IPD STUDIO

EAST LOS ANGELES COMMUNITY COLLEGE
STUDENT UNION BUILDING
SCHEMATIC DESIGN PROPOSAL

GREEN BACK DESIGN BUILD

PREPARED BY: NICHOLAS NORTHROP CODY BERGER ANDREW BROWN ROBERT LUEMERS EVAN WARREN

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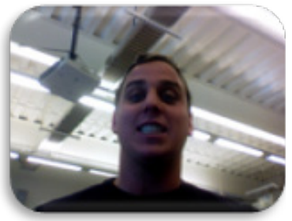
1.1 GBDB DESIGN TEAM

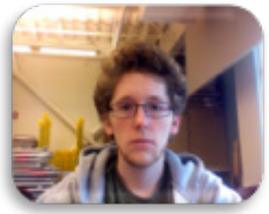
NICHOLAS NORTHROP
Senior Prinicpal Architect



Years with Greenback: 10
Years in Industry: 10
Education:
Bachelor's in Architecture from
Cal Poly San Luis Obispo in 1988.
Introduction:

Mr. Northrop has been in architectural design for the past 10 years. He has become a principal architect at Greenback Design Build and has been an integral part of the company's designs. He bring critical special thinking that has lead to highly functional building and GBDB's success. Mr. Northrop is a serious asset to the progress and expansion of GBDB and their designs.
Primary Function:
Lead the design and development of the projects acquired by GBDB.

EVAN WARREN
Principal Architect



Years with Greenback: 10
Years in Industry: 10
Education:
Bachelor's in Architecture from
Cal Poly San Luis Obispo in 1988.
Introduction:

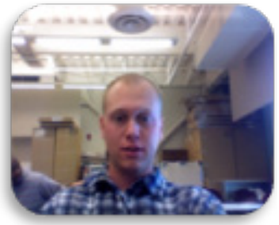
Mr. Warren has become a principal architect at Greenback Design Build and has been an integral part of the company's designs. He has become principal partners with Mr. Northrop and together they have lead GBDB's success. Mr. Warren is a serious asset to the progress and expansion of GBDB and their designs.
Primary Function:
Lead the design and development of the projects acquired by GBDB.

ANDREW BROWN
Superintendent

Years with Greenback: 7
Years in Industry: 7
Education:
Bachelor's in Construction Management from
Cal Poly San Luis Obispo in 1989.
Introduction:

Mr. Brown has been estimating and scheduling in the construction industry for 5 years. In that time, he was able to prove himself as a preconstruction specialist at Greenback after moving from the superintendent department early on in his career. In recent years, he has worked his way into his executive position where he continues to bring success. Andrew has become one of the most valuable assets to the overall project.
Primary Function:
Maintain accurate schedules, estimates and construction

CODY BERGER
Senior Project Manager



Years with Greenback: 11
Years in Industry: 11
Education:
Bachelor's in Construction Management from
Cal Poly San Luis Obispo in 1982.
Introduction:

Mr. Berger has been in the construction industry for 5 years. In that time, he was able to prove himself as a successful project manager at Greenback after moving from the estimating department early on in his career. In recent years, he has worked his way into his executive position where he continues to bring success. Cody has become one of the most valuable assets to Greenback Design-Build.
Primary Function:
Manage the company's long and short term goals to maintain success.

ROBERT LUEMERS
Architectural Engineer

Years with Greenback: 8
Years in Industry: 8
Licenses:
Structural Engineer (SE), California
Professional Engineer (PE), California

Introduction:

Mr. Luemers brings 8 years of experience in structural engineering design, including his extensive project work on education, auditorium, and healthcare facilities throughout California. Mr. Luemers has extensive experience with both Design-Bid-Build, and Design Build as both the final EOR and bridging Engineer.
Primary Function:
Ensure projects are safe, while retaining economy or function.

1.2 MISSION STATEMENT

Green Back Design Build is dedicated to providing quality construction that will save green and be green. Our philosophy has remained unchanged: Deliver a quality that is sustainable for the environment and the customer's wallet.
To that end, our mission is:
To perform for our customers the highest level of quality construction services at fair and market competitive prices.
To ensure the longevity of our company through repeat and referral business achieved by customer satisfaction. We wish to maintain the highest levels of professionalism, integrity, honesty and fairness in our relationships with our suppliers, subcontractors, professional associates and customers.

2.1 EXECUTIVE SUMMARY

Our proposal for ELAC's new center is that of focusing on efficient solutions for the programmatic needs of the site. After studying the requirements and desires of the planned facility, we set forth with what we deemed to be the most viable and effective solution while maintaining low costs and green standards.
The main thought in this process was how to incorporate all of these programs in one building, while maintaining a sense of connections in the campus in all directions, as well as becoming a destination for the students and staff/faculty of ELAC. We also aimed to make this a standard of green design and building for ELAC and future constructions there; our schedule of design build will ideally prove to be an effective choice in the future.
The building is separated into 3 floors, all connected by an atrium that connects the North and South sides. All the programs are organized based on usage and privacy- the most heavily travelled and commonly used cafeteria and bookstore are on the first floor, while the health center and faculty/staff lounges are located on the third. All spaces may view into the atrium, and all spaces are thus visually connected to one another, while still maintaining their own separation and function.
The first floor holds the cafeteria and the bookstore. The cafeteria houses the kitchen, purchasing/registers and the eating area, the latter of which continues outside towards the West lawn. The cafeteria connects directly to the atrium, where the reception connects to the North, South and West. The bookstore and its offices are located on the East side, where it is still easily accessed. The second floor has the multipurpose room, as well as ASU services and conference rooms. The multipurpose room needs its own side of the building; the large height and span provides for any function, with a balcony for outside gathering and queuing. The ASU services and offices are sectioned to the East, with their study and activity areas facing out onto a South balcony as well. The conference rooms are privately located to the North area of this floor, creating a separate space for those who require it. The third floor holds the most private of spaces, with the faculty and staff lounges that sit over the multipurpose room and the health center and shell offices which are on the East side.
All areas are analyzed and located based on function as well as proximity to light and heat gain. The main atrium's top windows face the North as to prevent overheating, whereas the balconies on the second floor face the South to provide for warming spaces. The functioning windows face the South, where the prevailing wind travels from, allowing for ventilation through the main and side spaces. The cafeteria is located as to provide the best access to the West lawn, as well as close to the main traffic through the campus. The windows on each façade also reflect sunlight gains and needs, with the overhangs above them blocking out unwanted heat in the summer months but still allowing for gain in the winter. The saw tooth roof above the atrium provides for convenient angles for PV placement as well; other PVs are also placed on the East roof for energy gains. There are cisterns underground in the North area of the sire above the building's footprint, designed to hold the expected rainfall over the entire site.
All areas have been considered for in terms of what should be needed- sunlight studies were done to determine wanted overhang lengths for shading, and calculations were done for how much water would be collected and used on the building. Area was carefully examined for every part of every program within the building; all segments were meticulously measured and organized to fit the requirements of the building.
GBDB wishes to choose the best options for the requirements it is given; as such, all options were brought into consideration, and many revisions were made to ideas that were not quite properly implemented. We desire to be able to accommodate all needs of our clients, while saving them money and having little to no adverse effects on the environment.

2.2 VISION STATEMENT

GBDB's vision is to have ELAC's new center become an integral gathering point and community center for students and faculty alike, with easy access to all programs available within.

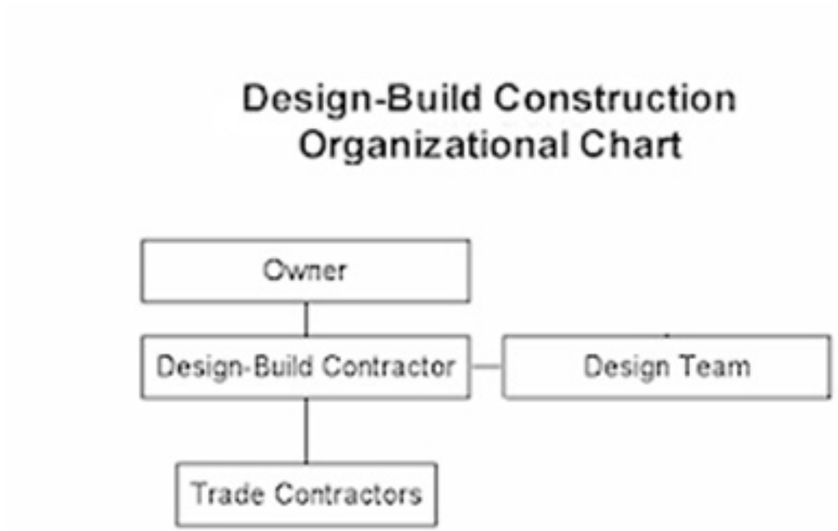
2.3 GOALS AND OBJECTIVES

-Minimize elevator and cafeteria wait times to one minute and provide direct routes through the building.
-Obtain 100% end user satisfaction
-Achieve LEED Platinum in order to set the standard for future green building practice in ELAC
-Tie all surrounding areas together in a point of focus and communication

2.4 APPLICANT QUALIFICATIONS

Regional Manager Cody Berger, LEED AP, DBIA, CIC
Project Manager Andrew Brown, LEED AP, DBIA, CIC
Structural Engineer Robert Luemers PE, SE
Principle Architect Nick Northrop AIA, LEED AP
Principle Architect Evan Warren AIA, LEED AP

3.1 ORGANIZATION CHART



3.2 METHODOLOGY

To complete this project on time and schedule we have decided not to create a joint venture, but instead to front the cost for specialty consultants. During the conceptual design phase GBDB will hire additional personal and contractors such as Foodservice Consultants Society International, a premier association promoting professionalism in foodservice and hospitality consulting, Acoustical Engineering Consultants (AEC), a acoustical consulting firm located in California to provides high quality and accurate consulting services in a timely manner, and Nursing Consultant Educational and Health Services (NCEHS), to assist in design of the health center and OSHPD criteria. These consultants will answer directly to the lead architect and work with him on a daily basis to obtain the best possible usage from these spaces.

3.3 EXEMPLARS

Mission College: Science and Technology Center
Owner: West Valley Mission Community College District
Cost: $9,698,000
Size: 32,000 sq. ft.

GBDB recently constructed a 32,000SF science building with roof mounted mechanical units, and roof mounted green house. Program areas include biology, chemistry and physics/ engineering laboratories, lecture rooms; faculty offices, and other spaces. Exterior walls are a combination of tilt up concrete panels, metal studs with composite metal panels and aluminum curtain walls. Interior walls are metal studs with drywall. Includes extensive utility connections to campus infrastructure.

UCSF: Fresno Medical Education and Research Center
Owner: University of California, San Francisco, Fresno

Cost: $17,000,000
Size: 55,000 sq. ft.

The project consists of three-story structural steel framed building with concrete on metal deck floors. Roofing is combination metal roofing and single ply membrane. Exterior walls are CMU, metal stud/plaster, and structural glazed system. Interior highlights include: underground HVAC ductwork, 190 seat auditorium, library and offices.

Lawrence Livermore National Laboratory
Owner: Lawrence Livermore National Laboratory
Cost: $16,898,000
Size: 57,000 sq. ft.

This GBDB building is two-story steel frame structure with exterior walls and prefabricated ceramic tile panels, concrete shear walls, and metal stud framing of approximately 65,000 sf and is designed as a high security facility. The ISR facility contain offices, open clerical work stations, secure conference rooms, secure meeting centers, a document storage area, graphics laboratory, print plant, photo lab and more.

4.1 CONCEPT DESCRIPTION

The proposed university center for ELAC holds a bookstore, cafeteria, health center, ASU services, a multipurpose room, and shell offices all within one building spread over 3 floors. The main views face the new lawn to the West, with appropriate open faces also displaying the cross transit through the building itself. The first floor is 18 feet tall, while the second floor is split with 18 and 13 foot spaces, and the third at 13 feet. All floors are connected to the main atrium and are able to view through it, allowing for strong visual connection to all of the programs from any space.

The first floor houses the cafeteria and the bookstore, with the kitchen spaces and receiving spaces respectively as well. These are the two spaces the majority of the faculty/staff and students will be using. The cafeteria faces the new lawn with an outdoor seating area, allowing for ease of access as well as welcoming views. The cafeteria is split with the main kitchen and a coffee area to prevent major cross-traffic from conflicting with those passing through. The bookstore is directly accessible through the North and South sides of the main atrium, and covers the entire East side of the first floor.

The second floor holds the multipurpose room, as well as the ASU services and conference rooms. The multipurpose room has a balcony that mainly faces the South and West, providing a comfortable waiting and lobby area for those using it. The multipurpose room is also directly connected and accessible to/from the conference rooms across the atrium, allowing for joint usage. The ASU is conveniently located near the main atrium and just offset from the main circulation paths, as to allow for a bit of privacy while still not being completely abstracted form the rest of the student programming. The ASU conference room is located more the North of this section, and the previously mention conference rooms are to the North and East of this floor, accessible through the atrium and ASU.

The third floor contains the health center, shell offices, and the staff/faculty lounges, being the spaces with the most privacy desired. The health center is located off to the Northeast of the floor, and is segregated for the safety and privacy of the students using the facilities. The faculty and staff lounges are located on the West side, set into and above the multipurpose room on the floor below. While separated, they still give a feeling of integration and connection with their views and proximity to the other programmatic spaces. The shell offices are located to the Southeast, available for whatever usage while remaining securely separated enough for privacy as well.

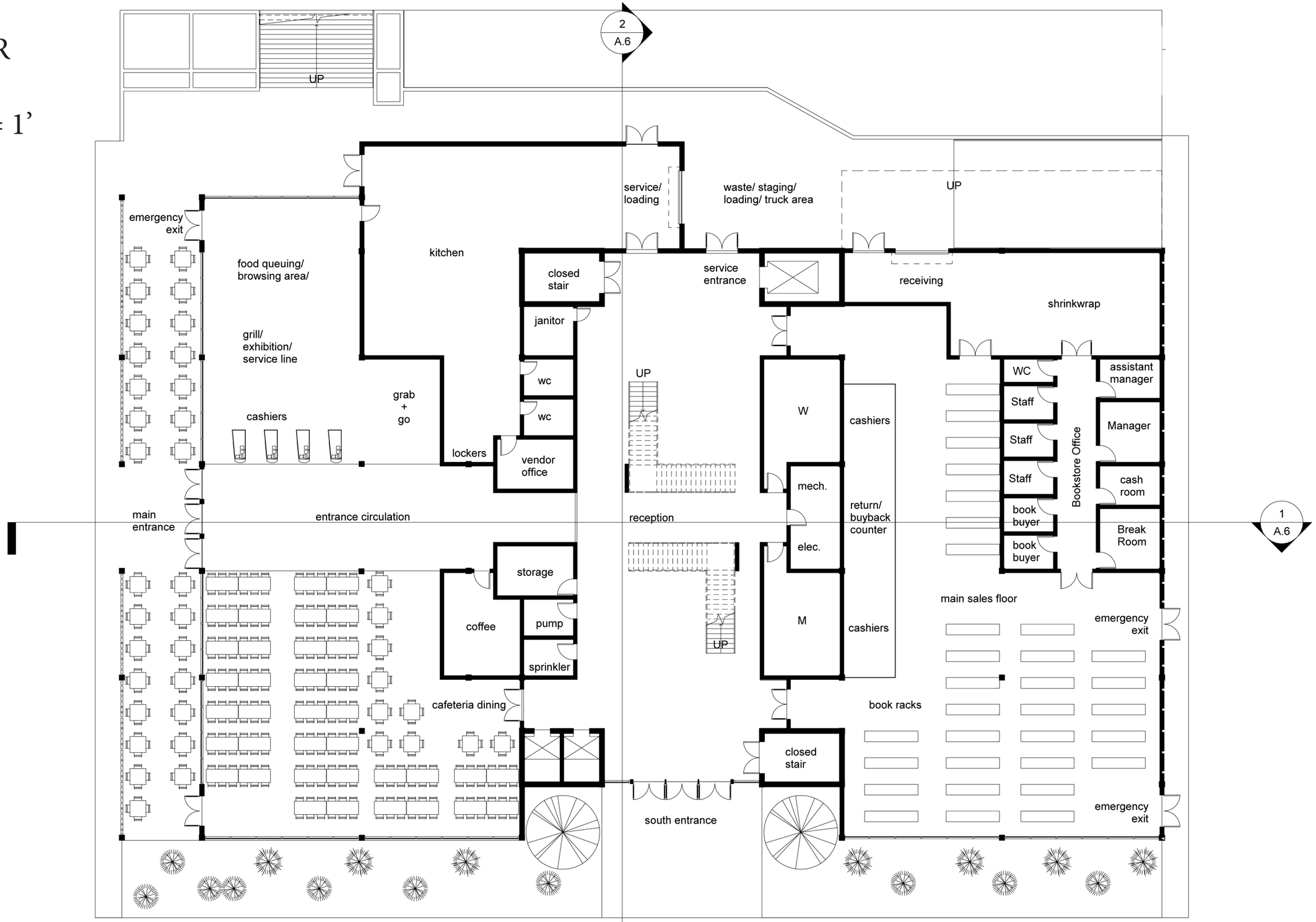
4.2 ARCHITECTURAL DESIGN NARRATIVE

The Master Plan designates specifications of design, such as needed areas of travel and relation to the surrounding site. This building aims to incorporate and meet all of those guidelines to represent what is needed most in the campus. The circulation moves around the site, in both N/S and E/W directions. The site sits within the slope, with given stairs and ramps to provide for access from the higher North side. The views from the site are given to the South and West sides are directed, with the North and East being the service accessible area. The landscaping was unable to accommodate the current trees, though new ones are scheduled to be planted on the South façade. The stacking of the programs has been set in accordance to the specifications as well, based on occupancy and usage. This building is designed to give a unique relationship of indoor and outdoor usages as well, promoting interaction of other campus spaces as well as programming within the building. It can also act as a pathway as requested, connecting though the building or around on the paths. The prominent structure provides for a strong visual connection of campus location as well, allowing for better campus recognition. The building aims to make an example for the future of the campus in its green design and building choices in materials and construction, goaled to work into the campus as well as become a symbol of it. The orientation of the building best provides for the lighting situation on its location, with the overhangs protecting spaces form overheating during summer times but allowing for heat when needed. The E/W axis allows for ventilation from the strong S winds, and provides for aeration in the atrium and side programs.

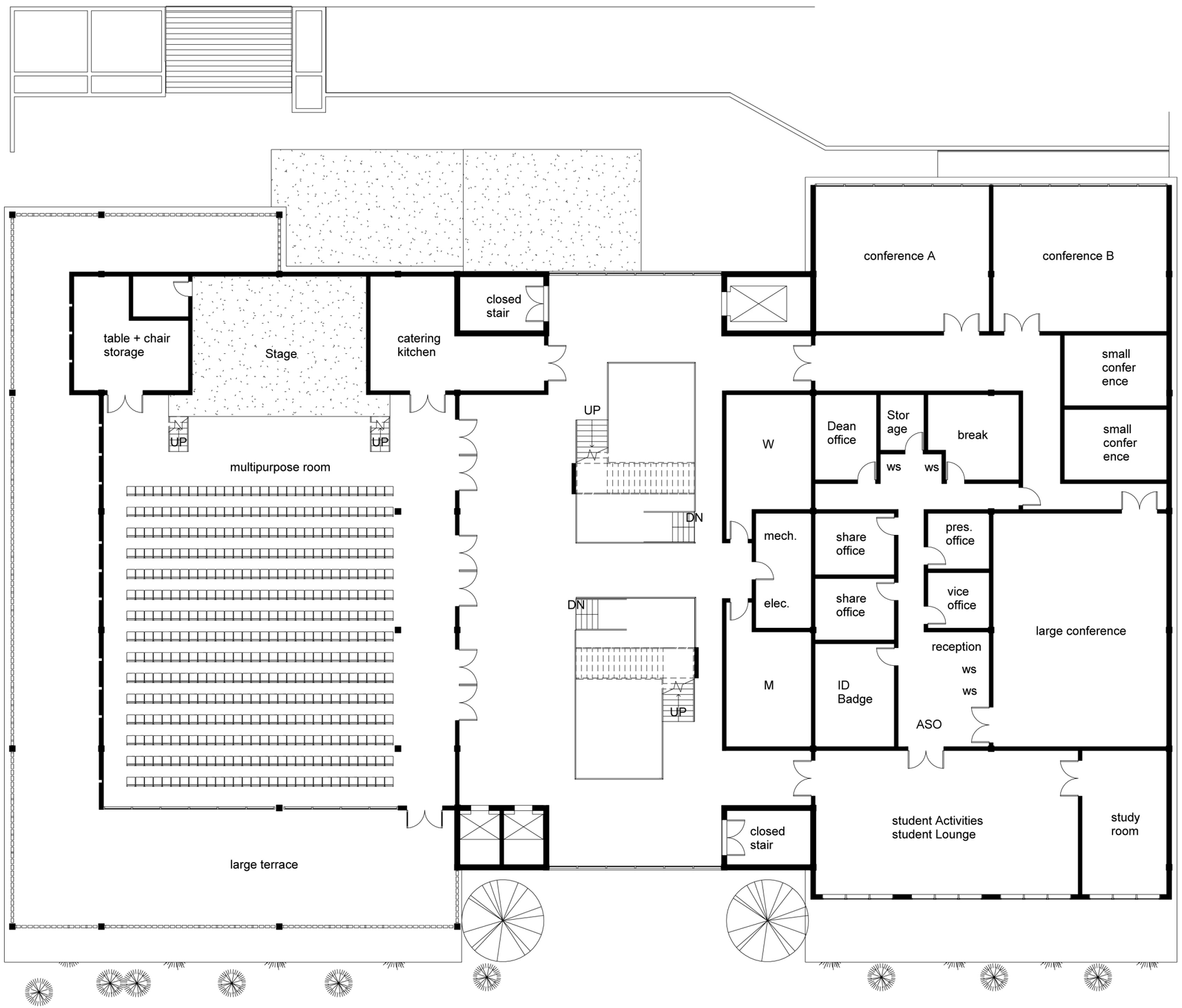
This building is designed in such a way as to facilitate the best circulate possible given the program and space provided. All sides are accessible from all sides of the site, and cross travel is permitted through the building. The large atrium allows for an excessive flow of the main population travelling to the bookstore and cafeteria, or to the programs located on floors above. For staff and departmental circulation, the main atrium stairs as well as the side stairs and elevators lead straight to their conference rooms, offices, and lounges. All of these spaces are separated physically from the main spaces, as to allow for separate people flow as well as privacy for those using those spaces. However, all of these spaces do meet in the middle in the large atrium, and all of these spaces are visually connected as well as a short distance away from one another. All of the people who use this building, regardless of usage, have the ability to travel through the main space, promoting interaction and conversation between students, faculty and staff.

The materials for the building were selected on the basis of the application as well as what type of sustainably they provide. The main cladding of the exterior is EcoClad, a composite surfacing that provides excellent weathering protection at a highly sustainable level. The stucco alternative provides for the contrast as well as being an excellently affordable exterior finish. The photovoltaic solutions on the exterior are incorporated into the roof's slope and extra area, as well as in the South side of the atrium's glass façade. The roof is set to have a solar reflective index of 29, meaning excess heat is reflected instead of being transferred into the building. On the interior, the furniture is made of recycled materials, working with LEED specifications of reused materials. Many are incorporated with rapidly rene wable materials as well, such as bamboo and wool. Much of the finishes are focused on the same ideal, as well as working with cost effective solutions like polished concrete flooring. The interior is to use LED lighting, as that is energy efficient and saves energy costs later on.

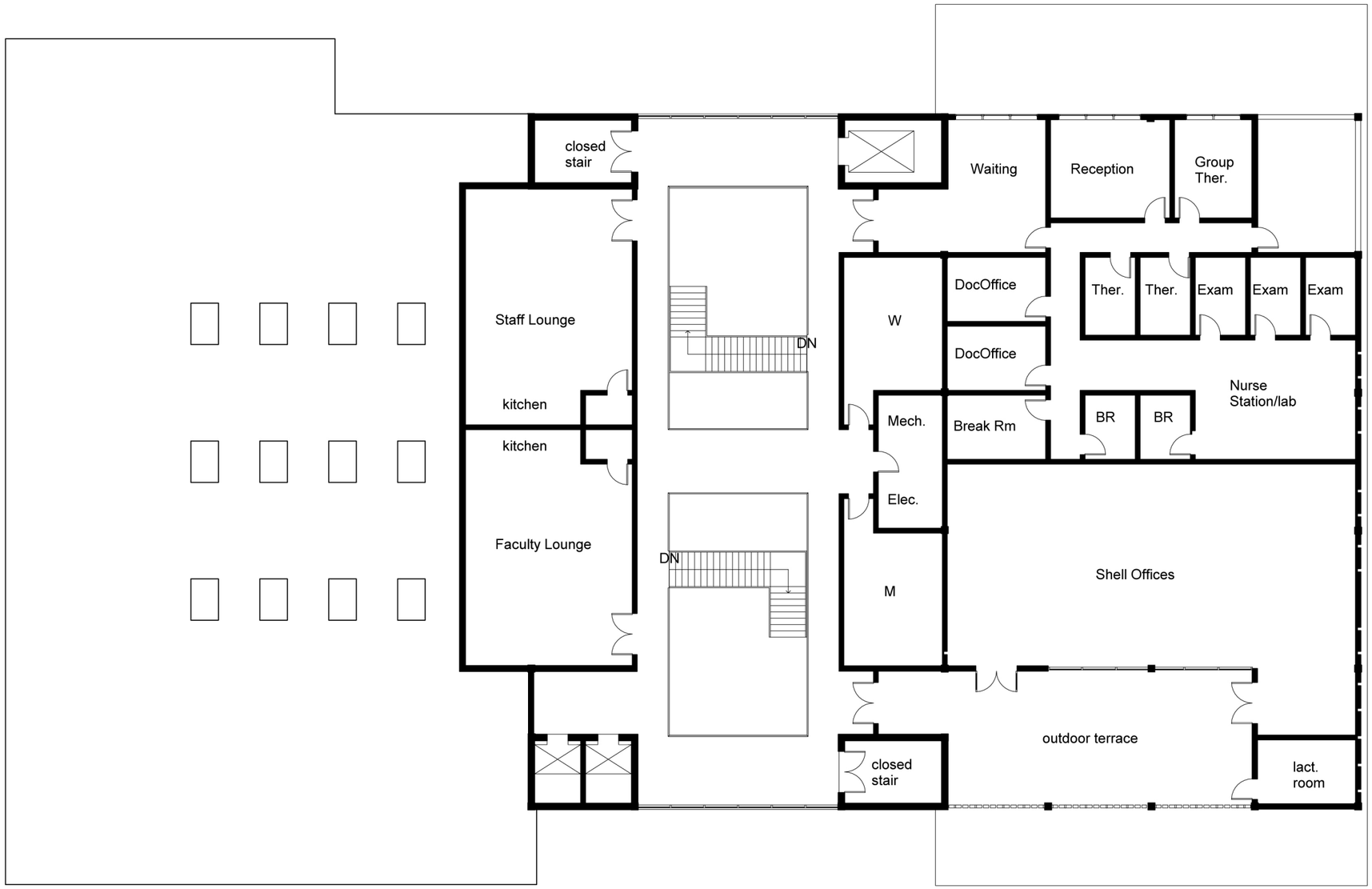
4.3 FIRST FLOOR PLAN 1/16” = 1’



4.4 SECOND FLOOR PLAN 1/16” = 1’

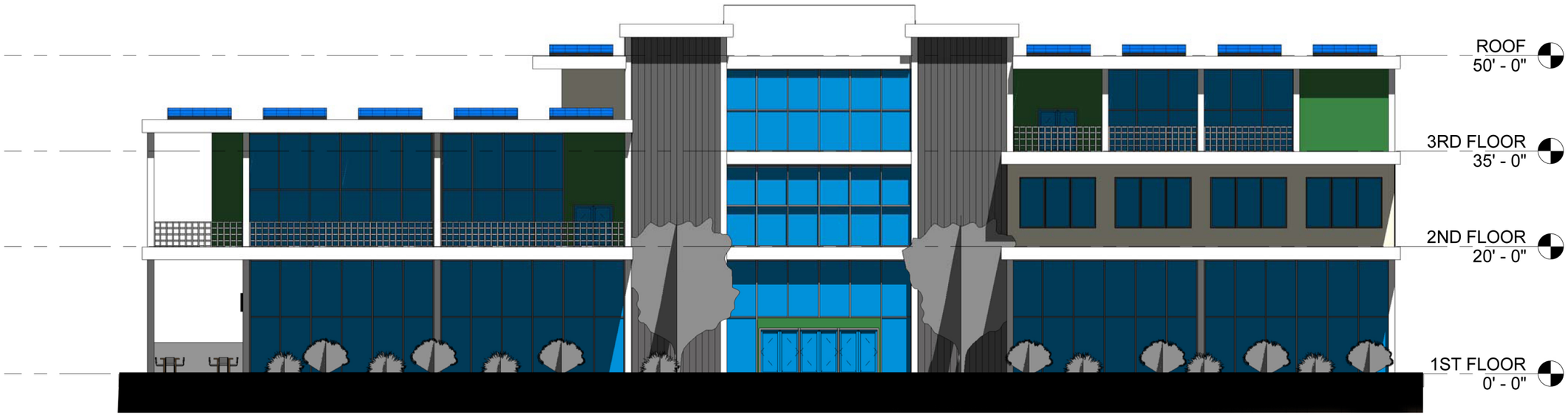


4.5 THIRD FLOOR PLAN 1/16" = 1'

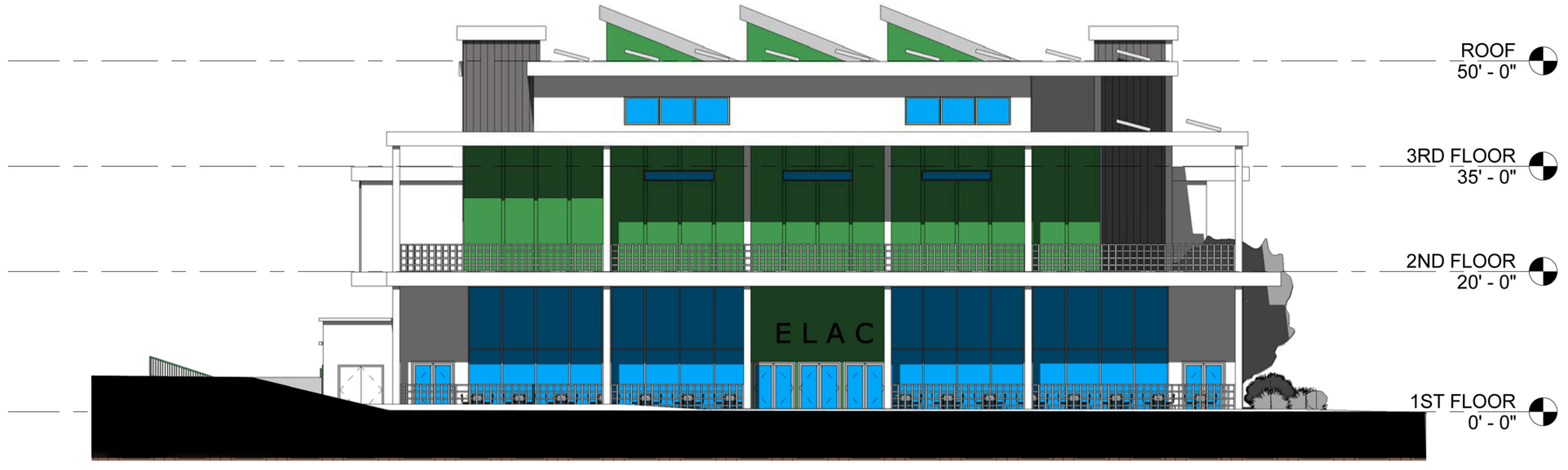


4.6 SITE PLAN

4.7 BUILDING ELEVATIONS



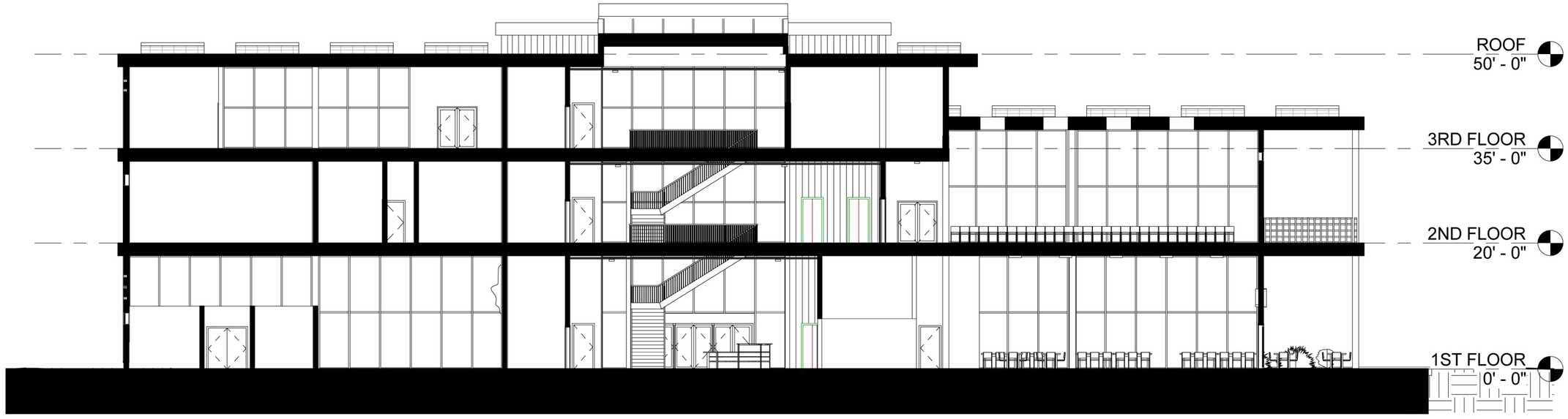
4.8 BUILDING ELEVATIONS



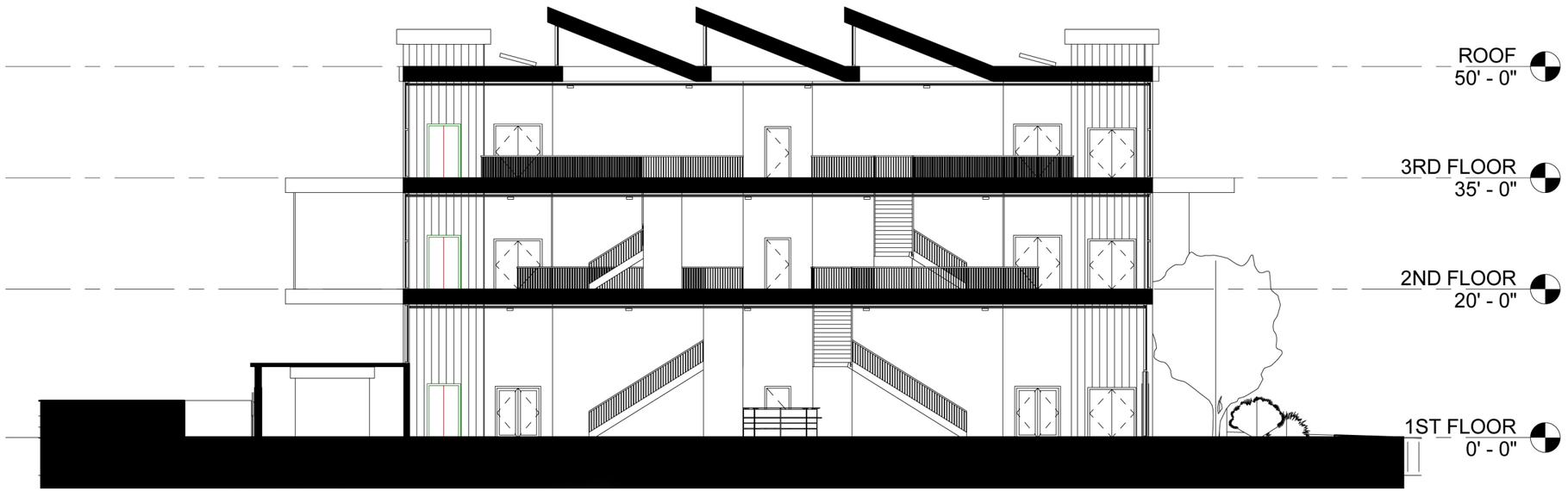
1 WEST ELEVATION
1/16" = 1'-0"

2 EAST ELEVATION
1/16" = 1'-0"

4.9 BUILDING SECTIONS



1 Section 1
1/16" = 1'-0"



2 Section 2
1/16" = 1'-0"

4.10 EXTERIOR PERSPECTIVES

SOUTH EAST

NORTH WEST

SOUTH WEST

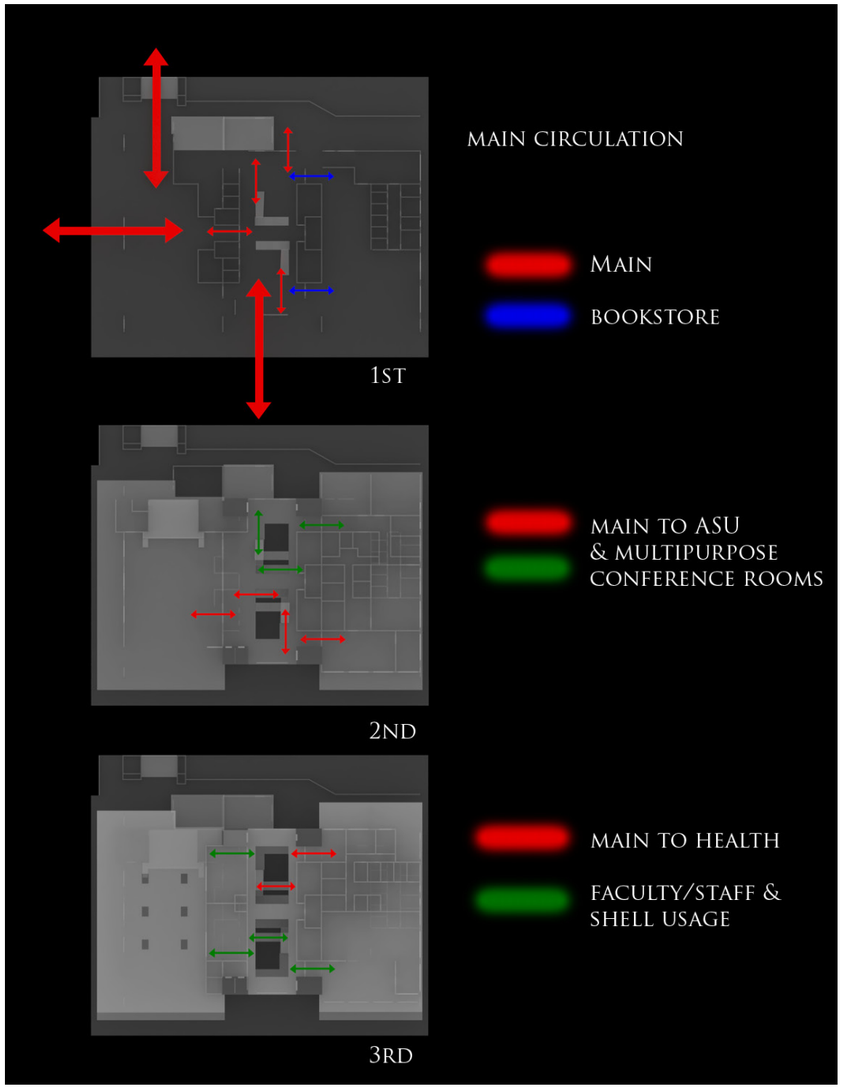
4.11 INTERIOR PERSPECTIVES

CAFETERIA

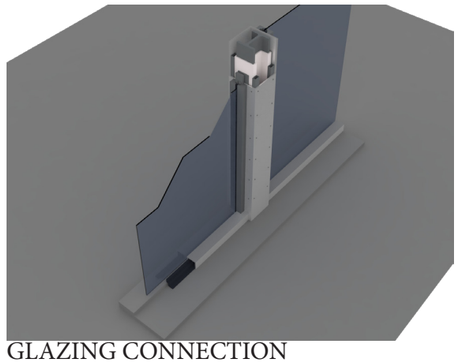
MULTIPURPOSE ROOM

RECEPTION/ MAIN CIRCULATION

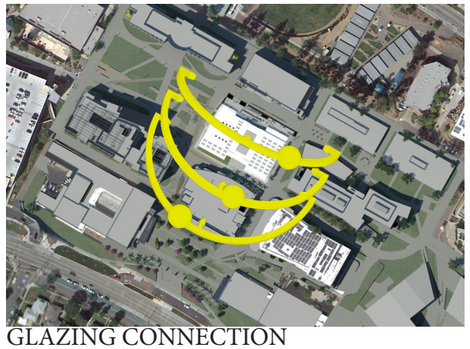
4.12 DESIGN DETAILS



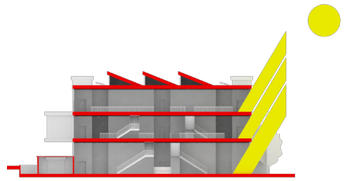
CLADDING CONNECTION



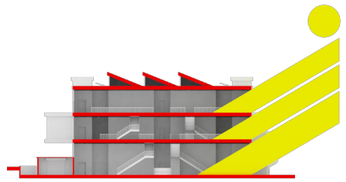
GLAZING CONNECTION



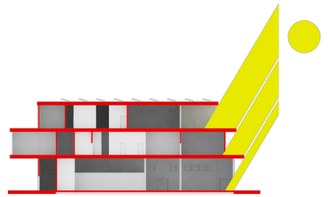
GLAZING CONNECTION



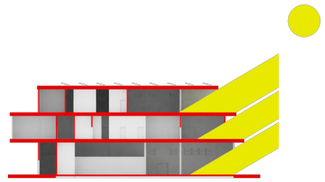
WEST SUN JUNE



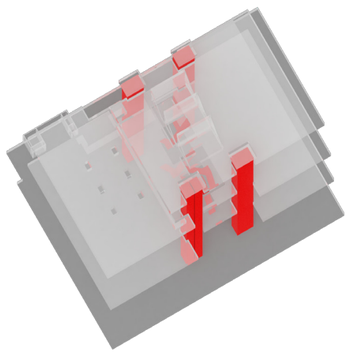
WEST SUN WINTER



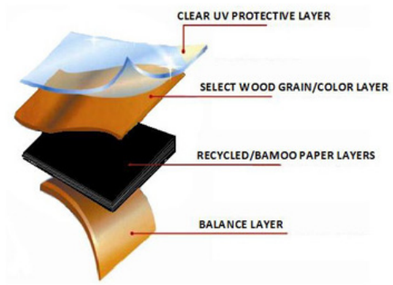
NORTH SUN JUNE



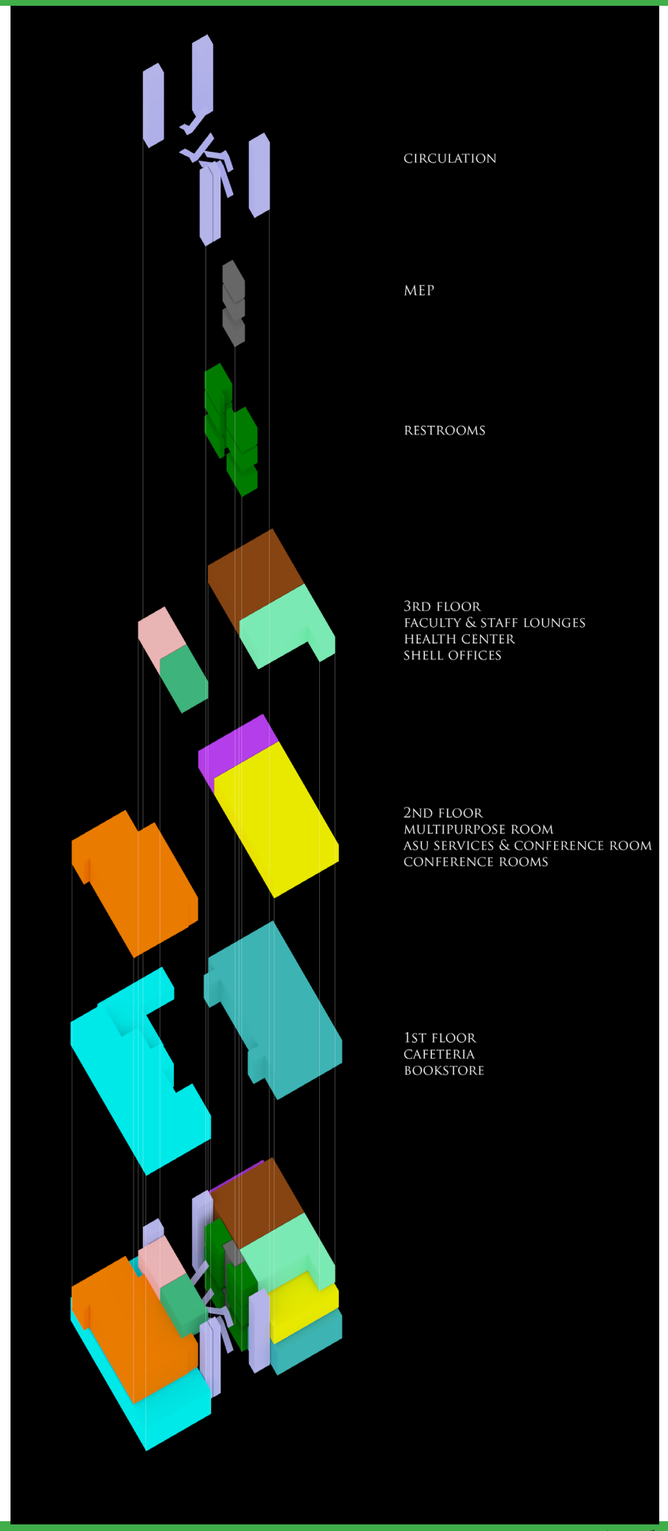
NORTH SUN WINTER



MAIN CIRCULATION



ECO CLAD MATERIAL



5.1 STRUCTURAL NARRATIVE

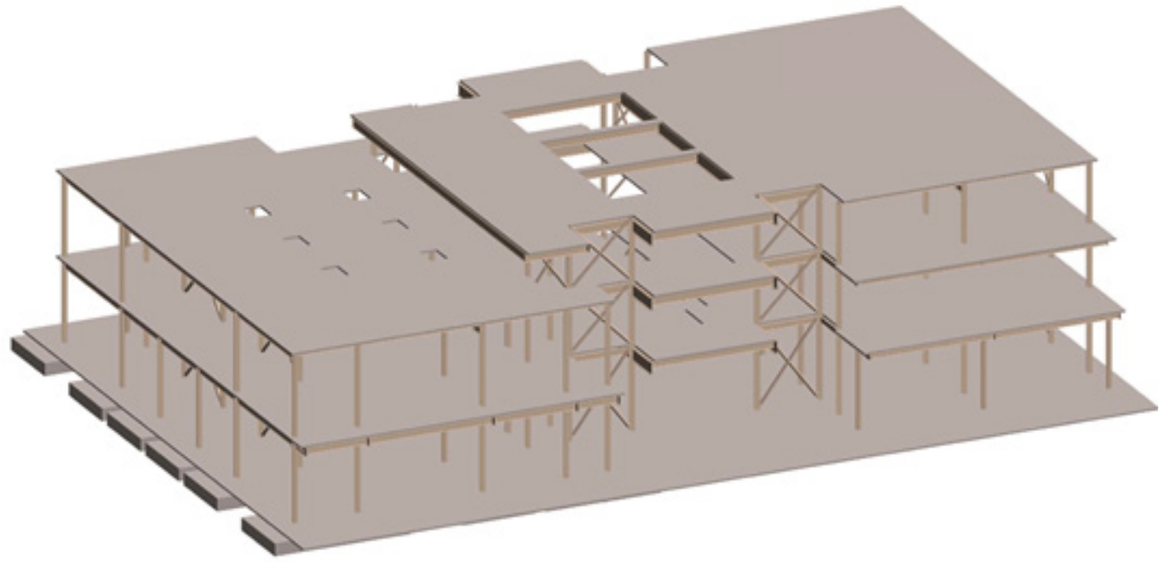
Steel framing will be used for the ELAC three-story student center. Steel was chosen both for its relatively low cost and for its ability to complete the spans required of some areas. Concrete will be used for footings and floor slabs. Light-weight concrete on metal deck was chosen to meet a two-hour fire-rating.

The most critical spans are above and below the multipurpose room. One girder above the multipurpose room spans 90', to reduce the number of columns obstructing the space to a minimum. To accommodate this span, there is minimal load above the multipurpose room – just roof loads. The 90' span is accomplished with a 40" deep beam. Long spans – 80' – also exist in the atrium, to make room for stairs. These spans can be accomplished with a 3' deep beam.

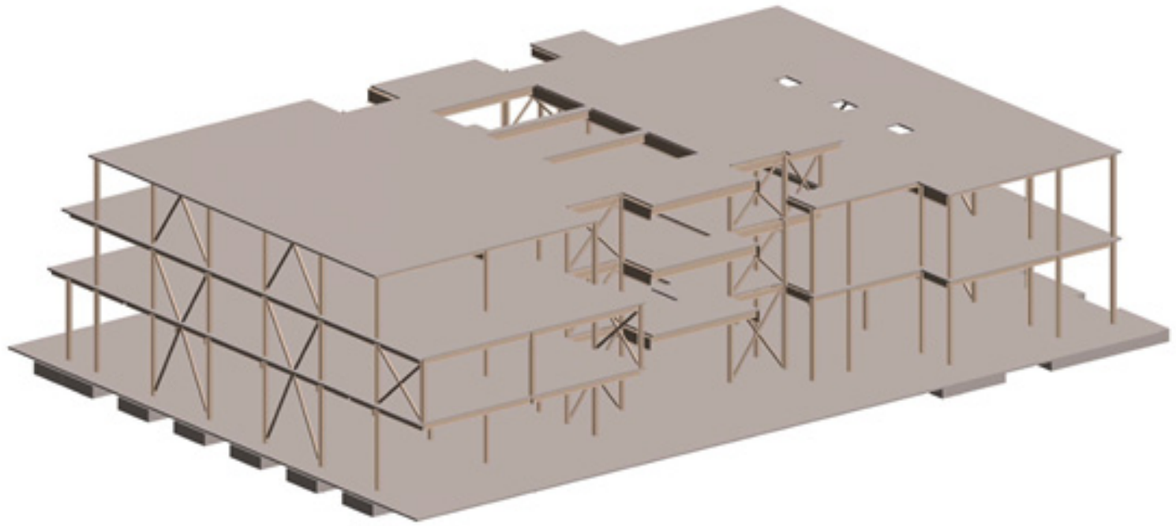
The multipurpose room – which also has a stage and kitchen – has the greatest loads of any space above the ground floor. As such, beams and girders supporting the multipurpose room exemplify the worst-case gravity loading for the building. The maximum depth for girders below the multipurpose room is determined to be 2', with a weight of 55 plf.

Lateral design of the building is governed by seismic loads. The lateral force-resisting system consists of braced frames placed symmetrically, to minimize torsional irregularity. Two additional braces have been provided between the third floor and roof, to connect the third floor roof above the multipurpose room to the third floor, allowing it to be re-strained by the lateral system. Additional braces have also been placed between the second and third floors on the north side. However, these braces are to support a 15' cantilever. They are not part of the lateral system.

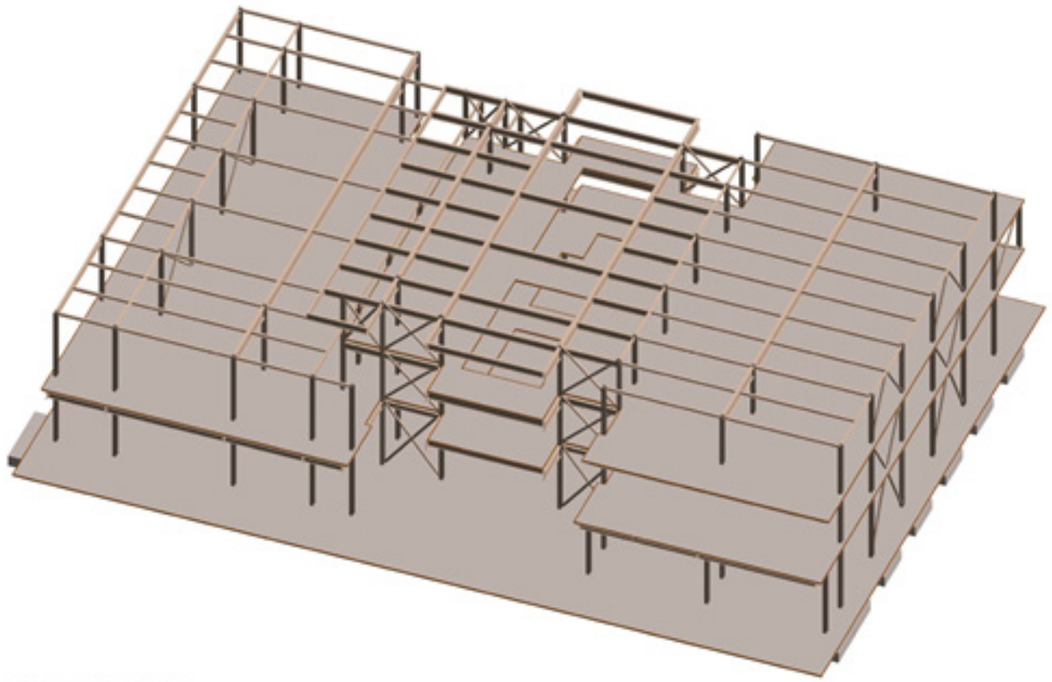
Because the building is long in the east-west direction, seismic joints will be placed on each side of the atrium, between the braces. The result will be to separate the east and west sides of the building.



1 S-W 3D FRAMING

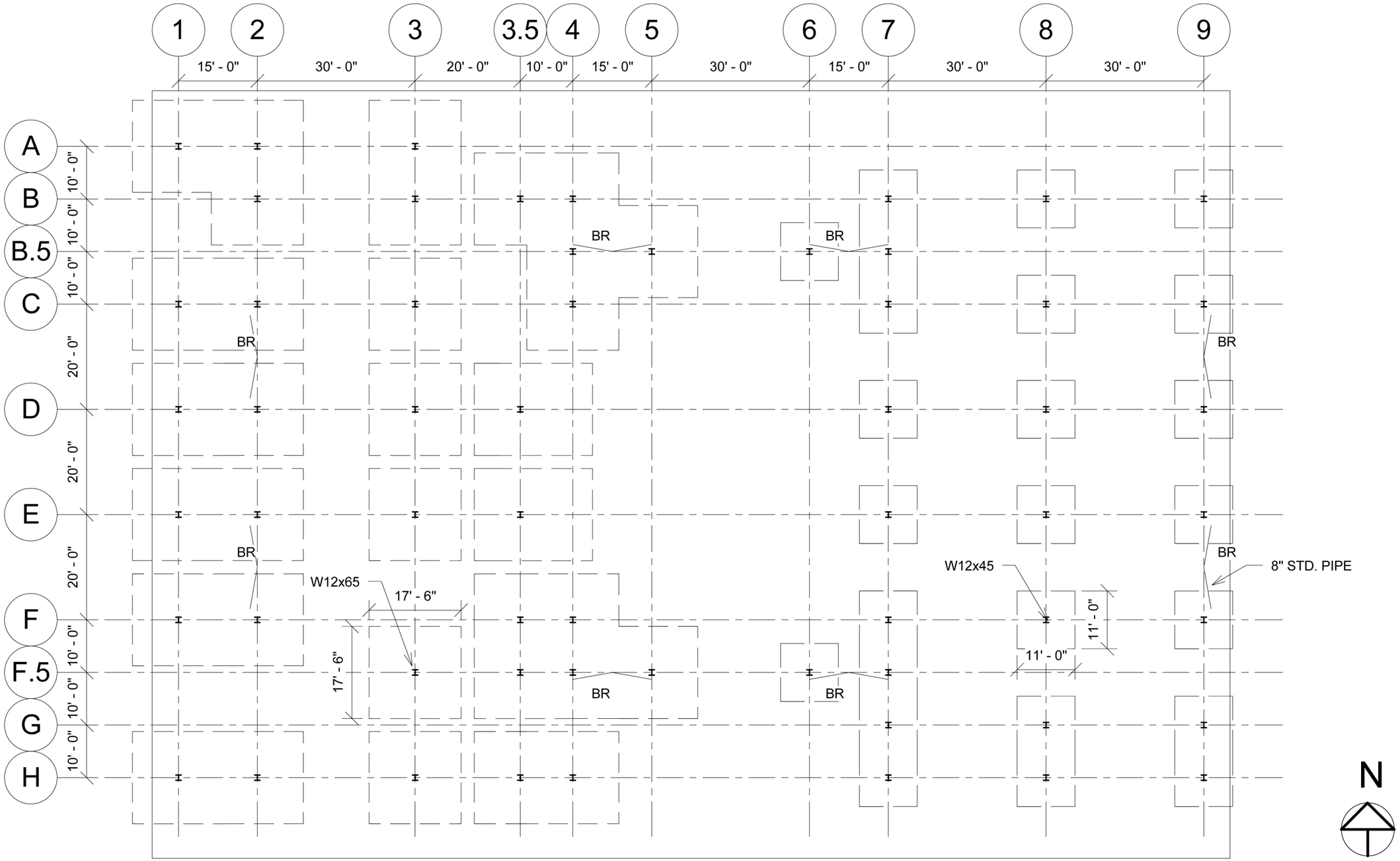


1 N-E 3D FRAMING

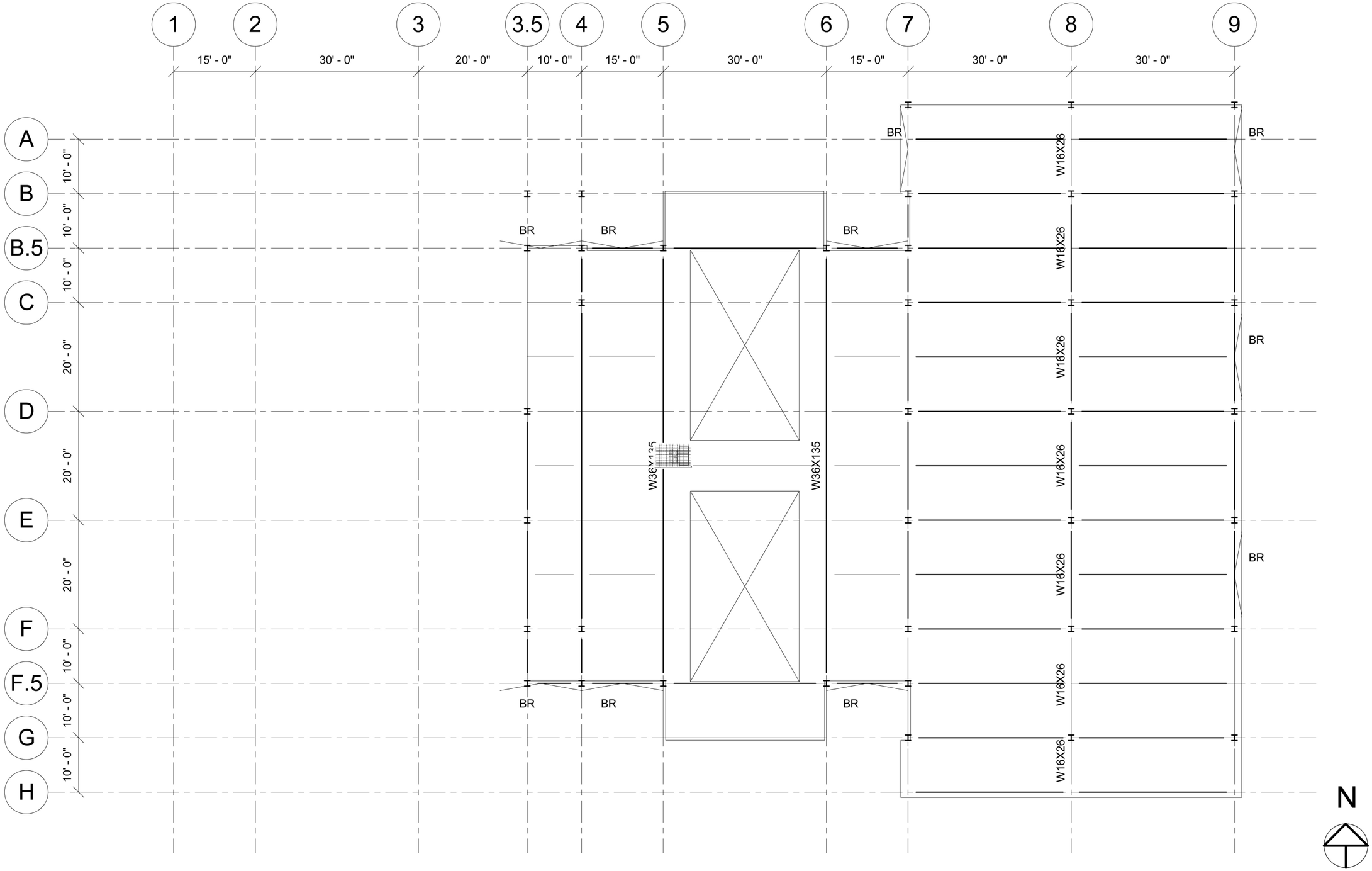


S-E 3D FRAMING SEMI-EXPOSED

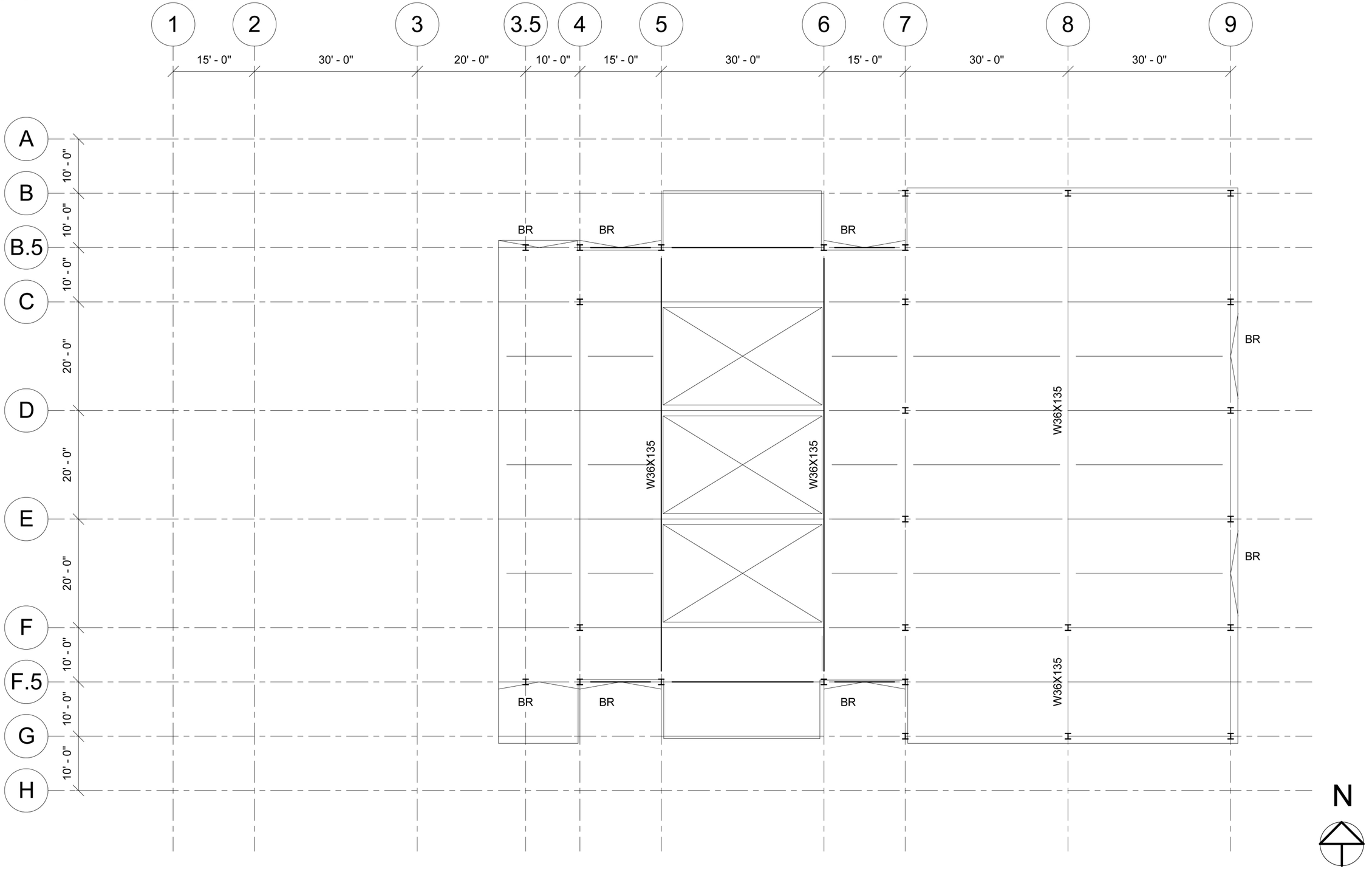
5.2 FOUNDATION PLAN



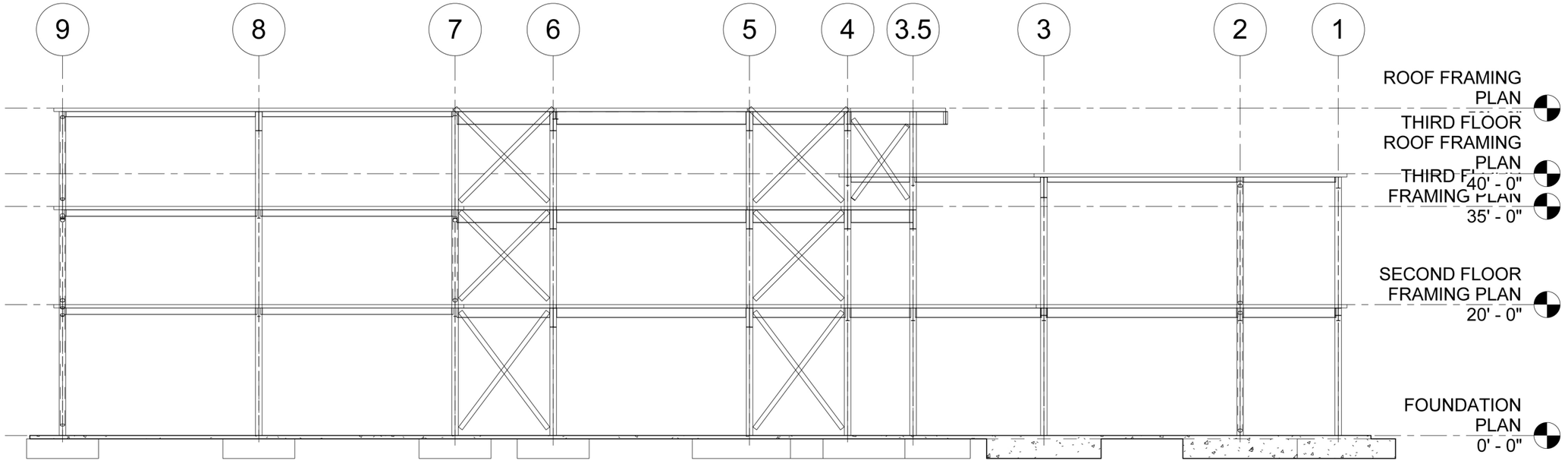
5.3 SECOND FLOOR FRAMING PLAN



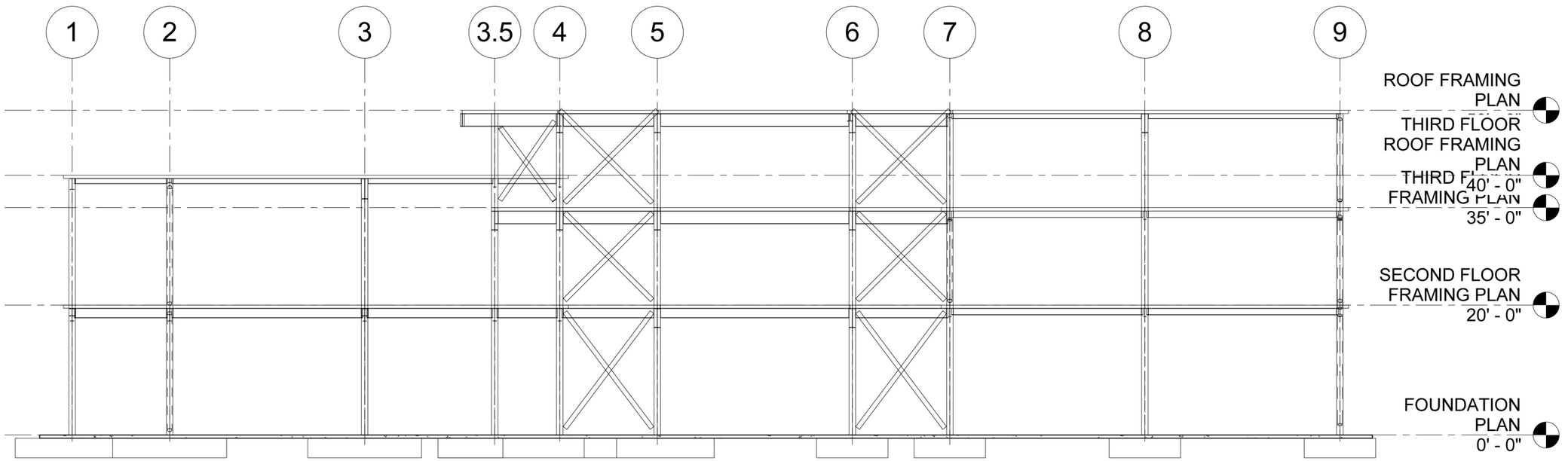
5.4 ROOF FRAMING PLAN



5.5 ELEVATIONS

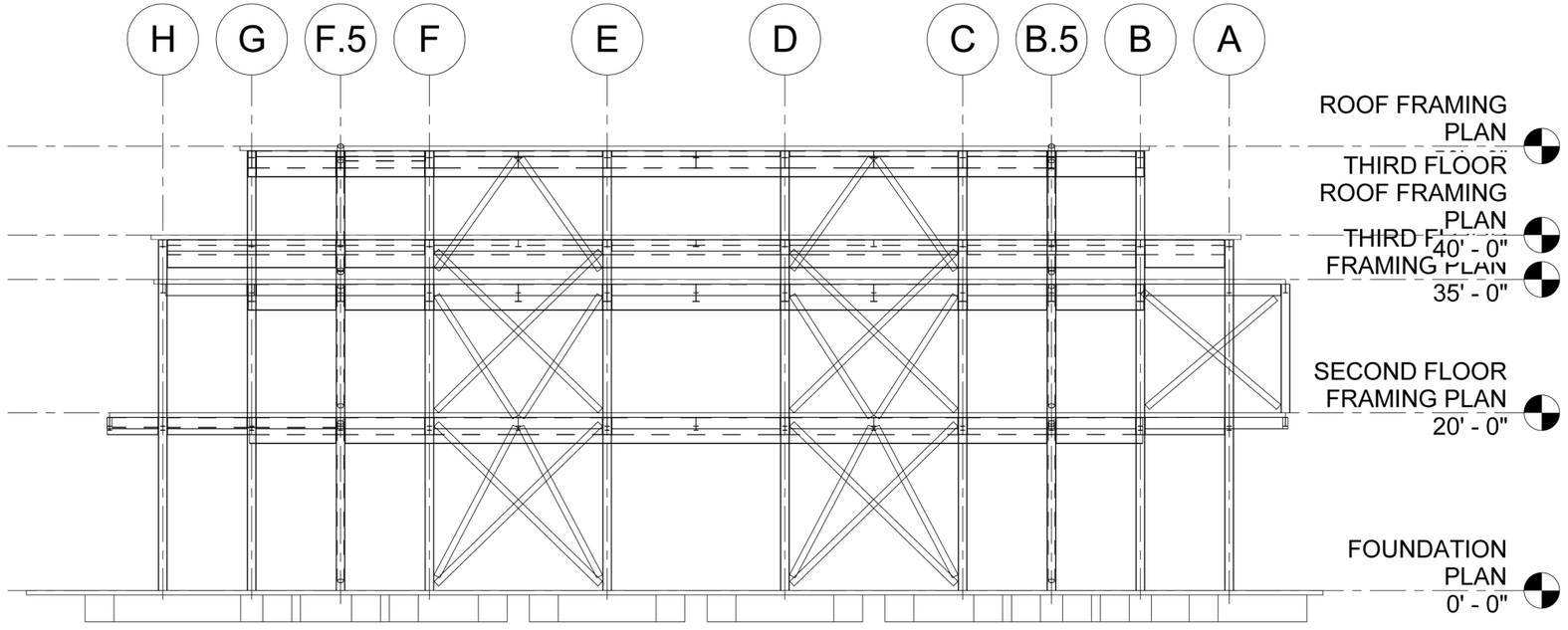


1 NORTH ELEVATION
1/16" = 1'-0"

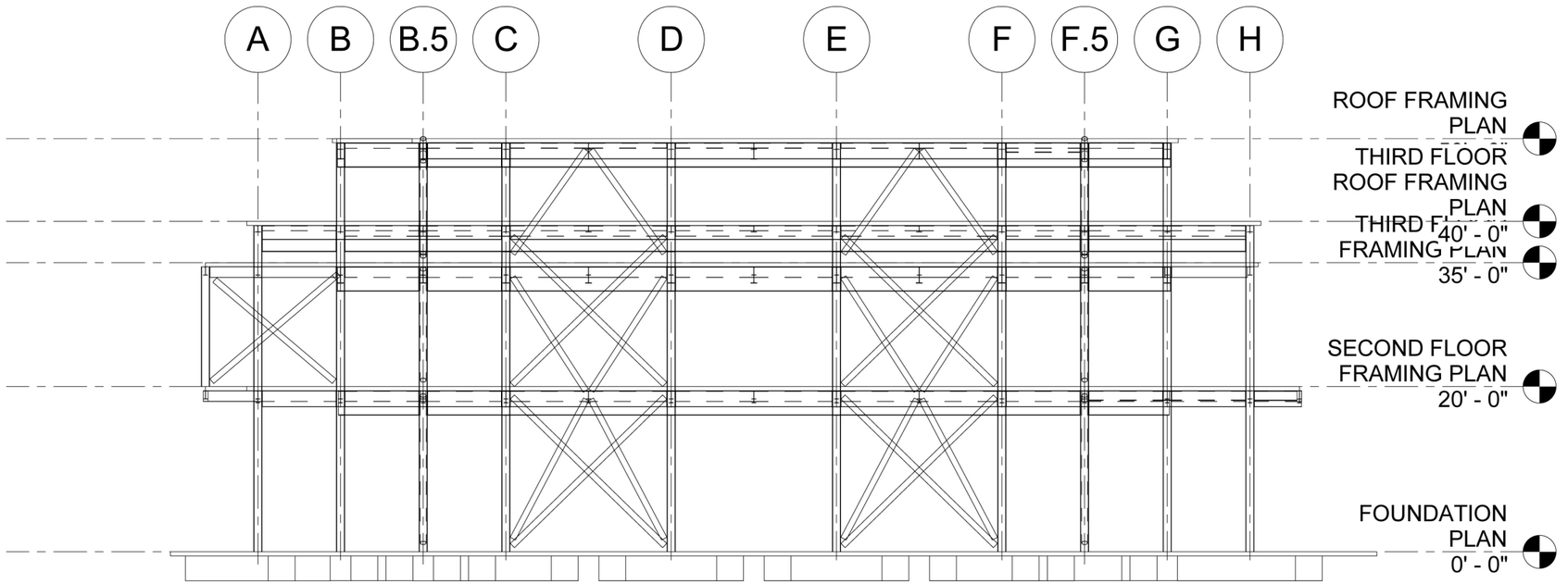


2 SOUTH ELEVATION
1/16" = 1'-0"

5.6 ELEVATIONS



1 EAST ELEVATION
1/16" = 1'-0"



2 WEST ELEVATION
1/16" = 1'-0"

6.1 SITE QUALITY CONTROL PLAN

Demolition Logistics

Demolition will consist of two long reach excavators and one payloader. One excavator will be position on either existing building. Next to each excavator will be a lay down and disposal area for demolished wood, steel, concrete, and other recyclable components. These materials will be loaded with the pay loader and hauled off by truck to their designated area. Along side each excavator will be a laborer with a hose to insure dust mitigation. At this time the site layout will consist of a temporary fence encompassing the site, haul roads, and a covered pedestrian walkway to protect against debris.

Construction Logistics

After the demolishing of the existing structures one dozer will clear the site and grub existing vegetation while another laborer mitigates dust. All excess dirt will be compiled on site in its designated area and stored for backfill. Once the site is cleared then mobilization will begin. Subcontractor trailer will be staged sequentially towards the southwest, along with porta-johns and temporary utilities for the trailers. Above that will be the material lay down area, which will be located along the incoming entrance and equipment parking area. This will ensure that all vehicles filled or off loaded in a relatively timely manner. Moving towards the building site there will be a washout pit. This is placed in proximity to the haul road where the concrete trucks will be staged as well as the concrete boom pump to ensure rapid delivery of concrete. To the south of the boom punp will be a crane and rigging area to ensure ease of loading the crane and rapid delivery of steel beams and cladding throughout the construction site.

Storm Water Pollution Prevention Plan

BioSwales and biomesh will prevent pollution of storm water runoff on the construction project to keep pollution out of storm drains, reduce exposure and discharge of materials and wastes to storm water, and by reducing erosion and sedimentation. Prevention techniques will include nonhazardous and hazardous waste, spill prevention control, vehicle and equipment cleaning, maintenance and fueling, sediment control during dewatering operations, site and waste management during paving operations, saw cutting and slurry control and cleanup, contaminated soil management, concrete, grout, and mortar waste management, erosion and sediment control during earthwork operations, employee and subcontractor training and awareness.

Disposal

There will be three disposal dumpsters on site one for trash, one for recycle, and one for reuse. The recyclable and reused material must be in accordance with LEED standards. The trash off haul by truck once a week in accordance to the traffic control plans.

Protection of Existing Facilities

All existing facilities, both private and public, within and adjacent to the work area must be protected from injury or damage with Tyvex sheathing and netting. This includes but is not limits too buildings, structures, street improvements, utilities, city trees, landscaping, and irrigation lines. Property damage or altered in any way during the performance of the work must be replaced or restored to its original condition.

Construction Entrance and Exit

All entrance and exits will have a gate to ensure security for the jobsite and student body. There will be one entrance to the southwest of the site and one exit to the west. All gates will have company signage, contact information for a complaint hotline, and MSDS sheets.

Noise Control

Construction activities will conform to the CPA Noise Ordinance, which will restrict hours of activity, levels of noise produced by individual pieces of equipment as well as noise produced generally.

Notification of Residences and Businesses

We have found that contractors who go to the trouble of informing the adjacent residences and businesses at the proposed project activities generally receive a better response to the project than contractors who don't. The following advanced notices must be given to residence/businesses and owners/tenants on all streets impacted by the work around the project. The text and method of distribution must be approved by the CPA Public Works Engineering Department.

1) Distribution of seven day 48 hour advance notice door hangers
2) Posting of no parking-Tow away signs on street, a minimum of 72 hours in advance of all work, which will require that no cars be parked within the construction area. Signs must be checked daily.
3) Distribution of written notification of activities/schedules and contacts for questions not less than once every three months, or more frequently if certain staging will impact them.

Traffic Control

GBDG is responsible and liable for doing all that is necessary and practical to ensure the safety of workers, pedestrians, bicyclists, and motorists. Traffic control must conform to the conditions as set forth in the city's planning department. Signs, cones, barricades, canopies, ect will be placed within a five mile radius to protect, warn, direct, and guide the traffic to and from construction site

Material Delivery

The contractor and any subcontractors or suppliers must at all times comply with the requirements of the CPA Truck Route Ordinance. Reference the Municipal code for directions of the size of vehicles, routing of trucks through the city, and other specific restrictions including streets, time lines, and local truck routings. As much as possible, material delivery should be completed before 10 am or shall not coincide with fifteen minutes prior and past the hour to allow students to get to class on time. The following shall be submitted weekly:

1) A vicinity map showing the project location and appropriate access routes
2) An estimation of the frequency of delivery trucks during each phase of Construction
3) Traffic control plans for truck delivery.

Construction Vehicle Parking

On street parking is very limited in the school district, therefore construction workers are encouraged to carpool. Any additional parking in the school lots must conform to the parking regulations. Parking permits may be purchased at the school administration office. All staging of construction trucks must be within property lines, or with public right away areas identified within an approved encroachment or street work permit issued by the public works department.

Material Storage

Suitable areas of the project site should be designated for material storage. These areas, to the maximum extent possible, will be away from catch basins, gutters, drainage courses, and creeks. Also a section of this area will be reserves for doors, windows, and cladding in order to protect them before installation.

Clean Up and Maintenance

Throughout the construction period, the project site must be maintained in a neat and orderly condition at all times in accordance with the provisions. Special attention is to be given to the off haul of demolition materials, earthwork and trash.

6.1 SITE QUALITY CONTROL PLAN

Dust Mitigation

Dust control measures must be implemented during construction to ensure that temporary air impacts are reduced to insignificant levels. Measures shall include watering all areas of exposed earth surfaces, avoiding overfills of trucks to minimize potential spillage in public right away. Care must be giving not to use too much water, thereby causing runoff and erosion. Dust alleviation and control measures must be maintained at all times including during non-working days. Roadways, sidewalks, and parking lots must be kept free of debris.

Site Quality Control Plan

Greenback Design-Build's Quality Control Plan has been established and developed to ensure high standards of quality for our projects. Procedures are provided to manage and maintain consistency and cooperation between the design professionals, construction managers, and subcontractors. All of these entities must strive to protect the quality and a final product that meets the owner's desires.

Design coordination will consist of organized and monitored document controls to eliminate confusion and miscommunication throughout the project. Project management will implement, maintain, and distribute lists on up-to-date designs, and procedures on how exactly to update for new designs. During the design-phases, document control is a primary concern.

Bi-weekly constructability reviews will be integrated throughout the design process. These will consist of review teams that are made up of project management and representatives from all appropriate disciplines or specialties. Work plans for each review will be implemented by the review teams and led by the review coordinator. Owner-involvement in design is encouraged and will be mandatory on a monthly-basis as well as substantial changes in design. This will ensure a design that meets the owner's desires, implements latest technologies, and is as efficient and economical as possible.

BIM models will be developed early in the design phases and used throughout the construction process. Clash protection will be fully-completed before construction of the trades involved. Subcontractors must have BIM capabilities and are required to follow Greenback Design-Build's procedures on implementing their scope into the BIM models. This includes timeframes and level-of-detail requirements.

Document control will also be integrated and maintained throughout the construction process. Project management will be responsible for issuing updated drawings to all subcontractors. This duty will be enforced and subcontractors will not be issued drawings for construction until procedures are followed to ensure these are correct and up-to-date. These procedures include review and signature by the design professionals, project management, and relevant subcontractor.

Subcontractors are required to have extensive quality control and assurance plans to ensure quality of their scope of work. This includes pre-fabrication shop quality plans as well as construction site quality plans. These plans must be provided in prequalification packages for review by project management teams before contract awarding. Inspections will be required for work on site, as well as appropriate work in pre-fabrication shops for all subcontractors. These inspections will be detailed on a checklist provided by project management prior to contract awarding. Pre-fabrications cannot be delivered to the jobsite until appropriate inspections have been completed and signed-off.

Design-Document Control

The design process requires countless changes from many factors such as constructability reviews, owner reviews, and any other design changes. These changes in design must be monitored at the utmost extent to ensure all parties are provides with up-to-date drawings.

Project management implement, maintain, and distribute lists and updated drawings as soon as they are updated. Documents will never be issued for fabrication or construction until all parties have provided a signature acknowledging their detailed review of the drawings.

Numbering systems for updated drawings will be strictly adhered-to and project management will update lists stating the changes. These lists will be updated immediately and distributed by project management to all design professionals, project management, and subcontractors.

Design Satisfaction

Owner-control of design is a major concern many owners have about design-build projects. Greenback Design-Build understands this concern and provides plans to keep the owner's desires our highest priority. This framework eliminates incentives for project management to be focused purely on cost.

Mandatory meetings and design-reviews with the owner will be on a monthly-basis, although owner-involvement is encouraged at all times. Our main concern is to maintain our customer's desires in the design of the project.

Feedback from the project management team will be provided to the owner about value engineering and other ways to save money, however changes will never be made unless the owner agrees. Motivation behind this feedback is for customer satisfaction. Open-book project accounting will ensure a fair deduction in scope for cost-saving changes.

Constructability Narrative

Constructability is a product of the optimum use of construction knowledge and experience in planning, design, procurement, and field operations to achieve a successful project that achieves the overall objectives. Greenback Design-Build's means for achieving a goal of this magnitude stems from our design-build integration. This type of contract is fully-utilized by a company that thrives off of the design-build atmosphere. Our constructability planning begins at the earliest stages of design.

Constructability reviews will be integrated on a bi-weekly basis throughout the design process. Our project management team will direct these reviews and subcontractors will be required to participate for their scopes of work. Subcontractor involvement proves to be beneficial for subcontractors, designers, construction managers, and ultimately the owner. Timeline for construction can be drastically reduced by providing advice and feedback from the experts to the designers early on in the process.

BIM programming and clash detection will be utilized as early as possible in the design process. This will not only help for quality control and reduce re-work, but it will give subcontractors the opportunity to provide feedback on design-efficiency and implementation of techniques and technologies that may be beneficial for overall project success.

Standard constructability issues and theories have been derived and introduced to our designers. These ideas were fabricated by past experience and will be developed further early in the process. This is a preliminary constructability effort before constructability reviews begin. The following constructability ideas are the bulk of this derived report given to our designers.

Equipment Selection

Equipment selection pertains to building systems equipment and construction-related equipment. It is necessary to obtain subcontractor feedback for building systems equipment as it regards to cost and true efficiency of equipment, labor savings, critical lead times, and warranty issues. This feedback will be obtained prior to design-development. Construction-related equipment should be considered when designing as well. Changes in design may have a direct affect on the cost for construction equipment due to site layout, material selection, and building systems equipment. Designers are to keep equipment selection in mind throughout the entire design process.

6.1 SITE QUALITY CONTROL PLAN

Material Selection

Material selection will be a main aspect of the fore-mentioned constructability reviews. This includes all relevant subcontractors. A preliminary list of standard material selection consists of the following:

- Standard sizing for materials such as cabinetry, structural base and flange plates, tiling, and others. The idea here is to reduce customization of as many parts of the project as possible.
- Minimal use of high-cost materials such as high-end finishes, fixtures, furnishings, distribution materials, and structural materials. Examples of high-cost materials to avoid if possible are the following:
  - Stainless steel
  - Copper electrical feeders and buses
  - Wide range of fixtures and furnishings
  - High-end tiling
- Selection of high-cost materials must be evaluated for their value added to the project. High-cost materials may be used if necessary.
- Labor-cost analysis must be used for material selection. In some cases, higher-cost material may save money on labor. Likewise, lower cost materials may have higher labor cost. Total cost of material and labor should be analyzed for material selection. Examples of this situation are:
  - Component aluminum handrail vs. steel handrail
    Component handrail has higher material cost, yet overall costs much less because of labor cost.
  - Prefabricated products to use throughout the project.
    Prefabricated products can usually save labor cost, however are generally higher in material cost.

Distribution Layout

Layout of shafts, hallway MEP racks, and penetration sleeves is important to plan early on. BIM programming will be our main tool for achieving this coordination. This should factor in space limitations and should develop subcontractor detailing to improve the submittal process. Ultimately, this will help to eliminate redundancies, delays, problems during construction and save money overall.

Submittal-Process Acceleration

Constructability efforts made as early as possible will be a catalyst for accelerations in the submittal processes. Detailing for major trades such as structural steel and concrete will be developed earlier. These will be details derived from the subcontractor's advice, which will drastically reduce confusion and information requests early in the construction phase. Items with longer lead times like steel can be covered earlier. This will mitigate problems with lead times. Decreasing the duration of submittal processing will decrease the overall time of construction. Purchasing and pricing can change dramatically based on material prices. Subcontractors can lock in at prices earlier, which will result in a mitigated risk of rising material cost.

Greenback Design-Build plans to use these ideas in a variety of ways on the project. Our main focus for constructability is to facilitate the transfer of information between designer and subcontractor, and subcontractor to subcontractor. This transfer of information results in an overall reduction in cost, duration, and risk on the project without reducing quality.

Commercial Value Proposition

Greenback Design-Build makes a constant effort to creating more sustainable solutions to our projects. We believe energy consumption can be reduced from a variety of ways. Our approach to these solutions is to find a monetary incentive for the owner's interest.

Upon review of building systems efficiency, we propose to use two different approaches to incorporate value into the project. These solutions are meant to help achieve LEED Gold, create higher indoor quality, increase campus sustainability-awareness, and make monetary sense to the owner.

This review was based on information input in a program called EQuest. The building is located in the Los Angeles area, which encounters very moderate weather. It is rectangular shape with the long direction being East and West. The total dimensions are 3 stories high, 195 feet in the East and West direction, and 120 feet in the north and south direction. The cladding of the building is primarily glazing(75%), but also utilizes stucco(5%), Eccoclad modular cladding(5%), and corrugated aluminum(5%). Small skylights are incorporated. The HVAC system will be a standard VAV system.

The building consists of a cafeteria, bookstore, offices, conference rooms, large multipurpose room, health center, and amenities. The cafeteria and bookstore share the first floor, while the offices and conference rooms are on the second and third floors. The large multipurpose room is located on the second floor, and the health center is located on the third floor. A large atrium travels all three floors in the middle of the building. We believe the design of this building should be very efficient due to orientations and light considerations, however electricity costs can be greatly reduced in other ways as well.

We propose the following Energy Efficiency Measures:

LED Lighting

LED lighting will be used throughout the building instead of fluorescent lighting. This shows almost a 50% decrease in electrical usage for lighting. With an initial extra cost of $200,000 and an estimated incentive of $5,000 from Savings By Design to be paid straight to the owner, incorporating LED lighting will cut the total electrical bill by 18% and pay back in 11.2 years.

Along with better light quality, LED lighting is much more efficient and lasts much longer than fluorescent lighting. This will dramatically reduce maintenance costs; however actual maintenance costs are only theoretical. LED lighting can last up to and sometimes over 50,000 hours, while fluorescent lighting only lasts up to 8,000 hours. Bulb replacement will be cut by over 70% in most cases.

Photovoltaic Systems

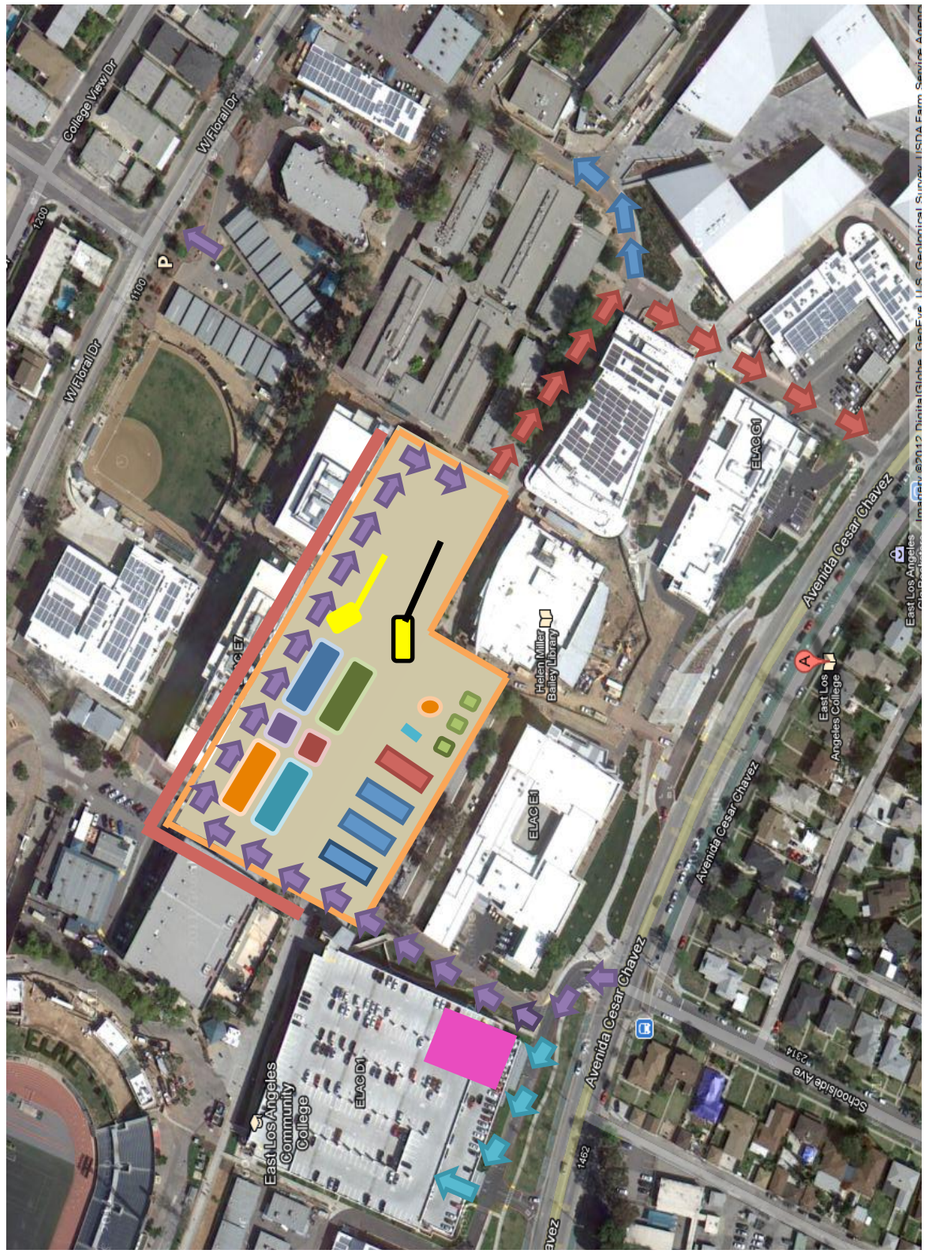
A 93 kW photovoltaic system will be incorporated on the roof of the building. The weight of this system is negligible and no structural reinforcing will be necessary. The entryway –glazing on the south side of the building will be a 5 kW photovoltaic glazing system. This will provide power and help filter sunlight going into the building. The initial cost of both photovoltaic systems will be $658,000, however solar initiative incentives will deduct that cost to $563,000. With total electrical savings of around 35% from the Baseline Design with LED lighting, the proposed photovoltaic systems will pay back in 18.4 years.

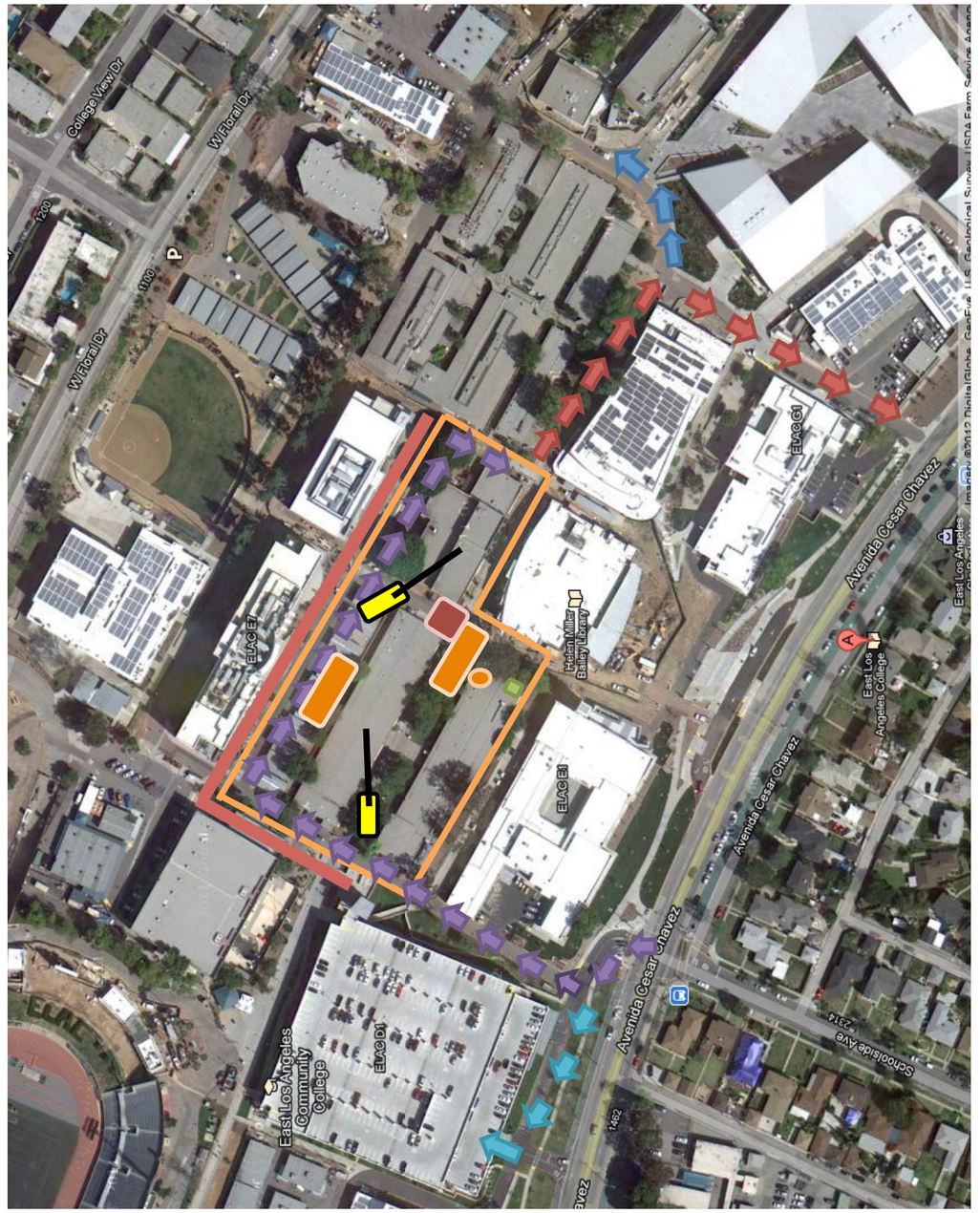
Overall Building Energy Consumption

With these two items included, the total electricity bill will be 46% less than the same building with typical fluorescent fixtures and no photovoltaic system. This is a dramatic decrease and both systems combined will pay back in 15.9 years from the decrease in electrical consumption.

The life cycle costing was calculated based on electrical rates relative to inflation over the past 30 years. Our conclusion was that electricity rates have been increasing at approximately the same rate as inflation. Simple payback was used to calculate cost savings and payback period.

6.2 SITE LOGISTICS PLAN





Primary Entrance

Parking

Primary Exit

6.3 DESIGN AND CONSTRUCTION SUMMARY SCHEDULE

Activity	Month
Schematic Design and Conceptual Estimates	1-4
Design Development and Specialty Consulting	4-12
Construction Documents and Procurement	9-11
DSA Approval	11-17
Notice to Proceed	12
Mobilization	12
Surveying	12
Demolition	12-19
Grading	19-20
Substructure	20-23
Structural Steel	23-28
Metal Decking	23-30
Glazing/Cladding	28-34
Interior Partitions	34-36
Rough MEP	34-36
Insulation	36
Drywall	37-40
Finish Carpentry	37-41
Finish MEP	38-40
Interior Finishes	48-40
PV System	34-36
Final Grading	39
Flatwork	33-34
Landscape	34-35
PunchList	41
Substantial Completion and Final Inspection	42

6.4 SCHEDULE NARRATIVE

The beginning of the schedule is impacted with design. However, due to the nature of our design build contract this design and specialty-consulting phase will also entail constructability reviews and contractor input. Once this beginning phase of design is finished the construction documents must be presented to the DSA for approval. All work must stop for this six-month process, which drastically alters the completion date. If the funding is available demolition will overlap the DSA approval if not then once approval is finished, work will immediately start with site demolition and site preparation.

The demolition phase will include the existing building will be having their utilities shut off, be stripped of glass and other hazardous components, and all reusable material salvaged. Once the existing buildings are gone the site will be the rough graded and grubbed and mobilization can occur. GBDG will move in its temporary trailer, connect it to the temporary utilities, and set up designated areas.

Once mobilization is complete we will begin with the sub structure. We must excavate for the cisterns and footings, form the stem walls and slabs, lay rebar, and pour concrete. Once the concrete is cured and floated we can begin with the structural steel.

The structural steel is a critical path item that if delay it will effect the completion date. All necessary effort will be given to have the structural systems erected with haste. Once the structural system is in place, corrugated metal decking will be fasten, under slab utilities and HVAC hangers emplace, rebar set and lightweight concrete poured. This decking phase will start on the bottom floor and work its way up and all other subcontractors following suit and working up. This will alleviate work loss due to trade stacking. From here the interiors will be framed. Once the interior partitions are complete the MEP can start running through the walls and interstitial space. Once the MEP is set drywall is needed. However due to moisture in the air the drywall cannot be installed until the building is enclosed. Therefore the cladding, glazing systems, doors, and windows must be installed at this time. Once this is complete the interior finishes, fixtures, furnishing, and cabinetry can be install and the building closeout can begin.

7.1 PRELIMINARY BASE PRICE

	$/SF Base Price		% of Price
Substructure(Group A)	$0.09	$697,000	4%
Shell(Group B)		$3,675,000	23%
Interiors(Group C)		$1,079,000	7%
Services(Group D)		$2,418,000	15%
Equipment & Furnishings(Group E)		$525,000	3%
Special Construction & Demolition(Group F)		$250,000	<1%
Building Sitework(Group G)	$0.04	$45,000	<1%
General Requirements		$1,781,000	11%
Construction Costs		$10,470,000	66%
Architecture, consulting, preconstruction		$676,000	4%
Legal fees		$48,000	0%
Permits, Bonds, Insurance		$290,000	2%
Allowances		$242,000	2%
Design & construction contingency		$2,610,000	16%
Soft Costs		$3,866,000	24%
Cost of the Work		$14,336,000	90%
General Overhead		$1,076,000	7%
Profit		$536,000	3%
Design-Builder Fee		$1,612,000	10%
BASE PRICE		$15,948,000	100%
Projected Total Gross Square Footage		$53,000	
Base Price per Gross Square Foot		$300.91	

7.2 COST MODEL PACKAGE COST

Substructure	
Standard Foundation	$356,000
Site work/ Excavation	$402,000
Demolition	$250,000
Superstructure	
Floor construction	$856,000
Roof construction	$490,000
External enclosure	
Exterior wall	$439,000
Window wall	$1,047,000
Photovoltaic	$658,000
Roofing	$185,000
Interiors	
Interior partitions	$310,000
Stairs	$155,000
Floor finishes	$427,000
Ceiling finishes	$187,000
Services	
Elevators and lifts	$227,000
Plumbing	$269,000
Mechanical	$996,000
Electrical	$926,000
Furnishings	$509,000
Construction Costs Modifiers	$10,470,000
Location	$542,000
Escalation	$465,000
General Requirements	$774,000
Soft Cost	$3,866,000
Architecture, Consulting, and Precons	$676,000
Legal Fees	$48,000
Permits and Bonds and Insurance	$290,000
Allowances	$242,000
Design and Construction Contingency	$2,610,000
Cost of Work	$14,336,000
Design Builder Fee	
General Overhead	$1,076,000
Profit	$536,000
Preliminary Base Price	$15,948,000
Building Price per SF	$300.91

7.3 BUILDING LIFE CYCLE COST

Building Life Cycle Costing

	Building Electrical Cost	Building Electrical w/ LED's	PV System Electrical Savings	Building cost with LED and PV	Natural GasCost
1	$104,200	86,860	$29,500	$57,360	$1,850
2	$106,284	88,597	$30,090	$58,507	$1,887
3	$108,410	90,369	$30,692	$59,677	$1,925
4	$110,578	92,177	$31,306	$60,871	$1,963
5	$112,789	94,020	$31,932	$62,088	$2,002
6	$115,045	95,900	$32,570	$63,330	$2,043
7	$117,346	97,818	$33,222	$64,597	$2,083
8	$119,693	99,775	$33,886	$65,889	$2,125
9	$122,087	101,770	$34,564	$67,206	$2,168
10	$124,529	103,806	$35,255	$68,551	$2,211
11	$127,019	105,882	$35,960	$69,922	$2,255
12	$129,560	107,999	$36,680	$71,320	$2,300
13	$132,151	110,159	$37,413	$72,746	$2,346
14	$134,794	112,363	$38,161	$74,201	$2,393
15	$137,490	114,610	$38,925	$75,685	$2,441
16	$140,239	116,902	$39,703	$77,199	$2,490
17	$143,044	119,240	$40,497	$78,743	$2,540
18	$145,905	121,625	$41,307	$80,318	$2,590
19	$148,823	124,057	$42,133	$81,924	$2,642
20	$151,800	126,539	$42,976	$83,563	$2,695
Total	$2,531,786	$2,110,470		$1,393,697	$44,950

8.1 SUSTAINABLE SITES

Sustainable Sites **26 of 26 Points Possible**

Prerequisite 1 **Construction Activity Pollution Prevention**

To earn these point GBDB will create and implement an erosion and sedimentation control plan for all construction activities associated with the project. The plan must conform to the erosion and sedimentation requirements of the 2003 EPA Construction General Permit OR local standards and codes. Loss of soil, sedimentation of streams will be prevented with Bioswales, sandbags, and soil filters around each storm drain. In order to mitigate the airborne pollution on the construction site, idling of construction vehicles will be banned and earthwork activities will be hosed down.

Credit 1 **Site Selection** **1**

The site is selected as a preexisting site and therefore shall to contribute to the loss of habitat or prime farmland.

Credit 2 **Development Density and Community Connectivity** **5**

The construction site is located on a previously developed site, and located within a ½ mile of a residential area or neighborhood with an average density of 10 units per acre, and within a ½ mile of 10 basic services.

Credit 3 **Brownfield Redevelopment** **1**

The west existing structures will be torn down and be declared a Brownfield by a local, state, or federal agency. Then it will be converted into the campus courtyard in which all existing soil will be remediated and the planted with native vegetation.

Credit 4.1 **Public Transportation Access** **1**

Public buses are available directly across the street at the 84 East LA College via Downtown metro station within a ¼ mile walking distance for students. Also all workers that utilize these routes will be compensated for their tickets in order to promote sustainable transportation and eliminate unnecessary congestion..

Credit 4.2 **Bicycle Storage and Changing Rooms** **1**

Construction will provide secure bicycle racks within 200 yards of a building entrance for 5% or more of the building occupants measure during peak hours. Showers and changing facilities are within 200 yards of a building entrance for .5% of the building occupants.

Credit 4.3 **Low-Emitting and Fuel-Efficient Vehicles** **3**

The general parking structure will provide preferred parking for low-emitting and fuel-efficient vehicles for 5% of the total vehicle parking capacity of the site. Also GBDG will provide a discounted parking rate as an acceptable substitute for preferred parking for low-emitting/ fuel-efficient vehicles. To establish a meaningful incentive in all potential markets, the parking rate must be discounted at least 20%. The discounted rate must be available to all customers, publicly posted at the entrance of the parking area and available for a minimum of 2 years.

Credit 4.4 **Parking Capacity** **2**

Parking capacity will meet but not exceed minimum local zoning requirements and provide preferred parking for carpools or vanpools for 5% of the total parking spaces.

Credit 5.1 **Protect or Restore Habitat** **1**

Restore or protect a minimum of 50% of the site or 20% of the total site area including building footprint, whichever is greater, with native or adapted vegetation.

Credit 5.2 **Maximize Open Space** **1**

The courtyard will be designed with the intention to maximize space for the student and provide a vegetated open space area adjacent to the building that is equal in area to the building footprint.

Credit 6.1 **Stormwater Design—Quantity Control** **1**

GBDB will implement a stormwater management plan that results in a 25% decrease in the volume of stormwater runoff from the 2-year 24-hour design storm

Credit 6.2 **Stormwater Design—Quality Control** **1**

Employee and subcontractor training and awareness will control the storm drains and a certified professional will test the storm flow to ensure quality of water entering the storm drain. They will also Implement a stormwater management plan that reduces impervious cover, promotes infiltration and captures and treats the stormwater runoff from 90% of the average annual rainfall using acceptable best management practices.

Credit 7.1 **Heat Island Effect—Non-roof** **1**

50% of the site hardscape will have shade from the existing tree canopy or within 5 years of landscape installation, shade from architectural devices or structures that have a solar reflectance index2 (SRI) of at least 29, and use hardscape materials with an SRI of at least 29.

Credit 7.2 **Heat Island Effect—Roof** **1**

To reduce the heat absorbing properties of the roofing materials will have a solar reflectance index (SRI) equal to or greater 78 for a minimum of 75% of the roof surface.

Credit 8 **Light Pollution Reduction** **1**

Reduce the input power (by automatic device) of all nonemergency interior luminaries with a direct line of sight to any openings in the envelope (translucent or transparent) by at least 50% between 11 p.m. and 5 a.m. After-hours override may be provided by a manual or occupant-sensing device provided the override lasts no more than 30 minutes.

8.2 WATER EFFICIENCY

Water Efficiency **10 of 10 Points Possible**

Prerequisite 1 **Water Use Reduction**

Employ strategies that in aggregate use 20% less water than the water use baseline by the use of waterless urinals, low flush toilets, and automatic facets with a flow rate of ½ gallon a minute.

Credit 1 **Water Efficient Landscaping** **4**

Reduce potable water consumption for irrigation by 50% from a calculated midsummer baseline case. Reductions include plant species that require less water,
Irrigation efficiency, and the use of captured rainwater by grey water cistern underneath the student union.

Credit 2 **Innovative Wastewater Technologies** **2**

Reduce potable water use for building sewage conveyance by 50% through the use of water-conserving fixtures or nonpotable water captured rainwater and recycled graywater.

Credit 3 **Water Use reduction** **4**

Lowflow toilets, urinals, lavatory faucets, and prerinse spray values with efficient irrigation will produce 30% water reduction.

8.3 ENERGY AND ATMOSPHERE

34 of 35 Points Possible

Prerequisite 1 Fundamental Commissioning of Building Energy Systems

All commissioning process activities will be completed by the project team and energy related systems.

Prerequisite 2 Minimum Energy Performance

Comply with the prescriptive measures identified in the Advanced Buildings™ Core Performance™ Guide developed by the New Buildings Institute. The building must will be less than 100,000 square feet and comply with Section 1: Design Process Strategies, and Section 2: Core Performance Requirements.

Prerequisite 3 Fundamental Refrigerant Management

Zero use of chlorofluorocarbon based refrigerants in new base building heating, ventilating, air conditioning and refrigeration (HVAC&R) systems. When reusing existing base building HVAC equipment, complete a comprehensive CFC phase-out conversion prior to project completion.

Credit 1 Optimize Energy Performance 18

Switching all light to LED's with motion sensors will improve the lighting energy efficiency by 46%+ for new buildings. Also all appliances will be energy star applicable. GDBD will demonstrate a percentage improvement in the proposed building performance rating compared with the baseline building performance rating.

Credit 2 On-Site Renewable Energy 1-7

35% of the building energy requirements will be from the photovoltaic's located on the roof.

Credit 3 Enhanced Commissioning 2

Implement, or have a contract in place to implementn independent commissioning authority (CxA) to lead, review and oversee the completion of all commissioning process activities in addition to the requirements of EA Prerequisite 1: Fundamental Commissioning of Building Energy Systems and in accordance with the LEED Reference Guide for Green Building Design and Construction, 2009 Edition

Credit 4 Enhanced Refrigerant Management 2

A night flush vent system will pump in cool night air for day use. R30 insulation will be installed in the roof and R17 in the wall to limit seepage and heat loss. GDBD will select refrigerants and heating, ventilation, air conditioning and refrigeration (HVAC&R) equipment that minimize or eliminate the emission of compounds that contribute to ozone depletion and climate change.

Credit 5 Measurement and Verification 3

Develop and implement a measurement and verification (M&V) plan consistent with Option B: Energy Conservation Measure Isolation, as specified in the International Performance Measurement & Verification Protocol (IPMVP) Volume III: Concepts and Options for Determining Energy Savings in New Construction, April 2003. The M&V period must cover at least 1 year of post-construction occupancy and provide a process for corrective action if the results of the M&V plan indicate that energy savings are not being achieved.

Credit 6 Green Power 2

Engage in at least a 2-year renewable energy contract to provide at least 35% of the building's electricity from renewable sources, as defined by the Center for Resource Solutions' Green-e Energy product certification requirements. All purchases of green power shall be based on the quantity of energy consumed, not the cost.

8.4 MATERIALS RESOURCES

14 of 14 Points Possible

Prerequisite 1 Storage and Collection of Recyclables

Recycling bin will be placed at strategic collection point and provide an easily-accessible dedicated area or areas for the collection and storage of materials for recycling for the entire building. Materials must include, at a minimum: paper, corrugated cardboard, glass, plastics and metals.

Credit 1 Construction Waste Management 1-3

75% of all construction material will be recycled or salvaged.

Credit 1.1 Maintain Existing Walls, Floors, and Roof 0 of 3

None

Credit 1.1 Maintain Existing Interior Non structural Elements 1

GDBD will reuse HVAC, doors, floor coverings and ceiling systems in at least 50% (by area) of the completed building, including additions.

Credit 2 Construction Waste Management 1-2

GBDB will recycle and/or salvage nonhazardous construction and demolition debris. Develop and implement a construction waste management plan that, at a minimum, identifies the materials to be diverted from disposal and sorted on-site.

Credit 3 Materials Reuse 1-2

All existing dimensional framing such as beams and posts as well as doors and frames, and cabinetry will be salvaged, refurbished, or reused. Prior to demolition Habitat for humanity will be called in order to salvage building materials from the existing structure.

Credit 4 Recycled Content 1-2

Use materials with recycled content such that the sum of postconsumer recycled content is alt least 1/2 of the preconsumer content constitutes at least 10% or 20%, based on cost. All concrete floors and columns will have recycled fly ash and recycled steel will be uses for the interior columns and roof. Wood materials will be a composite with post consumer waste and counter top will be a composite with recycled glass.

Credit 5 Regional Materials 1-2

Construction building materials or products will be used that have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project site for a minimum of 10% or 20%, based on cost, of the total materials value.

Credit 6 Rapidly Renewable Materials 1

This construction project will use rapidly renewable building materials and products for 2.5% of the total value of all building materials and products used in the project, based on cost. Materials such as bamboos and woods for its architectural and structural woodwork and wool, cotton insulation will be used.

Credit 7 Certified Wood 1

All construction will use a minimum of 50% of wood-based materials and products that are certified in accordance with the Forest Stewardship Council's principles and criteria, for wood building components.

8.5 INDOOR ENVIRONMENTAL QUALITY

15 of 15 Points Possible

Prerequisite 1 Minimum Indoor Air Quality Performance

Construction will meet the minimum requirements of Sections 4 through 7 of ASHRAE Standard 62.1-2007, Ventilation for Acceptable Indoor Air Quality and m echanically ventilated spaces will be designed using the ventilation rate procedure or the applicable local code, whichever is more stringent.

Prerequisite 2 Environmental Tobacco Smoke (ETS) Control

Smoking in the building will be prohibited. On-property smoking within 25 feet of entries, outdoor air intakes and operable windows is also prohibited. Signage will be provided to allow smoking in designated areas.

Credit 1 Outdoor Air Delivery Monitoring 1

A permanent monitoring systems will be installed to ensure that ventilation systems maintain design minimum requirements and that monitoring equipment to generate an alarm when airflow values or carbon dioxide (CO2) levels vary by 10% or more from the design values via either a building automation system alarm to the building operator or a visual or audible alert to the building occupants

Credit 2 Increased Ventilation 1

Glazing systems installed on the upper floors shall have workable window for extra ventilation to increase breathing zone outdoor air ventilation rates to all occupied spaces by at least 30% above the minimum rates required by ASHRAE Standard 62.1-2007 as determined by IEQ Prerequisite 1: Minimum Indoor Air Quality Performance.

Credit 3.1 Construction IAQ Management Plan—During Construction 1

We will develop and implement an IAQ management plan for the construction and during construction to exceed the recommended control measures and protect stored on-site and installed absorptive materials from moisture damage. If permanently installed air handlers are used during construction, filtration media with a minimum efficiency reporting value (MERV) of 8 must be used at each return air grille, as determined by ASHRAE Standard 52.2- 1999.

Credit 3.2 Construction IAQ Management Plan—Before Occupancy 1

After construction ends, prior to occupancy and with all interior finishes installed, install new filtration media and perform a building flush-out by supplying a total air volume of 14,000 cubic feet of outdoor air per square foot of floor area while maintaining an internal temperature of at least 60° F and relative humidity no higher than 60%.

Credit 4.1-4.4 Low-Emitting Materials-Adhesives, Sealants, Paints, 1 Coatings, Flooring, Composite Wood, and Agrifiber products

Adhesives and sealants, paints and coatings, flooring systems and composite wood will be low emitting rated materials and must comply with South Coast Air Quality Management District (SCAQMD) Rule #1168 with no VOC.

Credit 5 Indoor Chemical and Pollutant Source Control 1

Design facility cleaning and maintenance areas with isolated exhaust systems for contaminants. Maintain physical isolation from the rest of the regularly occupied areas of the building. Install permanent architectural entryway systems such as grills or grates to prevent occupant-borne contaminants from entering the building.

Credit 6.1 Controllability of Systems—Lighting 1

To provide a high level of lighting system control for individual occupants or groups in multi-occupant spaces and promote their productivity, comfort and well-being. We will provide individual lighting controls for 90% of the building occupants to enable adjustments to suit individual task needs and preferences.

Credit 6.2 Controllability of Systems—Thermal Comfort 1

To provide a high level of thermal comfort system control by individual occupants or groups in multi-occupant spaces we will provide individual comfort controls for 50% of the building occupants to enable adjustment. Operable windows will be used in lieu of controls for occupants located 20 feet inside and 10 feet to either side of the operable part of a window.

Credit 7.1 Thermal Comfort—Design 1

Heating, ventilating and air conditioning (HVAC) systems and the building envelope will be designed to meet the requirements of ASHRAE Standard 55-2004, Thermal Comfort Conditions for Human Occupancy.

Credit 7.2 Thermal Comfort—Verification 1

A permanent monitoring system to ensure that building performance meets the desired comfort criteria as determined by IEQ Credit 7.1: Thermal Comfort—Design will be provided and a thermal comfort survey of building occupants within 6 to 18 months after occupancy will be conducted.

Credit 8.1 Daylight and Views—Daylight 1

Most of the exterior skin will consist of glazing, which will let in more then necessary daylight and will demonstrate through computer simulations that 75% or more of all regularly occupied spaces areas achieve daylight luminance levels of a minimum of 25 footcandles (fc) and a maximum of 500 fc in a clear sky condition on September 21 at 9 a.m. and 3 p.m.

Credit 8.2 Daylight and Views—Views 1

The sitting areas and cafeteria will be facing the eastern direction into the court yard to provide scenic views and achieve a direct line of sight to the outdoor environment via vision glazing between 30 inches and 90 inches above the finish floor for building occupants in 90% of all regularly occupied areas.

8.6 INNOVATION AND DESIGN PROCESS

6 of 6 Points Possible

Credit 1.1 Innovation in Design: Saw Tooth Roof 1

The saw tooth roof faces to the south to provide natural daylight to the occupants and promote their well-being.

Credit 1.2 Innovation in Design: Photo Voltaic Glass 1

The exterior glazing has photo voltaic properties as well as lets in natural daylight to increase efficiency of energy and students.

Credit 1.3 Innovation in Design: Glass Atrium 1

The glass atrium in the center of the complex creates effective open space for the student, natural light, and escape for hot air.

Credit 1.4 Innovation in Design: Specific Title 1

Credit 1.5 Innovation in Design: Specific Title 1

Credit 2 LEED Accredited Professional 1

4 principal participant of the project team shall be a LEED Accredited Professional

8.7 REGIONAL PRIORITY CREDITS

4 of 4 Points Possible

Regional Priority: EAc2	1%renewable energy
Regional Priority: IEQc8.1	Classroom: 75%
Regional Priority: MRc1.1	Building reuse: 75%
Regional Priority: SSc5.2	
Regional Priority: WEc2	
Regional Priority: WEc3	40% reduction

Total Points= 102

LEED 2009 for New Construction Certified Gold

8.8 LEED SUMMARY

LEED 2009 for New Construction and Major Renovation

Project Checklist — Group 11

Project Name: ELAC Bookstore and Student Center

21	0	0	**Sustainable Sites**		Possible Points:	21
Y			Prereq 1	Construction Activity Pollution Prevention		
1	0	0	Credit 1	Site Selection		1
5	0	0	Credit 2	Development Density and Community Connectivity		5
1	0	0	Credit 3	Brownfield Redevelopment		1
1	0	0	Credit 4.1	Alternative Transportation—Public Transportation Access		1
1	0	0	Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	p. 7	1
3	0	0	Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles		3
2	0	0	Credit 4.4	Alternative Transportation—Parking Capacity		2
1	0	0	Credit 5.1	Site Development—Protect or Restore Habitat		1
1	0	0	Credit 5.2	Site Development—Maximize Open Space		1
1	0	0	Credit 6.1	Stormwater Design—Quantity Control		1
1	0	0	Credit 6.2	Stormwater Design—Quality Control		1
1	0	0	Credit 7.1	Heat Island Effect—Non-roof	p. 16	1
1	0	0	Credit 7.2	Heat Island Effect—Roof	p. 17	1
1	0	0	Credit 8	Light Pollution Reduction		1
9	0	1	**Water Efficiency**		Possible Points:	10
Y			Prereq 1	Water Use Reduction—20% Reduction		
4	0	0	Credit 1	Water Efficient Landscaping	p. 23	2 to 4
2	0	0	Credit 2	Innovative Wastewater Technologies		2
3	0	1	Credit 3	Water Use Reduction	p. 26	2 to 4
34	0	1	**Energy and Atmosphere**		Possible Points:	35
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems		
Y			Prereq 2	Minimum Energy Performance		0
Y			Prereq 3	Fundamental Refrigerant Management		
18	0	1	Credit 1	Optimize Energy Performance		1 to 19
7	0	0	Credit 2	On-Site Renewable Energy	p. 38	1 to 7
2	0	0	Credit 3	Enhanced Commissioning		2
2	0	0	Credit 4	Enhanced Refrigerant Management		2
3	0	0	Credit 5	Measurement and Verification		3
2	0	0	Credit 6	Green Power		2
11	3	0	**Materials and Resources**		Possible Points:	14
Y			Prereq 1	Storage and Collection of Recyclables		0
0	3	0	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof		1 to 3
1	0	0	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements		1
2	0	0	Credit 2	Construction Waste Management		1 to 2
2	0	0	Credit 3	Materials Reuse	p. 51	1 to 2

6	0	0	**Materials and Resources, Continued**			
2	0	0	Credit 4	Recycled Content	p. 52	1 to 2
2	0	0	Credit 5	Regional Materials	p. 53	1 to 2
1	0	0	Credit 6	Rapidly Renewable Materials	p. 54	1
1	0	0	Credit 7	Certified Wood	p. 55	1
15	0	0	**Indoor Environmental Quality**		Possible Points:	15
Y			Prereq 1	Minimum Indoor Air Quality Performance		0
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control		0
1	0	0	Credit 1	Outdoor Air Delivery Monitoring		1
1	0	0	Credit 2	Increased Ventilation		1
1	0	0	Credit 3.1	Construction IAQ Management Plan—During Construction		1
1	0	0	Credit 3.2	Construction IAQ Management Plan—Before Occupancy		1
1	0	0	Credit 4.1	Low-Emitting Materials—Adhesives and Sealants		1
1	0	0	Credit 4.2	Low-Emitting Materials—Paints and Coatings		1
1	0	0	Credit 4.3	Low-Emitting Materials—Flooring Systems		1
1	0	0	Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products		1
1	0	0	Credit 5	Indoor Chemical and Pollutant Source Control		1
1	0	0	Credit 6.1	Controllability of Systems—Lighting		1
1	0	0	Credit 6.2	Controllability of Systems—Thermal Comfort		1
1	0	0	Credit 7.1	Thermal Comfort—Design		1
1	0	0	Credit 7.2	Thermal Comfort—Verification		1
1	0	0	Credit 8.1	Daylight and Views—Daylight	p. 77	1
1	0	0	Credit 8.2	Daylight and Views—Views		1
4	0	2	**Innovation and Design Process**		Possible Points:	6
1	0	0	Credit 1.1	Innovation in Design: Saw Tooth Roof	p. 83	1
1	0	0	Credit 1.2	Innovation in Design: PV Glass	p. 83	1
1	0	0	Credit 1.3	Innovation in Design: Glass Atrium	p. 83	1
0	0	1	Credit 1.4	Innovation in Design: Specific Title	p. 83	1
0	0	1	Credit 1.5	Innovation in Design: Specific Title	p. 83	1
1	0	0	Credit 2	LEED Accredited Professional	p. 84	1
4	0	0	**Regional Priority Credits**		Possible Points:	4
1	0	0	Credit 1.1	Regional Priority: EAc2	p. 85	1
1	0	0	Credit 1.2	Regional Priority: IEQc8.1	p.85	1
1	0	0	Credit 1.3	Regional Priority:MRc1.1	p.85	1
1	0	0	Credit 1.4	Regional Priority:WEc3	p.85	1
[illegible]	1	1	**Total**		Possible Points:	110

8.9 PROGRAM SUMMARY

First Floor		Area SF	Quantity	Total		Area SF	Quantity	Total
Cafeteria		8613	1	8613		8300	1	8300
Bookstore		7120	1	7120		6600	1	6600
Services/Maint		1207	1	1207		1500	1	1500
Public Space		3858	1	3858		4000	1	4000
	Vert Circ		4				4	
	Horiz Circ		1				1	
	Shafts		N/A				N/A	
	Restrooms		2				2	
	MEP		1				1	
		Subtotal:		**20798**		**Subtotal:**		**20798**
		ASF:		**15943**		**ASF:**		**14460**
		GSF:		**21540**		**GSF:**		**21265**
Second Floor								
Multipurpose		5645	1	5645		5400	1	5400
	Terrace		1				1	3300
ASU		3177	1	3177			1	2925
Student Activities		1367	1	1367			1	1500
	Lounge							
	Study							
Services/Maint		728	1	728			1	900
Public Space		7643	1	7643			1	4500
Conference Rooms		1855	1	1855			1	1950
		Subtotal:		**20648**		**Subtotal:**		**20648**
		ASF:		**12379**		**ASF:**		**20475**
		GSF:		**21535**		**GSF:**		**21868**
Third Floor								
Health Services		2136	1	2136			1	3150
Faculty Lounge		859	1	859			1	875
Staff Lounge		859	1	859			1	875
Shell Offices		2088	1	2088			1	1950
Services/Maint		295	1	295			1	900
Public Space		3857	1	3857			1	1600
		Subtotal:		**12385**		**Subtotal:**		**12385**
		ASF:		**6369**		**ASF:**		**9350**
		GSF:		**12385**		**GSF:**		**12746**
		Total GSF:		**55460**		**Total GSF:**		**55879**
		Total ASF:		**34691**		**Total ASF:**		**44285**

GREENBACK = SLANG FOR MONEY (DOLLAR BILLS)

GREEN = MONEY

BACK = RETURN

OUR DESIGNS SAVE MONEY AND RETURN IT BACK TO THE OWNER'S WALLETS

GREEN = SUSTAINABLE DESIGN

BACK = SUPPORT

WE SUPPORT SUSTAINABLE EFFORTS FOR OUR FUTURE

GREENBACK DESIGN BUILD = A FIRM THAT WILL HELP CLIENTS SAVE MONEY AND HELP THE ENVIRONMENT THROUGH SUSTAINABILITY ..... WIN WIN.

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