Northeast Lakeview College
NEW STEM EDUCATION BUILDING

Schematic Design Submittal

July 24, 2018

Ford, Powell & Carson
Architects & Planners, Inc.

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Northeast Lakeview College
NEW STEM EDUCATION BUILDING
Schematic Design Submittal
Architectural Design Narrative
July 24, 2018

The new STEM Education building will be located to the west of the existing Academic Building on the Northeast Lakeview College campus. The physical address for the campus is 1201 Kitty Hawk Rd., Universal City, Texas 78148. The campus sits on property in located in both Universal City and Live Oak, Texas. The STEM building siting places it within Live Oak jurisdiction.

The building is composed of two separate wings. A single one-story wing houses all chemistry, geology and physics labs along with shared lab prep areas, lab technicians, a chemistry research lab, loading/delivery and a tutorial center. A dedicated mechanical room will serve the lab wing. The main three-story wing will house technical and computer labs, student breakroom, a theatre style classroom and a flexible classroom on the first floor. General classrooms and computer labs will be located on the second floor. The Department Chair and all faculty offices, faculty breakroom, conference rooms and the large flexible meeting room are located on the third floor.

The composition of the building features a volume containing the theatre style classroom, flexible classroom and flexible meeting room offset from the main three-story volume. A wide interior corridor allows for collaborative spaces including student sticky spaces (informal collaboration and study areas) and private meeting rooms distributed on both first and second floors. Vertical openings in the corridor connect the first and second floors visually. The third floor faculty suite, conference rooms and flexible meeting room have expansive views to the south towards the campus green and the lake.

To the greatest extent possible, interior partitioning will be constructed utilizing the modular, demountable "DIRTT" system. This will allow greater flexibility in future interior renovation to accommodate growth and new college academic programs.

The building is 86,862 square feet gross square feet achieving a 60% assignable to gross efficiency rate.

Exterior materials will consist of veneer brick and composite metal panels to complement existing campus buildings. Fenestration will consist of aluminum and glass storefront, curtain-wall and entry doors. Roofing to be modified bitumen. Metal panel canopy projections will shade southern fenestration, exterior balconies and north entrance.

Interior finishes will comply with the Alamo Colleges Design Standards. Classroom and lab floors will be generally polished concrete, restrooms will have ceramic porcelain tile, ceilings will be either 2 x 2 acoustical tile or painted drywall. For the 3rd floor flexible meeting room, a Variance Request will be submitted to allow the use of carpet tile to accommodate programming.

Two entrances are located on the north side of the building. The west entrance leads directly to the lab wing while the east entry provides controlled after hours entry to the flexible meeting room on the third floor protecting access to the lab wing. The southeast corner of the building contains a plaza that doubles to serve fire apparatus access and maintenance and food truck access to the campus green.

Project: Alamo Colleges District Support Operations Building
San Antonio, Texas

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GENERAL

The project consists of a 1-story, 20,500 square foot north wing and a 3-story, 70,000 square foot south wing. The north wing will house chemistry laboratories and associated support offices. The south wing will house general classrooms on the first and second floors, and offices on the third floor. The south wing will also have large flex spaces at the east end of the first floor and third floors, as well as roof top terraces on the third floor.

The new building situated at the northern end of the campus, west of the existing Academic Building I. The project site slopes moderately down nearly 14 feet toward the west.

STRUCTURAL SYSTEMS

FOUNDATIONS

According to geotechnical information from the existing nearby Academic Building I, authored by DRASH Consulting Engineers in 2006, the site is anticipated have expansive clay soils. The primary structural loads will be carried by drilled straight shaft piers bearing on tan or gray marl. Piers will be designed using a combination of end bearing and skin friction. Depths are anticipated to range from about 25' to 35'. High torque drill equipment will be required to install piers at this site, particularly in the partially cemented and cemented marl. A Geotechnical Report will be required to verify actual conditions and establish foundation design criteria. The geotechnical investigation is being procured by the College but is not yet available.

STRUCTURAL FRAMING SYSTEM STUDY

Several structural systems have been considered by the Design Team and the Construction Manager. The following items were among the factors considered in selecting the floor framing options:

- Structural depth
- Cost
- Construction schedule
- Effect of Architectural elements, such as exterior walls, floor finishes, and ceiling height
- Effect of Mechanical systems, such as trades' coordination when laying out ductwork
- Vibration, for occupant comfort

There were four structural systems that were analyzed and evaluated in the structural floor framing study representing a "typical bay" of the south 3-story wing. These systems included:

- Concrete two-way flat plate consisting of a nominal 10" thick slab in the general field, 9" thick drop panels at interior columns, and a 24" deep perimeter beam. Beams will be required at other limited locations, such as around large openings and along column lines where columns from one bay to the next don't align. The floor is supported by 20" square concrete columns. Lateral loads are resisted by moment frame action along column "strips" of the slab in line with columns.
- Concrete "wide pan joists" consisting of a 4 5/8" thick slab spanning to 7" wide, 20 5/8" deep "joists" spaced at roughly a 6 ft spacing. The joists span to flush bottom girders. The floor is supported by 20" square concrete columns. 15" wide beams, parallel to joists, span to the columns to act as a moment frame to resist lateral loads.
- Concrete "standard pan joists" consisting of a 3" thick slab spanning to 6" wide, 19" deep joists spaced at a 3ft spacing. The joists span to 36" wide flush bottom interior girders and to 30" wide by 23 ¼" deep perimeter girders, supported by 20" square concrete columns. 26" wide beams, parallel to joists, span to the columns to act as a moment frame to resist lateral loads.
- Composite steel framing consisting of a 6" normal weight concrete slab on 3" composite metal deck. The slab spans to steel wide flange beams, roughly spaced at 7'-6". The steel beams span to steel wide flange girders and to steel wide flange columns. Lateral loads will be resisted by additional steel wind bracing.
- In all four framing options proposed above, the roof is framed using 1 ½" metal roof deck on open web steel joists spaced at 6ft to steel girders.

Refer to the typical bay framing drawings following the narrative for further clarification of each system discussed above. The relative merits of each system were considered and compared. The concrete flat plate system was chosen by the Design Team with concurrence from the project's Construction Manager. This framing system resulted in the lowest cost per square foot compared to the other systems, other qualitative advantages, and no significant disadvantages.

ELEVATED FLOOR FRAMING

Due to the expansive clay soils and the topography of the site, the ground floor for both the north and south wings of the building will be framed using an elevated floor slab over crawl space. The framing system used, per the system selection system noted in the above section, is a concrete flat plate with drop panels. A deep perimeter grade beam/wall is anticipated where relative depth to adjacent finished grade is limited. Where adjacent finished grade is significant, such as on the west end of both wings, the crawl space may alternatively have an Architectural skirt or left exposed in lieu of a tall wall. Entrances to the building will be coordinated with the Design Team and will likely require structured stoop slabs or transition slabs to mitigate the heave effects of expansive soils.

The second and third floors of the south wing will be framed using the concrete flat plate with drop panels per the system selection system noted in the above section. Interior beams will be required to frame large interior openings, such as elevator pits, stairwells, and mechanical chases. A beam is also required at the typical perimeter to support a masonry shelf angle.

The east end of south wing will house a double-height, column-free flex space at Level 1. A portion of this space will have tiered seating constructed of overbuilt concrete plinths on top of the flat slab. The east end of south wing another column-free flex space at Level 3. The Level 3 floor slab here will be constructed with a 10" flat slab that spans to 30" wide by 24" deep (unbonded) post-tensioned concrete girders. Both of these flex spaces will have operable partitions hung from the framing above.

The south side of south wing at Level 3 will also have an occupied roof terrace. This space will be framed using a 12" thick flat slab, recessed a nominal amount.

ROOF FRAMING

Both the north wing and south wing roofs will be framed using 1 ½" deep galvanized 22 ga. metal roof deck supported by open web steel joists, spaced roughly 5'-6". The steel joists will span to steel wide flange girders. The north wing roof will be supported using structural steel tube columns. The south wing roof will be supported by extending the concrete columns

up to the roof level. The south wing roof has several areas of overhangs, likely framed with joist top chord extensions and outrigger tubes.

LATERAL FRAMING

At the north wing, lateral loads will be resisted by the metal roof deck diaphragm spanning to structural steel braced frames.

At the south wing, the lateral loads will be resisted by the metal roof deck diaphragm spanning to the concrete columns. The concrete columns will cantilever up from the concrete moment frame levels below.

An expansion joint is planned at the north edge of south wing and will carry through the foundation.

STRUCTURAL MATERIALS

CONCRETE

- Columns: 5600 psi
- Floor Framing: 4000 psi
- Drilled Piers: 3000 psi
- Fly Ash: up to 25% replacement for typical concrete

REINFORCING

- ASTM A615 Grade 60

POST-TENSIONING

- ASTM A416 270 KSI, unbonded

STRUCTURAL STEEL

- Wide Flange Sahpes: ASTM A 992
- Angles, Channels, Plate: ASTM A 36
- Tubes: ASTM A 500, Grade B
- Pipes: ASTM A 53, Grade B
- Bolts: ASTUM A 325, snug tight

DESIGN ANALYSES

CODES AND STANDARDS

This building code references, and therefore codifies the following standards, which will also be used for this project:

- IBC 2018
- ACI 318-14 - Building Code Requirements for Structural Concrete.
- AISC 360-16 – Specifications for Structural Steel Buildlings.
- ASCE 7-16 – Minimum Design Loads for Buildings and other Structures

DESIGN CRITERIA

- Deflection Control of 3/8” or L/600 live load deflection in the plane of walls for horizontal members supporting masonry walls.
- Vibration evaluation for human occupant comfort

DESIGN LOADS

DEAD LOADS

Dead loads include the weight of the structural components, permanent fixtures (permanent partitions/walls, ceilings, mechanical equipment, etc.). An allowance of 10 psf will be included for typical ceiling and tenant mechanical loads.

LIVE LOADS

- Typical minimum: 100 psf (based upon the ACCD Guidelines)
- Auditorium with fixed seats and tiered/sloped floor: 60 psf
- Library loads: 125 psf
- Mechanical Rooms: 150 psf
- General Roofs: 20 psf
- Roofs above mechanical rooms: 50 psf
- Occupied Roofs: 100 psf
- Live load reductions are to be computed per the Building Code and ACCD design guidelines (reductions limited to columns only).

WIND LOADS

Wind loads have been obtained from ASCE 7-16 and the following parameters:

- Risk Category – III (substantial risk to human life)
- Basic Wind Speed, V –120 MPH
- Exposure Category “C”

SEISMIC LOAD

Seismic loads will be obtained from ASCE 7-16. A site-specific soils report is not yet available for this project, and these values are subject to that report.

FIRE RESISTANCE

This project is anticipated to be Type IIB construction; 0 hour rated construction.

Schematic Design Narrative
for
Northeast Lakeview College
STEM Education Building
Universal City, Texas – Campus Address
Live Oak, Texas – Building Location

Project #18002690.00
July 24, 2018

A. Introduction

1. Purpose

a. The primary purpose of this report is to describe and provide a permanent record of the building systems for the Northeast Lakeview College STEM Education Building in San Antonio, Texas. In addition to describing the systems, the fundamental assumptions used for the design are outlined.

2. Project Description

a. The project constructs an approximately 80,000 square-foot, new construction, three-story STEM education building that will include computer labs, flexible classrooms, theatre style classrooms, technical labs, science labs and flexible meeting rooms. The construction budget is anticipated to be approximately $28,000,000.

B. Governing Codes

1. International Building Code, 2018 Edition with Live Oak, TX amendments.
2. International Mechanical Code, 2018 Edition with Live Oak, TX amendments.
3. International Plumbing Code, 2018 Edition with Live Oak, TX amendments.
4. International Energy Conservation Code, 2018 Edition (there are no applicable Live Oak, TX amendments).
5. International Fuel Gas Code, 2018 Edition with Live Oak, TX amendments.
6. International Fire Code, 2018 Edition (there are no applicable Live Oak, TX amendments).
7. National Electrical Code, NFPA 70, 2017 Edition without Article 80.

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C. Heating, Ventilation and Air Conditioning Design Requirements

1. Mechanical Systems Design Criteria

a. Cooling

1) Design Outdoor Air Conditions: 100°Fdb/78°Fwb.

2) Space Environmental Requirements:

a) 72°F ± 2°F (deadband), 50%RH high limit.

b) Electrical and mechanical rooms: 85°F

3) Cooling Safety Factor: 10%

b. Heating

1) Design Outdoor Air Conditions: 25°F

2) Space Environmental Requirements

a) 72°F ± 2°F

b) Electrical and mechanical rooms: 65°F

3) Heating Safety Factor: 30%

c. Laboratory Air Changes per Hour (ACH)

1) The following are the design team's recommended minimum occupied laboratory hourly exhaust air change rates to maintain safe laboratory conditions for human occupancy:

a) Bio Chemistry – 8 ACH

b) Chemistry - 8 ACH

c) Organic Chemistry - 8 ACH

d) Shared Science Preparation - 8 ACH

e) Physics - 4 ACH

f) Geology - 2 ACH

2) Makeup air for fume hood exhaust and/or space cooling load may drive the design maximum supply airflow higher than required to makeup for the exhaust air change rates listed above.

2. Heating and Cooling Systems

a. System Description

1) Cooling

a) The existing campus chilled water plant will provide chilled water for use at all chilled water coils in this building.

(1) To accommodate anticipated additional future chilled water needs, the existing buried 10" chilled water pipes will be replaced with 12" pipes within the scope of this

project. These pipes will terminate in a valve box with valves and caps for future extension of the new piping.

(2) Chilled water mains will be routed below grade from the new 12" mains to the new building crawlspace. The piping is anticipated to enter the crawlspace at its nearest point to the buried main piping near the northeast corner/sides of the building. Inside the crawlspace the chilled water piping will be routed to serve cooling coils on the first floor and to riser locations to serve cooling coils on the second and third floors. Piping within the crawl space will be supported from the underside of the floor slab. Pipe expansion/motion compensation will be provided to account for buried pipe movement due to expansive soils anticipated at the site.

(3) Chilled water piping 2" and smaller will be copper with soldered or mechanical press joints and fittings. Shutoff valves will be ball type. Piping 2-1/2" and larger will be standard weight black steel with butt-welded or flanged joints and butt-welded fittings. Shutoff valves will be butterfly type.

b) Dedicated cooling only split systems will be provided to serve the IDF and MDF rooms. Humidification will not be provided in these spaces.

2) Heating

a) All heating sources serving the building will be electric resistance type.

b) Electric unit heaters will be provided in service and equipment spaces as required.

3. Supply and Return Air Handling Systems

a. Science Labs

1) A 100% outside air, modular, indoor, variable air volume, central station air handling unit with the following components will deliver cooled and dehumidified supply air to individual zones served by single duct VAV terminal air boxes and air valves with integral or duct mounted electric resistance reheat coils.

a) Integral modulating outside air damper.

b) MERV 8 pre-filters.

c) Run-around loop energy recovery coil to pretreat outside air prior to entering the heating and cooling coils.
   (1) This coil is piped to a similar coil located within the laboratory exhaust air stream. A 20% propylene glycol water solution is pumped between the coils to transfer heat to and from the outside air and exhaust air streams.
   (2) The glycol solution prevents this water loop from freezing during low ambient outdoor air conditions.
   (3) The energy recovery water loop pumps will be provided in an N+1 configuration to provide full redundancy on this loop.
   (4) Energy recovery water piping 2" and smaller will be copper with soldered or mechanical press joints and fittings. Shutoff valves will be ball type. Piping 2-1/2" and larger will be standard weight black steel with butt-welded or flanged joints and butt-welded fittings. Shutoff valves will be butterfly type.
d) Electric resistance heating coil.
   (1) Sized assuming the energy recovery loop is not operating.
e) Chilled water cooling coil.
   (1) Sized assuming the energy recovery loop is operating.
f) Supply fan array with electrically commutated motors.
   (1) Sized to deliver approximately 24,000 CFM.

b. Computer Labs, Flexible Classrooms, Theatre Style Classrooms, Technical Labs and Flexible Meeting Rooms
   1) Four modular, indoor, variable air volume, central station air handling units with the following components will deliver cooled and dehumidified supply air to individual zones served by single duct VAV terminal air boxes with integral electric resistance reheat coils.
      a) Integral modulating outside air, return air and relief air dampers.
      b) MERV 8 pre-filters.
      c) Fixed plate, enthalpy, air-to-air energy recovery heat exchanger.
      d) Electric resistance heating coil (where energy recovery heat exchanger discharge air temperature is lower than 50°F).
      e) Chilled water cooling coil.
      f) Supply fan array with electrically commutated motors.
         (1) Sized to deliver the following approximate CFMS:
            (i) AHU-2: 20,500 CFM.
            (ii) AHU 3, 4 and 5: 17,250 CFM.

(2) Fans will be driven by variable frequency drives.

g) Return fan array with electrically commutated motors.

(1) Sized for the same CFM as the supply fan array for economizer operation.

c. Fan coil units with chilled water coils and electric resistance heat will be provided in enclosed stairwells.

d. Ductwork

1) Supply ductwork will be galvanized steel with wrap type insulation upstream of terminal air devices and liner type insulation downstream of terminal air devices.

e. Ductwork Accessories

1) Duct mounted media type sound attenuators are anticipated to be required between supply outlets and air valves due to noise generated by the pressure drop across the air valve.

f. Air curtains will be provided at the loading dock exterior door to reduce air flow into and out of the loading dock area when the doors are in use.

4. Exhaust Air Handling Systems

a. Science Labs

1) A rooftop mounted, mixed flow induced dilution type exhaust fan system with the following components will be installed to exhaust the science lab area of the building.

a) Curb-mounted exhaust air intake plenum with following components:

(1) Integral modulating outside air and exhaust fan isolation dampers.

(i) Exhaust fan isolation dampers operate as two-position dampers, but modulating control is required to allow the opening and closing speed to be adjusted to reduce nuisance alarms at the fume hood controllers.

(2) Run-around loop energy recovery coil to pretreat outside air prior to entering the heating and cooling coils.

(i) This coil is piped to a similar coil located within the laboratory exhaust air stream. A 20% propylene glycol water solution is pumped

between the coils to transfer heat to and from the outside air and exhaust air streams.

(ii) The glycol solution prevents this water loop from freezing during low ambient outdoor air conditions.

(iii) The energy recovery water loop pumps will be provided in an N+1 configuration to provide full redundancy on this loop.

(iv) Energy recovery water piping 2" and smaller will be copper with soldered or mechanical press joints and fittings. Shutoff valves will be ball type. Piping 2-1/2" and larger will be standard weight black steel with butt-welded or flanged joints and butt-welded fittings. Shutoff valves will be butterfly type.

b) Two exhaust fans.

(1) Each fan is sized for 100% of the required capacity providing 100% redundancy in the event of a fan failure.

(2) Fans will operate at constant volume. VFDs allow for balancing of final operating speed and control over time duration for fan speed to increase from off to on or reduce from on to off to reduce nuisance alarms at the fume hood controllers.

(i) The use of a VFD on these fans does not result in a reduction in energy consumption, as the fan stack discharge nozzle discharge air velocity will be maintained at a constant setpoint at all times to ensure hazardous exhaust fumes are directed high enough above the roofline for worker safety.

(ii) As the building exhaust airflow rate decreases, outdoor air bypass dampers integral to the exhaust fan system intake plenum open to make up the airflow rate difference with outside air to maintain discharge nozzle velocity. Since the fan stack discharge nozzle opening area is constant, the airflow rate through the nozzle needs to remain constant to maintain a set discharge air velocity.

c) Noise-reducing manufacturer-provided discharge nozzle wind band.

d) Stack extension to elevate discharge opening a minimum of 10'-0" above the roof level.

b. Computer Labs, Flexible Classrooms, Theatre Style Classrooms, Technical Labs and Flexible Meeting Rooms
   1) General exhaust will be provided for all restrooms and janitor's closets within these areas of the building.

c. Ductwork
   1) Branch exhaust ductwork dedicated to individual fume hoods will be stainless steel or polypropylene between the connection to the fume hood and the exhaust main.
   2) Exhaust ductwork branches and mains not dedicated to individual fume hoods will be galvanized steel.

d. Ductwork Accessories
   1) Packless-type sound attenuators are anticipated to be required between general exhaust inlets and fume hood connections and the exhaust air valve due to noise generated by the pressure drop across the air valve.

5. Controls System

a. The existing Automated Logic Controls facility management and control system (FMCS) will be extended to serve the Science Building.

b. Airflow measuring stations will be provided in air handling unit outdoor air intakes, supply fan inlets, and return fan inlets to control the outside airflow intake rate and speed of the return fan.

c. Carbon dioxide sensors will be provided for all spaces that are densely occupied as defined in IECC to allow reductions in the outside airflow rate to conserve energy.

d. A laboratory control system will be provided, including high precision supply and exhaust air valves, fume hood monitors, fume hood sash opening potentiometers, and controllers. This system will interface with the FMCS.
   1) Acceptable Manufacturers: Phoenix Controls.
      a) Phoenix Controls will be the basis of design. The design team intends to review additional acceptable manufacturers with the College as the design progresses.

e. Equipment anticipated to be provided with manufacturer-provided controllers:
   1) Laboratory control system

D. Plumbing Design Requirements

1. Plumbing Fixtures

a. Toilet room plumbing fixtures (lavatories, water closets, urinals) will be porcelain type. Fixture colors will be selected by the Architect. Sensor-operated flush valves and sensor-operated faucets will be provided.

b. Laboratory plumbing fixtures mounted to casework and fume hoods will be specified by the Architect and provided by the casework provider.

c. Emergency laboratory fixtures will be specified by IMEG and provided by the plumbing contractor.

2. Domestic Water System Components

a. Service Connection

1) A new domestic water service main will be extended from the existing site water main to serve this building. A backflow prevention device will be provided and located within a first-floor mechanical room.

a) Design of water service 5' and further from the building is by the Civil Engineer.

b. Pipes and Distribution

1) Combined service water piping will be ductile iron and cement-mortar lined, with push-on joints and fittings with rubber gaskets.

2) Potable cold, hot, and tempered water piping will be copper with solder or mechanical press joints and fittings. Shutoff valves in piping 3" and smaller will be ball type. Insulation will be glass fiber. Insulation will be covered with an all-service jacket in mechanical rooms.

3) Shutoff valves will be located at all major branch and all final use locations.

3. Domestic Water Heating System Components

a. Water Heater

1) A new electric resistance water heater will be installed. Hot water will be stored within the tank and distributed at 140°F with point of use mixing valves provided at the fixtures.

b. Recirculation System

1) A pumped domestic water recirculation system will be provided to continuously circulate the domestic hot water through the piping

network and water heater, maintaining an elevated water temperature to reduce the wait time for hot water at fixture outlets. Pump operation will be controlled to maintain the temperature of the water entering the heat exchanger within a set temperature dead band.

4. Sanitary Waste and Vent System Description

   a. Sanitary Service Connection: A new sanitary service main will be extended to the building from the existing site sanitary main.
      1) Design of sanitary service 5' and further from the building is by the Civil Engineer.

   b. Pumps: A sump pump sized for 50 GPM per car will be provided within each elevator pit and will be indirectly connected to the sanitary system.

   c. Piping: Underfloor sanitary and vent piping will be PVC. Above grade piping within wall cavities, chases, and non-plenum ceiling areas will be PVC. Above grade piping in plenum ceiling areas will be no-hub cast iron.

5. Acid Sanitary Waste and Acid Vent System Description

   a. A below grade central neutralization basin with grade level maintenance access will be installed outside the building. All sanitary waste from sinks within laboratories will be routed through the neutralization basin prior to connecting with the site sanitary waste service main.

   b. Piping: Underfloor acid sanitary and acid vent piping will be Schedule 40 fire retardant polypropylene drainage pipe with electrically fused joints. Above grade piping within wall cavities, chases, and non-plenum ceiling areas will be Schedule 40 fire retardant polypropylene drainage pipe with electrically fused joints. Above grade piping in plenum ceiling areas will be Schedule 40 polyvinylidene fluoride (PVDF) drainage pipe.

6. Storm Water System Description

   a. Storm Service Connection: A new storm sewer service will be extended to the building.
      1) Design of storm sewer service 5' and further from the building is by the Civil Engineer.

b. Piping

1) Underfloor storm piping will be PVC. Above grade piping within chases and non-plenum ceiling areas will be PVC. Above grade piping in plenum ceiling areas will be no-hub cast iron.

a) Primary storm drain piping will be routed down inside chases and column enclosures and underfloor to the site service connection outside the building.

b) Secondary roof overflow drain piping will be routed down inside chases and column enclosures to lamb's tongue fittings and will spill onto grade.

E. Laboratory Utility Design Requirements

1. Natural Gas Description

a. Service Connection and Pressure

1) A new natural gas service main will be extended from the existing campus main.

a) Design of natural gas service 5' and further from the building is by the Civil Engineer.

b. A natural gas regulator will be provided at the building entrance.

c. A manual reset normally closed solenoid valve will be installed in the gas main upstream of connections to any gas consuming fixtures. Under a loss of power scenario, this valve will close and will not automatically reopen when power is restored.

d. Individual automatic reset normally open solenoid valves will be installed in each natural gas piping branch dedicated to an individual lab. An emergency shutoff button/switch will be installed at the exit from the lab to shut off the gas supply to the space in the event of an emergency or prior to leaving for the night.

e. Piping: Natural gas piping will be Schedule 40 black steel pipe with threaded connections for 2" and under sizes and with butt-welded connections for 2-1/2" and larger sizes

2. Compressed Air

a. Source Equipment: An air compressor with a tank, refrigerated air dryer, and controls will be installed in a mechanical room.

b. Piping: Piping will be Type L hard drawn seamless copper tube with 100% lead-free solder joints.

3. Vacuum

   a. Source Equipment: A vacuum pump with a tank and controls will be installed in a mechanical room.

   b. Piping: Piping will be Type L hard drawn seamless copper tube with 100% lead-free solder joints.

4. Pure Water: A central pure water system will be installed to distribute pure water to the required outlet locations within the laboratories. Water quality requirements are currently unknown. The design team will discuss with laboratory users to determine these requirements and confirm the required equipment.

   a. Piping: Piping in non-plenum areas will be Schedule 80 polypropylene without plasticizers or pigments. Joints will be fusion welded with polypropylene socket fused or flanged fittings. Piping in plenum ceiling areas will be polyvinylideneflouride (PVDF) without plasticizers or pigments. Joints will be fusion welded with PVDF socket fused or flanged fittings.

Prepared by: Brandon S. Garbrecht, PE, LEED AP BD+C

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ELECTRICAL

SCHEMATIC DESIGN NARRATIVE

FOR

ALAMO COMMUNITY COLLEGE DISTRICT

NORTHEAST LAKEVIEW COLLEGE

STEM BUILDING

UNIVERSAL CITY, TX

Prepared by:

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Electrical

The following summary includes major parameters utilized in the design of the Electrical systems for the Alamo Community College District – Northeast Lakeview STEM Building. The electrical distribution system shall be designed to all applicable national, state, and local codes. Design criteria will be such that the new electrical system will meet the design requirements set forth by Alamo Colleges District. Care will be taken to design a facility that meets the needs of the end user and complies with energy conservation requirements.

Code Analysis:

1. All electrical and fire alarm systems will be designed and constructed in accordance with the following codes and standards in addition to the codes listed in project specifications.
    a. National Fire Protection Association:
        i. 2015 NFPA 1 – Fire Code
        ii. 2014 NFPA 70 – National Electric Code
        iii. 2015 NFPA 70E – Standard for Electrical Safety in the Workplace
        iv. 2013 NFPA 72 – National Fire Alarm and Signaling Code
        v. 2015 NFPA 101 – Life Safety Code
        vi. 2013 NFPA 110 – Standard for Emergency and Standby Power Systems
        vii. 2013 NFPA 780 – Standard for the Installation of Lightning Protection Systems
    b. International Code Council:
        i. 2018 International Building Code (IBC)
        ii. 2018 International Fire Code (IFC)
        iii. 2018 International Energy Conservation Code (IECC)
        iv. 2013 ASME A17.1 – Safety Code for Elevators and Escalators
    c. Alamo Colleges District Standards and Design Guidelines

    All Codes and Standards listed above shall include recent City of Live Oak amendments.

Electrical Utility Service

1. The existing campus is served by the electric utility (CPSE) at medium voltage. Electric service through the campus is made from underground distribution to transformers at utilization voltage to each building. An extension of the existing campus distribution for the STEM building will be routed from an existing manhole adjacent to Academic Building 1, underground to a new manhole, located at the North side of the proposed STEM building. A new, 1500 kVA, pad mounted transformer is proposed to be located adjacent to the proposed manhole.

Main Service Switchboard

1. Service voltage to the new building is proposed to be 480/277V, three phase, and four wire. The building is estimated to require a 2,000 Amp service. A main switchboard is proposed to be located in the main electrical room on the first level of the North wing. If the building requires a fire pump, it would be served from a cable tap box adjacent to the service transformer with an underground feed to the fire pump controller. The switchboard will have an individually mounted, 100% rated, main switch, group mounted, molded case branch breakers, and a Surge Protective Device (SPD). The main switchboard will serve downstream electrical distribution equipment at second and third level electrical rooms and elevator equipment. Digital instrumentation metering within the main section will be specified for the building.

Electrical Distribution

1. First Floor –
    a. The main electrical room on the first floor, North wing will contain the main switchboard, a step down, dry type transformer and distribution panels and associated 208Y/120V, 3 phase distribution equipment. The main switchboard will feed distribution to electrical rooms on each floor. This room will also house a lighting control panel for common areas and exterior lighting.
    b. First floor electrical rooms at the South wing will each contain a 480/277V panelboard, dry type transformer and 208/120V panelboards.
2. Upper floors – Two electrical equipment rooms are required at each of the upper levels. These rooms will contain electrical distribution equipment that includes 480/277V and 208/120V panelboards.

3. Laboratory Rooms – Each Lab room will be provided with a recessed 208/120V panelboard to serve branch circuits within the room. Lab room panelboards shall be specified with shunt trip main circuit breakers, controlled by a utility controller located adjacent to the panelboard..

Wiring Devices

1. Ground Fault Circuit Interrupter (GFCI) type receptacles will be specified for all areas noted within 2017 NEC 210.8(B), including but not limited to restrooms, kitchens, rooftops, outdoors, within 6-feet of sinks, and indoor wet locations.
2. Receptacles with integral Universal Serial Bus (USB) charging ports will be provided near all Distributed Informal Study Areas and as otherwise requested.

Lighting Systems

1. Light fixture selection and layout will provide energy efficient lighting with adequate light levels. Selection of light fixtures will be coordinated with the Architect and Interior Designer and per the University system standards and criteria. LED source light fixtures will be specified. If applicable, the number of different types of LED lighting fixtures used will be minimized in for improved efficiency and reduced maintenance requirements. Lighting systems and controls will be designed to comply with applicable energy codes.

2. Proposed Lighting and Control Matrix:

Space Type / Description	Design Criteria		Control Strategies					Notes
			Levels	Automatic Interface				
	Target Illuminance [fc] (Design Goal ± 5fc)	Target LPD [W/ft²] (90% of 2015 IECC Table C405.4.2(2))	S - Single Level M - Multiple Levels D - Dimming (1% / 10%)	V - Vacancy Mode O - Occupancy Mode M - Maintenance Mode	Daylight Responsive	Multi-Scene Preset	Schedule (BMS/DDC)	
General Instructional Space								
Classrooms, Paired with Lab	50	1.12	10%	O				COS
Classrooms, with Movable Wall	40	1.12	1%	O		✔		COS
Table / Chair Storage	10	0.57	S	V				PIR
Audio / Visual Closet	50	1.54	S	M				PIR
Lecture Hall	30	1.12	1%	O		✔		COS
Administrative Offices								
Receptionist Area / Waiting Rm.	15	0.81	M	O				COS
Office, Department Chair	30	1.00	10%	V				WOS
Workroom / Supply Storage	30	1.11	M	O				PIR
Office, Faculty	30	1.00	10%	V				WOS
Office, Adjunct	30	0.88	10%	V				COS
Workroom / Supply Storage	30	1.11	M	O				WOS
Building Common Spaces								
Lobby	15	0.81	M	O	☼		🕒	MTS
Conference Room	30	1.11	1%	V	☼	✔		COS
Distributed Informal Study Areas	15	1.12	M	O	☼			COS
Lactation Room	30	0.88	S	V				PIR
Faculty / Staff Lounge	30	0.66	M	V				COS
Non-Assignable Spaces								
Janitor Closet	10	0.86	S	M				PIR
MDF / IDF Rooms	50	1.54	S	M				PIR
Mechanical Rooms	30	0.86	S	M				PIR
Electrical Rooms	30	0.86	S	M				PIR
Restrooms	15	0.88	S	O				COS
Corridors	15	0.59	M	O	☼		🕒	MTS
Stairs	10	0.62	M	O			🕒	COS
Exterior								
Walkway	1	0.14	S		☼		🕒	MTS
Canopy	5	0.36	S		☼		🕒	MTS

3. Life safety egress lighting will be provided to meet minimum code required foot-candle levels. Exit signs and egress lighting will be circuited through central inverter battery systems.

Lightning Protection

1. A complete, Class II lightning protection system will be provided. The system will be designed and installed by certified personnel to comply with the UL master label requirements or LPI certification.

End of Narrative

BASIS OF DESIGN

4.10 TECHNOLOGY NARRATIVE

07-20-18

INTRODUCTION

The primary purpose of this Schematic Design Narrative is to clearly describe the requirements and parameters for building-wide cabling infrastructure, premise security, and AV/multimedia systems to support network-based technology systems and to meet the STEM Education Building program requirements. The structured cabling, security, and AV system designs will be consistent with Alamo Colleges' district-wide standards and industry best practices.

The New STEM Education Building for Northeast Lakeview College will accommodate a variety of general courses as well as serve as the new home for Chemistry, Physics, and Geology, and incorporate a variety of instructional spaces, faculty areas, and shared spaces.
Instructional spaces include general classrooms, a theater classroom, flexible quad classroom, computer labs, technical lab spaces, chemistry labs, a physics lab, and a geology lab. Additional student support spaces include consultation/meeting rooms and student sticky spaces. Additional faculty support spaces include offices, conference rooms, and workrooms.

Detailed space requirements are as outlined in the Program Document dated April 27, 2018 by Facility Planning and Consulting. True North Consulting Group (TNCG) will review spaces with the Architect which include AV options within the program document, such that required infrastructure aligns with the chosen option. (i.e. Large flat panel display in lieu of a digital projector and screen.)

1. Cabling Infrastructure

The structured cabling design for the New STEM Academic Building will be consistent with the Alamo Colleges Infrastructure Standards Document dated 06/19/2018. "Cabling Infrastructure" in this section is defined as a combination of all copper and optical fiber telecommunications cables, equipment/patch cables and connecting hardware. The cabling infrastructure design will include necessary drawings and specifications to bring district-wide cabling systems to current industry standards necessary to support current and future voice, data, wireless, security and AV/multimedia applications.

The cabling design will, in general, meet the design requirements listed in the current Alamo Colleges Infrastructure Standards. The following list of cabling infrastructure subsystems will be described in this narrative as well as design descriptions:

- Horizontal (Station) Cabling: Horizontal cabling is the cabling between the work area or classroom telecommunications outlet and the telecommunications room (TR). Horizontal cabling is often referred to as "station cabling." In general, the horizontal cabling outlets at this building will consist of the following:
    - Large offices (>140SF) will receive a dual Cat 6 data outlet at the anticipated desk location and at two additional perimeter walls excluding the entry wall. This design calls for a total of six (6) cables/jacks at each large office space. If cost savings options are being considered, Alamo Colleges could elect to reduce the total cable count in these offices to four (4) cables/jacks.

- Smaller offices (<140SF) will receive dual Cat 6 data outlets at two opposite walls excluding the entry wall.
- Dual Cat 6 data outlets at strategic locations in classrooms and other instructional spaces. Each typical classroom will receive three dual Cat 6 data outlets on three walls of the classroom for a total of six connections.
- Cat 6 data outlet where required to support AV/Multimedia systems including a dual Cat 6 ceiling mounted data outlet if a ceiling mounted projector is utilized, or a single data connection to support each flat panel display.
- Dual Cat 6A data at wireless access points.
- Single Cat 6 data cable for each surveillance camera.

- Backbone Cabling: Backbone Cabling is the cable and hardware interconnecting telecommunication rooms (MDF/IDFs), building demarcation rooms and equipment rooms. Backbone cabling is the most critical physical component to ensuring LAN/WAN and Internet connectivity to and within the new building.
  - Fiber optic cabling will consist of multi-mode and single-mode fiber connecting the MDF to each building IDF space for high-speed network backbone connections. Per the Alamo Colleges' standards, this will include 6-strand singlemode and 12-strand 50-micron OM4 multimode fiber with all strands terminated on LC connectors.
  - Category 6A Link Cabling: Cabling will consist of two Category 6A cabling uplinks connecting the MDF to each building IDF space. The intent of this cabling is to back up the fiber links listed above.
  - Voice Backbone Cabling: Cabling will consist of twisted 25 pair Category 3 copper cabling connecting the building MDF (or IDF-1) to each building IDF space for alarm and other analog connections. These cables shall be terminated on wall mounted 110 blocks with legs.
- Telecommunications Rooms: "Telecommunications Rooms" in this section is defined as the spaces or rooms that house patching systems, cabling components, and network systems that serve the technology systems throughout the facility. These spaces are also referred to as a Main Distribution Frame (MDF) and Intermediate Distribution Frame (IDF). As more systems converge onto the local area network (voice, security, wireless), the rooms that house network electronics are more critical than ever. It is important that these rooms are secure and only authorized IT personnel have access to the network equipment. Where rooms are not dedicated, the design will include security, lockable cabinets to house network components.
  - The facility will have one Main Distribution Frame (MDF/IDF-1) that houses building-serving systems and several Intermediate Distribution Frames (IDF) that house area serving technology systems.
  - Horizontal cabling has a distance limitation of 90-meters (295'). New rooms will be located as necessary for all horizontal cables to stay within this distance limitation.

2. Premise Security Systems

"Electronic Safety & Security" refers to a combination of door access control and IP video surveillance systems. The security system design will be consistent with Alamo Colleges' current standards and will include Video Insight surveillance and Vanderbilt Access Control systems to

ensure the systems in this facility integrate into other Alamo Colleges' facilities and maintain a single, centrally-managed solution for each system.

- Video Surveillance System: Video Surveillance Systems consist of interior and exterior cameras, mounting hardware, storage systems and the video management system software that manages and archives video. The video management system also provides a graphical user interface allowing the user to access live and recorded video.
    - Interior cameras will consist of vandal resistant, high-resolution IP-based cameras placed at entrances/exits, gathering areas, lobbies and other high priority areas.
    - Exterior cameras will consist of weather resistant, high-resolution cameras placed to cover select areas of the building perimeter and parking areas around the building.
- Access Control: The Access Control system is defined as the entry control system and equipment that allows authorized personnel into designated secure areas. Access control also refers to the process of managing databases or records and determining levels of authorized entry, such as who will be granted access and when they may enter the designated space.
    - Doors requiring card readers will be fitted with appropriate conduits and electronic locking hardware. This portion of the project requires close coordination between the security system specifications, architectural specifications, hardware, and contractors.
    - The access control system will be an extension of the existing district-wide Vanderbilt system. All exterior doors will have door contacts that tie into the access control system for monitoring of propped and forced-open doors.
    - Readers will be placed on exterior doors, equipment rooms and select interior doors throughout the building.

3. AV/Multimedia Systems

The audiovisual/multimedia systems for this project consist of a standard room design for each instructional space based on Alamo Colleges' standards and the final Program Document. Each space requiring audio visual technology and related systems will be designed specifically for the requirements of that space. Specific instructional spaces include requirements for a lockable media cabinet and other instruction spaces require local inputs only. TNCG shall review these spaces with the Architect for final determination of lockable media cabinet. Specific spaces in the Program Document include the option of a large digital flat panel display in lieu of a ceiling mounted projector and motorized screen. These locations will be reviewed with the Architect and the Client to determine if AV program requirements will be better met with alternative display options.

- Video systems will support current digital media input and display systems.
- Control systems will meet Alamo Colleges' standard Crestron wall mounted control.

4. Technology Systems by Programmed Space

- Below is a preliminary matrix of data, AV, and security access control requirements by programmed areas. Note that wireless access points, security video cameras, and exterior door access control items will be generated based upon the overall developed floor plans in the Design Development phase.

Northeast Lakeview STEM Academic Building
Programmed Spaces & Technology Systems
80,500 Gross SF

Revised 07-19-18

	Description	Ref Page#	Qty.	SF. Ea.	occupants	CAT6 Data Drops	Key Note	CAT6A Data Drops	Key Note	Podium with lockable media cabinet/ Classroom Multimedia system; includes Media Cabinet;Audio; Projector;Motorized Screen	Key Note	Projector; Motorized Screen	Key Note	XLarge Flat Panel Display	Key Note	Large Flat Panel Display	Key Note	Small Flat Panel Display	Key Note	Card Readers, Interior	Key Note	Card Readers, **Exterior**	Key Note	Wireless Access Point	Key Note	Wireless Access Point **(Common Areas)**	Key Note	AV Control Room	Key Note	Video Camera, Interior	Key Note	Video Camera, **Exterior**	Key Note
TS-01	Classrooms	4.12	9	875	28-30	11	A	2	B	1	C	0	D	0		0		0		1		0		1		0		0		0		0	
TS-02	Shared Storage	4.14	1	500	N/A	4		0		0		0		0		0		0		1		0		0		0		0		0		0	
TS-03	Theater Style Classroom	4.16	1	2000	85	13		4		1		0		0		0		0		2		0		2		0		0		0		0	
TS-04	Computer Labs	4.18	4	1000	35-37	45		2		1		0		0		0		0		2		0		1		0		0		0		0	
TS-05	Flexible Classroom	4.20	1	2700	116-132	44		8		4		4		0		0		0		4		0		4		0		0		0		0	
TS-06	Associated Storage Room	4.22	1	200	N/A	4		0		0		0		0		0		0		1		0		0		0		0		0		0	
TS-07	Technical Lab / Studio	4.24	2	1700	21	15		2		1		0		0		0		0		1		0		1		0		0		0		0	
TS-08	Lab Prep Space	4.26	1	400	10-12			0		0		0		0		0		0		1		0		0		0		0		0		0	
TS-09	Technical Lab / Studio	4.28	1	1500	21	15		2		1		0		0		0		0		1		0		1		0		0		0		0	
TS-10	Lab Prep Space	4.30	1	200	4-6			0		0		0		0		0		0		1		0		0		0		0		0		0	
TS-11	Chemistry Labs	4.32/4.34	1	1300	25	11		2		1		0		0		0		0		2		0		1		0		0		0		0	
TS-12	Chemistry Labs	4.32/4.34	3	1300	25	11		2		1		0		0		0		0		2		0		1		0		0		0		0	
TS-13	Instrumentation Room	4.36	1	400	10-12	6		0		0		0		0		0		0		1		0		0		0		0		0		0	
TS-14	Chemical Storage	4.37	2	100	N/A	0		0		0		0		0		0		0		1		0		0		0		0		0		0	
TS-15	Chemistry Research Lab	4.38	1	300	8-10	0		2		0		0		0		0		0		1		0		1		0		0		0		0	
TS-16	Adjacent Student Work Area	4.39	1	80	2	4		0		0		0		0		0		0		0		0		0		0		0		0		0	
TS-17	Bio Chem Lab	4.40	1	1300	25	11		2		1		0		0		0		0		2		0		1		0		0		0		0	
TS-18	Shared Science Prep Rooms	4.42	2	400	6-10	4		0		0		0		0		0		0		1		0		0		0		0		0		0	
TS-19	Lab Tech Office	4.43	2	110	3	5		0		0		0		0		0		0		1		0		0		0		0		0		0	
TS-20	Physics Lab	4.44	1	1300	37	11		2		1		0		0		0		0		2		0		1		0		0		0		0	
TS-21	Prep Room	4.46	1	150	N/A	0		0		0		0		0		0		0		1		0		0		0		0		0		0	
TS-22	Geology Lab	4.48	1	1300	37	11		2		1		0		0		0		0		2		0		1		0		0		0		0	
TS-23	Geology Storage / Prep	4.50	1	150	N/A	0		0		0		0		0		0		0		1		0		0		0		0		0		0	
TS-24	Tutorial Center	4.52	1	1000	32	17		2		0		1		0		0		0		1		0		1		0		0		0		0	
FS-01	Chair Office	4.56	2	180	5	6		2		0		0		0		0		0		1		0		1		0		0		0		0	
FS-02	Admin Assistants	4.57	2	64	3	4		0		0		0		0		0		0		0		0		0		0		0		0		0	
FS-03	Associated Student Waiting	4.58	1	100	5-8	2		0		0		0		0		0		0		0		0		0		0		0		0		0	
FS-04	Faculty Office	4.59	22	110	3	6		0		0		0		0		0		0		1		0		0		0		0		0		0	
FS-05	Conference Room	4.60	2	400	15-20	6		2		0		1		0		0		0		1		0		1		0		0		0		0	
FS-06	Shared Workroom	4.61	1	300	8-10	6		2		0		0		0		0		0		1		0		1		0		0		0		0	
FS-07	Adjunct Faculty Office	4.62	1	400	Varies	14		2		0		0		0		0		0		1		0		1		0		0		0		0	
BS-01	Flexible Meeting Room	4.64	1	4400	228	38		8		5		0		0		0		0		4		0		4		0		0		0		0	
BS-02	Associated Storage Room	4.68	1	250	N/A	0		0		0		0		0		0		0		1		0		0		0		0		0		0	
BS-03	Catering Area	4.69	1	250	Varies	0		0		0		0		0		0		0		1		0		0		0		0		0		0	
BS-04	AV Control Room	4.70	1	100	N/A	6		2		0		0		0		0		0		1		0		1		0		0		0		0	
BS-05	Student Sticky Spaces	4.71	10	75	2-4	6		0		0		0		0		0		0		0		0		0		0		0		0		0	
BS-06	Private Meeting / Consultation Sp	4.72	4	100	4	4		0		0		0		0		0		0		0		0		0		0		0		0		0	
BS-07	Faculty Breakroom	4.74	1	400	16-20	12		2		0		0		0		0		0		1		0		1		0		0		0		0	
BS-08	Student Breakroom	4.76	1	200	8-10	6		2		0		0		0		0		0		0		0		1		0		0		0		0	
BS-09	Lactation Room	4.77	1	120	1	4		0		0		0		0		0		0		0		0		0		0		0		0		0	
BS-11	Loading Dock / Delivery Bay	4.79	1	500	N/A	0		2		0		0		0		0		0		2		0		1		0		0		0		0	
	Total Quantity					**786**		**84**		**30**		**7**		**0**		**0**		**0**		**87**		**0**		**42**		**0**		**0**		**0**		**42**	

Key Notes

A CAT6 Dual Data at each perimeter Wall (8); 2 data a instructors station; 2 Data at Projector

B (2) CAT6A to WAP

C Class room AV System, Media Cabinet, Audio System, Sources, Crestron, projector, motorized Screen

D Projector and Motorized screen without Media Cabinet

SECTION 00 0110
TABLE OF CONTENTS – TECHNICAL SPECIFICATIONS

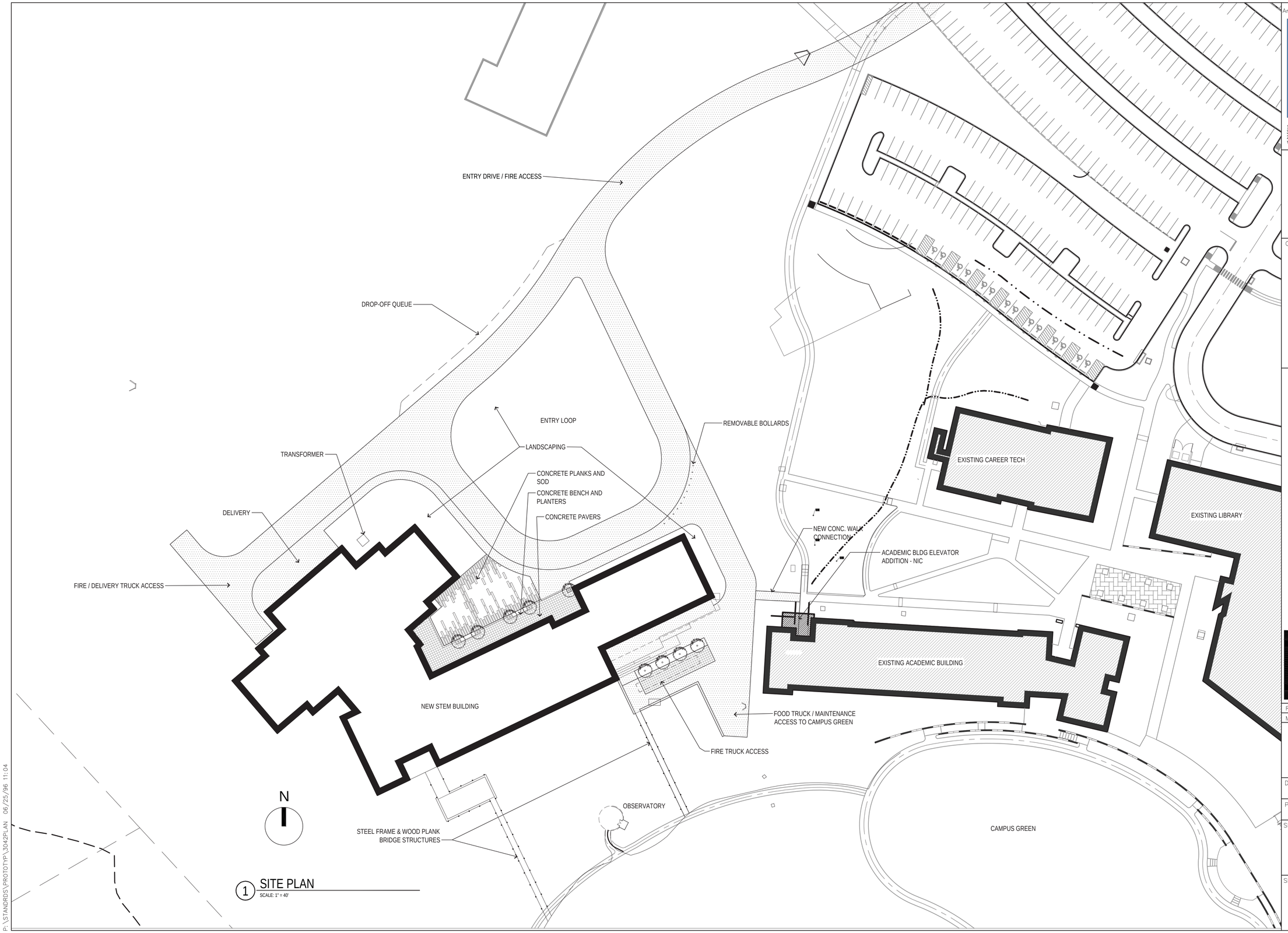
DIVISION 33 – UTILITIES

END OF SECTION

NELC
New STEM Education Building
FPC #96601
Space Summary

	Programmed ASF	SD ASF	Delta
Teaching Spaces			
Classrooms (9 @ 875)	7,875	7,992	117
Classroom & Computer Lab Shared Storage Room (1 @ 500)	500	472	(28)
Sub-Total General Classroom Spaces	8,375	8,464	89
STEM			
Theater Style Classroom	2,000	2,035	35
Associated Storage Room (Shared with Classroom Storage)	-		
Computer Labs	4,000	4,646	646
Associated Storage Room (Shared with Classroom Storage)	-		
Flexible Classroom (Divisible by 4)	2,700	2,775	75
Associated Storage Room (A&M)	200	228	28
Technical Lab/Studio	3,400	3,501	101
Lab Prep Space	400	574	174
Technical Lab/Studio	1,500	1,503	3
Lab Prep Space	200	203	3
Sub-Total STEM Spaces	14,400	15,465	1,065
Science			
Chemistry Labs (Organic, Intro, General 1 & General 2) (4 @ 1,300)	5,200	5,248	48
Instrumentation Room (1 @ 400)	400	428	28
Chemical Storage (2 @ 100)	200	224	24
Chemistry Research Lab (1 @ 300)	300	334	34
Adjacent Student Work Area (1 @ 80)	80	180	100
Bio Chem Lab (1 @ 1,300)	1,300	1,312	12
Shared Science Prep Rooms (2 @ 400)	800	768	(32)
Lab Tech Office (2 @ 110)	220	202	(18)
Physics Lab (1 @ 1,300)	1,300	1,312	12
Prep Room (1 @ 150)	150	636	486
Geology Lab (Built-in Cabinetry) (1 @ 1,300)	1,300	1,312	12
Geology Storage/Prep (1 @ 150)	150	150	-
Tutorial Center 1 @ 1,000)	1,000	1,087	87
Sub-Total Science Spaces	12,400	13,193	793
Sub-Total for Teaching Spaces	35,175	37,122	1,947
Faculty Spaces			
STEM Advising Suite			
Chair Office (1 @ 180)	180	187	7

Dean's Office (1 @ 180)	180	187	7
Administrative Assistants (2 @ 64)	128	122	(6)
Associated Student Waiting (1 @ 100)	100	114	14
Faculty Offices (22 @ 110)	2,420	2,420	-
Conference Rooms (2 @ 400)	800	880	80
Shared Workroom (1 @ 300)	300	332	32
Adjunct Faculty Offices (1 @ 400)	400	474	74
Sub-total for Faculty Spaces	4,508	4,716	208
Suite Circulation	1,127	2,441	1,314
Sub-total for Faculty Spaces & Circulation	5,635	7,157	1,522
Shared Building Spaces			
Meeting Spaces			
Flexible Meeting Room (1 @ 4,400)	4,400	4,708	308
Associated Storage Room (1 @ 250)	250	252	2
Catering Area (1 @ 250)	250	272	22
AV Control Room (1 @ 100)	100	98	(2)
Student Sticky Spaces (10 # 75)	750	750	-
Private Meeting/Consultation Spaces (4 @ 100)	400	400	-
Sub-total for Meeting Spaces	6,150	6,480	330
Support Spaces			
Faculty Breakroom (1 @ 400)	400	423	23
Student Breakroom (1 @ 200)	200	234	34
Lactation Room (1 @120)	120	116	(4)
Family/Unisex Restrooms (2 @ 60)	120	134	14
Loading Dock/Delivery Bay (1 @ 500)	500	559	59
Sub-total for Support Spaces	1,340	1,466	126
Sub-total for Shared Building Spaces	7,490	7,946	456
Total Assignable Square Footage of Building Spaces	48,300	52,225	3,925
Total Building Spaces (GSF @60% Efficiency)	80,500	86,976	6,476
	60.0%	*60.0%*	



1 SITE PLAN
SCALE: 1" = 40'

P:\STANDRDS\PROTOTYP\3042PLAN 06/25/96 11:04

Architects
FORD POWELL &CARSON
Architects & Planners, Inc.
1138 East Commerce Street
San Antonio, Texas 78205
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SD PACKAGE

NOT FOR CONSTRUCTION

Consultant

ALAMO COLLEGES
Northeast Lakeview College STEM Education Building

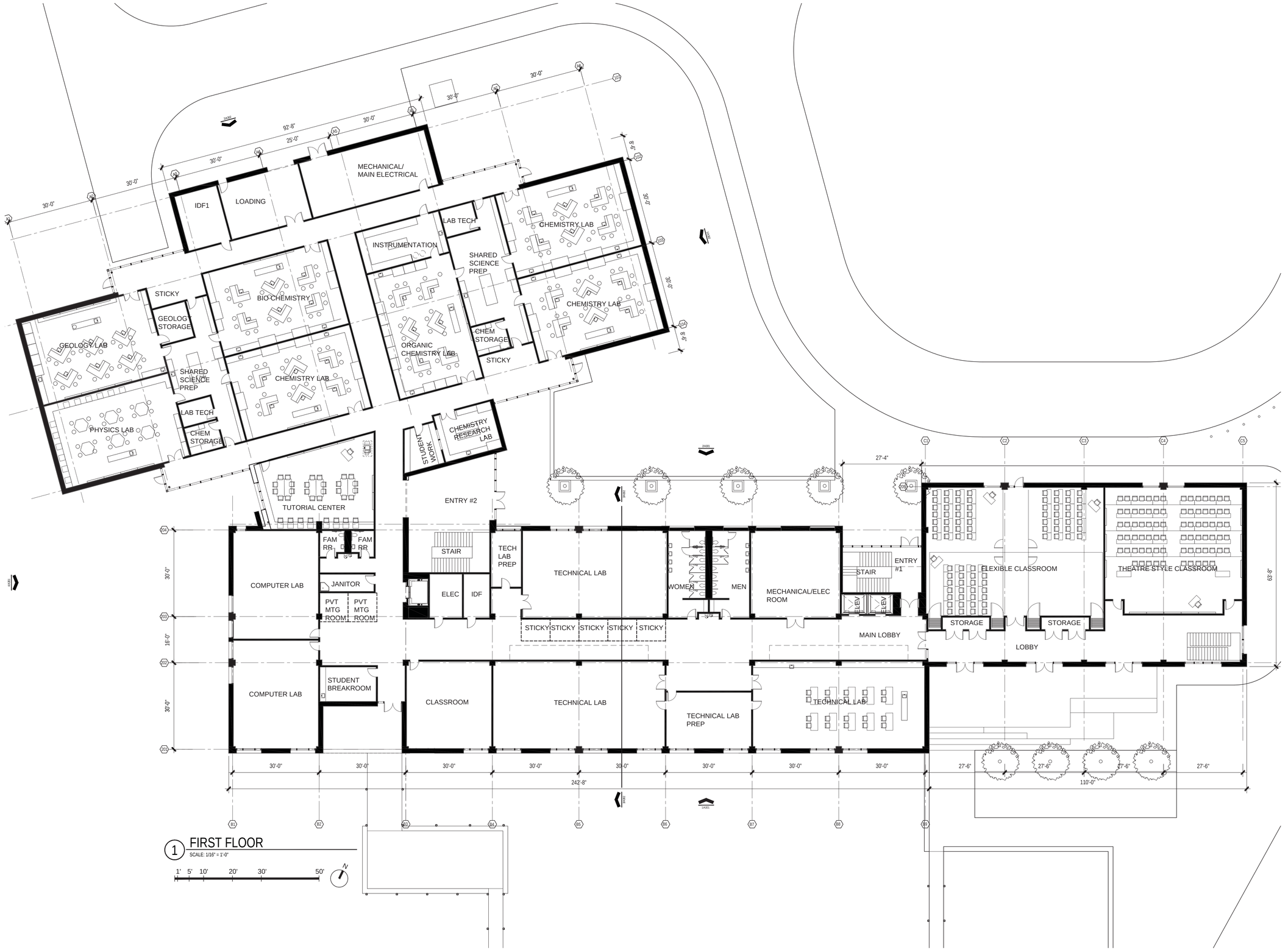
REVISIONS

MARK	DATE	DESCRIPTION

Date	Checked By: HJM
Project Number: 96601	Drawn By: HJM

Sheet Title: SITE PLAN

Sheet Number: A101



1 FIRST FLOOR
SCALE: 1/16" = 1'-0"

1' 5' 10' 20' 30' 50'

N

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Sheet Title
FLOOR PLAN
LEVEL ONE

Sheet Number
A201

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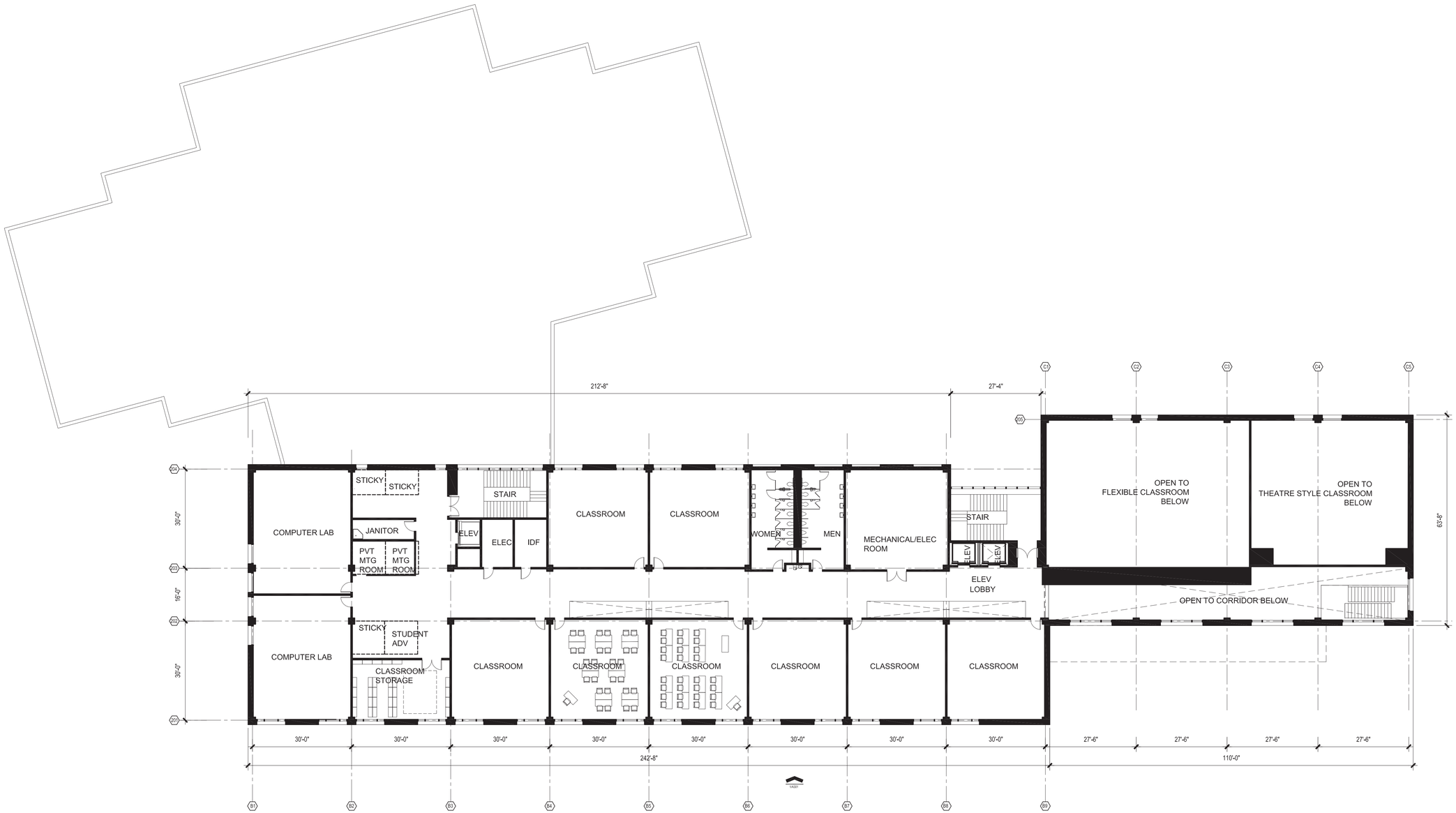

1 SECOND FLOOR
SCALE: 1/16" = 1'-0"

1' 5' 10' 20' 30' 50'

N

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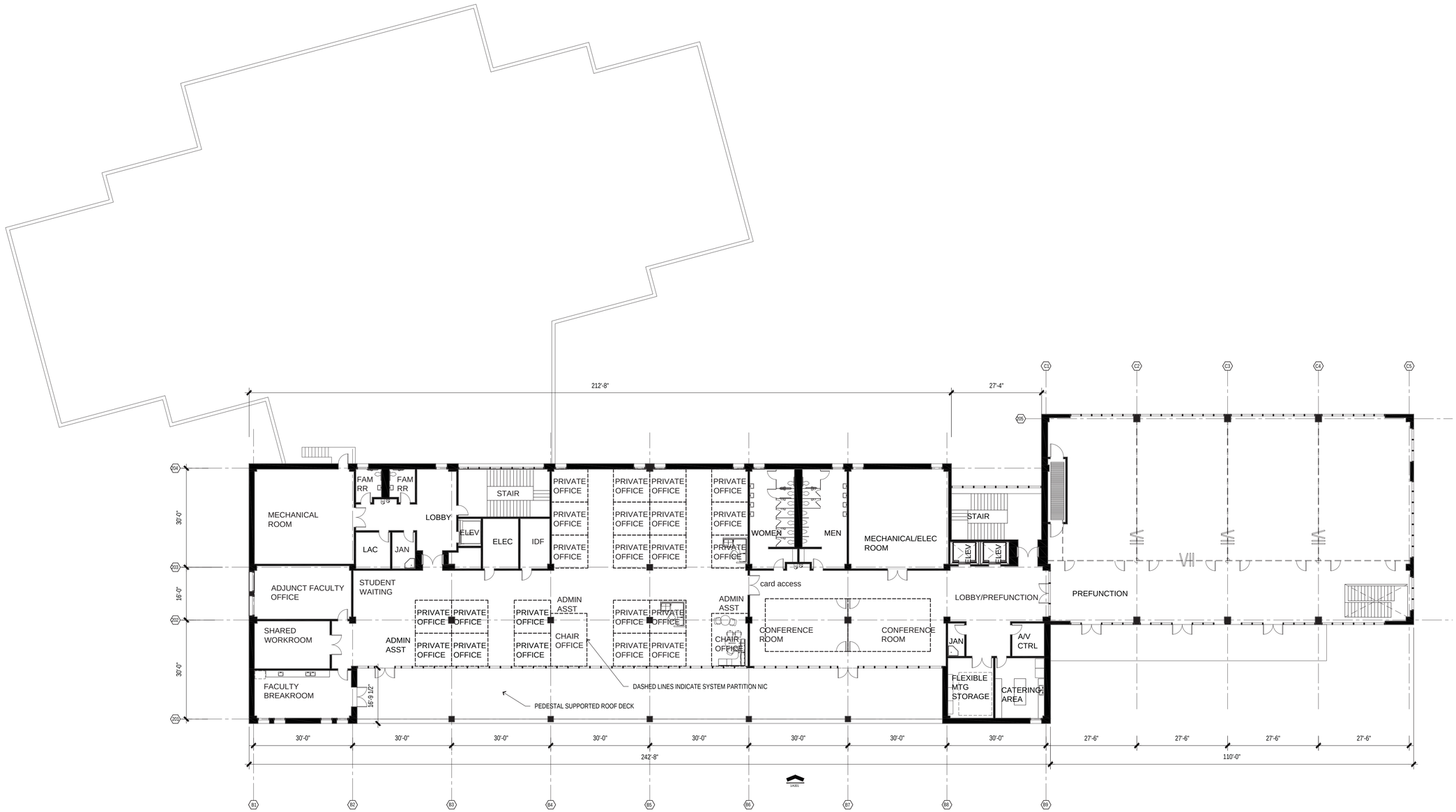
Sheet Title
FLOOR PLAN
LEVEL TWO

Sheet Number
A202



1 THIRD FLOOR
SCALE: 1/16" = 1'-0"

1' 5' 10' 20' 30' 50'

N

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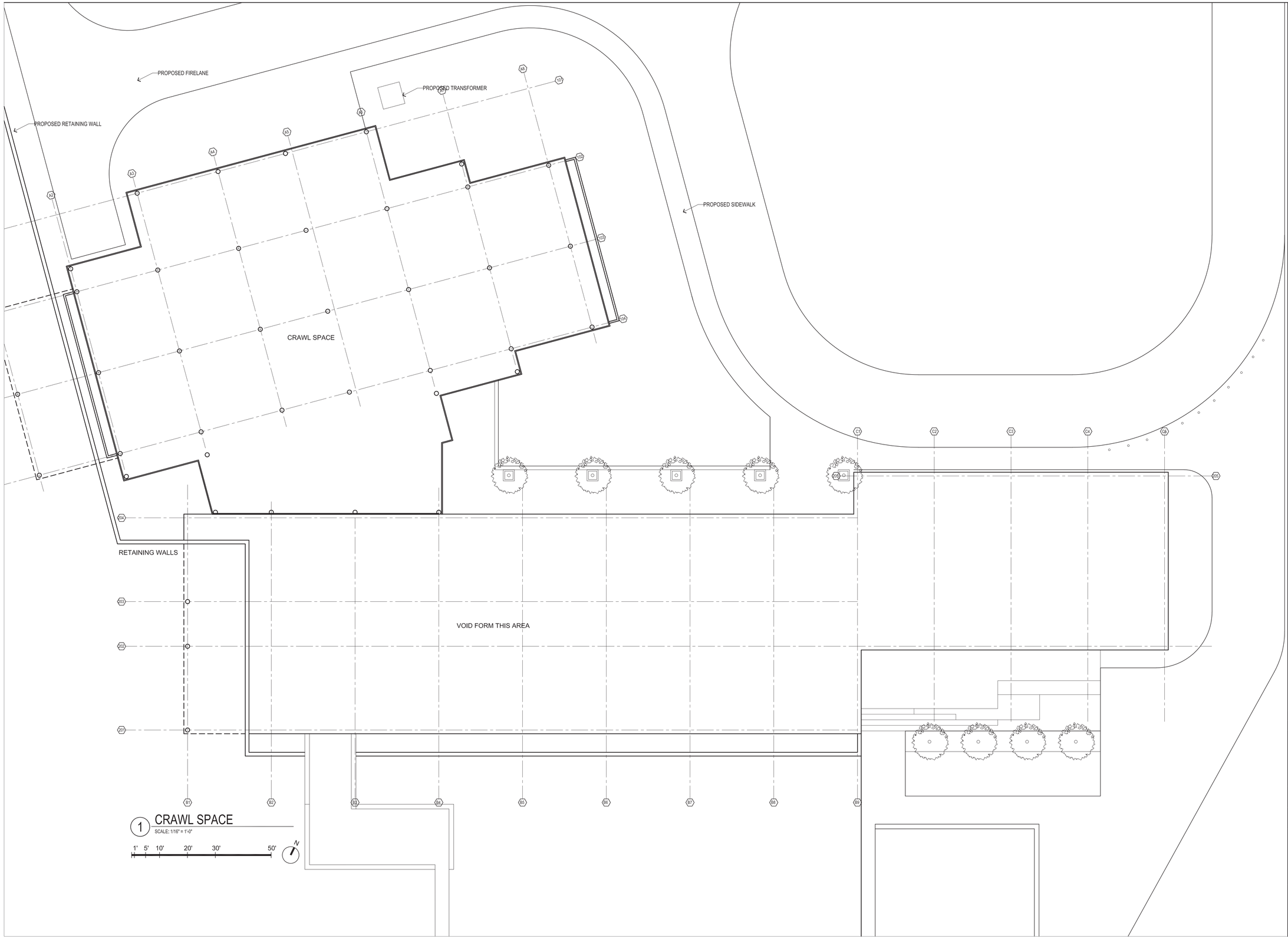
Sheet Title
FLOOR PLAN
LEVEL THREE

Sheet Number
A203



1 CRAWL SPACE
SCALE: 1/16" = 1'-0"

1' 5' 10' 20' 30' 50'

N

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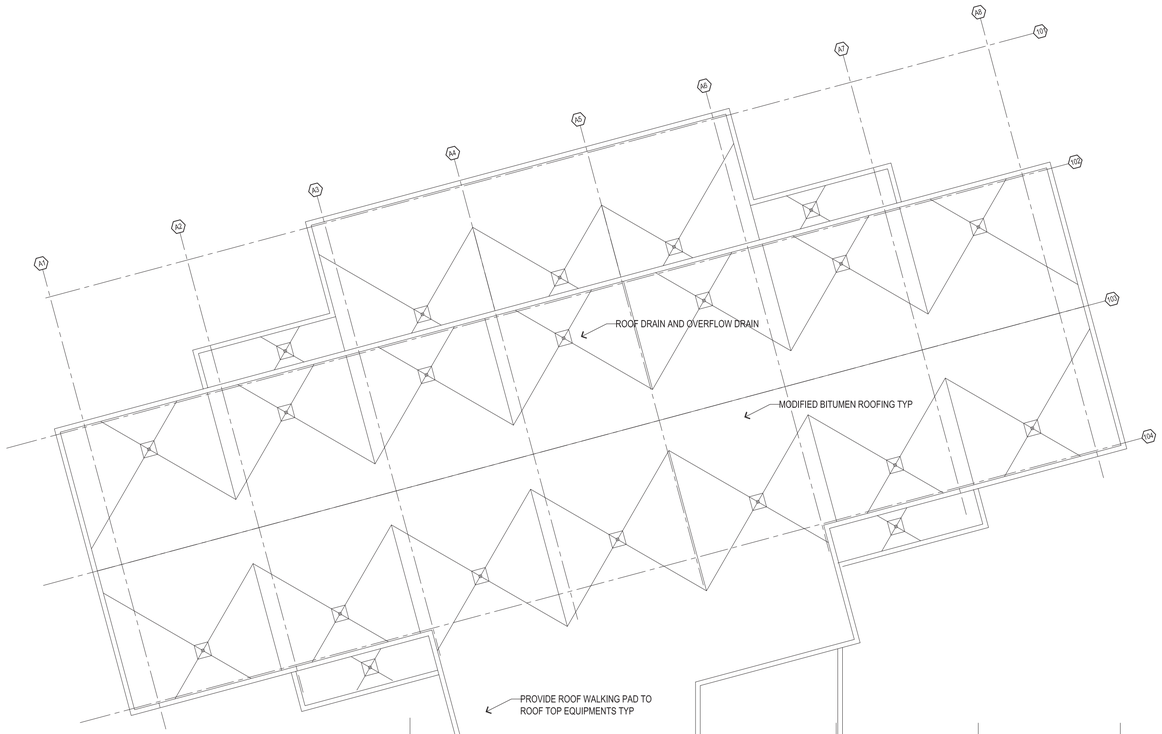
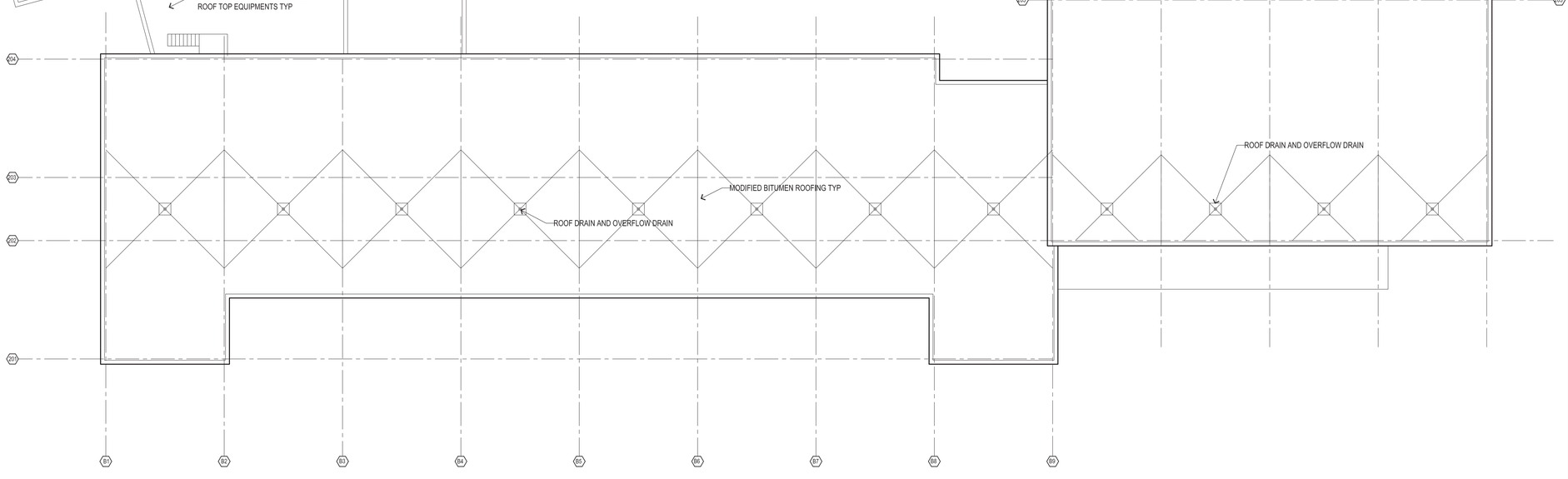
Sheet Title
FLOOR PLAN
CRAWL SPACE

Sheet Number
A204





1 ROOF PLAN
SCALE: 1/16" = 1'-0"

1' 5' 10' 20' 30' 50' N

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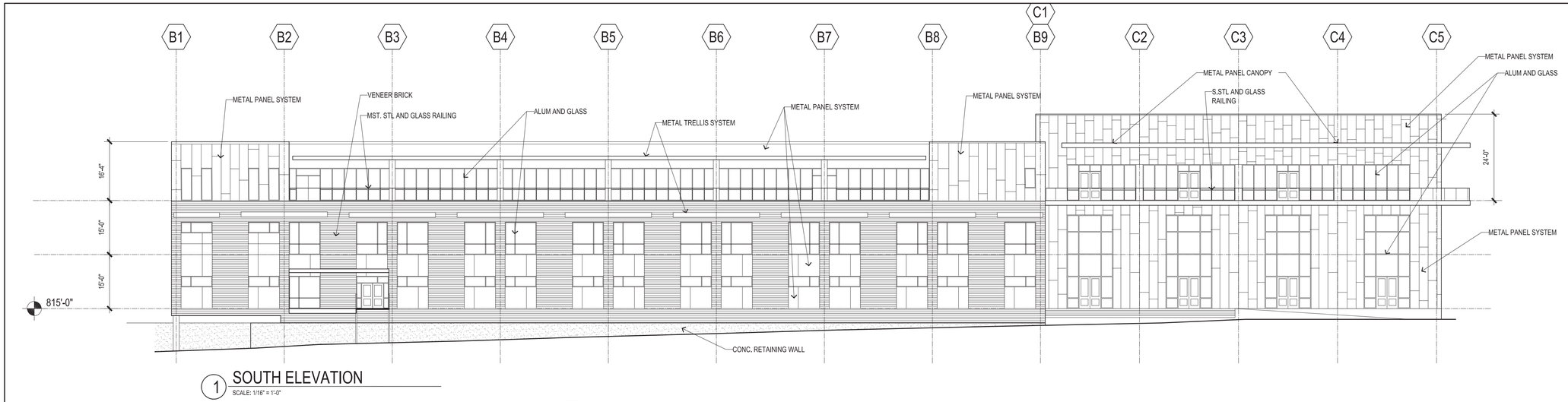
Sheet Title
ROOF PLAN

Sheet Number
A205



1 SOUTH ELEVATION
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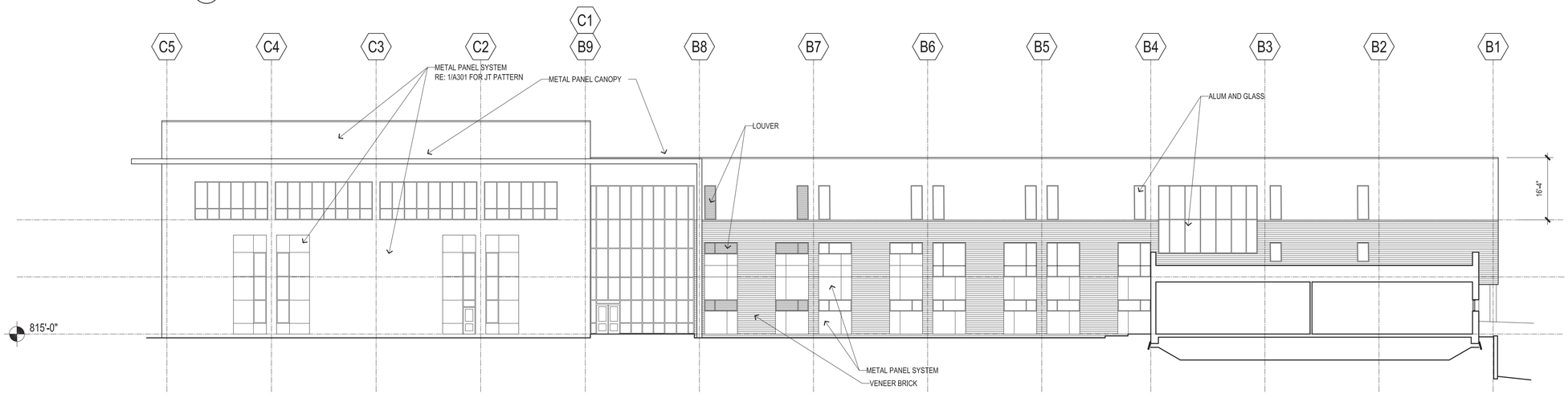
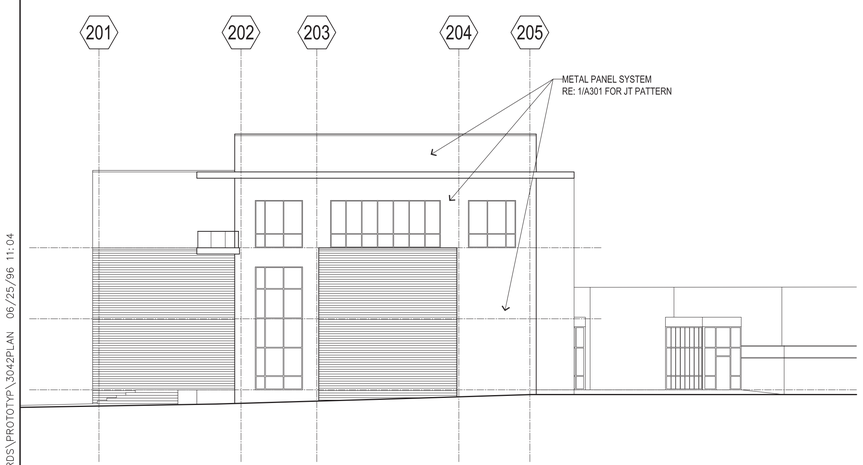
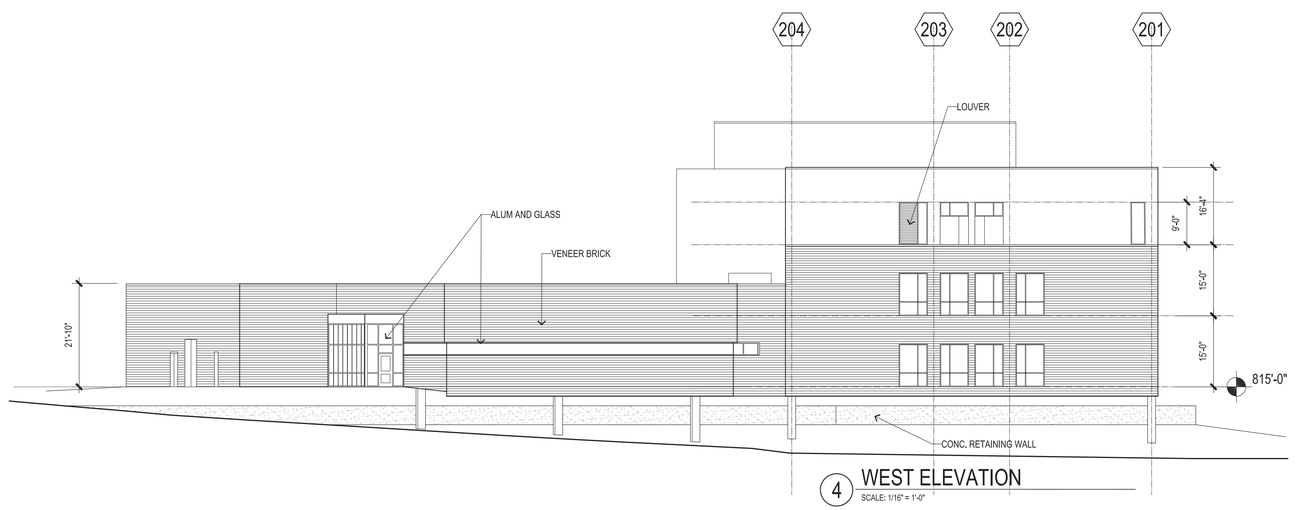


2 NORTH ELEVATION
SCALE: 1/16" = 1'-0"



3 EAST ELEVATION
SCALE: 1/16" = 1'-0"



4 WEST ELEVATION
SCALE: 1/16" = 1'-0"

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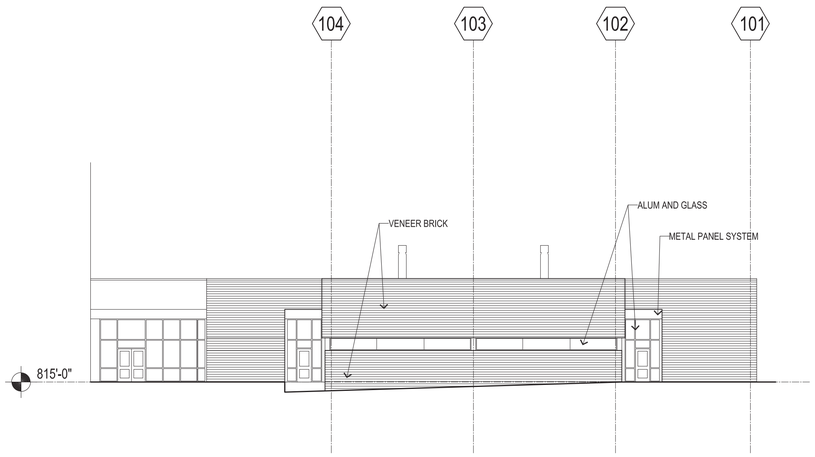
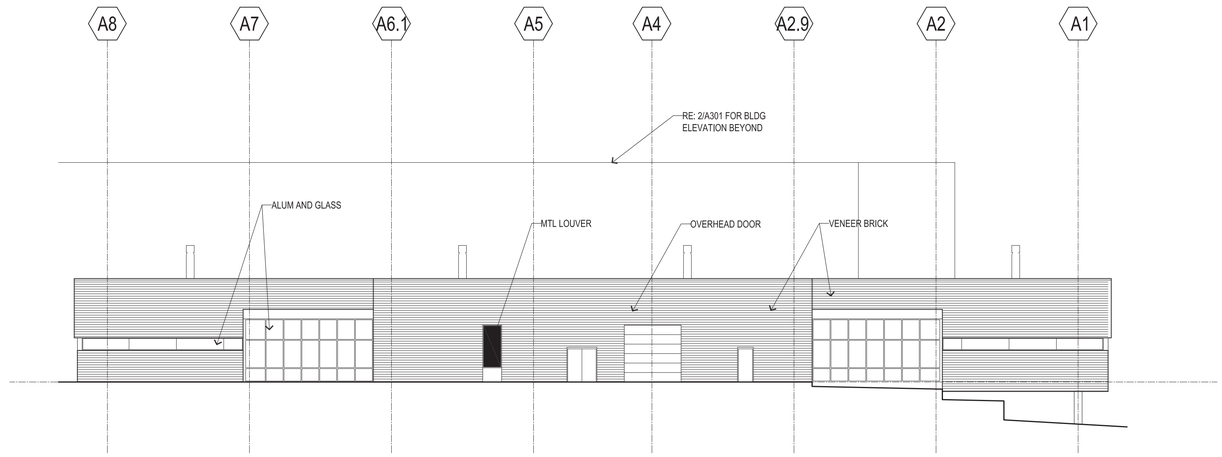
Sheet Title
ELEVATIONS

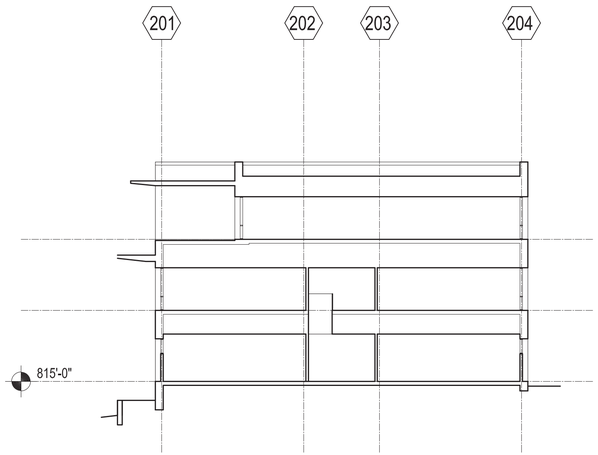
Sheet Number
A301



1 WEST ELEVATION - LAB WING
SCALE: 1/16" = 1'-0"



2 NORTH ELEVATION - LAB WING
SCALE: 1/16" = 1'-0"



3 BUILDING SECTION
SCALE: 1/16" = 1'-0"

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Sheet Title
ELEVATIONS

Sheet Number
A302

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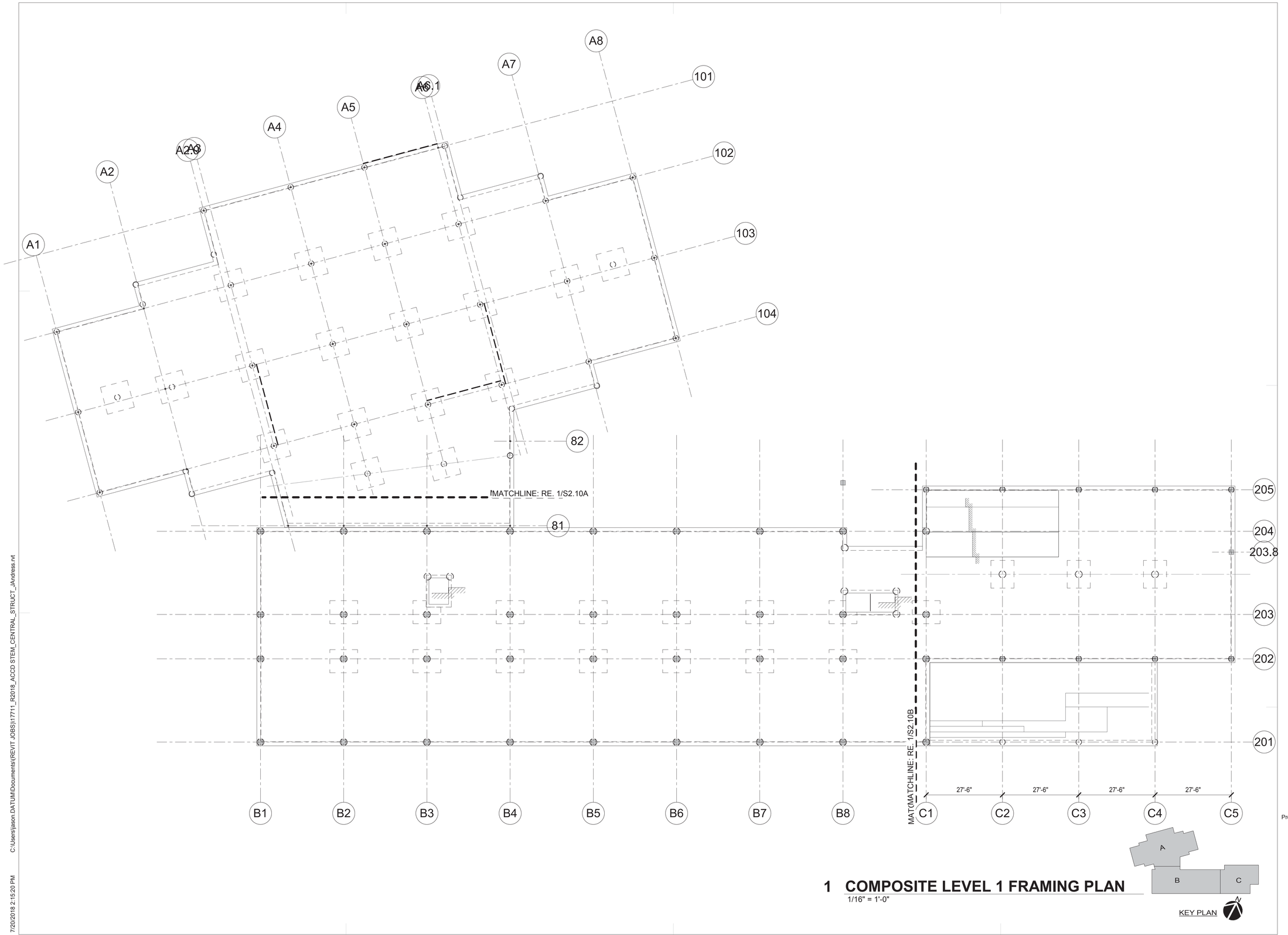

1 COMPOSITE LEVEL 1 FRAMING PLAN

1/16" = 1'-0"

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SHEET TITLE

COMPOSITE LEVEL 1 FRAMING PLAN

SHEET NUMBER

S2.10

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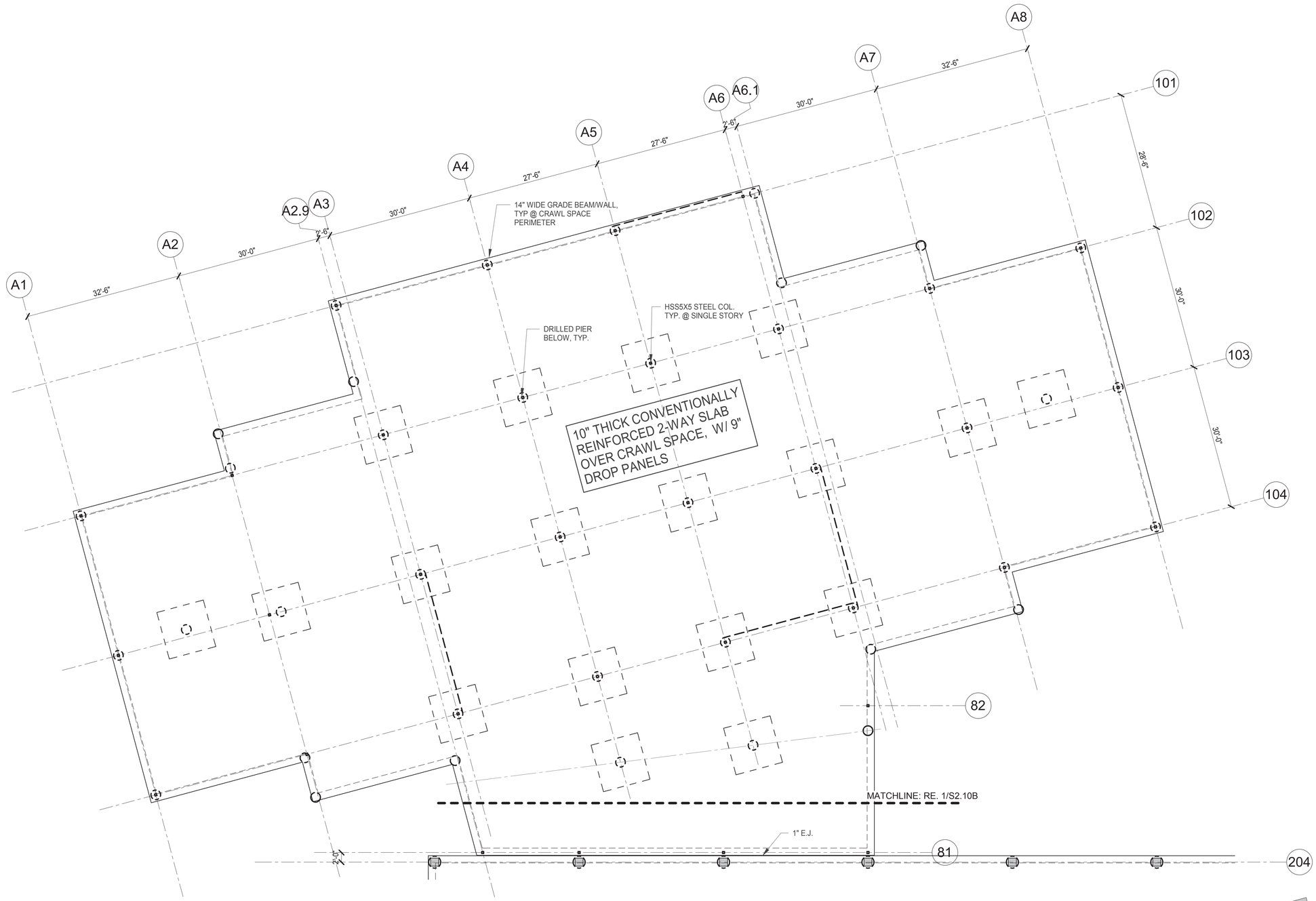
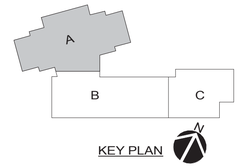


1 Level 1 - AREA A

3/32" = 1'-0"



KEY PLAN

Architects

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LEVEL 1 FRAMING PLAN- AREA A

SHEET NUMBER

S2.10A

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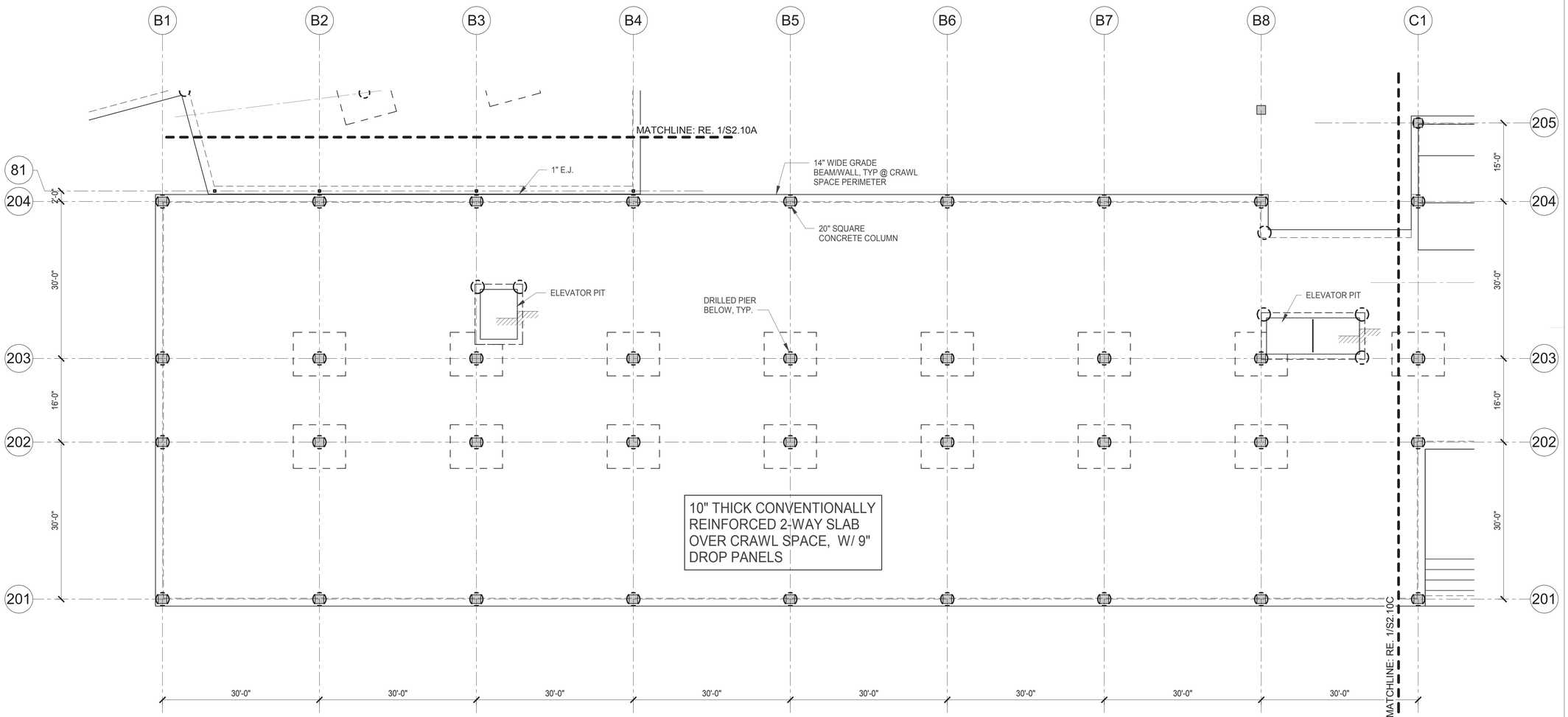
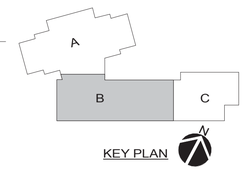


1 Level 1 - AREA B
3/32" = 1'-0"



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LEVEL 1 FRAMING PLAN - AREA B

SHEET NUMBER
S2.10B

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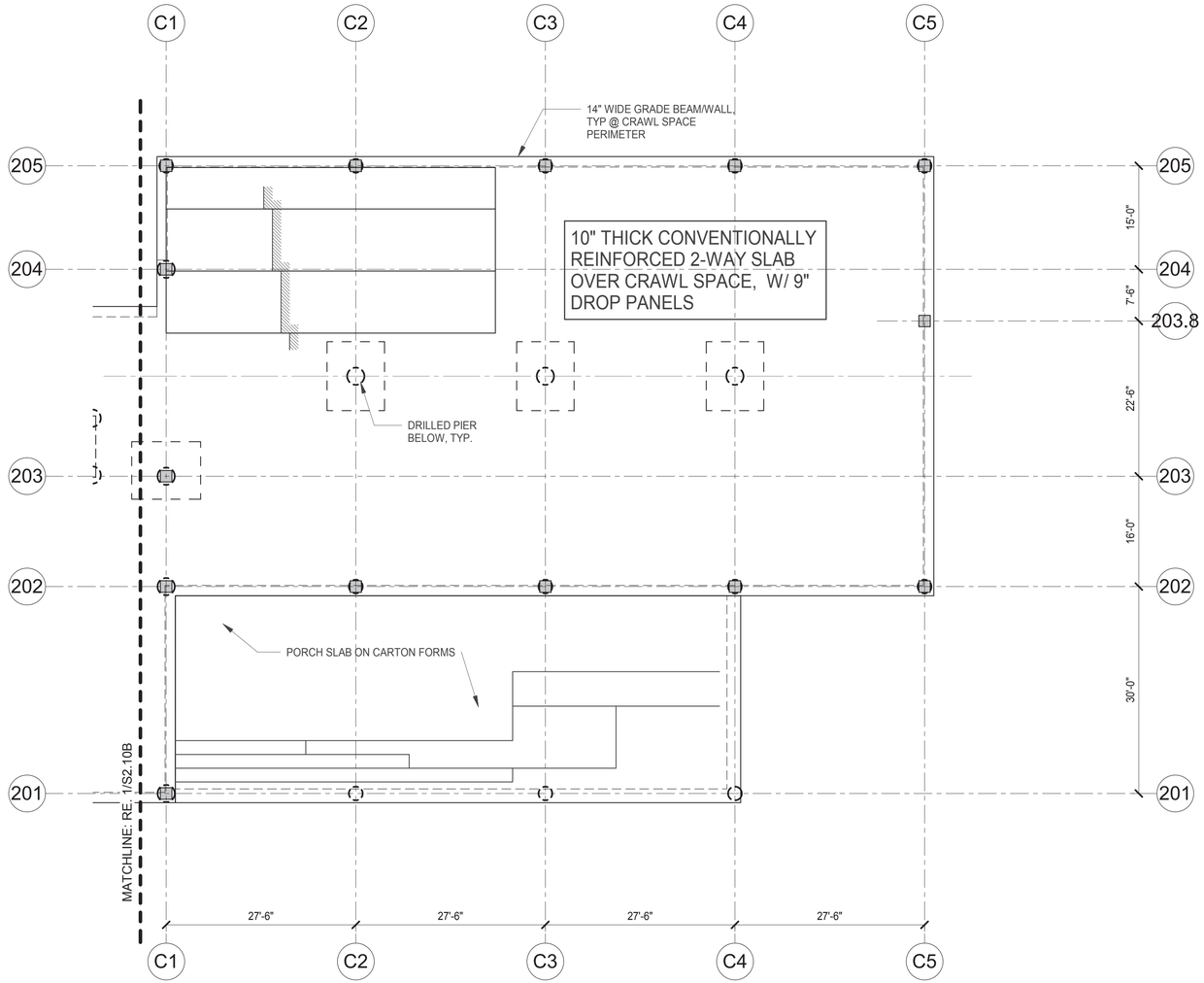
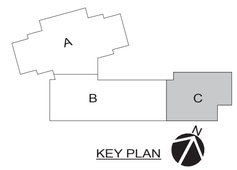


1 Level 1 - AREA C

3/32" = 1'-0"



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LEVEL 1 FRAMING PLAN - AREA C

SHEET NUMBER

S2.10C

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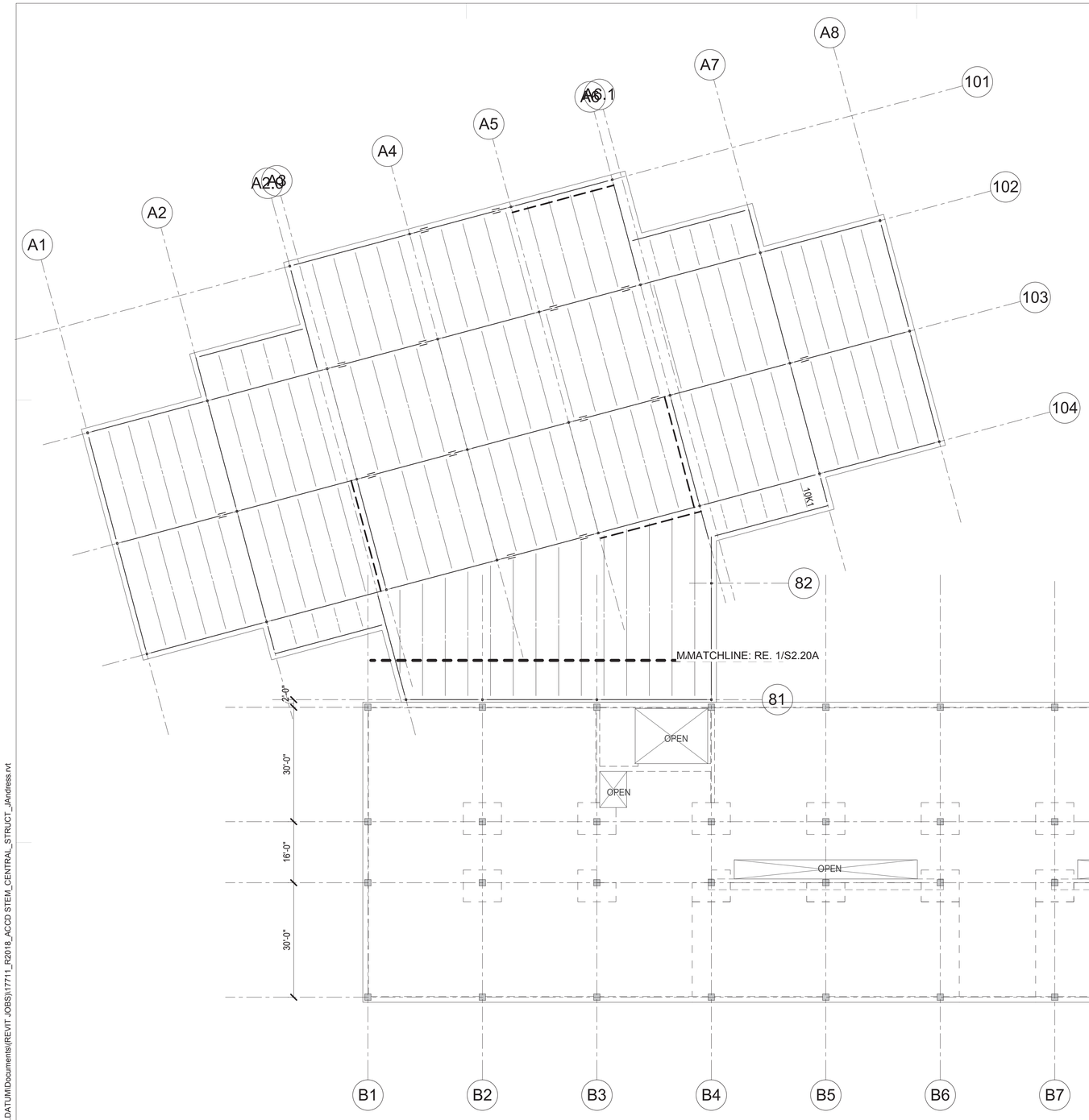

1 COMPOSITE LEVEL 2 FRAMING PLAN

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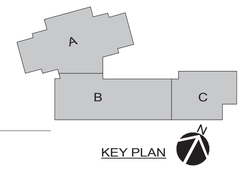

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COMPOSITE LEVEL 2 FRAMING PLAN

SHEET NUMBER
S2.20

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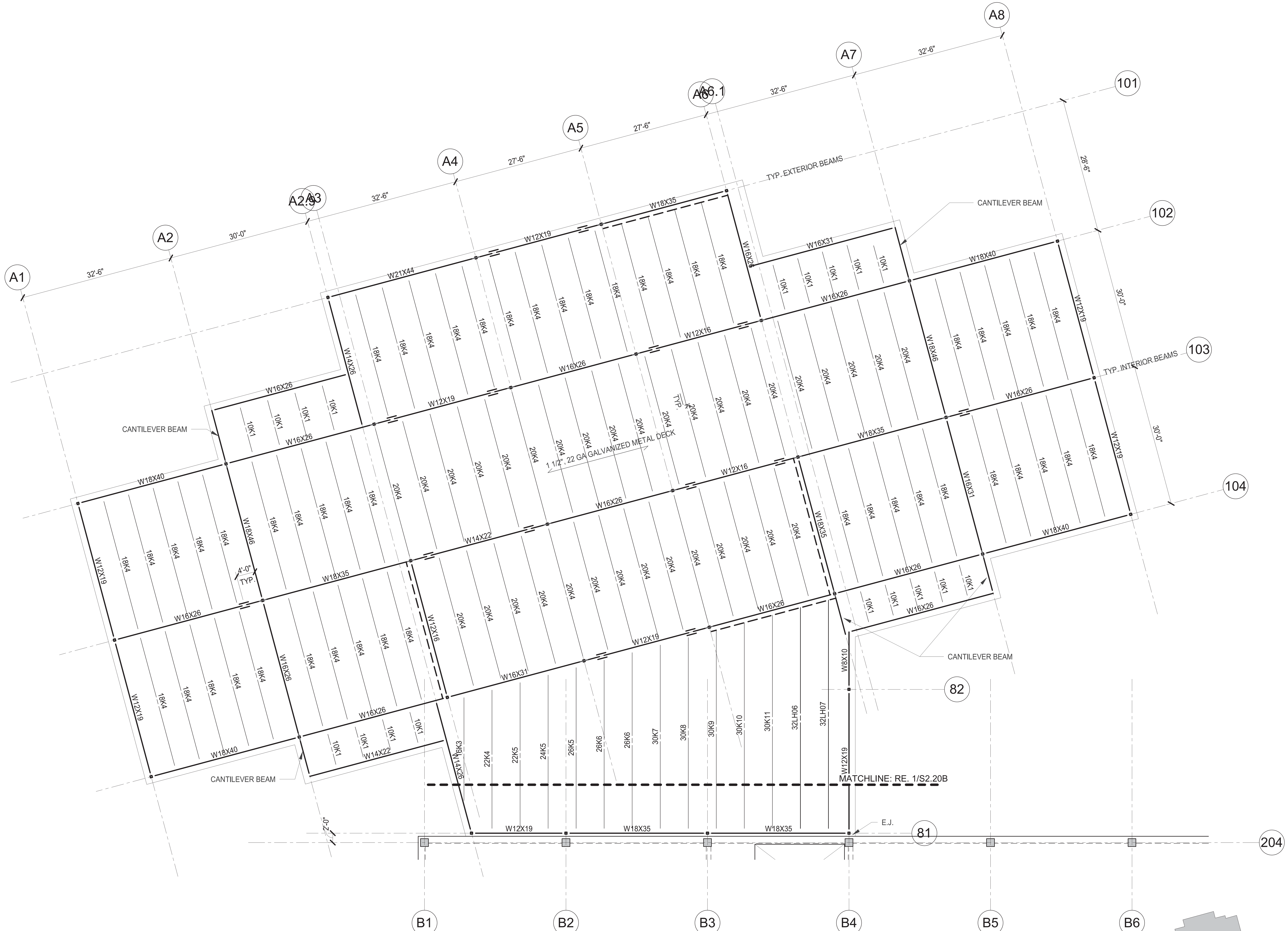
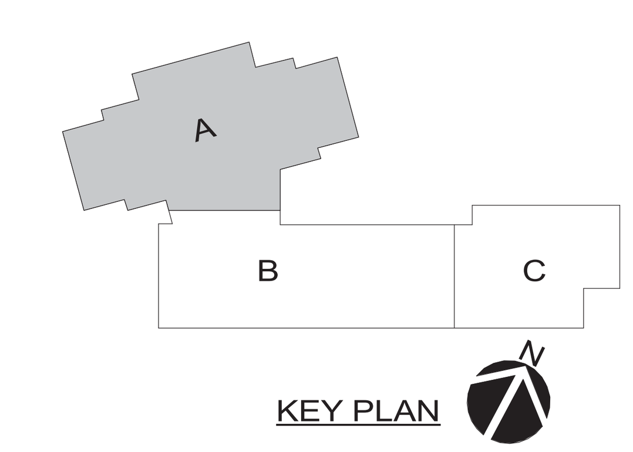


1 Level 2 - AREA A

3/32" = 1'-0"



KEY PLAN

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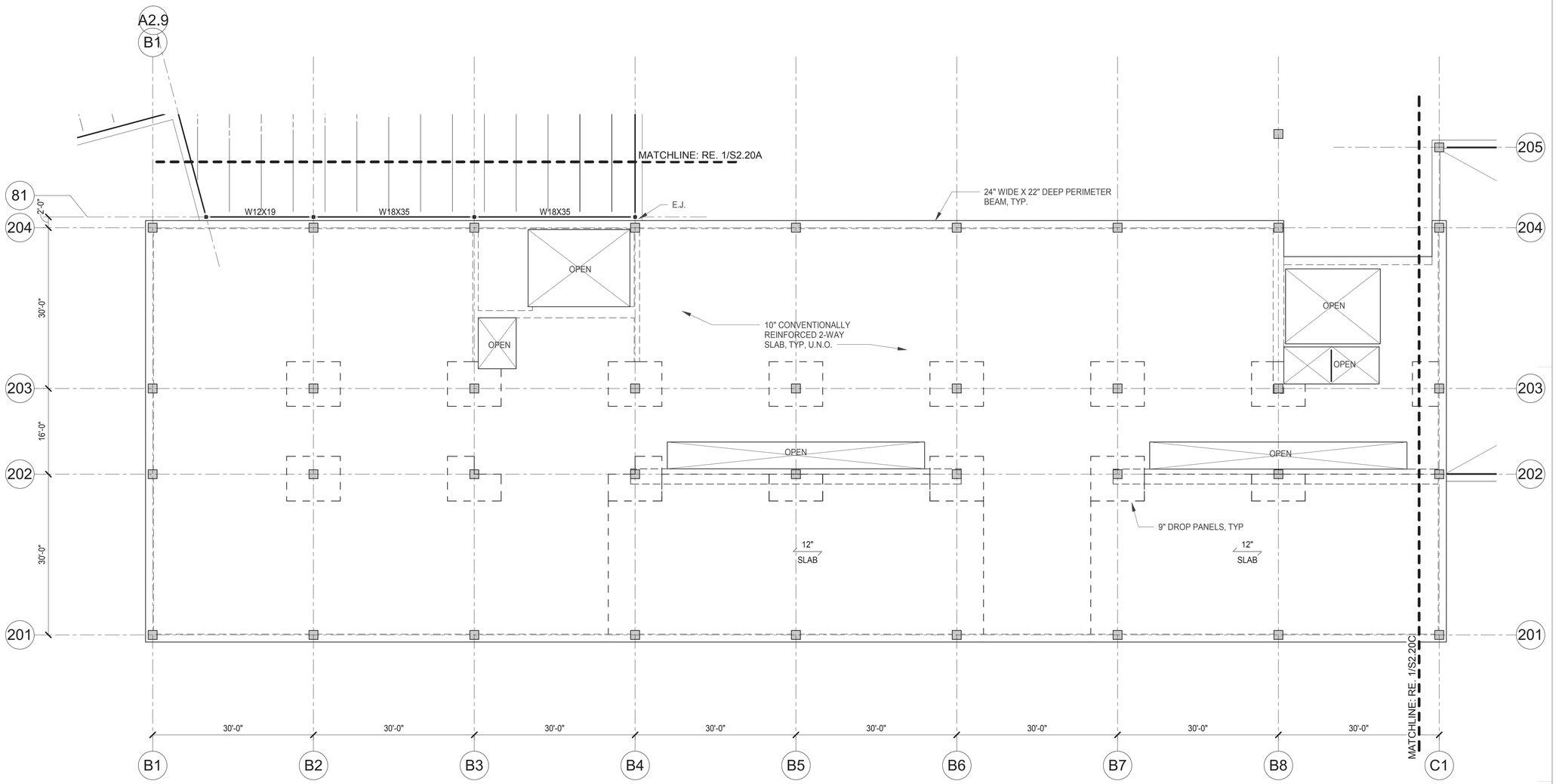
SHEET TITLE

ROOF FRAMING PLAN - AREA A

SHEET NUMBER

S2.20A



1 Level 2 - AREA B
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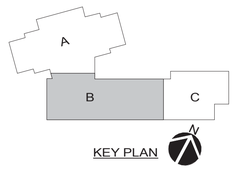

KEY PLAN

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LEVEL 2 FRAMING PLAN - AREA B

SHEET NUMBER
S2.20B

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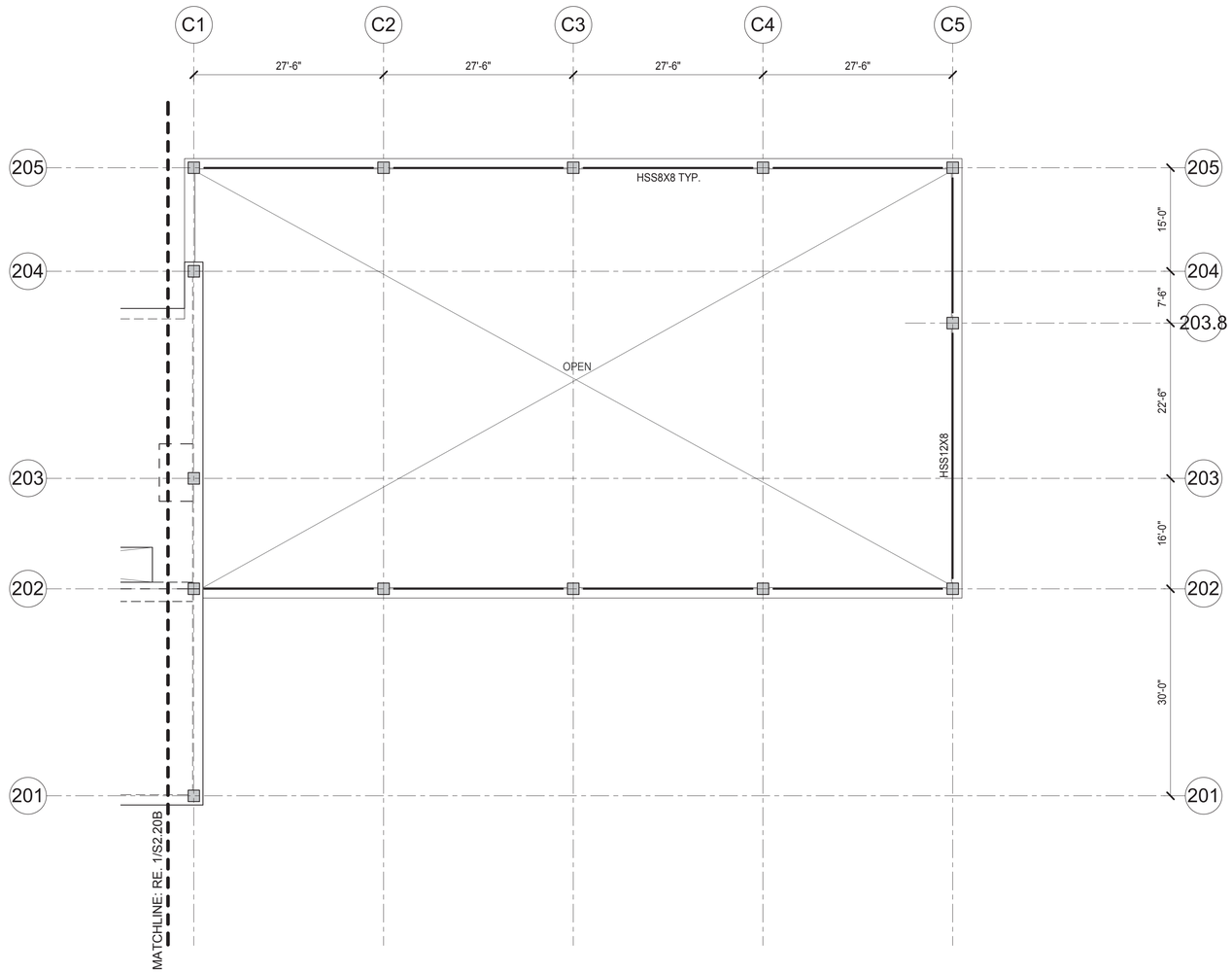

1 Level 2 - AREA C
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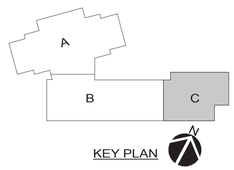

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07/18/18	
PROJECT NUMBER	Drawn By
Project Number	

SHEET TITLE
LEVEL 2 FRAMING PLAN - AREA C

SHEET NUMBER
S2.20C

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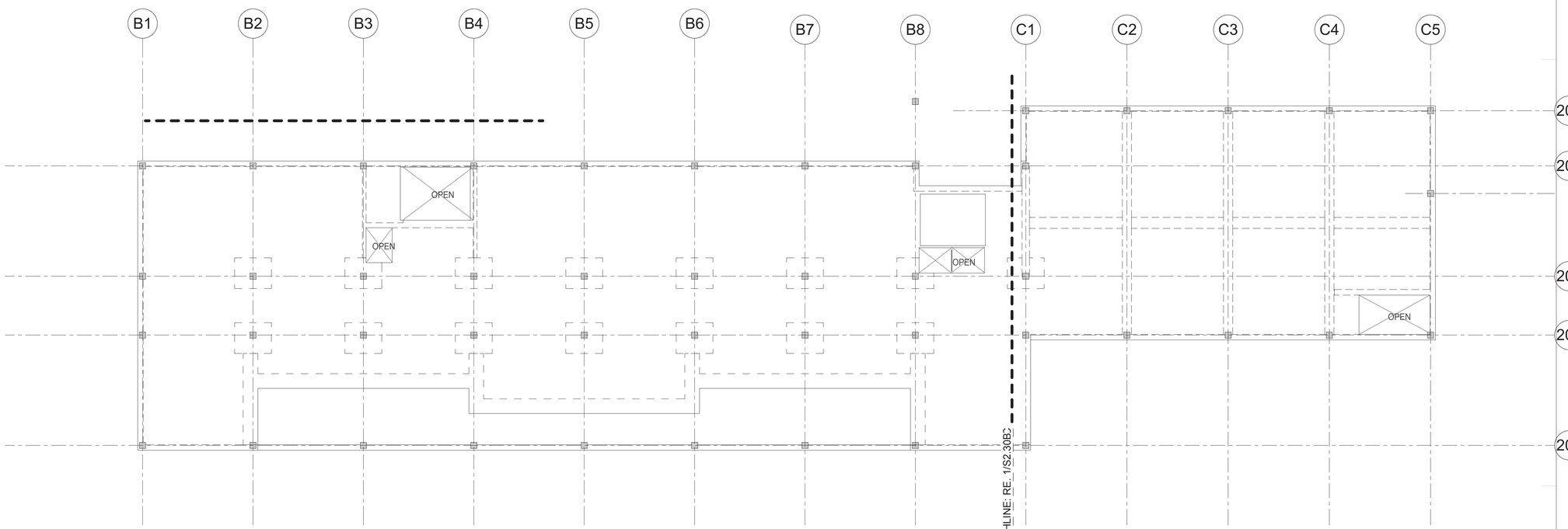
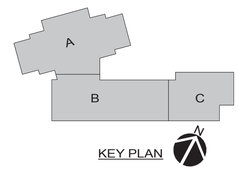


1 COMPOSITE LEVEL 3 FRAMING PLAN"

1/16" = 1'-0"



Architects

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1138 East Commerce Street
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210/226-1246
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PROJECT STATUS

SCHEMATIC DESIGN

Consultant

DatumRios
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816 Camaron St Ste 245, San Antonio, TX 78212

Datum Rios Project No. 17711

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PROJECT NAME

ALAMO COLLEGES
Northeast Lakeview College
STEM Education Building

REVISIONS

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SHEET TITLE
COMPOSITE LEVEL 3 FRAMING PLAN

SHEET NUMBER
S2.30

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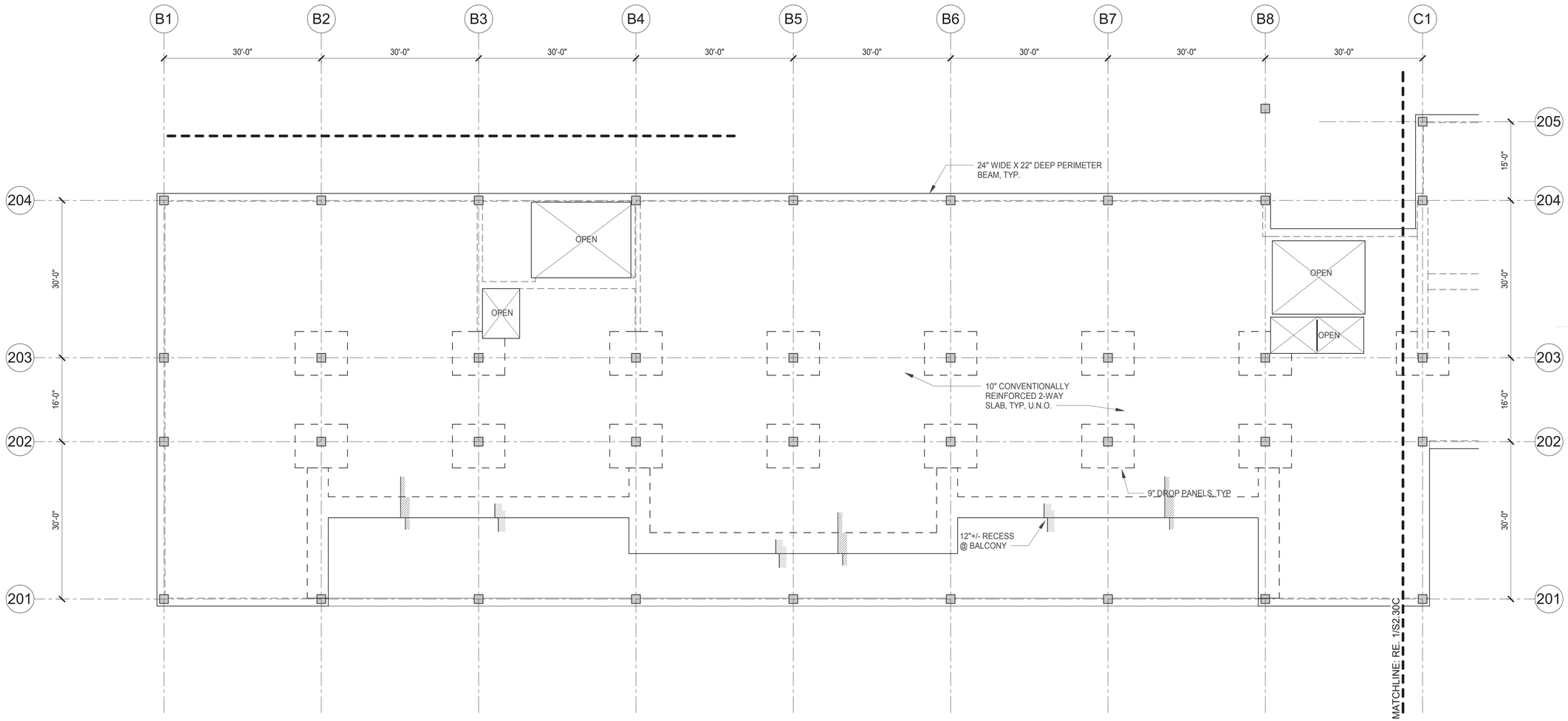
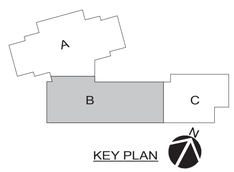


1 Level 3 - AREA B

3/32" = 1'-0"



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LEVEL 3 FRAMING PLAN - AREA B

SHEET NUMBER

S2.30B

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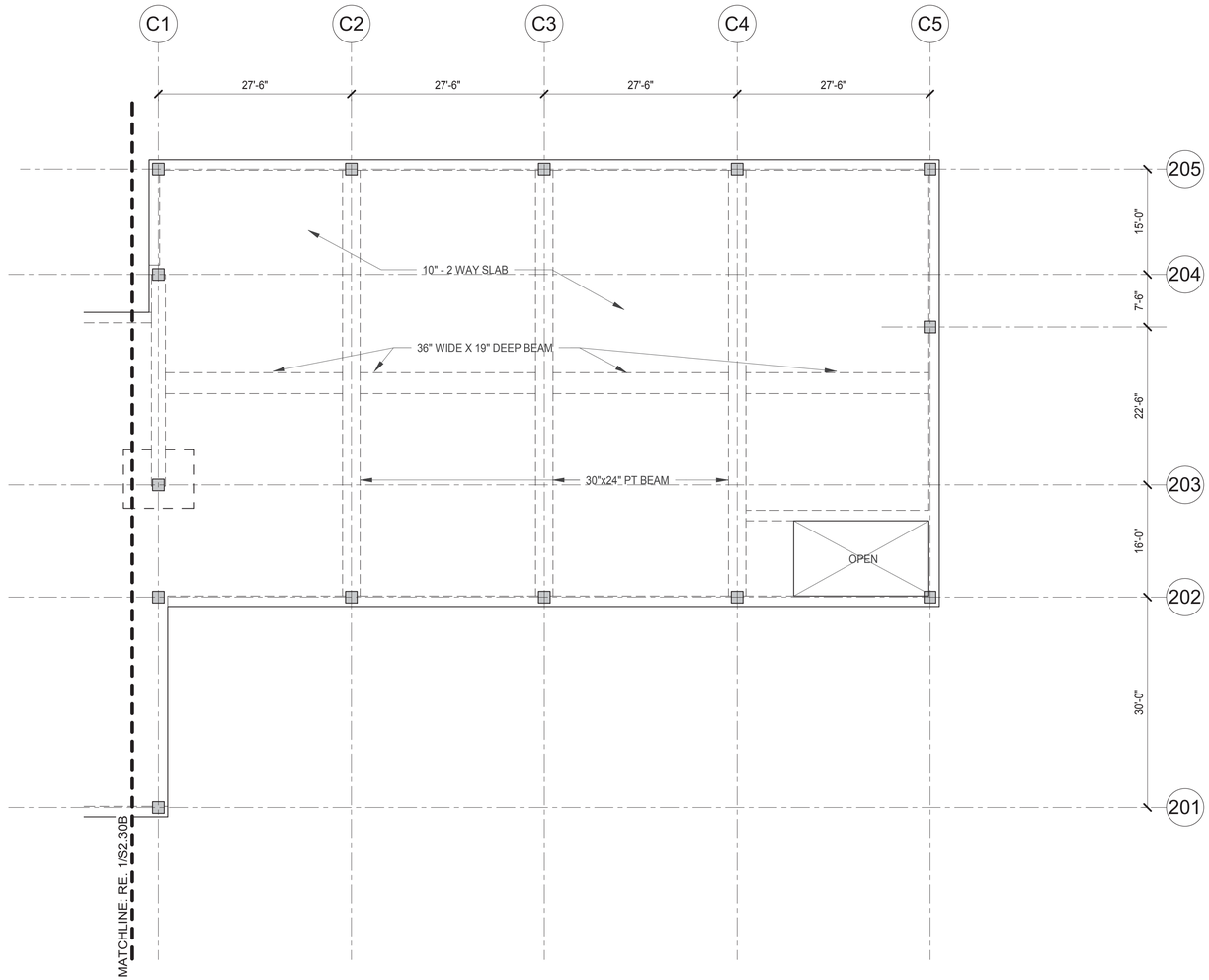
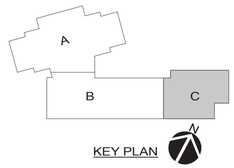


1 Level 3 - AREA C
3/32" = 1'-0"



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SHEET TITLE
LEVEL 3 FRAMING PLAN - AREA C

SHEET NUMBER
S2.30C

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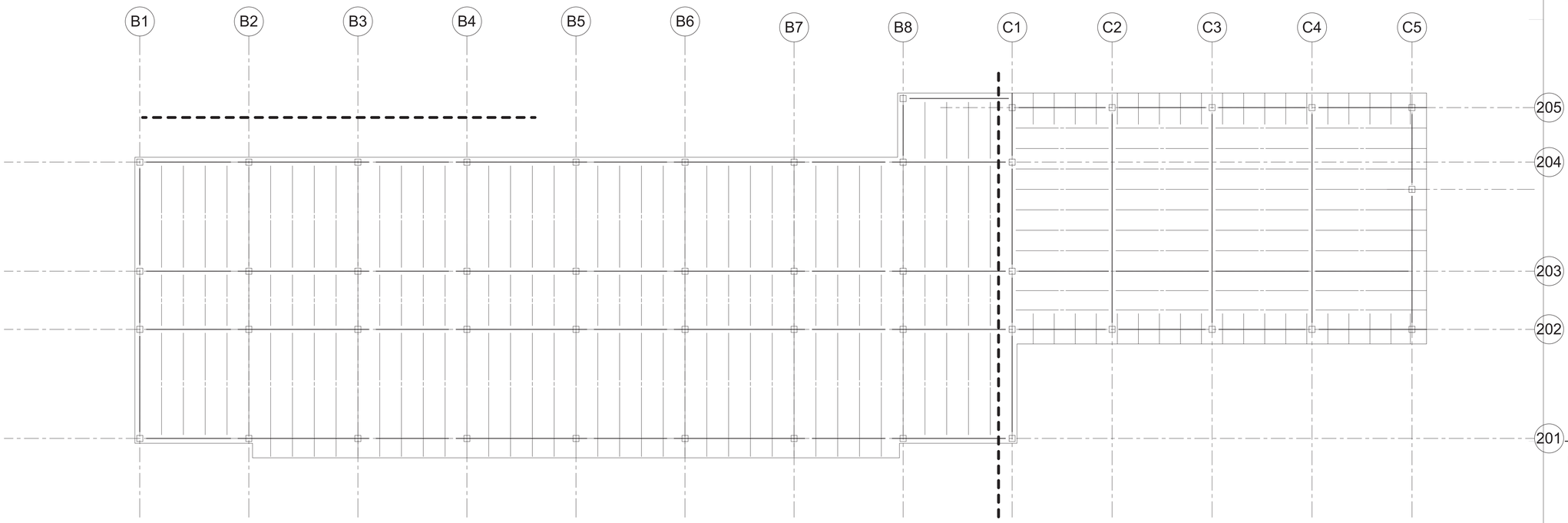
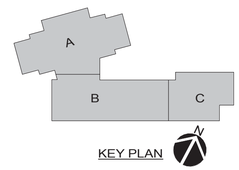


1 COMPOSITE ROOF FRAMING PLAN"

1/16" = 1'-0"



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COMPOSITE LEVEL 3 ROOF PLAN

SHEET NUMBER

S2.40

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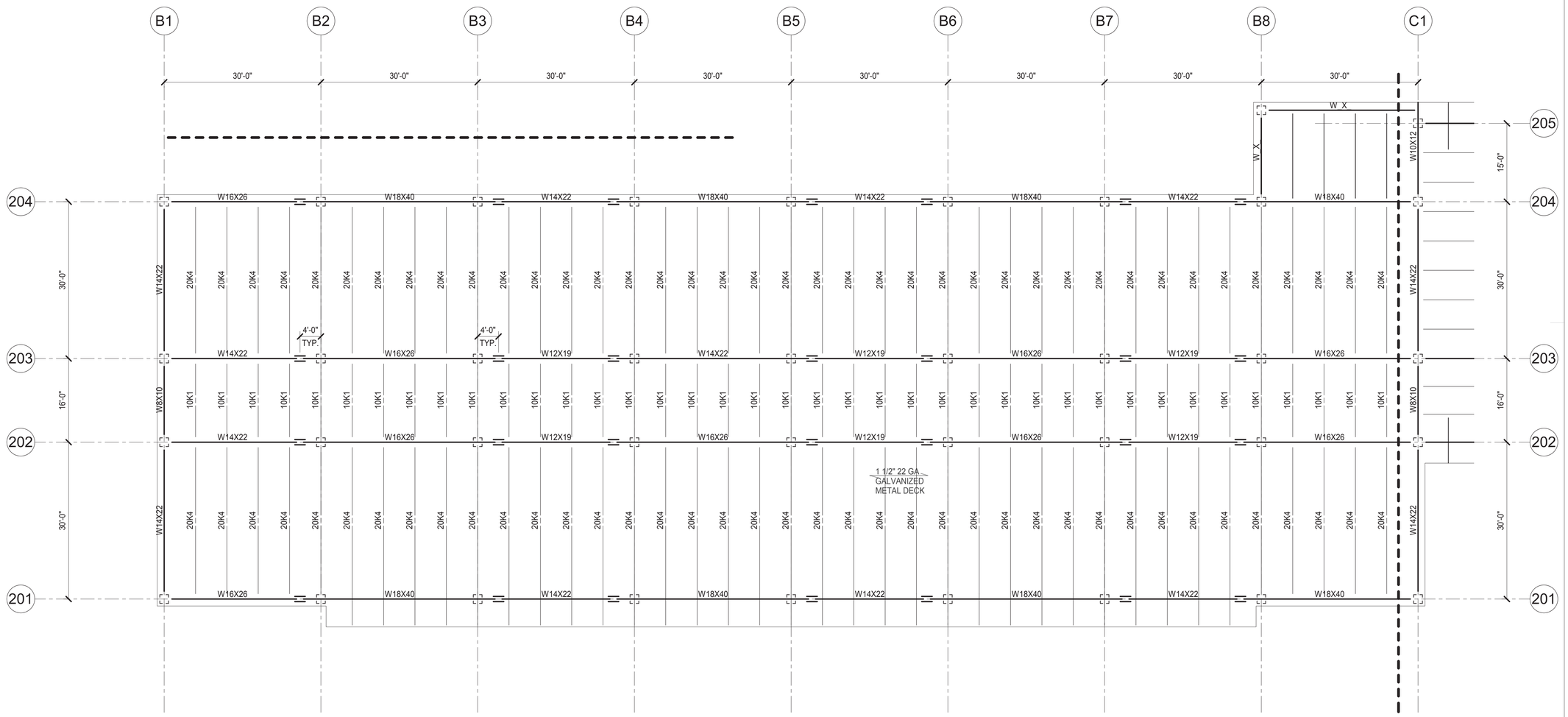
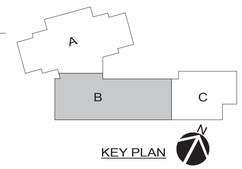


1 ROOF - AREA B

3/32" = 1'-0"



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PROJECT STATUS

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Northeast Lakeview College
STEM Education Building

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SHEET TITLE

ROOF FRAMING PLAN – AREA B

SHEET NUMBER

S2.40B

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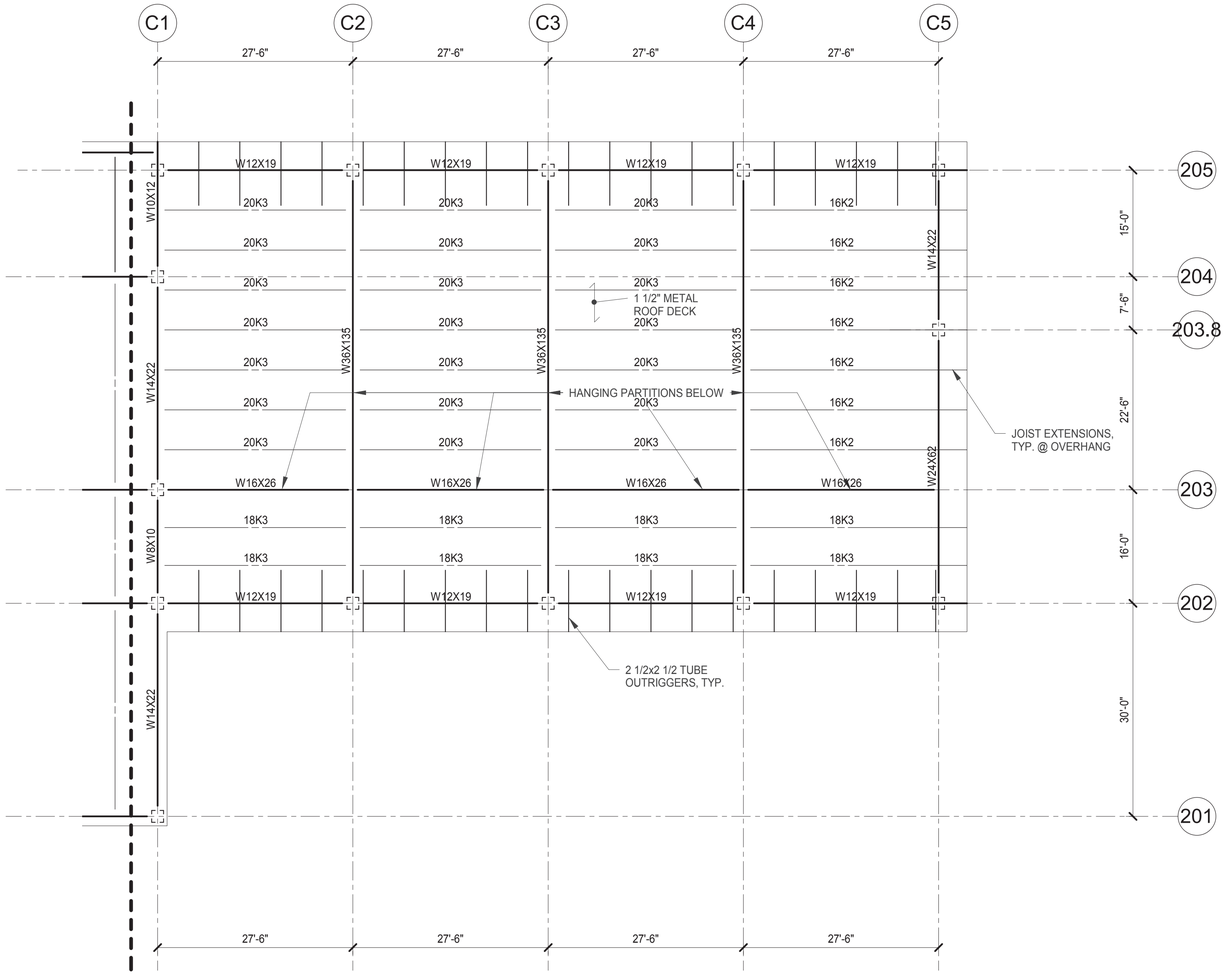
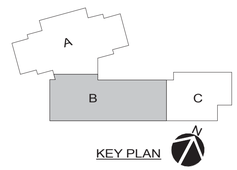


1 ROOF - AREA C

3/32" = 1'-0"



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SHEET TITLE

ROOF FRAMING PLAN – AREA C

SHEET NUMBER

S2.40C

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STEM EDUCATION BUILDING
NORTHEAST LAKEVIEW COLLEGE

FPC #99601
JULY 24,2018

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STEM EDUCATION BUILDING
NORTHEAST LAKEVIEW COLLEGE

FPC #99601
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