundations	$77,183	$20.50	8.89%
A20	Basement Construction	$0	$0.00	0.00%
B10	Superstructure	$56,475	$15.00	6.51%
B20	Exterior Enclosure	$345,793	$91.84	39.84%
B30	Roofing	$51,040	$13.56	5.88%
C10	Interior Construction	$35,480	$9.42	4.09%
C20	Stairs	$0	$0.00	0.00%
C30	Interior Finishes	$6,589	$1.75	0.76%
D10	Conveying Systems	$0	$0.00	0.00%
D20	Plumbing	$0	$0.00	0.00%
D30	HVAC	$61,740	$16.40	7.11%
D40	Fire Protection	$585	$0.16	0.07%
D50	Electrical	$74,088	$19.68	8.54%
E10	Equipment	$0	$0.00	0.00%
E20	Furnishings	$0	$0.00	0.00%
F10	Special Construction	$0	$0.00	0.00%
F20	Selective Building Demolition	$0	$0.00	0.00%
	Building Construction Cost	$708,972	$188.31	81.68%
G10	Site Preparation	$2,500	$0.66	0.29%
G20	Site Improvements	$0	$0.00	0.00%
G30	Site Mechanical Utilities	$0	$0.00	0.00%
G40	Site Electrical Utilities	$0	$0.00	0.00%
G90	Other Site Construction	$0	$0.00	0.00%
	Sitework Cost	$2,500	$0.66	0.29%
Z10	General Requirements (22%)	$156,524	$41.57	18.03%
	Subtotal of Estimated Construction Cost	**$867,996**	**$230.54**	**100.00%**
	CONTRACTOR FEES			
	Bonds and Insurance (1.50%)	$13,020	$3.46	1.50%
	Overhead and Profit (10.00%)	$86,800	$23.05	10.00%
	Total Estimated Construction Cost	**$967,815**	**$257.06**	**111.50%**
	90% SCHEMATIC DESIGN PHASE ADJUSTMENTS			
	Contingency to 100% CD's (10.00%)	$96,782	$25.71	11.15%
	Cost Index to Q4 '25 (3.68%)	$35,616	$9.46	4.10%
	Total Estimated Bid Amount	**$1,100,213**	**$292.22**	**126.75%**

Montana PBS

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5. BUDGET BREAKDOWN

SMA PROGRAM COST ESTIMATE BUILDING ANNEX

100% Schematic Design

Montana PBS

S M A architecture + design

MSU Visual Communications - Annex
Site Area: 51,151 SF
Building Area: 3,765 SF

Construction Cost Estimate
Design Phase: 90% Schematic Design
MACC: $16,800,000

Code	Item Description	Quan	Unit	Unit Price	Total
A10	**Foundations**				
A1010	Foundations	3,765	sqft	20.50	77,182.50
	Foundations Total				**77,182.50**
B10	**Superstructure**				
B1020	Wood Roof Framing and Sheathing, by sqft of roof area	3,765	sqft	15.00	56,475.00
	Superstructure Total				**56,475.00**
B20	**Exterior Enclosure**				
B2010	Brick Veneer	2,240	sqft	66.00	147,840.00
B2010	Exterior Wall Assembly, by sqft of building area	3,765	sqft	20.35	76,617.75
B2010	Vertical Aluminum Plank Siding	1,950	sqft	40.00	78,000.00
B2010	Exterior Building Signage	1	lsum	1,000.00	1,000.00
B2030	Insulated Hollow Metal Door, 3'-0" x 7'-0"	3	each	900.00	2,700.00
B2030	Hollow Metal Door Frame, 3'-0" x 7'-0", single	1	each	575.00	575.00
B2030	Hollow Metal Door Frame, 6'-0" x 7'-0", single	1	each	650.00	650.00
B2030	Sectional Insulated Overhead Door, 10'x8'	4	each	7,000.00	28,000.00
B2030	Exterior Door Hardware, average cost per opening	3	set	3,100.00	9,300.00
B2030	Paint Exterior Hollow Metal Door Frames	3	each	185.00	555.00
B2030	Paint Exterior Hollow Metal Doors	3	each	185.00	555.00
	Exterior Enclosure Total				**345,792.75**
B30	**Roofing**				
B3010	Roofing, composition shingles, 9:12	5,104	sqft	10.00	51,040.00
	Roofing Total				**51,040.00**
C10	**Interior Construction**				
C1010	Fixed Interior Partitions	960	sqft	10.00	9,600.00
C1020	Hollow Metal Door, 3'-0" x 7'-0"	9	each	725.00	6,525.00
C1020	Hollow Metal Door Frame, 3'-0" x 7'-0", single	5	each	575.00	2,875.00
C1020	Hollow Metal Door Frame, 6'-0" x 7'-0", single	2	each	650.00	1,300.00
C1020	Interior Door Hardware, average cost per opening	9	set	1,200.00	10,800.00
C1020	Paint Interior Hollow Metal Door Frames	9	each	185.00	1,665.00
C1020	Paint Interior Hollow Metal Doors	9	each	185.00	1,665.00
C1030	Interior Room Signage	7	each	150.00	1,050.00
	Interior Construction Total				**35,480.00**
C30	**Interior Finishes**				
C3020	Sealed Concrete Floors	3,765	sqft	1.75	6,588.75
	Interior Finishes Total				**6,588.75**
D30	**HVAC**				
D3000	HVAC, annex	3,765	sqft	16.40	61,740.00
	HVAC Total				**61,740.00**
D40	**Fire Protection**				
D4030	Fire Extinguisher & Semi-Recessed Cabinet	1	each	585.00	585.00
	Fire Protection Total				**585.00**
D50	**Electrical**				
D5000	Electrical, incl. fire alarm, annex	3,765	gsf	19.68	74,088.00
	Electrical Total				**74,088.00**
G10	**Site Preparation**				
G1000	Survey and Staking	1	lsum	2,500.00	2,500.00
	Site Preparation Total				**2,500.00**
	Grand Total	**3,765**	**gsf**	**188.97**	**711,472.00**

6 PROJECT SCHEDULE

6. PROJECT SCHEDULE

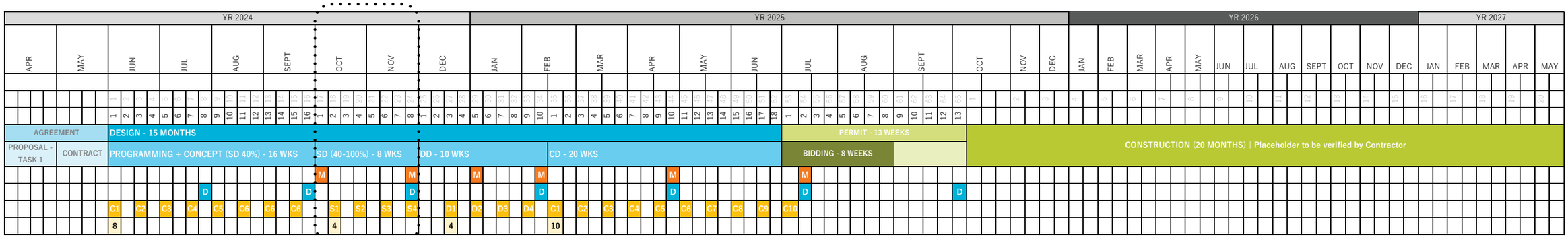
PRELIMINARY PROJECT SCHEDULE

The preliminary project schedule, developed in May of 2024, provides the project with guidelines for specific project phase timelines and progressions. The dates indicate herein are not set in stone, as a certainly flexibility is always needed for any project type and especially when incorporating Entitlement and Permitting phases.

Early engagement with a General Contractor will allow for clarity for Montana State University on the opportunities and challenges within this renovation and addition. They will help inform the schedule moving forward.

MTPBS, VisComm - PROPOSED DESIGN SCHEDULE

10/17/2024



MILESTONES

- M MEETINGS
- M OWNER REVIEW MILESTONE (GENERALLY 50% & 100%)
- D DELIVERABLE
- x R HOLD FOR OWNER REVIEW (2 WEEKS)

D DESIGN DELIVERABLE

END JULY - PROGRAMMING
END SEPT - 100% CONCEPT

END OF NOVEMBER - 100% SD
EARLY JANUARY 2025 - 50% DD
MID FEBRUARY 2025 - 100% DD
APRIL 2025 - 50% CD
JUNE 2025 - 75% CD
JULY 2025 - 100% CD
SEPTEMBER 2025 - CONFORMANCE SET

NOTES

SD - SCHEMATIC DESIGN
DD - DESIGN DEVELOPMENT
CD - CONSTRUCTION DOCUMENTS
CONSTRUCTION TIMELINE - To be established by GCCM.

D MTPBS MEETINGS

Design meetings with the "Work Group" including MTPBS, SMA, and others as appropriate will be held every other week. Meeting's indicated with "X" to represent phase and "Number" representing quantity of meetings in phase.

This document serves as a **milestone** as we move into the **next phase** of this **exciting journey**. The presented information serves as evidence of the commitment of the entire team to continue to further understand building and programmatic requirements, refinement of aesthetic design concepts, budget analysis, and collaboration with all stakeholders as we enter the **Design Development** phase. SMA looks forward to continued excellence in project delivery for the **MTPBS team and Montana State University**. The project is ever evolving, even as you read this document, to ensure a successful project is realized as an **asset for the entire state**.

Thank you!

Montana PBS

SMA architecture + design