Addendum #5

To:	Bid Documents Dated June 5, 2020
Project Name:	Indiana State University – Dreiser Hall Renovation
Project #:	19052
Date:	July 2, 2020

This Addendum, issued prior to bidding, alters, amends, corrects, or clarifies the Proposal Documents to the extent stated herein and does thereby become a part of the Proposal Documents and will become part of the Contract Documents of the successful bidder(s).

ITEMS INCLUDED IN THIS ADDENDUM

1. General
2. Changes to the Project Manual
3. Changes to the Drawings
4. MEP Addendum #5

GENERAL

1. Per Section 001010 – INSTRUCTION TO BIDDERS - 3.07 A. states “Proposals submitted by non-Indiana corporations shall be accompanied by a certificate of good standing issued by the Indiana Secretary of State.” This form is now known as a “Certificate of Existence”. A link to the website to order these is attached to this Addendum.
2. Per a bidder request, the Geotechnical Report is attached to this addendum.
3. The interior of the building will be open to bidders on both July 7 and July 8 from 9 a.m. to 3 p.m. If for any reason the contractors have issues accessing the building, please call Bryan Duncan at 812.237.8195 or the main Facilities Management number 812.237.8100.

PROJECT MANUAL

1. Table of Contents – Replace in its entirety.

2. Section No. 00 10 10 – INSTRUCTION TO BIDDERS
   A. Replace in its entirety.

3. Section No. 00 20 20 – BID FORM
   A. Replace in its entirety.
   B. This revised bid form is to be submitted with the bid.

4. Section No. 04 21 13 – VENEER MASONRY SYSTEM

A. Add modified revised section with specified Granite.

5. Section No. 05 51 13 – METAL PAN STAIRS
   A. Add Section.

6. Section No. 05 52 13 – PIPE AND TUBE RAILINGS
   A. Add Section.

7. Section No. 05 73 13 – GLAZED DECORATIVE METAL RAILINGS
   A. Add Section.

8. Section No. 07 42 13.19 – INSULATED METAL WALL PANELS
   A. Add Section.

9. Section No. 08 51 13 – ALUMINUM WINDOWS
   A. 2.01 B. Add Winco Windows 3250 series historic window line as acceptable product.
   B. 2.04 L.1. Exterior Grids to read: Finish matching the widnows system. Profile beveled grid (1.125”). Fasten grid to sloped perimeter vent at each contact point. Two piece snap grids are not permited as a substitute.
   C. 2.04 L 2. Interior Grid to read: 1.125” x 0.062” aluminum flat bar grid as applicable, finish to match window system.

10. Section No. 08 71 10 – DOOR HARDWARE SCHEDULE
    A. Modify SFIC Core on all applicable Hardware Groups to read:
       SFIC Core 7 Pin (Supplied, Pinned, and Installed by Contractor to match Owner’s Existing Keying System)

11. Section No. 09 54 26 – WOOD CEILINGS
    A. Add Section.

12. Section No. 11 52 13 – PROJECTION SCREENS
    A. Add Section.

13. Section No. 11 61 33 – RIGGING SYSTEMS
    A. Add Section.
    B. Add Rigging Matrix.

14. Section No. 12 24 13 – ROLLER SHADES
    A. Add Section.

15. Section No. 12 66 00 – TELESCOPING STANDS
    A. Add modified section with additional approved manufacturers and clarification on seat type.

16. Section No. 14 05 00 – BASIC ELEVATOR REQUIREMENTS
    A. Delete Section in its entirety.

17. Section No. 14 21 25 – ELECTRIC TRACTION PASSENGER ELEVATORS (MACHINE ROOMLESS)
    A. Modify 1.03 A.2. as follows:

a) 6 stops and 7 openings (4 front (opens to to east) 3 rear (opens to west) as follows:
   1) Basement – front
   2) SW Entry – rear
   3) First Floor – front
   4) Control Room – rear
   5) Second Floor – front
   6) Third Floor – front and rear
b) Floor Markings - TBD

18. Section No. 28 13 00 – ELECTRONIC ACCESS CONTROL (EAC) SYSTEM
    A. Add Section.

DRAWINGS

1. Sheet S0.03 – Standard Str. Details
   A. Reissue Sheet – see clouds.

2. Sheet S1.00 – Str. Basement Floor Plan
   A. Reissue Sheet – see clouds.

3. Sheet S1.01 – Str. First Floor Plan
   A. Reissue Sheet – see clouds.

4. Sheet S1.02 – Str. Second Floor Plan
   A. Reissue Sheet – see clouds.

5. Sheet S2.00 – Foundation Plan - Lobby
   A. Reissue Sheet – see clouds.

6. Sheet S3.01 – Str. Sections
   A. Reissue Sheet – see clouds.

7. Sheet S3.02 – Str. Sections
   A. Reissue Sheet – see clouds.

8. Sheet S3.03 – Str. Sections
   A. Reissue Sheet – see clouds.

9. Sheet S4.01 – Str. Details
   A. Reissue Sheet – see clouds.

10. Sheet S4.03 – Str. Details
    A. Reissue Sheet – see clouds.

11. Sheet S4.04 – Str. Details
    A. Reissue Sheet – see clouds.

12. Sheet D1.00, D1.01, D1.02, and D1.03 – Demolition Plans

A. Revise Note 37 to read: REMOVE EXISTING ALUMINUM WINDOW SYSTEM AND ANY REMNANTS OF UNDERLYING STEE/ALUMINUM ORIGINAL WINDOWS IN THEIR ENTIRETY.

13. Sheet A1.00B – Basement Reflected Ceiling Plan
    A. Reissue Sheet – see clouds.

14. Sheet A1.00C – Basement Finish Plan
    A. Reissue Sheet – see clouds.

15. Sheet A1.01 – 1st Floor Plan
    A. Reissue Sheet – see clouds.
    B. Relocate areaway at south elevation approximately 3'-0" to the west. All other construction associated with this move is to be relocated as well. This is not depicted on updated drawing.

16. Sheet A1.01A – 1st Floor Dimension Plan
    A. Reissue Sheet – see clouds.

17. Sheet A1.01B – 1st Floor Reflected Ceiling Plan
    A. Reissue Sheet – see clouds.

18. Sheet A1.02B – 2nd Floor Reflected Ceiling Plan
    A. Reissue Sheet – see clouds.

19. Sheet A1.02C – 2nd Floor Finish Plan
    A. Reissue Sheet – see clouds.

20. Sheet A1.03B – 3rd Floor Reflected Ceiling Plan
    A. Reissue Sheet – see clouds.

21. Sheet A2.01 – Exterior Elevations
    A. Reissue Sheet – see clouds.

22. Sheet A2.02 – Exterior Elevations
    Reissue Sheet – see clouds.

23. Sheet A3.01 – Building Sections
    Reissue Sheet – see clouds.

24. Sheet A4.02 – Vertical Circulation Sections and Details
    Reissue Sheet – see clouds.

25. Sheet A5.20 – Millwork and Details
    Reissue Sheet – see clouds.

26. Sheet A5.21 – Millwork and Details
    Reissue Sheet – see clouds.

27. Sheet A5.22 – Millwork and Details
    Reissue Sheet – see clouds.

28. Sheet A5.23 – Millwork and Details
    Reissue Sheet – see clouds.

29. Sheet A5.24 – Interior Details
    Reissue Sheet – see clouds.

30. Sheet A5.25 – Interior Details
    Reissue Sheet – see clouds.

31. Sheet A6.02 – Details
    Reissue Sheet – see clouds.

32. Sheet A8.01 – Door Schedule and Frame Elevations
    A. Reissue Sheet – see clouds.

MEP ADDENDUM #5

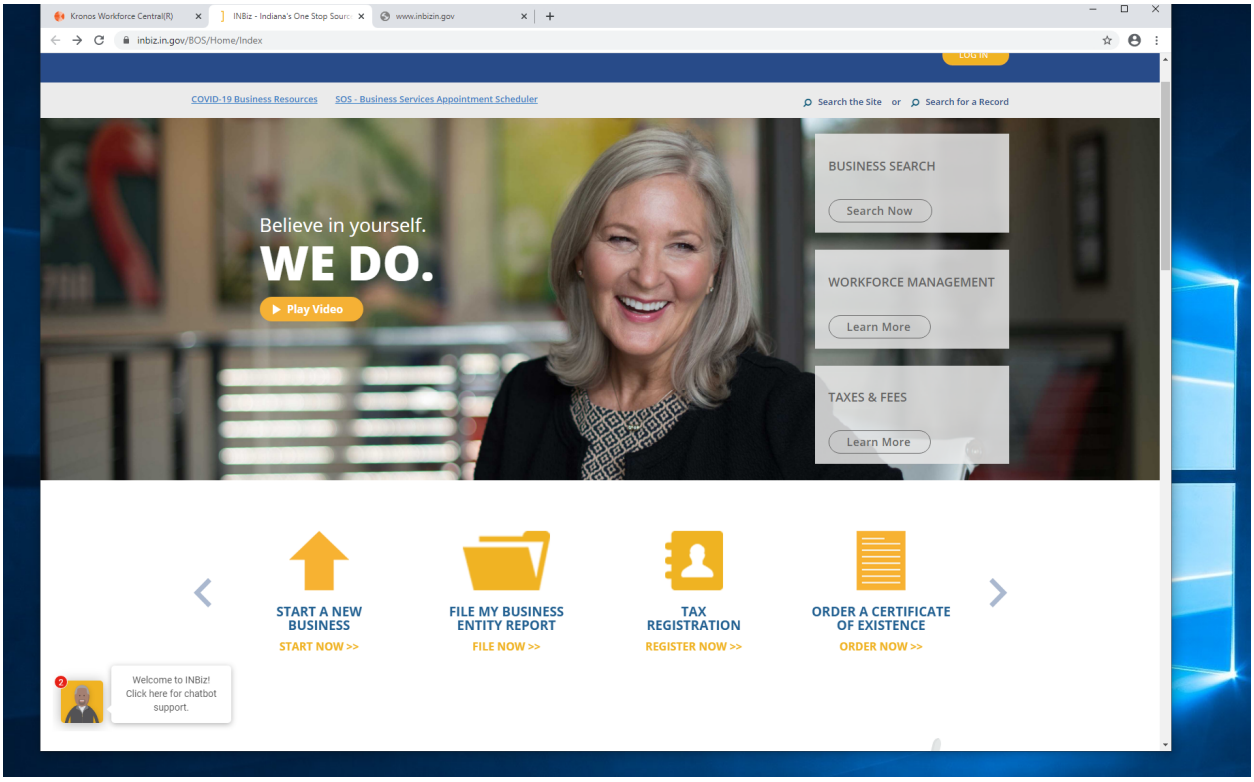
Attached

Certificate of Good Standing – Indiana Secretary of State's Office – This certificate should be provided to Indiana State University Purchasing within the bid documents for all public works projects.

To order a Certificate of Good Standing for the State of Indiana please go to:

https://inbiz.in.gov/BOS/Home/Index

Then click on the icon marked as Order a Certificate of Existence as shown below:



PATRIOT ENGINEERING and Environmental, Inc.
Engineering Value for Project Success
Consulting Environmental, Geotechnical and Materials Engineers

Report of
Geotechnical Engineering Investigation
Dreiser Hall Renovations
Indiana State University
221 N. 6th Street
Terre Haute, Indiana
Patriot Project No. 20-0345-02G

Prepared For:

Mr. Jonathan Young
Browning Day
626 N. Illinois Street
Indianapolis, IN 46204

Prepared By:

Patriot Engineering and Environmental, Inc.
1359 N. Aberdeen Ave.
Terre Haute, IN 47804

May 13, 2020

PATRIOT ENGINEERING
and ENVIRONMENTAL, Inc.
Engineering Value for Project Success

May 13, 2020

Mr. Jonathan Young
Browning Day
626 N. Illinois Street
Indianapolis, IN 46204

RE: Report of
Geotechnical Engineering Investigation
Dreiser Hall Renovations
Indiana State University
221 N. 6th Street
Terre Haute, Indiana
Patriot Project No. 20-0345-02G

Dear Jonathan:

Attached is the report of our geotechnical engineering investigation for the proposed building addition and renovation to Dreiser Hall on the campus of Indiana State University. This investigation was completed in general accordance with our Proposal No. 20-0455-02G dated March 24. Approval to conduct this investigation was provided in your email containing notice to proceed dated March 25, 2020.

This report contains the results of laboratory tests performed on samples obtained from the site, and geotechnical recommendations pertinent to the site development, design, and construction.

We appreciate the opportunity to perform this geotechnical engineering investigation and look forward to working with you during the construction phase of the project. If you have any questions regarding this report or if we may be of any additional assistance regarding any geotechnical aspect of the project, please do not hesitate to contact our office.

Respectfully submitted,
Patriot Engineering and Environmental, Inc.

Timothy C. Govert
Senior Project Manager

Ralph M. O'Quinn, P.E.
Senior Project Engineer

RALPH M. O'QUINN
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REPORT OF GEOTECHNICAL ENGINEERING INVESTIGATION

Dreiser Hall Renovation
Indiana State University
221 N. 6th Street
Terre Haute, Indiana
Patriot Project No. 20-0345-02G-

1.0 INTRODUCTION

1.1 General

Indiana State University is planning renovations to the existing Dreiser Hall located at 221 N. 6th Street on the main campus. The project is expected to include interior alterations and upgrades as well as an addition to the structure. Browning Day has employed Patriot Engineering & Environmental, Inc. (Patriot) to perform a Geotechnical investigation of the proposed project site to assist in the design and construction planning process. The results of our geotechnical engineering investigation for the project are presented in this report.

1.2 Purpose and Scope

The purpose of this investigation has been to determine the general near surface and subsurface conditions within the project area and to develop the geotechnical engineering recommendations necessary for the design and construction of addition and renovations. This was achieved by drilling test borings, and by conducting laboratory tests on samples collected from the borings. This report contains the results of our findings, an engineering interpretation of these results with respect to the available project information, and recommendations to aid in the design and construction of the proposed Dresier Hall project.

2.0 PROJECT INFORMATION

The proposed project is expected to include a new lobby addition, new theater slab and new elevator pit in the renovation, as well as complete renovations of classroom spaces and mechanical and electrical systems. The proposed improvements largely stem from needs relating to Americans with Disabilities Act (ADA) requirements for accessibility. Dreiser Hall was constructed in 1950, with no appreciable renovations or upgrades since initial construction. Other improvements reflect updated building usage and current needs.

Dreiser Hall is a 3-story building mostly supported upon a basement level. Only the west-central portion that includes the existing auditorium does not involve basement level support. This center area of the building includes a 255-seat auditorium, which currently serves the College of Arts and Sciences for academic learning purposes. The audience seating slopes downward from the entrance level at elevation 93.75' at the western side to approximate elevation 89' at the base of the stage. It is our understanding that the depressed portion of this theater venue would be filled to support a new slab and interior foundations as part of the renovations.

Based on information furnished by the VS Engineering, the structural engineer of record, maximum foundation and slab loads and bearing depths are as follows:

- Lobby Addition Columns: 29.4-kips (Elev. 91.75-ft.)
- Lobby Addition Walls: 2.75-kips per lineal foot (Elev. 91.75-ft.)
- Theater slab Max Area Load: 250-pounds per square foot (Elev. 93.0-ft.)
- Elevator Shaft Mat: 410-kips (Elev. 81.33-ft.)

*existing lobby entrance elevation = 93.75-ft

Patriot should be consulted if any of the above-mentioned details or loads are incorrect or modified through the design process. The recommendations contained herein may require alteration to meet modified conditions.

3.0 INVESTIGATIONAL PROCEDURES

3.1 Field Work

Prior to commencement of our subsurface investigation, the borings were marked in the field at the locations established by the client. In addition to public utility clearance by Indiana Underground Plant Protection Service (IUPPS), a private utility locating firm was engaged to perform active and passive scans of the proposed boring areas. The identified underground facilities were marked with paint to avoid conflict or damage from the drilling efforts.

Four (**4**) borings were drilled, sampled, and tested using a Mobile B-45 Drill Rig at the project site on April 3, 2020, at the approximate locations shown on the Boring Location Map in Appendix A. These borings were performed immediately adjacent to the exterior walls of Dreiser Hall as shown in the Soil Boring Location Map (Fig 1) in Appendix A of this report. Each of the borings was drilled at the preplanned locations, as marked by our

representative. The soil borings were drilled to depths of 30-feet at each of the sites. All depths are given as feet below the existing ground surface. These borings are identified as Borings B-1, B-2, B-5 and B-6 in this report.

The soil borings were advanced using 3¼" I.D. (inside diameter) hollow-stem augers. Samples were recovered in the undisturbed material below the bottom of the augers using the standard drive sample technique in accordance with ASTM D 1586-74. A 2" O.D. (outside diameter) by 1-3/8" I.D. split-spoon sampler was driven a total of 18-inches with the number of blows of a 140-pound hammer falling 30-inches recorded for each 6-inches of penetration. The sum of blows for the final 12-inches of penetration is the Standard Penetration Test result commonly referred to as the N-value (or blow-count). Split-spoon samples were recovered at 2.5-feet intervals, beginning at a depth of 1-foot below the existing surface grade, extending to a depth of 10-feet, then at 5-foot intervals thereafter to the termination of the boring. Water levels were monitored at each borehole location during drilling and upon completion of the boring. The boreholes were backfilled with auger cuttings prior to demobilization for safety considerations.

In addition to the soil borings performed with the drill rig, our representatives investigated the interior subgrade conditions beneath the building slabs in two (2) locations. These locations are identified as Borings B-3 and B-4 in this report. Boring B-3 was performed in the basement level in the southern section of the building. Boring B-4 was located in the center area of the auditorium portion of the building, toward the on-grade, west end. The in-place slab-on-grade sections were penetrated with a hammer drill to facilitate hand auger probing and the use of a dynamic cone penetrometer (DCP) device to evaluate the relative density of the soils immediately beneath the slabs. Probing and evaluation in these locations was limited to a depth of about 2-feet since the probe holes collapsed upon removal of the auger and DCP. The profile information and DCP blow counts are recorded on the appropriate Boring Logs in Appendix A of this report.

3.2 Laboratory Evaluation

Upon completion of the boring program, all of the samples retrieved during drilling were returned to *Patriot*'s soil testing laboratory where they were visually examined and classified. A laboratory-generated log of each boring was prepared based upon the driller's field log, laboratory test results, and our visual examination. Test boring logs and a description of the classification system are included in Appendix A in this report. Indicated on each log are: the primary strata encountered, the depth of each stratum change, the depth of each sample, the Standard Penetration Test results, groundwater

conditions, and selected laboratory test data. The laboratory logs were prepared for each boring giving the appropriate sample data and the textural description and classification.

4.0 SITE AND SUBSURFACE CONDITIONS

4.1 Site Conditions

Dreiser Hall is located at 221 N. 6th Street in the southwestern portion of the Indiana State University Campus. The margins surrounding the building are landscape and lawn with concrete sidewalks and entrances to the building. The landscaped margins on the west side are the narrowest. The building is bordered by 6th Street and the campus Quad on the west and east sides, respectively, and Dede Plaza to the north and the Gillum Hall to the South.

The entrances to Dreiser Hall's west side are at the 6th Street level. The elevations raise to the east with stairs stepping up about 5-feet to the Quad level midway along the building's south side. The contours are accommodated with gradual slopes along Dreiser Hall's north side. The entrance to the building's east side is at the 1st floor level.

The natural geology at the site is comprised predominantly of alluvial (water placed) soils deposited as the result of glacial meltwater during the Wisconsin Glacial event. The Wabash River Basin feature is the direct result of this event. These deposits tend to extend to depths in excess of 100-feet below the surface and can be generally described as fine to coarser with increased depth. The alluvium is supported upon underlying Pennsylvanian-aged sedimentary rock, typically consisting of sandstone and shale with interbedded limestone and coal seams. In the main channel area, these sedimentary rock layers have been significantly eroded and weathered by the mechanical actions of the water over time.

The project area resides on a very mature site. That is, the influence of past developments associated with the downtown area is typically evident. Often times these parcels have been developed and redeveloped several times since the establishment of the city in 1811. The upper 10 to 15-feet of the soil section is frequently disturbed from these activities. Backfill relating to past basements, underground utility networks, coal storage and cisterns are often encountered as are remnant foundations that were allowed to remain in-place during demolition of prior structures. It is often difficult or impossible to fully distinguish materials as "fill" material, as the borrow used is often similar to the native

soils. Traces of foreign matter such as bricks, cinders or concrete provide indications of certain fill, while out of sort particle-size such as coarse gravels near the surface can indicate “possible fill” materials.

4.2 Subsurface Conditions

4.2.1 Exterior Soil Borings (B-1, B-2, B-5 & B-6)

Our interpretation of the subsurface conditions is based upon widely spaced soil borings drilled at the approximate locations shown on the Boring Location Map in Appendix A. The following discussion is general; for more specific information, please refer to the boring logs presented in Appendix A. It should be noted that the dashed stratification lines shown on the soil boring logs indicate approximate transitions between soil types. In situ stratification changes could occur gradually or at different depths. All depths discussed below refer to depths below the existing ground surface.

The area immediately surrounding the building is covered with landscaping including mulch along the building’s western wall and maintained lawn area on the other sides. Decorative trees and shrubs are also present. At our soil borings performed in these landscaped areas, the organic matter (mulch and topsoil) layer at the surface measured about 10 to 12-inches thick.

The surficial layer is generally underlain by a profile that appears to be FILL/BACKFILL associated with the construction of the building, which typically extends to depths of 8 to 13- feet below the existing ground surface. This profile is comprised of very loose to loose SILTY SAND and SAND with trace silt. The exact demarcation of fill versus native soils is difficult to establish since the FILL materials are generally similar to native soils in the vicinity. Our identification and differentiation are based on textural differences and experience with natural geology of the downtown Terre Haute area, along with context of the surrounding building geometry. Standard Penetration Test N-values (blow counts) in this FILL profile varied from 2 to 8 blows per foot with an average of about 5-bpf.

Below the generally silty sands in the aforementioned profile, the project soil borings encountered loose to very dense SAND with minor gravel content to SAND and GRAVEL layers. Standard Penetration Test N-values (blow counts) in these granular soils varied from 6-blows per foot to 50-blows per 1-inch advancement with an average of about 46-bpf. The soil borings terminated in dense to very dense SAND and GRAVEL at 30-feet

below the surface.

4.2.2 Interior Soil Probing (B-3, & B-4)

Our investigation of the conditions inside the building indicate that the in-place, reinforced concrete slabs measure about 5 to 6-inches in thickness. The basement slab is an exposed, troweled finish floor. The auditorium slab is covered with VCT flooring tiles.

The basement level slab at our location B-3 is supported by medium dense SAND with trace gravel which appears to be native soil. The soil supporting the auditorium slab at our Boring B-4 is comprised of medium dense SILTY SAND which is identified as FILL based on textural indications and assumed building construction methodology. Blow counts derived from a Dynamic Cone Penetrometer (DCP) ranged from 13 blows per 1.75-inch increment in Boring B-3 to 19-blows per increment in Boring B-4. The soils and engineering properties described above were noted to depths of 2-feet beneath the slabs at each location.

4.3 Groundwater Conditions

During the drilling process, sampling tools were routinely observed for the existence of free-water which would indicate groundwater presence. Additionally, the open boreholes were also observed for water above the collapse depth after the removal of the augers upon the completion of each hole. Based on these methods, groundwater was not encountered in any of the test borings drilled at the site.

The term groundwater pertains to any water that percolates through the soil found on site. This includes any overland flow that permeates through a given depth of soil, perched water, and water that occurs below the “water table”, a zone that remains saturated and water-bearing year round.

It should be recognized that fluctuations in the groundwater level should be expected over time due to variations in rainfall and other environmental or physical factors. At this site, the Wabash River Stage will directly affect the groundwater conditions, particularly when excessive local precipitation coincides with appreciable upstream flow. However, we would not expect that groundwater conditions would exist within the building profile since shallowest groundwater in the downtown area even during high river stage is typically in excess of 20-feet below the surface. The true static groundwater level can only be determined through observations made in cased holes over a long period of time, the installation of which was beyond the scope of this investigation.

5.0 DESIGN RECOMMENDATIONS

5.1 Basis

Our recommendations are based on data presented in this report, which include soil borings, laboratory testing and our experience with similar projects. Subsurface variations that may not be indicated by a dispersive exploratory boring program can exist on any site. If such variations or unexpected conditions are encountered during construction, or if the project information is incorrect or changed, we should be informed immediately since the validity of our recommendations may be affected.

5.2 Foundations

The nature of the planned new foundations on the inside and outside of the existing building will involve bearing conditions comprised of varying native soil and interior and exterior fill materials at varying depths. Additionally, the interior materials beneath the slabs could only be investigated to a nominal depth of about 2-feet. For these reasons, it is prudent to recommend slightly conservative bearing pressures while also requiring specific inspections of the foundation excavations and in-place compaction efforts. These recommendations are discussed in Section 6 of this report.

Based on the findings of our soil borings, the new foundations relating to the new lobby renovation columns and walls can be supported on the in situ soils at or about elevation 91-ft. The column and wall footings should be proportioned using a net allowable soil bearing pressure not exceeding 2,500 pounds per square foot (psf). For proper performance at the recommended bearing pressure, foundations must be constructed in compliance with the recommendations for footing excavation inspection that are discussed in the Construction Considerations Section 6.0 of this report.

The base mat for the proposed elevator shaft will bear at greater depth than the foundations for the lobby addition. As such, the bearing conditions would be greatly improved, resting upon generally dense to very dense granular soils. Given the engineering properties at and below the proposed bearing depth of 81-ft +/-, we recommend that the elevator shaft mat should be proportioned using a maximum net bearing pressure of 10,000-psf.

In using the above net allowable soil bearing pressures, the weight of the foundation and backfill over the foundation need not be considered. Hence, only loads applied at or above the minimum finished grade adjacent to the footing need to be used for dimensioning the foundations. Each new foundation should be positioned so it does not induce significant pressure on adjacent foundations; otherwise the stress overlap must be considered in the design.

All exterior foundations and foundations in unheated areas should be located at a depth of at least 24-inches below final exterior grade for frost protection. However, interior foundations or those protected from frost influence can bear at depths of approximately 12-inches below the finished floor. We recommend that strip footings be at least 18-inches wide and column footings be at least 24-inches wide for bearing capacity considerations. These minimum dimensions should dictate foundation sizes regardless of dimensioning yielded using the allowable bearing pressures per applied load.

Using the recommended bearing pressures listed above, we estimate that the total foundation settlement should not exceed approximately 1-inch and that differential settlement should not exceed about ¾-inch. Careful field control during construction is necessary to minimize the actual settlement that will occur.

Positive drainage of surface water, including downspout discharge, should be maintained away from structure foundations to avoid wetting and weakening of the foundation soils both during construction and after construction is complete.

5.3 Slabs-on-Grade

Based on the findings of our investigation, the shallow soils below the organic surficial materials outside the building and in place slabs in the building appear suitable for new floor slab support, or support of additional grade-raise fill to support new slabs. It will be important that the subgrade soils are properly prepared to maintain the suitability. We recommend that all floor slabs be designed as "floating", that is, fully ground supported and not structurally connected to walls or foundations. This is to minimize the possibility of cracking and displacement of the floor slab because of differential movements between the slab and the foundation. Although the movements are estimated to be within the tolerable limits for the structural safety, such movements could be detrimental to the slabs if they were rigidly connected to the foundations.

A modulus of subgrade reaction, “K_{30}” value of 250-pounds per cubic inch (pci), is

recommended for the design of ground supported floor slabs. It should be noted that the "K_{30}" modulus is based on a 30-inch diameter plate load. Adjustments to design may be necessary to accommodate larger are loads.

The building floor slabs should be supported on a minimum 6-inch thick, granular base course, bearing on a suitably prepared subgrade (refer to Section 6.0 Construction Considerations). The granular base course is expected to help distribute loads and equalize moisture conditions beneath the slab. All slabs should be liberally jointed and designed with the appropriate reinforcement for the anticipated loading conditions.

5.4 Lateral Earth Pressures

The magnitude of the lateral earth pressure is dependent on the method of backfill placement, the type of backfill soil, drainage provisions and whether or not the wall is permitted to yield during and/or after placement of the backfill. When a wall is held rigidly against horizontal movement, the lateral pressure against the wall is greater than the "active" earth pressure that is typically used in the design of free-standing retaining walls. Therefore, rigid walls should be designed for higher "at-rest" pressures (using an at-rest lateral earth pressure coefficient, K_o), while yielding walls can be designed for active pressures (using an active lateral earth pressure coefficient, K_a).

The foundation walls proposed for the project site are expected to be rigid walls. Therefore, provided **a clean open-graded granular material is used for backfill**, a total soil unit weight (γ_t) of 125-pcf and an at-rest lateral earth pressure coefficient (K_o) of 0.45 can be used for calculating the lateral earth pressures. This would correspond to an equivalent fluid pressure of 57-pounds per square foot (psf) per foot of wall height. This equivalent fluid pressure would increase linearly from zero (0) psf at the ground surface, to its maximum at the base of the wall. If the onsite soils are to be used for backfill against walls, the values should be adjusted to 135-pcf for total soil unit weight (γ_t), and 0.50 for the at-rest lateral earth pressure coefficient (K_o).

The shear resistance against base sliding can be computed by multiplying the minimum normal force on the base of the footing times a coefficient of friction of 0.37. Lateral earth pressures can be computed as discussed above. A minimum factor of safety of 1.5 is recommended for sliding stability.

Table 5.4: Summary of Lateral Earth Design Pressures:

Backfill Material	Soil Unit Weight (γ_t) (pcf)	At-Rest Coefficient (K_o)	Active Coefficient (K_a)	Passive Coefficient (K_p)	Coefficient of Friction
Clean, granular fill	125	0.45	0.30	3.2	0.45
On-site soils	130	0.50	0.33	3.0	0.40

It has been assumed that the static weight per axle of equipment utilized for the compaction of the backfill materials adjacent to the below-grade wall will not exceed 2 tons per axle for non-vibratory equipment and 1 ton per axle for vibratory equipment. All heavy equipment, including compaction equipment heavier than recommended above, should not be allowed closer to the wall (horizontal distance) than the vertical distance from the backfill surface to the bottom of the wall.

5.5 Seismic Considerations

For structural design purposes, we recommend using a ***Site Classification of "C"*** as defined by the 2014 Indiana Building Code (modified 2012 International Building Code (IBC)). Furthermore, along with using a Site Classification of "C", we recommend the use of the maximum considered spectral response acceleration and design spectral response acceleration coefficients provided in Table No. 5.5 below.

Table 5.5: Seismic Design
Spectral Response Acceleration Coefficients

PERIOD (SECOND)	MAXIMUM CONSIDERED SPECTRAL RESPONSE ACCELERATION COEFFICIENT	SOIL FACTOR	DESIGN SPECTRAL RESPONSE ACCELERATION COEFFICIENT
0.2	S_S = 0.262 g	1.2	S_{DS} = 0.209 g
1.0	S_1 = 0.115 g	1.685	S_{D1} = 0.129 g

The values listed in Table 5.5 were obtained from on-line seismic hazard calculation software utilizing latitude 39.4693 North and longitude 87.4099 West as the

designation for identifying the location of the parcel, applying IBC 2015 references. Other earthquake resistant design parameters should be applied consistent with the minimum requirements of the governing Indiana Building Code.

It has been our experience that the values yielded from empirical charts can be conservative for seismic design. If the building designers and owner wish to obtain more site specific seismic data and believe that design value would be achieved, *Patriot* can conduct geophysical testing upon request. Test methods such as ReMi testing or downhole or cross-hole seismic testing would provide direct shear wave velocity values for design purposes. Geophysical testing was beyond the scope of this investigation.

6.0 CONSTRUCTION CONSIDERATIONS

6.1 Site Preparation

All areas that will support foundations, floors or newly placed structural fill must be properly prepared. All loose surficial soil, mulch or "topsoil" and other unsuitable materials must be removed. Unsuitable materials include: frozen soil, relatively soft material, relatively wet soils, deleterious material, or soils that exhibit a high organic content.

Ten (10) to (12) inches of loose surficial topsoil and mulch were encountered in the borings performed outside of the building footprint. The organic cover was measured at discrete locations as shown on the Boring Plan (Appendix A). The material thickness measured at the boring locations may or may not be representative of the overall average thickness at the site. Therefore, it is possible that the actual stripping depth will significantly vary from this data. The data presented should be viewed only as a guide to the approximate stripping depth that will be required to remove organic material at the surface. Additional field exploration by *Patriot* would be required to provide an accurate estimate of the stripping depth. This limited data indicates that a minimum stripping depth will be required to remove the organic material at the surface, followed by the potential for additional stripping and/or scarification and recompaction as may be required to achieve suitable subgrade support. It is also important that the site is not overly stripped based merely on visual observations, particularly by dark coloration. The extent of stripping should be determined by Patriot during the site preparation activities through sampling and testing to determine organic content or other deleterious matter.

Prior to construction of floor slabs, pavements or the placement of new structural fill, the exposed subgrade must be evaluated by a *Patriot* representative which will include proofrolling of the subgrade. Proofrolling should consist of repeated passes of a loaded, pneumatic-tired vehicle such as a tandem-axle dump-truck or scraper. The proofrolling operations should be observed by a *Patriot* representative, and the proofrolling vehicle should be loaded as directed by *Patriot*. Any area found to rut, pump, or deflect excessively should be compacted in-place or, if necessary, undercut and replaced with structural fill, compacted as specified below.

Care must be exercised during grading and fill placement operations. The combination of heavy construction equipment traffic and excess surface moisture can cause pumping and deterioration of the near surface soils. The severity of this potential problem depends to a great extent on the weather conditions prevailing during construction. The contractor must exercise discretion when selecting equipment sizes and also make a concerted effort to control construction traffic and surface water while the subgrade soils are exposed. We recommend that heavy construction equipment (i.e., dump trucks, scrapers, etc.) be rerouted away from the building and pavement areas. If such problems do arise, the operations in the affected area should be halted and the *Patriot* representative contacted to evaluate the condition.

6.2 Foundation Excavations

A *Patriot* representative should be present during the excavation of all foundations for the project. This will allow our representative to observe the excavated soils and view the bearing conditions on an ongoing basis and make corrections as-needed during digging. This will ultimately provide more efficient and timely effort in the event that undercutting and over-excavation are necessary to remove unsuitable soils. Inspections will include hand auger probing, visual inspection, comparison to the findings of the project soil borings and possible testing with dynamic cone penetrometer or other engineering equipment. Any localized soft soil zones encountered at the bearing elevations should be further excavated until adequate support soils are encountered. The cavity should be backfilled with structural fill as defined below, or the footing can be poured at the excavated depth. Structural fill used as backfill beneath footings should be limited to lean concrete, well graded sand and gravel, or crushed stone placed and compacted in accordance with Section 6.3.

If it is necessary to support spread footings on structural fill, the fill pad must extend laterally a minimum distance beyond the edge of the footing. The minimum structural

pad width would correspond with a point at which an imaginary line extending downward from the outside edge of the footing at a 1H:2V slope intersects the surface of the natural soils. For example, if the depth to the bottom of excavation is 4 feet below the bottom of the foundation, the excavation would need to extend laterally beyond the edge of the footing at least 2 feet, as shown in Illustration A found at the conclusion of this report.

In order to reduce total and differential settlement, the bottoms of all footings must be compacted in-place using a vibratory steel plate or vibratory roller. Compaction should continue until 100% of a Standard Proctor maximum dry density has been attained. In the event that the materials are highly variable making accurate proctor values difficult to maintain, compaction should continue until the effort indicates no further gain in density using the effort. The soils must be sufficiently moist but not wet during the compaction effort. Wetting and drying may be necessary. Compaction efforts and procedures should be observed by a *Patriot* representative to verify equal coverage and adequate effort.

We recommend that all footings should be poured the same day as they are excavated to protect the bearing surface from desiccation or wetting, weathering or other disturbance that could compromise the soils supporting the new foundation. If it is not possible to complete the forming, reinforcement installation and placement of concrete in the same day as digging, the foundation excavation must be protected from all disturbances or other forms of deterioration. Construction traffic on the exposed surface of the bearing soil will potentially cause some disturbance of the subgrade and consequently loss of bearing capacity. However, the degree of disturbance can be minimized by proper protection of the exposed surface and/or limiting construction activities on the bearing surface.

Excavation slopes should be maintained within OSHA requirements. Based on the findings of the soil borings, we believe that the soil conditions at this site should be classified as Type C in accordance with OSHA 29 CFR parts 1926.650 through 1926.652. It should be recognized, however, that this information is provided as preliminary as determined by discrete borings of in situ materials. The contractor's "competent person", as defined by law, must classify the actual soils and conditions in the field relating to excavation protection, health and safety. We recommend that any surcharge fill or heavy equipment be kept at least 5-feet away from the edge of any excavation.

Also, excavations that occur near existing in-use foundations should be carefully performed making a conscious effort not to undermine the support of the in-use

foundations. If it is necessary to excavate soil adjacent to and below the bearing elevation of any in-use foundations**,** *Patriot* should be contacted to make further recommendations regarding these excavations. Please refer to Illustration B at the end of this report for further details. The contractor should use shoring, underpinning or other stabilizing methods to protect existing foundations as necessary.

6.3 Structural Fill and Fill Placement Control

Structural fill, defined as any fill which will support structural loads, should be clean and free of organic material, debris, deleterious materials and frozen soils. Samples of the proposed fill materials should be tested prior to initiating the earthwork and backfilling operations to determine the classification, the natural and optimum moisture contents and maximum dry density and overall suitability as a structural fill.

In general, the on-site soils appear suitable for use as structural fill for the project. Since the upper profile is comprised of apparent FILL materials, it should be anticipated that some of the excavated materials could be unsuitable for re-use due to debris content. Also, the very loose to loose conditions noted in some of the exterior FILL materials could also lead to a shortage of material to complete the project due to increased compaction efforts associated with the new construction. Therefore, some importing of material may be necessary to replace lost volume from mechanical compaction.

It should be noted that soils encountered during construction activities may be subject to special considerations or handling due to potential environmental impacts. Soils containing debris, foreign matter or other contaminants designated as special or hazardous as designated by state, local or federal regulatory agencies may require individualized handling and/or disposal. Designation and testing of materials for special treatment or direction for handling are outside the scope of this investigation.

All structural fill beneath floor slabs, adjacent to foundations and over foundations, should be compacted to at least 95-percent of its maximum Standard Proctor dry density (ASTM D-698). This minimum compaction requirement should be increased to 100-percent of the maximum Standard Proctor dry density for fill supporting footings, provided these are designed as outlined in Recommendations, Section 5.0.

To achieve the recommended compaction of the structural fill, we suggest that the fill be

placed and compacted in layers not exceeding eight (8) inches in loose thickness. All fill placement should be monitored by a *Patriot* representative.

Fill placement control and field density (compaction) testing should be conducted by a *Patriot* representative during construction. Fill placement inspection should involve full-time observation of newly placed materials during fill and/or backfill operations to control lift thickness, material quality and compaction effort. Field density testing should be performed in accordance with ASTM D6938, nuclear gauge method, or ASTM 1556, sand-cone method. The frequency of testing should produce a minimum of one (1) density test result per 2,500-square feet, per material-lift, and as necessary to adequately represent the area and compaction effort.

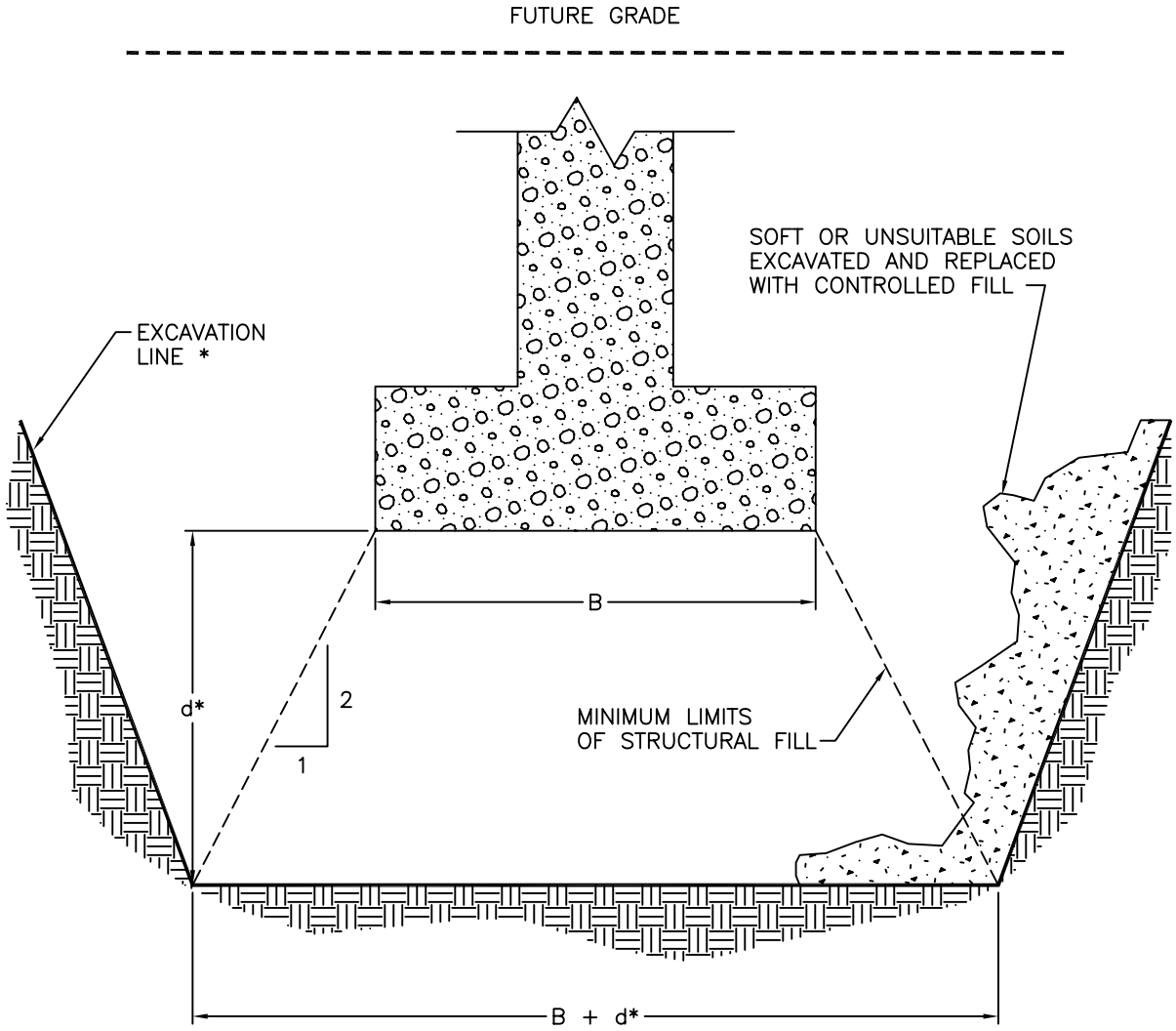
Compaction can be attained through various means of compaction equipment and techniques. In general, sheepsfoot rollers perform more efficiently in cohesive soils, while vibratory smooth drums and plates perform better with granular soils. “Flooding” or “jetting” with water as a means of compaction is unacceptable.

6.4 Groundwater

Each of the borings was dry at the cave in depths shown on the boring logs. Based on this data as well as our experience with many nearby projects, we do not anticipate that groundwater will be a significant obstacle on this project. However, localized and sporadic groundwater infiltration may occur into the building foundation excavations on this site, depending on seasonal conditions, local precipitation, etc. Groundwater inflow into shallow excavations above the groundwater table is expected to be adequately controlled by conventional methods such as gravity drainage and/or pumping from sumps.

7.0 ILLUSTRATIONS

See Illustrations A and B on the following pages. These illustrations are presented to further visually clarify several of the construction considerations presented in Section 6.2.



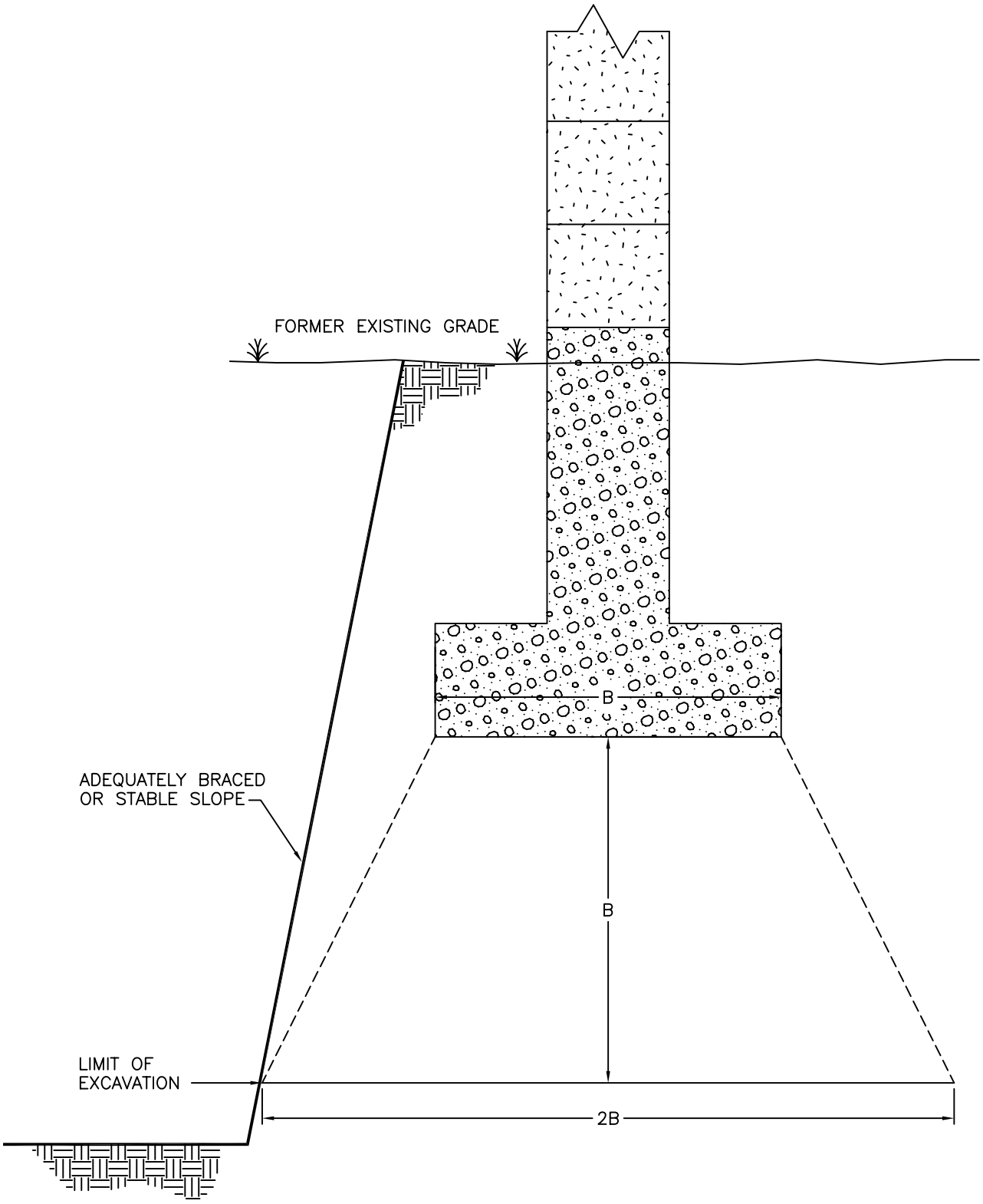
*d IS DEPTH TO SUITABLE SOILS

* IN COMPLIANCE WITH OSHA STANDARDS

PATRIOT ENGINEERING
and ENVIRONMENTAL, INC.
1359 N. Aberdeen Ave. Terre Haute, IN 47804
(812)466.5559 FAX (812)466.5509

Excavation for Footings In an Area of Fill ILLUSTRATION A

PROJECT NO.	FIGURE
PAT–UC	1



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1359 N. Aberdeen Ave. Terre Haute, IN 47804
(812)466.5559 FAX (812)466.5509

Excavation Near Existing
In Use Foundations
ILLUSTRATION B

PROJECT NO.	FIGURE
PAT–UC1	1

APPENDIX A

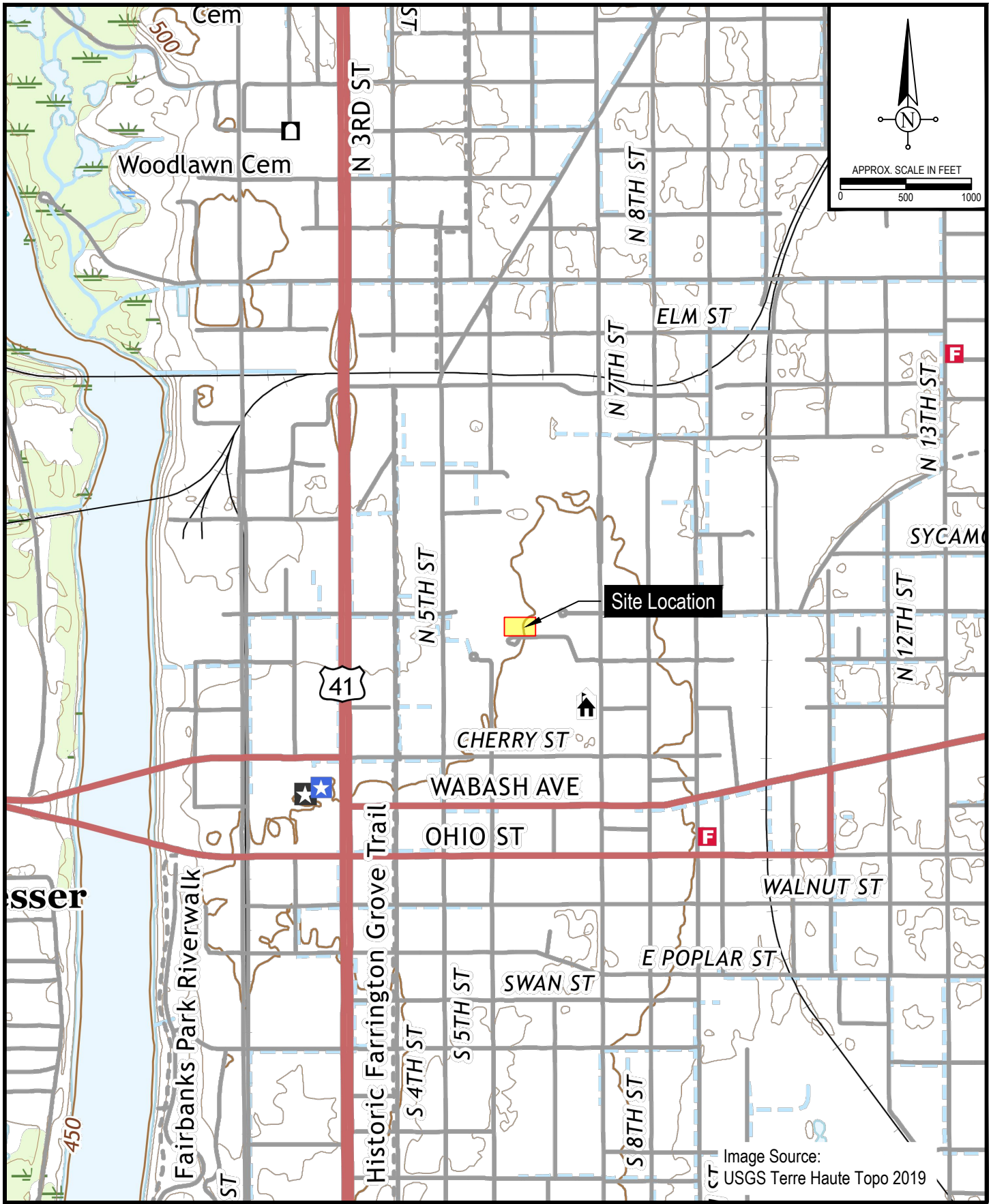
Site Vicinity Map

Boring Log Key

Unified Soil Classification

Boring Location Map

Boring Logs



Patriot Engineering & Environmental, Inc.

Project: Dreiser Hall Renovations 221 North 6th Street Terre Haute, Indiana	
	Drawn By: J. DuMond
Project Number: 20-0345-02	Approved: T. Govert
Date: April 15, 2020	DWG: 20-0345-02_geo

Figure 1

Site Vicinity Map

PATRIOT ENGINEERING and Environmental, Inc.
Engineering Value for Project Success

BORING LOG KEY

UNIFIED SOIL CLASSIFICATION SYSTEM
FIELD CLASSIFICATION SYSTEM
FOR SOIL EXPLORATION

NON COHESIVE SOILS
(Silt, Sand, Gravel and Combinations)

Density

Very Loose	-4 blows/ft. or less
Loose	-5 to 10 blows/ft.
Medium Dense	-11 to 30 blows/ft.
Dense	-31 to 50 blows/ft.
Very Dense	-51 blows/ft. or more

Grain Size Terminology

Soil Fraction	Particle Size	US Standard Sieve Size
Boulders	Larger than 12”	Larger than 12”
Cobbles	3” to12”	3” to 12”
Gravel: Coarse	¾” to 3”	¾” to 3”
Small	4.76mm to ¾”	#4 to ¾”
Sand: Coarse	2.00mm to 4.76mm	#10 to #4
Medium	0.42mm to 2.00mm	#40 to #10
Fine	0.074mm to 0.42mm	#200 to #40
Silt	0.005mm to 0.074 mm	Smaller than #200
Clay	Smaller than 0.005mm	Smaller than #200

RELATIVE PROPORTIONS FOR SOILS

Descriptive Term	Percent
Trace	1 - 10
Little	11 - 20
Some	21 - 35
And	36 - 50

COHESIVE SOILS
(Clay, Silt and Combinations)

Consistency	Unconfined Compressive Strength (tons/sq. ft.)	Field Identification (Approx.) SPT Blows/ft.
Very Soft	Less than 0.25	0 - 2
Soft	0.25 – < 0.5	3 - 4
Medium Stiff	0.5 - < 1.0	5 - 8
Stiff	1.0 - < 2.0	9 -15
Very Stiff	2.0 - < 4.0	16 - 30
Hard	Over 4.0	> 30

Classification on logs are made by visual inspection.

Standard Penetration Test - Driving a 2.0” O.D., $1^{3/8}$” I.D., sampler a distance of 1.0 foot into undisturbed soil with a 140 pound hammer free falling a distance of 30.0 inches. It is customary for **Patriot** to drive the spoon 6.0 inches to seat into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and making the tests are recorded for each 6.0 inches of penetration on the drill log (Example - 6/8/9). The standard penetration test results can be obtained by adding the last two figures (i.e. 8 + 9 = 17 blows/ft.).

Strata Changes - In the column “Soil Descriptions” on the drill log the horizontal lines represent strata changes. A solid line (————) represents an actually observed change, a dashed line (- - - - - -) represents an estimated change.

Groundwater observations were made at the times indicated. Porosity of soil strata, weather conditions, site topography, etc., may cause changes in the water levels indicated on the logs.

Groundwater symbols: ▼-observed groundwater elevation, encountered during drilling; ∇-observed groundwater elevation upon completion of boring.

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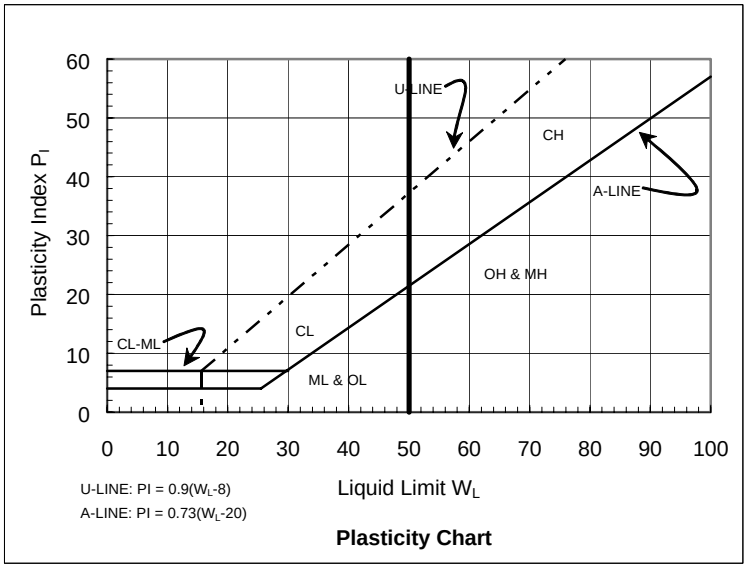
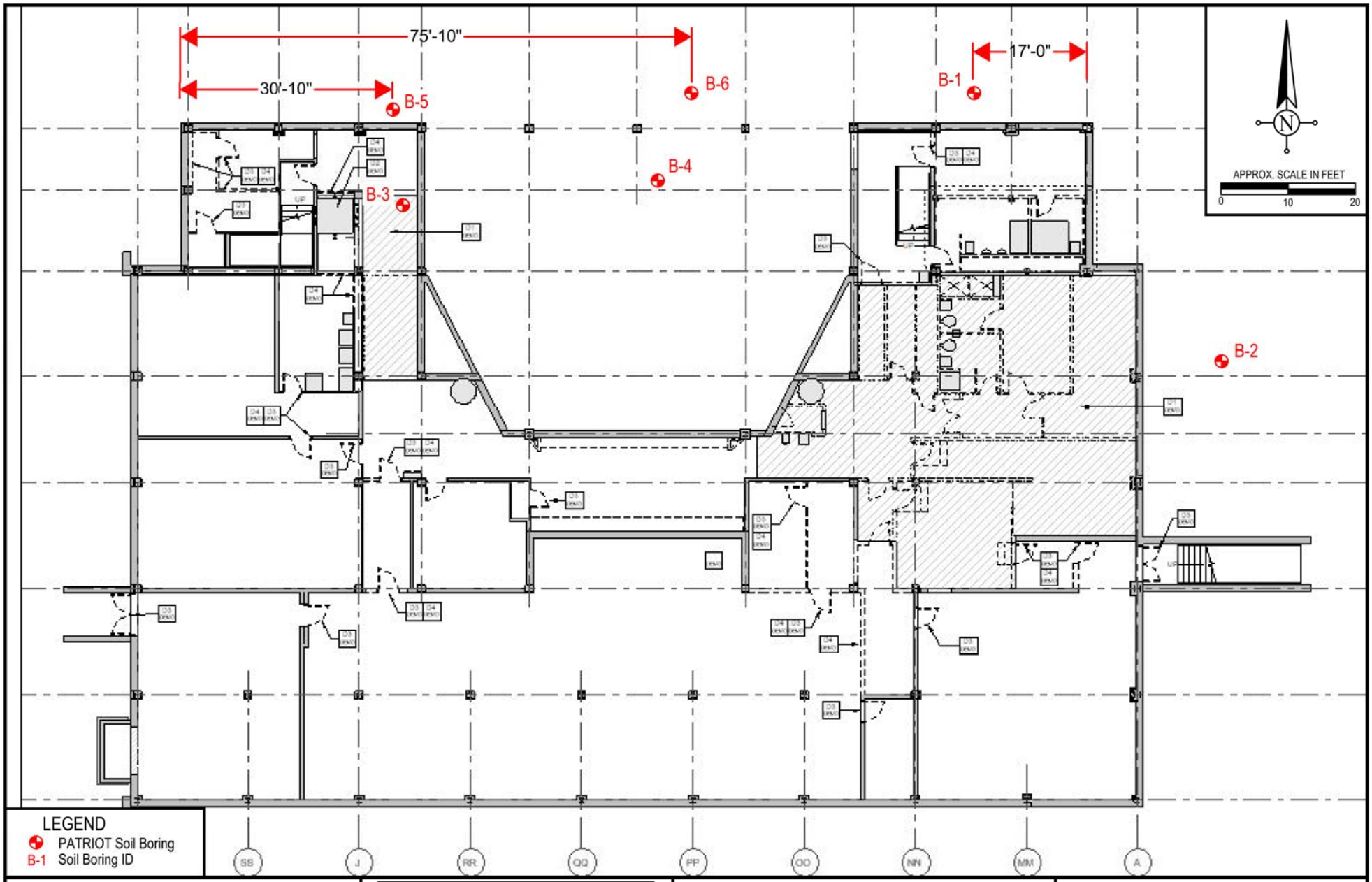
and Environmental, Inc.

Unified Soil Classification

Major Divisions			Group Symbol		Typical Names	Classification Criteria for Coarse-Grained Soils		
Coarse-grained soils (more than half of material is larger than No. 200)	Gravels (more than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (little or no fines)	GW		Well-graded gravels, gravel-sand mixtures, little or no fines	$C_U \geq 4$ $1 \leq C_C \leq 3$	$C_U = \frac{D_{60}}{D_{10}}$	$C_C = \frac{D^2_{30}}{D_{10} D_{60}}$
			GP		Poorly graded gravels, gravel-sand mixtures, little or no fines	Not meeting all gradation requirements for GW ($C_U < 4$ or $1 > C_C > 3$)		
		Gravels with fines (appreciable amount of fines)	GM	$\frac{d}{u}$	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below A line or $P_I < 4$	Above A line with $4 < P_I < 7$ are borderline cases requiring use of dual symbols	
			GC		Clayey gravels, gravel-sand-clay mixtures	Atterberg limits above A line or $P_I > 7$		
	Sands (more than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (little or no fines)	SW		Well-graded sands, gravelly sands, little or no fines	$C_U \geq 6$ $1 \leq C_C \leq 3$	$C_U = \frac{D_{60}}{D_{10}}$	$C_C = \frac{(D_{30})^2}{D_{10} D_{60}}$
			SP		Poorly graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW ($C_U < 6$ or $1 > C_c > 3$)		
		Sands with fines (appreciable amount of fines)	SM	$\frac{d}{u}$	Silty sands, sand-silt mixtures	Atterberg limits below A line or $P_I < 4$	Limits plotting in hatched zone with $4 \leq P_I \leq 7$ are borderline cases requiring use of dual symbols	
			SC		Clayey sands, sand-clay mixtures	Atterberg limits above A line with $P_I > 7$		
Fine-grained soils (more than half of material is smaller than No. 200)	Silt and clays (liquid limit <50)		ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity	1. Determine percentages of sand and gravel from grain size curve. 2. Depending on percentages of fines (fraction smaller than 200 sieve size), coarse-grained soils are classified as follows: Less than 5% - GW, GP, SW, SP More than 12% - GM, GC, SM, SC 5-12% - Borderline cases requiring dual symbols		
			CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
			OL		Organic silts and organic silty clays of low plasticity			
	Silts and clays (liquid limit >50)		MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts			
			CH		Inorganic clays or high plasticity, fat clays			
			OH		Organic clays of medium to high plasticity, organic silts			
	Highly organic soils		PT		Peat and other highly organic soils			



Plasticity Chart



LEGEND

PATRIOT Soil Boring

B-1 Soil Boring ID

Patriot Engineering & Environmental, Inc.

NOTES:

1. Boring locations were staked by PATRIOT. All locations are shown as approximate.
2. All locations were determined in the field with references to existing landmarks.
3. Image Source: Client's Site Plan
4. Scale as shown.

Project: Dreiser Hall Renovations
221 North 6th Street
Terre Haute, Indiana

	Drawn By: J. DuMond
Project Number:20-0345-02	Approved: T. Govert
Date: April 15, 2020	DWG: 20-0345-02_geo

Figure 2

Soil Boring Location Map

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LOG OF BORING B-1

Dreiser Hall Renovation
Indiana State University
221 N. 6th Street
Terre Haute, Indiana

Client Name	: Browning Day	Driller	: M. Walker
Project Number	: 20-0345-02G	Sampling	: Splitspoon
Logged By	: T. Govert	Weather	: Partly Sunny, 60°F
Start Date	: 4/3/20		
Drilling Method	: HSA		

Water Levels
▼ During Drilling: Dry
▽ After Completion: Dry

Depth in Feet	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0				MULCH/TOPSOIL (11")						
		SM		Brown, moist, loose SILTY SAND with trace clay & gravel (FILL)	1	89	2/2/3			
					2	100	2/2/3			
5				Brown, moist, loose fine to medium grained SILTY SAND (FILL)	3	100	2/2/3			
		SM			4	56	3/3/3			
10										
				Tan, dry, dense well graded SAND with some gravel	5	100	9/14/21			
15		SW								Borehole collapsed at 15-feet after auger removal.
					6	89	19/22/21			
20				Tan, dry, very dense SAND and GRAVEL						
					7	56	37/50-4"			
25		SP								
					8	83	32/38/50-4"			
30				Boring terminated at 30-ft.						

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Indianapolis, Terre Haute, Evansville, Fort Wayne, Lafayette, Bloomington
Louisville, KY Dayton, Cincinnati, OH Nashville, TN

LOG OF BORING B-2

Dreiser Hall Renovation
Indiana State University
221 N. 6th Street
Terre Haute, Indiana

Client Name	: Browning Day	Driller	: M. Walker
Project Number	: 20-0345-02G	Sampling	: Splitspoon
Logged By	: T. Govert	Weather	: Partly Sunny, 63°F
Start Date	: 4/3/20		
Drilling Method	: HSA		

Water Levels
▼ During Drilling: Dry
▽ After Completion: Dry

Depth in Feet	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0				GRASS/TOPSOIL (10")						
		SM		Brown, moist, loose SILTY SAND with trace clay & gravel (FILL)	1	100	4/4/4			
					2	100	3/3/3			
5					3	100	2/3/3			
		SM		Reddish Brown, moist, loose fine to medium grained SILTY SAND (FILL)	4	89	3/3/4			
10										
		SP		Brown, moist, loose SAND and GRAVEL	5	67	3/3/3			
15										
		SW		Brown, moist, medium dense well graded SAND with some gravel	6	72	8/9/10			Borehole collapsed at 18-feet after auger removal.
20										
		SP		Tan, slightly moist, very dense SAND and GRAVEL	7	39	28/50-1"			
25										
					8	67	28/41/48			
30				Boring terminated at 30-ft.						

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LOG OF BORING B-3

Dreiser Hall Renovation
Indiana State University
221 N. 6th Street
Terre Haute, Indiana

Client Name	: Browning Day	Driller	: T. Govert
Project Number	: 20-0345-02G	Sampling	: Hand Auger; DCP
Logged By	: T. Govert	Weather	: Partly Sunny, 60°F
Start Date	: 4/3/20		
Drilling Method	: Hand Auger Probing		

Water Levels
▼ During Drilling: Dry
▽ After Completion: Dry

Depth in Feet	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0				CONCRETE SLAB (5")						
		SP-SM		Light Brown, loose to medium dense SAND with trace gravel	1	25	3/6/7			
				Boring terminated at 2-ft.						
5										
10										
15										
20										
25										
30										

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LOG OF BORING B-4

Dreiser Hall Renovation
Indiana State University
221 N. 6th Street
Terre Haute, Indiana

Client Name	: Browning Day	Driller	: T. Govert
Project Number	: 20-0345-02G	Sampling	: Hand Auger; DCP
Logged By	: T. Govert	Weather	: Partly Sunny, 60°F
Start Date	: 4/3/20		
Drilling Method	: Hand Auger Probing		

Water Levels
▼ During Drilling: Dry
▽ After Completion: Dry

Depth in Feet	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0				CONCRETE SLAB (6")						
		SM		Brown, medium dense SILTY SAND (FILL)	1	25	9/9/10			
				Boring terminated at 2-ft.						
5										
10										
15										
20										
25										
30										

PATRIOT ENGINEERING and Environmental Inc.
Indianapolis, Terre Haute, Evansville, Fort Wayne, Lafayette, Bloomington
Louisville, KY Dayton, Cincinnati, OH Nashville, TN

LOG OF BORING B-5

Dreiser Hall Renovation
Indiana State University
221 N. 6th Street
Terre Haute, Indiana

Client Name	: Browning Day	Driller	: M. Walker
Project Number	: 20-0345-02G	Sampling	: Splitspoon
Logged By	: T. Govert	Weather	: Partly Sunny, 63°F
Start Date	: 4/3/20		
Drilling Method	: HSA		

Water Levels
▼ During Drilling: Dry
▽ After Completion: Dry

Depth in Feet	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0				MULCH/TOPSOIL (12")						
		SM		Reddish Brown, moist, very loose fine to medium grained SILTY SAND (FILL)	1	100	2/2/2			
5					2	100	1/1/1			
					3	100	2/2/2			
		SP-SM		Brown, moist, loose SAND with trace silt & gravel (FILL)	4	100	1/2/4			
10										
		SP-SM		Brown, moist, medium dense SAND and GRAVEL with trace silt	5	67	5/10/11			Borehole collapsed at 15-feet after auger removal.
15										
		SP		Brown, moist, dense to very dense SAND with some gravel	6	83	9/14/24			
20										
					7	67	20/27/32			
25										
		SP		Brown, moist, very dense SAND and GRAVEL	8	6	50-1"			
30				Boring terminated at 30-ft.						

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Indianapolis, Terre Haute, Evansville, Fort Wayne, Lafayette, Bloomington
Louisville, KY Dayton, Cincinnati, OH Nashville, TN

LOG OF BORING B-6

Dreiser Hall Renovation
Indiana State University
221 N. 6th Street
Terre Haute, Indiana

Client Name	: Browning Day	Driller	: M. Walker
Project Number	: 20-0345-02G	Sampling	: Splitspoon
Logged By	: T. Govert	Weather	: Partly Sunny, 56°F
Start Date	: 4/3/20		
Drilling Method	: HSA		

Water Levels
▼ During Drilling: Dry
▽ After Completion: Dry

Depth in Feet	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0				MULCH/TOPSOIL (12")						
		SM		Dark Brown, moist, very loose fine grained SILTY SAND (FILL)	1	100	2/1/1			
		SM		Reddish Brown, moist, very loose to loose fine to medium grained SILTY SAND (FILL)	2	100	2/1/1			
5					3	100	2/2/3			
		SP-SM		Brown, moist, medium dense SAND with some gravel, trace silt	4	100	3/6/9			
10										
		SP		Brown, slightly moist, medium dense SAND with a little gravel	5	100	8/12/16			Borehole collapsed at 17-feet after auger removal.
15										
		SP-SM		Brown, moist, dense SAND with trace gravel & silt	6	89	4/12/18			
20										
		SP		Brown, slightly moist, dense to very dense SAND and GRAVEL	7	89	16/22/28			
25										
					8	6	50-3"			
30				Boring terminated at 30-ft.						

APPENDIX B

General Qualifications

and

Standard Clause for Unanticipated Subsurface Conditions

GENERAL QUALIFICATIONS

of Patriot Engineering's Geotechnical Engineering Investigation

This report has been prepared at the request of our client for his use on this project. Our professional services have been performed, findings obtained, and recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This warranty is in lieu of all other warranties either expressed or implied.

The scope of our services did not include any environmental assessment or investigation for the presence or absence of wetlands, hazardous or toxic materials in the soil, groundwater, or surface water within or beyond the site studied. Any statements in this report or on the test borings logs regarding vegetation types, odors or staining of soils, or other unusual conditions observed are strictly for the information of our client and the owner.

This report may not contain sufficient information for purposes of other parties or other uses. This company is not responsible for the independent conclusions, opinions or recommendations made by others based on the field and laboratory data presented in this report. Should there be any significant differences in structural arrangement, loading or location of the structure, our analysis should be reviewed.

The recommendations provided herein were developed from the information obtained in the test borings, which depict subsurface conditions only at specific locations. The analysis, conclusions, and recommendations contained in our report are based on site conditions as they existed at the time of our exploration. Subsurface conditions at other locations may differ from those occurring at the specific drill sites. The nature and extent of variations between borings may not become evident until the time of construction. If, after performing on-site observations during construction and noting the characteristics of any variation, substantially different subsurface conditions from those encountered during our explorations are observed or appear to be present beneath excavations we must be advised promptly so that we can review these conditions and reconsider our recommendations where necessary.

If there is a substantial lapse of time between the submission of our report and the start of work at the site, or if conditions have changed due to natural causes or construction operations at or adjacent to the site, we urge that our report be reviewed to determine the applicability of the conclusions and recommendations considering the changed conditions and time lapse.

We urge that Patriot be retained to review those portions of the plans and specifications that pertain to earthwork and foundations to determine whether they are consistent with our recommendations. In addition, we are available to observe construction, particularly the compaction of structural backfill and preparation of the foundations, and such other field observations as may be necessary.

In order to fairly consider changed or unexpected conditions that might arise during construction, we recommend the following verbiage (Standard Clause for Unanticipated Subsurface Conditions) be included in the project contract.

STANDARD CLAUSE FOR UNANTICIPATED SUBSURFACE CONDITIONS

"The owner has had a subsurface exploration performed by a soils consultant, the results of which are contained in the consultant's report. The consultant's report presents his conclusions on the subsurface conditions based on his interpretation of the data obtained in the exploration. The contractor acknowledges that he has reviewed the consultant's report and any addenda thereto, and that his bid for earthwork operations is based on the subsurface conditions as described in that report. It is recognized that a subsurface exploration may not disclose all conditions as they actually exist and further, conditions may change, particularly groundwater conditions, between the time of a subsurface exploration and the time of earthwork operations. In recognition of these facts, this clause is entered in the contract to provide a means of equitable additional compensation for the contractor if adverse unanticipated conditions are encountered and to provide a means of rebate to the owner if the conditions are more favorable than anticipated.

At any time during construction operations that the contractor encounters conditions that are different than those anticipated by the soils consultant's report, he shall immediately (within 24 hours) bring this fact to the owner's attention. If the owner's representative on the construction site observes subsurface conditions which are different than those anticipated by the consultant's report, he shall immediately (within 24 hours) bring this fact to the contractor's attention. Once a fact of unanticipated conditions has been brought to the attention of either the owner or the contractor, and the consultant has concurred, immediate negotiations will be undertaken between the owner and the contractor to arrive at a change in contract price for additional work or reduction in work because of the unanticipated conditions. The contract agrees that the following unit prices would apply for additional or reduced work under the contract. For changed conditions for which unit prices are not provided, the additional work shall be paid for on a time and materials basis."

Another example of a changed conditions clause can be found in paper No. 4035 by Robert F. Borg, published in ASCE Construction Division Journal, No. CO2, September 1964, page 37.

VOLUME 1

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PART 1- INSTRUCTIONS TO BIDDERS

1.01 GENERAL

A. Bidders shall carefully read the Notice to Bidders with regard to preparation of proposals, which includes the date and place for receiving proposals. See PART 3 of this Section 001010 Instructions to Bidders for a complete list of the required forms for Bidding.

B. Bid Submission Instructions

1. Due to concerns and to conform to State and Federal guidelines regarding Coronavirus (COVID-19) Proposals shall be received between 1:30pm and 2:00pm local time **July 15, 2020** in the lobby at the Indiana State University, Facilities Management and Purchasing Building, 951 Sycamore Street, Terre Haute, Indiana 47809. Bidders shall drop off their Bids and immediately leave the area. Do not linger in the area waiting for a Bid Opening. There will not be a public in person meeting for the Bid Opening for this Project. If you wish to submit your Bid prior to 1:30pm call 812-237-3600 to schedule someone to meet you at the main entrance door to accept your Bidding Documents.

2. If a Bidder wishes to submit their Bid via overnight delivery the Bidder is instructed to overnight Bid (FEDEX and UPS) to the following address:

   ISU Purchasing Department
   C/O ISU Mail Room
   30 North 7th Street
   Terre Haute, IN 47807

   Overnight Bids are to **arrive before 3:00pm on July 14, 2020**.

3. The Bids will be opened at 2:30pm local time on **July 15, 2020**. Interested Bidders may "attend" the Bid opening via conference call on this date and time by calling 1-812-237-5920 and when prompted enter the Conference ID 6567905 followed by the #. The Bid Tabs will be posted to the plan room by noon of the day following the Bid Opening date under the Addenda Tab for the Project.

C. All Bidders shall fully inform themselves of the conditions under which the work is to be performed, the site of the work, the obstacles that may be encountered, and other relevant matters concerning the work to be performed.

D. **The Contractor shall begin Work within seven (7) days after Award. All Work shall be substantially completed by November 12, 2021. Final closeout shall be within thirty (30) calendar days thereafter. A warranty walk-thru will be held eleven (11) months from the date of substantial completion**.

E. No Bidder, after being awarded the contract, shall be allowed any extra compensation for reason of their failure to fully inform themselves, prior to their Bidding, of all requirements of the Contract Documents, the Drawings, and Specifications.

F. If any Bidder for the proposed contract is in doubt as to the true meaning of any part of the Drawings, Specifications or their proposed Contract Documents, they may submit to the Owner written request for any interpretation thereof. The Bidder submitting the request will be responsible for its prompt delivery. Any interpretation of the proposed documents will be made only by an Addendum duly issued. A copy of such Addendum will be posted to the ISU Plan Room and e-mail notification sent to each registered plan holder (see 1.07 of this Section). Such Addendum, if any, issued before submission of the Bids, shall be taken into account and included in the proposal.

G. Any Bidder may withdraw their Bid at any time prior to the scheduled time for the receipt of bids.

H. No Bidder may withdraw their Bid or proposal for a period of One Hundred Twenty (120) calendar days after date and time set for opening Bids.

I. It is understood that the Owner reserves the right to waive any irregularities in Bidding and to accept or reject any or all Bids.

J. It is further understood on Bids with multiple Bid Packages the Owner reserves the right to selectively Award individual Bid Packages to multiple Prime Bidders submitting the lowest and best Bids for the individual Bid Packages.

1.02 EXAMINATION OF SITE AND BIDDING DOCUMENTS

A. The site shall be carefully examined prior to bidding to ascertain the location of the work, existing conditions, and all other matters which may affect the work under this Contract. Each Bidder by making their Bid represents that they have visited the site and familiarized themselves with the local conditions under which the Work is to be performed.

B. **Dreiser Hall will be open and unlocked for Bidder visits on June 9, 10, 11 and June 24, 2020 from 9:00am until 3:00pm.** Parking shall be in ISU Parking Lot 5 at 6th and Cherry Street. These will be the only opportunities for Bidders to visit the site. Visitors shall observe established social distancing protocols and no more than two (2) persons on the elevator at any time. No Bidder, after being awarded the contract, shall be allowed any extra compensation for reason of their failure to visit the site prior to Bidding.

C. The Bidding Documents shall be carefully examined to ascertain the character, quality and quantity of the work to be performed, of materials and items to be furnished, of equipment and facilities needed during construction, of utilities and of all other matters which may affect the work under the Contract. Each Bidder by making their Bid represents that they have read and fully understands the Bidding Documents.

1.03 SPECIAL COVID-19 GUIDELINES

A. Any time a Contractor, a Subcontractor, all their employees, any Suppliers and any Delivery Persons are on the Campus of Indiana State University they shall comply with the Indiana State University rules and guidelines regarding Covid-19. These rules mirror the rules of the State of Indiana.

B. Any time a Contractor, a Subcontractor, all their employees, any Suppliers and any Delivery Persons are on the jobsite they shall comply with the rules established by the General Contractor.

1.04 PRE-BID CONFERENCE

A. A pre-bid conference will be held to answer Bidders' questions regarding the Bidding Documents.

B. An Addendum will be issued confirming any information conveyed at pre-bid conference and no verbal response tendered during pre-bid conference shall have legal standing unless so confirmed by Addendum.

1.05 BIDDING QUESTIONS

A. All questions, even if asked and answered at the pre-bid conference, shall be submitted in writing via e-mail to the Architect/Engineer/Owner.

B. The last day for questions to submitted shall be three (3) business days prior to the scheduled date for the receipt of Bids. Any questions submitted after that date may not receive consideration.

1.06 EXECUTION OF AGREEMENT

A. For all Projects the forms of agreement which the successful Bidder, as Contractor, will enter into will be an ISU Award Letter, an ISU Purchase Order and a Contract for Construction. Prior to issuance of the Purchase Order the Contractor shall provide to the Director of Purchasing the Labor and Material Performance Bond, their most current financial statement and vendor trade credit references as evidence of financial capability to perform the work and the policies of insurance or insurance certificates as required by the Contract Documents and listed in the Award Letter. All Bonds and Insurance shall have an A.M. Best rating of not less than an "A". Once all the required paperwork has been received by ISU Purchasing and the Purchase Order issued, five (5) copies the Contract for Construction Between Indiana State University and Contractor, will be mailed to the Contractor for their signature and return to the Senior Vice President for Finance and Administration for Owner signature. A fully executed copy of this Contract will be returned to the Contractor for their files.

B. Time Limits for Execution of Agreement.

1. The successful Bidder shall supply the required paperwork (their Financial Statement (if not supplied with their Bid), Certificate of Insurance and their Performance and Payment Bond) to the ISU Purchasing Department within ten (10) calendar days after receipt of the ISU Award Letter.

2. The successful Bidder shall within seven (7) calendar days after receipt of the Contract for Construction Between Indiana State University and Contractor enter into the written Contract to perform the work in accordance with the Drawings and Specifications by signing and returning the Contract to the Senior Vice President for Finance and Administration for Owner's signature and return to the Bidder.

C. In the case a Bidder whose Bid is accepted, fails to perform their Bid by providing the required paperwork within ten (10) calendar days after receipt of the Award Letter and entering into the written Contract with the Owner within seven (7) calendar days after receipt, then this failure may be cause for their certified check, draft or Bid Bond, and the proceeds thereof, to remain the absolute property of the Owner, as liquidated damages, it being impossible to estimate the amount of damages such failure would occasion.

1.07 INDEMNIFICATION

A. Bidders, in consideration of the privilege of Bidding, specifically waive all rights both legal and equitable which they have or might be construed to have against Indiana State University because of any action taken in accepting or rejecting bids and proposals, for themselves, and /or for subcontractors, suppliers and/or manufacturers, who may file an action based on any such acceptance or rejection. Bidders shall be liable for any resultant reasonable attorney fees and expenses incurred by Indiana State University.

1.08 ADDENDA

A. All Addenda for the Project will be posted on the ISU Plan Room at: http://www.indstateplanroom.com/.

B. A Bidder must register for a free account the first time they access the ISU Plan Room website.

C. The Bidder will receive an e-mail notifying that an Addendum is available for download from this site. The Bidder is advised to periodically check this link in the event an e-mail fails to deliver.

1.09 SUBSTITUTIONS PRIOR TO BID

A. Requests for substitution of any material, construction, equipment and methods named or described in the Specifications, on the Drawings and any Addenda issued shall be submitted in writing to the Architect/Engineer and Owner a minimum of seven (7)

calendar days prior to Bidding. Complete support documentation shall be provided that the item to be substituted is equal to or exceeds the material, construction, equipment or methods named or described in the Specifications, on the Drawings and any Addenda issued with the request for substitution. It is solely at the discretion of the Architect/Engineer and the Owner to allow any requests for substitution.

B. Should it be determined after Award of the Bid that the Bidder based their Bid on any material, construction, equipment and methods not named or described in the Specifications, on the Drawings and any Addenda issued as approved for substitution prior to Bidding shall be disallowed and the material, construction, equipment and methods named or described in the Specifications, on the Drawings and any Addenda issued shall be provided at no additional cost to the Owner.

PART 2 – SUBCONTRACTORS, SUPPLIER AND MANUFACTURER'S BIDS TO BIDDERS

2.01 SUBCONTRACTOR, SUPPLIER AND MANUFACTURE BUNDLING OF PRICES TO PROSPECTIVE BIDDERS

A. Subcontractors, Suppliers and Manufacturers are permitted to bundle quote prices to Bidders however these bundled prices may not be used to withhold providing individual pricing to a Bidder for bundled items when requested by a Bidder to provide individual pricing. No subcontractor or supplier shall make it a condition of their bid that another part of the project be awarded to them.

B. Failure to provide individual pricing upon Bidder's request may be cause to disqualify a Subcontractor or Supplier and Manufacturer from Indiana State University Projects.

PART 3 - EXECUTION FORMS FOR BIDDING

3.01 BID BOND

A. A certified or cashier's check or Bid Bond is a mandatory requirement to be submitted with the Bid and shall be based on not less than five (5) percent of the Bid amount total of the Base Bid(s) and all add Alternates.

B. The Bid bond shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. The Bid Bond shall be obtained from surety or insurance company that is duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. In addition to appearing on Circular 570 U.S. Dept. of the Treasury, such Surety or insurance company shall maintain an A.M. Best's Rating of not less than "A.

C. Failure to submit an acceptable Bid Bond with the Bid shall disqualify a Bidder.

3.02 BIDDERS FINANCIAL STATEMENT

A. With their Bid the Bidder shall submit their most current independently audited or reviewed financial statement and vendor trade credit references as evidence of financial capability to perform the work.

B. Failure to submit the Bidder's financial statement may be cause to disqualify a Bidder.

3.03 CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION (SECTION 001020 OF PROJECT MANUAL)

A. This certificate is required by the regulations implementing Executive Order 12549 Debarment and Suspension, 34 CFR Part 85, Section 85.510, Participants' responsibilities. The regulations were published as Part V11 of the May 26, 1988 Federal Register (pages 19160-19211).

B. Submit at time of Bid. Failure to submit with the Bid may be cause to disqualify a Bidder.

3.04 MBE/WBE/VBE PARTICIPATION PLAN. (SECTION 001040 OF THE PROJECT MANUAL)

A. See Section 001030 MBE/WBE/VBE COMPLIANCE INSTRUCTIONS for full details on submission of the Participation Plan.

B. This Plan must be submitted at time of Bid by **all Bidders**. Failure to submit with the Bid may be cause to disqualify a Bidder.

3.05 MANDATORY TIER II REPORTING REQUIREMENT FOR PROJECTS EQUAL TO OR GREATER THAN $500,000.00. (Note: this form may not be included in all Project Manuals)

A. MBE/WBE/VBE utilization in the performance of this Contract must be reported with each Application for Payment using the ISU Business Diversity Spend Reporting Form for Construction/Renovation/Facilities Repair Projects (see included: Tier II Spend Report Form.xlsx.)

B. Compliance with Owner's Mandatory Tier II Reporting Requirement is a condition for the approval of an Applications for Payment.

C. An electronic copy in Excel format will be included with the Award Letter when applicable.

3.06 BIDDER'S CERTIFICATION OF A**U**THORIZED EMPLOYMENT (SECTION 001045 OF THE PROJECT MANUAL)

A. Bidder must certify at time the of Bidding that they have read and understand the "Contractor's Certification of Authorized Employment" provision of the Contract Documents In Section 002011 Amendments to General Conditions Article 13, subparagraph 13.1.7.3 and its subparagraphs

B. Submit at time of Bid. Failure to submit with the Bid may be cause to disqualify a Bidder.

3.07 BID FORM (SECTION 002000 OF THE PROJECT MANUAL)

A. In order to receive consideration, make all Bids in strict accordance with the following:

1. Proposals shall be submitted only on the form furnished, a copy of which is bound into and forms a part of this Project Manual, and which will become a part of the Purchase Order Contract of the successful Bidder (use a photocopy of the Bid Form herein).

2. Proposals shall be completely and correctly filled out using ink or typewriter, with signatures in ink.

3. Prices, except unit prices and percentages, shall be stated both in figures and in writing. In the event of a discrepancy between writing and the figures, the written amount shall govern.

4. Proposals shall be signed by the Bidder, by a partner, or a duly authorized officer for a corporation, and shall give the Bidder's business address and telephone number. Failure to sign the Bid form may be cause to disqualify a Bid.

5. Proposals submitted by non-Indiana corporations shall be accompanied by a certificate of good standing issued by the Indiana Secretary of State.

6. Any interlineation, alteration or erasure of the published Bid Form may be grounds for rejection of the proposal. Proposal shall contain no recapitulation of the work to be done.

7. Proposals shall be based only on the material, construction, equipment and methods named or described in the Specifications, on the Drawings, and any Addenda issued prior to Bidding. See item 1.08 of this Sections for substitution request requirements.

B. Modification of proposals already submitted will be accepted by letter, fax or telegram if received by the Owner prior to the date and hour set for opening of proposals.

C. Each Bid shall be addressed to the Owner, and shall be delivered to the Office of the Director of Purchasing at the address given in the Notice to Bidders on or before the day and hour set for opening of Bids. Each Bid shall be enclosed in a sealed envelope bearing the title of the Project, the name of the Bidder, and the date and hour of the Bid opening. It is the sole responsibility of the bidder to see that their bid is received on time.

3.08 ADDENDA

D. Indicate receipt of Addenda on the Bid Form in the spaces provided for acknowledgement.

E. Failure to indicate receipt may be cause to disqualify a Bid.

3.09 BID FORM - BASE BID(S)

A. Base Bid(s) shall be based only on the material, construction, equipment and methods named or described in the Specifications, on the Drawings, and any Addenda issued prior to Bidding. See item 1.08 of this Section for substitution request requirements.

B. On Bids with multiple Base Bid Packages the Owner reserves the right to selectively Award individual Base Bid Packages to multiple Prime Bidders submitting the lowest and best Bids for the individual Bid Packages.

3.10 BID FORM - ALTERNATE BID(S)

A. Each Bidder, in addition to submission of the Base Bid, shall submit a Bid for any Alternate(s) as called for (if any). Failure to submit said Alternate Bid(s) shall be sufficient cause for the Owner to reject any proposal in its entirety. Also the Owner may consider the Alternate Bid in awarding of a Contract, but is under no obligation to accept any Alternate Bid.

B. Proposals shall be based only on the material, construction, equipment and methods named or described in the Specifications, on the Drawings, and any Addenda issued prior to Bidding. See item 1.08 of this Section for substitution request requirements.

3.11 BID FORM – ALLOWANCES

A. Allowances (if any) shall be included in the applicable Bid (Base Bid(s) or Alternate Bid(s)) as called for in the Allowance Section of the Bid Form and/or Section 012360 Allowances.

B. It is solely at the discretion of the Architect/Engineer/Owner what costs may be applied to an Allowance.

C. Any unused portion of an Allowance shall be returned to the Owner at Contract Closeout.

3.12 NON-COLLUSION AFFIDAVIT

A. The Bidder, by its officers and agents or representatives present at the time of filing their bid, being duly sworn, say on their oaths that neither they nor any of them have in any way, directly or indirectly, entered into any arrangement or agreement with any other bidder, or with any public office of the State of Indiana, of any county or municipality or other public offices whereby such affiance or either of them, has paid or is to pay to such other bidder or public officer any sum of money, or has given or is to vie to such other bidders or public officer anything of value whatever, or such affiance of affiance or either of them has not, directly or indirectly entered into any arrangement or agreement with any other bidder or bidders, which tends to or does lessen or destroy free competition in letting of the contract sought for by the attached bids; that no inducement of any form or character other than which appears upon the face of the bid will be suggested, offered, paid, or delivered to any person whomsoever to influence the acceptance of the said bid or awarding of the contract, nor has this bidder any agreement or understanding of any

kind whatsoever, with any person whomsoever to pay, deliver to, or share with any other person in any way or manner, any of the proceeds of the contract sought by this bid.

B. Submission of the signed Bid Form indicates compliance.

3.13 NON-DISCRIMINATION

A. The Bidder and its Subcontractors, if any, shall not discriminate against any employee or applicant for employment, to be employed in the performance of this Contract, with respect to their hire, tenure, terms, conditions or privileges of employment or any matter directly or indirectly related to employment because of their sex, race, natural origin, ancestry or religion or disability as prohibited under the Americans with Disabilities Act. Breach of this covenant may be regarded as a material breach of the Contract.

B. Submission of the signed Bid Form indicates compliance.

3.14 CERTIFICATION OF UNITED STATES STEEL PRODUCTS

A. The Bidder certifies that the Bidder and all Subcontractors will comply with the statutory obligations to use steel products made in the United States.

B. Submission of the signed Bid Form indicates compliance.

3.15 BID FORM - APPENDIX A SUBCONTRACTOR AND SUPPLIER/MANUFACTURERS LISTS

A. The Prime Contractor (Bidder) shall list all Subcontractors and Suppliers/Manufacturers called for in Appendix A of the Bid Form at the time of Bid Submission. Failure to provide this information may be sufficient cause to disallow a Bid.

B. **The Prime Contractor (Bidder) shall use the Subcontractors, Suppliers, Materials and Equipment as listed in the Bid Form Appendix "A" submitted at the time of Bid. It is the Prime Contractor's (Bidder's) responsibility to assure they have listed the correct Subcontractors, Suppliers, Materials and Equipment on their Bid Form. THERE SHALL BE NO CHANGES PERMITTED TO THESE LISTS.**

1. Exception: If the Architect/Engineer or Owner determines the Subcontractors, Suppliers, Materials or Equipment are not acceptable, the Owner shall notify the Prime Contractor (Bidder) in writing within two (2) working days after receipt of Bids of the unacceptable Subcontractor(s), Supplier(s), Material(s) and/or Equipment(s).

3.16 BID FORM - APPENDIX B UNIT PRICES

A. Each Bidder shall submit pricing for Unit Prices as called for (if any) in Appendix B. Failure to submit said pricing may be sufficient cause for the Owner to reject any proposal in its entirety. Also the Owner may consider the Unit Pricing in awarding of a Contract.

B. Unit Prices shall be based only on the material, construction, equipment and methods named or described in the Specifications, on the Drawings, and any Addenda issued prior to Bidding.

C. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

3.17 APPENDIX C COMPREHENSIVE SUBCONTRACTOR AND SUPPLIER & MANUFACTURER LISTS

A. Included with Section 002000 Bid Form is a comprehensive listing of Subcontractors and Suppliers & Manufacturers. This list shall be submitted within twenty four (24) hours after the Bid opening. **THERE SHALL BE NO CHANGES PERMITTED TO THESE LISTS ONCE SUBMITTED.**

1. Exception: If the Architect/Engineer or Owner determines the Subcontractors, Suppliers, Materials or Equipment are not acceptable, the Architect shall notify the

Prime Contractor (Bidder) in writing within two (2) working days after receipt of Appendix C of the unacceptable Subcontractor(s), Supplier(s), Material(s) and/or Equipment(s).

B. Submit Appendix C via e-mail to the following individuals:

1. Jonathan Young jyoung@browningday.com
2. Greg Jacoby gjacoby@browningday.com
3. Mike Bonnett Mike.Bonnett@indstate.edu,
4. Bryan Duncan Bryan.Duncan@indstate.edu,
5. Pat Teeters patrick.teeters@indstate.edu

3.18 BID FORM - APPENDIX D

A. By 2:00pm on the next business day after receipt of Bids the Bidder shall submit, a wage rate schedule for the workers of the Prime Bidder and all major Subcontractors involved in the Work. The wage rate shall include the worker's hourly rate plus all fringe benefits to be paid to the worker.

B. A major Subcontractor is defined as any Subcontractor whose portion of the Bid is in excess of $250,000 or 20% of the total Bid whichever is less.

C. Failure to submit this wage rate schedule within the allotted time may be sufficient cause to disallow a Bid. The wage rates provided may be used as a basis for Award of the Bid.

D. The Owner reserves the right to require certified payroll records to be provided to verify the wage rates listed on the wage rate schedule are accurate.

END OF SECTION 001010

BID FORM (Revised for Addendum # 5)

BASED ON BID FORM
FORM NO. 96
REVISED FORMAT 1/14/2013

GENERAL BID FOR PUBLIC BUILDING

PROJECT: **Dreiser Hall Renovation Bid # B0027086**

TO: INDIANA STATE UNIVERSITY
BOARD OF TRUSTEES
TERRE HAUTE, INDIANA

FROM:

_____
(Name of Bidder) (Company Name)

_____
(Address)

_____
(City, State, Zip)

PHONE NUMBER _____

DATE: _____

SUBMITTED BY: _____ _____
(Signature) (Title)
The Bidder's signature certifies the Bidder is in compliance with all aspects of the Bid Documents

ADDENDA
The following Addenda have been received. The modifications to the bidding documents noted therein have been considered and all costs thereto are included in the Bid Sum(s).

Addendum #_____	Dated _____
Addendum #_____	Dated _____
Addendum #_____	Dated _____
Addendum #_____	Dated _____
Addendum #_____	Dated _____
Addendum #_____	Dated _____
Addendum #_____	Dated _____

OWNER'S RIGHTS REGARDING ACCEPTANCE OF BIDS
It is understood that the Owner reserves the right to accept or reject any Bid and to waive any irregularities in Bidding. It is further understood on Bids with multiple Base Bid Packages the Owner reserves the right to selectively Award individual Base Bid Packages to multiple Prime Bidders submitting the lowest and best Bids for the individual Base Bid Packages.

TAX EXEMPT
Indiana State University is a Tax Exempt Institution and Indiana Sales Tax for products permanently incorporated in work shall not be included as part of the Bid. All other applicable Federal, State and Local taxes shall be included in the Bid sum. Tax exempt certificate available upon request.

BID FORM (Revised for Addendum # 5)

OFFER:
Pursuant to and in compliance with 'Instructions to Bidders', and other Bidding Documents prepared by the Indiana State University Facilities Management Department for the above mentioned project, the signer, having become thoroughly familiar with the terms and conditions of the proposed Contract Documents and with local conditions affecting the performance and costs of the Work at the place where the Work is to be completed, and having fully inspected the site in all particulars, hereby proposes and agrees to fully perform the Work within the time stated and in strict accordance with the intent of the proposed Contract Documents, including furnishing bonds, insurance, labor, materials, and to do all the Work required to construct and complete in accordance with the proposed Contract Documents as follows:

BASE BID: Indiana State University Dreiser Hall Renovation per Specifications and Drawings.

_____ Dollars ($_____)
(State Amount in Words)

ALTERNATE BIDS

1. Alternate No. 1: Add operable function for exterior windows.

_____ Dollars ($_____)
(State Amount in Words) Add ☐ Deduct ☐

2. Alternate No. 2: Add portions of wood paneling on 2nd and 3rd floors.

_____ Dollars ($_____)
(State Amount in Words) Add ☐ Deduct ☐

3. Alternate No. 3: Add masonry restoration work. Refer to Building Elevation Drawings for Areas of Restoration

_____ Dollars ($_____)
(State Amount in Words) Add ☐ Deduct ☐

4. Alternate No. 4: Revised: Add pipe grid and theatrical lighting in room 014 – Performance and Technology Lab

_____ Dollars ($_____)
(State Amount in Words) Add ☐ Deduct ☐

5. Alternate No. 5: Add work associated with opening up Stair #2.

_____ Dollars ($_____)
(State Amount in Words) Add ☐ Deduct ☐

6. Alternate No. 6: Add select areas of glazed wall system on 1st and 3rd floors.

_____ Dollars ($_____)
(State Amount in Words) Add ☐ Deduct ☐

7. Alternate No. 7: Add reroofing work.

_____ Dollars ($_____)
(State Amount in Words) Add ☐ Deduct ☐

8. Alternate No. 8: Add stage lift

_____ Dollars ($_____)
(State Amount in Words) Add ☐ Deduct ☐

ALLOWANCES

1. A $20,000 Allowance shall be included in the Base Bid for the A/E to create “Record Drawings” as detailed in Section 017700 Contract Closeout.
2. A $300,000 Allowance shall be included in the Base Bid for Unforeseen Conditions and General Construction Contingency. It is solely at the discretion of the Architect/Engineer/Owner what costs may be applied to this Allowance.

ACCEPTANCE
This offer shall be opened to acceptance and is irrevocable for the period as follows:

- Base Bid and All Alternates - One Hundred Twenty (120) calendar days from the Bid opening date.

If the Owner accepts the Bid within the time period stated above, Bidder will:

- Furnish the required bonds and insurance certificates within ten (10) calendar days of receipt of the Award Letter
- Commence work within seven (7) calendar days of receipt of the Award Letter or as Directed by the Owner.
- Execute the Contract for Construction Between Indiana State University and Contractor within seven (7) calendar days of receipt of the Contract.

The Bidder agrees to coordinate and expedite their work and that if the Award is given within fourteen (14) calendar days from the Bid opening date the work shall be substantially completed as listed in Section 001010 Instructions to Bidders 1.01 C. If the Award is not made within the stated fourteen (14) calendar days then the substantial completion date may be adjusted as allowed by the Contract Documents or as mutually agreed upon in writing by the Owner and Contractor.

NON-COLLUSION AFFIDAVIT

The Bidder, by its officers and agents or representatives present at the time of filing their bid, being duly sworn, say on their oaths that neither they nor any of them have in any way, directly or indirectly, entered into any arrangement or agreement with any other bidder, or with any public office of the State of Indiana, of any county or municipality or other public offices whereby such affiance or either of them, has paid or is to pay to such other bidder or public officer any sum of money, or has given or is to vie to such other bidders or public officer anything of value whatever, or such affiance of affiance or either of them has not, directly or indirectly entered into any arrangement or agreement with any other bidder or bidders, which tends to or does lessen or destroy free competition in letting of the contract sought for by the attached bids; that no inducement of any form or character other than which appears upon the face of the bid will be suggested, offered, paid, or delivered to any person whomsoever to influence the acceptance of the said bid or awarding of the contract, nor has this bidder any agreement or understanding of any kind whatsoever, with any person whomsoever to pay, deliver to, or share with any other person in any way or manner, any of the proceeds of the contract sought by this bid.

NON-DISCRIMINATION

The Bidder and its Subcontractors, if any, shall not discriminate against any employee or applicant for employment, to be employed in the performance of this Contract, with respect to their hire, tenure, terms, conditions or privileges of employment or any matter directly or indirectly related to employment because of their sex, race, natural origin, ancestry or religion or disability as prohibited under the Americans with Disabilities Act. Breach of this covenant may be regarded as a material breach of the Contract.

CERTIFICATION OF UNITED STATES STEEL PRODUCTS

The Bidder certifies that the Bidder and all Subcontractors will comply with the statutory obligations to use steel products made in the United States.

MBE/WBE/VBE BIDDING:

See Section 001030 for requirements for MBE/WBE/VBE Compliance. Section 001040 MBE/WBE/VBE Participation Plan must be completed by **all Bidders** and submitted with the Bid. Failure to submit with the Bid may be sufficient cause to disqualify a Bid.

EXPERIENCE QUESTIONNAIRE

List similar projects completed by your organization:

1. Contract Amount _____

   Description _____

   Date Completed _____

   Owner_____
   (Name and phone #)

2. Contract Amount _____

   Description _____

   Date Completed _____

   Owner _____
   (Name and phone #)

List similar projects currently under construction by your organization

1. Contract Amount _____

   Description _____

   Date Completed _____

   Owner _____
   (Name and phone #)

2. Contract Amount _____

   Description _____

   Date Completed _____

   Owner _____
   (Name and phone #)

Yes ☐ No ☐ Has your organization ever failed to complete any work awarded it?

If yes, where and why?

_____

_____

_____

Yes ☐ No ☐ Does your Organization have any pending litigation or litigation completed within the past five (5) years initiated by your Organization or the Owner as a result of your work on another Project?

If yes, attach a complete listing, with your Bid, of all such litigation(s) and name(s) of Institutions and/or Parties involved with complete contact information. Failure to submit this information may result in disqualification of your Bid.

Yes ☐ No ☐ Has your Organization been cited for violation of State or Federal regulations within the past twelve months?

If yes, what was the violation and resolution?

_____

_____

_____

List references from firms for which your organization has performed work. Provide firm name, contact person name and phone number.

_____

_____

_____

APPENDICES

The following Appendices are submitted with the Bid:
Appendix A - Subcontractors and Supplier & Manufacturer Lists
Appendix B - Unit Prices
Appendix C - Complete Subcontractor and Supplier & Manufacturer Lists to be submitted within 24 hours after Bid.
Appendix D - Wage Rate Schedules

OATH AND AFFIRMATION

Attested to this ____ day of _____, 201____

By _____

ACKNOWLEDGMENT

State of _____
SS:

County of _____

_____ being duly sworn, deposes and
(Name of person)

says that he/she is _____ of
(Title)

_____ and that the
(Name of organization)
statements contained in the foregoing bid, certification and affidavit are true and correct.

Subscribed and sworn to before me by _____

this _____ day of _____, 201___

_____
Notary Public

My Commission Expires _____

County of Residence _____

SUPPLEMENTS TO BID FORM

TO: INDIANA STATE UNIVERSITY

PROJECT: **Dreiser Hall Renovation Bid # B0027086**

DATE: _____

SUBMITTED BY:
(full name)

(full address)

In accordance with Instructions to Bidders and Bid Form, we include the Supplements to Bid Form for Appendices listed below. The information provided shall be considered an integral part of the Bid Form.

Appendix A - Subcontractor and Manufacturers List (to be submitted at time of Bid)
Failure to submit may be cause to disqualify bid

_____
(Bidder)

_____
(Project)

The following will be performed (or provided) by the Subcontractors and Manufacturers listed herein and coordinated by us.

The Prime Contractor (Bidder) shall list all Subcontractors and Suppliers/Manufacturers called for in Appendix A of this Bid Form at the time of Bid Submission. Failure to provide this information may be sufficient cause to disallow a Bid.

The Prime Contractor (Bidder) shall use the Subcontractors, Suppliers, Materials and Equipment as listed in the Bid Form Appendix "A" submitted at the time of Bid. It is the Prime Contractor's (Bidder's) responsibility to assure they have listed the correct Subcontractors, Suppliers, Materials and Equipment on their Bid Form. THERE SHALL BE NO CHANGES PERMITTED TO THESE LISTS.

Exception: If the Owner determines the Subcontractors, Suppliers, Materials or Equipment are not acceptable, the Owner shall notify the Prime Contractor (Bidder) in writing within two (2) working days after receipt of Bids of the unacceptable Subcontractor(s), Supplier(s), Material(s) and/or Equipment(s).

(Listings begin on next page)

APPENDIX A – SUBCONTRACTOR LIST

Bidder shall provide the names of all applicable Subcontractors

Description	Subcontractor
Steel Fabricator	
Steel Erector	
Curtain Wall / Storefront	
Concrete Work	
Masonry Work	
Roofing Work	
Electrical Work	
IT (Voice Data) Work	
Sheet Metal Work	
Mechanical	
Temperature Control	
Plumbing Work	
FP Sprinkler Work	
Site Work	

APPENDIX A – SUPPLIER & MANUFACTURERS LIST

Bidder shall provide the names of all applicable Suppliers and Manufacturers

Product Description	Supplier	Manufacturer
Roofing System (Alternate Bid)		
Elevator		
Heat Exchanger		
Built-up AHU (AHU 1)		
Modular CSAC (AHU 2)		
Mini-Split Units		
Pumps		
VAV Boxes		

Exhaust Fans	_____	_____
Panelboards	_____	_____
Switchboards	_____	_____

Appendix B – Unit Prices

1. Unit Price #1 Repointing Materials and Labor per square foot of brick repointing. $_____ sq ft

2. Unit Price #2 Plaster Patching Materials and Labor per square foot of plaster patching. $_____ sq ft

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Appendix C – To be submitted within 24 hours after Bids received. See Section 001010 Instructions to Bidders 3.17 for further instructions

APPENDIX C – SUBCONTRACTOR LIST

Bidder shall provide the names of all the applicable Subcontractors with the Bid.

Description	Subcontractor
Ceiling Work	
Flooring Work	
Terrazzo Restoration	
Painting Work	
Testing (Electrical)	
Audio/Visual	
Theatrical Lighting / Integrator	
Theatrical Rigging	
Fire Alarm Installer	
Testing and Balancing (Mechanical)	
Irrigation Work	
Landscaping Work	
Sedimentation Control	

APPENDIX C – SUPPLIER AND MANUFACTURER'S LIST

Bidder shall provide the names of all applicable Suppliers and Manufacturers

Product Description	Supplier	Manufacturer
Ceiling: Grids		
Ceiling: Panels		
Flooring: Tile		
Flooring: Carpet		
Hollow Metal Frames		
Doors		
Door Hardware		

Signage	_____	_____
Hydraulic Cement	_____	_____
Aluminum Entrances and Storefronts	_____	_____
Windows	_____	_____
Operable Windows (Alternate)	_____	_____
Plumbing Fixtures and Trim	_____	_____
Plumbing Faucets	_____	_____
Grilles & Diffusers	_____	_____
Fire Alarm	_____	_____
Wiring Devices	_____	_____
Lighting	_____	_____
Lighting Controls	_____	_____
Theatrical Lighting Controls	_____	_____
Theatrical Lighting Fixtures	_____	_____

Appendix D – Wage Rate Schedules

By 2:00pm on the next business day after receipt of Bids the Bidder shall submit, a wage rate schedule for the workers of the Prime Bidder and all major Subcontractors involved in the Work. Failure to supply the wage rate schedule(s) as required by the Bidding Documents may be sufficient cause to disallow a Bid

END OF SECTION 002000

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SECTION 042113 – VENEER MASONRY SYSTEM

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Concrete masonry, Face brick units.

B. Reinforcement, anchorage, and accessories.

C. Granite and limestone exterior veneer and trim.

1.02 REFERENCES

A. ACI 530 - Building Code Requirements for Masonry Structures.

B. ACI 530.1 - Specifications for Masonry Structures.

C. ASTM A82 - Cold-Drawn Steel Wire for Concrete Reinforcement.

D. ASTM A123- Zinc (Hot-Dipped Galvanized) Coatings on Iron and Steel Products.

E. ASTM A167- Stainless and Heat-Resisting Chromium-Nickel Steel Plate.

F. ASTM A525- Steel Sheet, Zinc Coated, (Galvanized) by the Hot-Dip Process

G. ASTM A641- Zinc-Coated (Galvanized) Carbon Steel Wire.

H. ASTM B370- Copper Sheet and Strip for Building Construction.

I. ASTM C55- Concrete Building Brick.

J. ASTM C73- Calcium Silicate Face Brick (Sand-Lime Brick).

K. ASTM C90 - Load-Bearing Concrete Masonry Units.

L. ASTM C126- Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units.

M. ASTM C216- Facing Brick (Solid Masonry Units Made From Clay or Shale).

N. ASTM C652- Hollow Brick (Hollow Masonry Units Made From Clay or Shale).

O. ASTM C744- Pre-faced Concrete and Calcium Silicate Masonry Units.

P. IMIAC- International Masonry Industry All-Weather Council: Recommended Practices and Guide Specification for Cold Weather Masonry Construction.

Q. UL - Fire Resistance Directory.

1.03 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 530 and ACI 530.1.

1.04 ENVIRONMENTAL REQUIREMENTS

A. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.

B. Maintain materials and surrounding air temperature to maximum 90 degrees F (32 degrees C) prior to, during, and 48 hours after completion of masonry work.

PART 2 – PRODUCTS

2.01 BRICK UNITS

A. Face Brick: To match existing building brick. Submit sample to be approved by Architect.

B. Size and Shape: To match existing building brick. Submit sample to be approved by Architect.

2.02 CUT STONE VENEER AND TRIM

A. Cut Indiana Oolitic Limestone.

B. Grade: Select

C. Color: Buff

D. Surface Texture: Smooth

E. Accessories:

1. Anchors, dowels, ties: Galvanized steel, 1.25 oz./sq. ft. of sizes and configurations required for support of stone and superimposed loads.

2. Setting Shims: Plastic type.

2.03 GRANITE STONE VENEER AND TRIM

F. Granite: Iridian by Coldspring.

G. Grade: n/a

H. Color: Gray speckled.

I. Surface Texture: Rub & Sand finish.

J. Accessories:

1. Anchors, dowels, ties: Galvanized steel, 1.25 oz./sq. ft. of sizes and configurations required for support of stone and superimposed loads.

2. Setting Shims: Plastic type.

2.04 REINFORCEMENT ANCHORAGE

A. Wall Ties: Formed steel wire, adjustable, hot dip galvanized to ASTM A123.

2.05 FLASHINGS

A. Plastic Flashings: Sheet polyvinyl chloride; minimum 10 mil.

B. Lap Sealant: Butyl

2.06 ACCESSORIES

A. Building Paper: No. 15 asphalt saturated felt.

B. Weeps: Preformed plastic tubes.

C. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

B. Verify items provided by other sections of work are properly sized and located.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied to other sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Brick Units:

1. Bond: Running to match existing building.

2. Coursing: Three units and three mortar joints to equal 8 inches.

3. Mortar Joints: Concave.

3.04 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Lay hollow masonry units with face shell bedding on head and bed joints.

C. Buttering corners of joints or excessive furrowing of mortar joints are not permitted.

D. Remove excess mortar as work progresses.

E. Interlock intersections and external corners.

F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

H. Isolate top joint of masonry walls from horizontal structural framing members and slabs or decks with compressible joint filler.

3.05 WEEPS

A. Install weeps in veneer at 24 inches on center horizontally above shelf angles and lintels and at bottom of walls.

3.06 CAVITY BEHIND VENEER

A. Do not permit mortar to drop or accumulate into cavity air space or to plug weeps.

B. Provide cavity drainage material at minimum 1-inch thick by 10-inch high with dovetail profile to collect mortar drippings.

3.07 REINFORCEMENT AND ANCHORAGE

A. Secure wall ties to stud framed back-up and embed into masonry veneer at maximum 16 inches on center vertically and 36 inches on center horizontally. Place at maximum 3 inches on center each way around perimeter of openings, within 12 inches of openings.

3.08 MASONRY FLASHINGS

A. Extend flashings horizontally at foundation walls and above ledge or shelf angles and lintels.

B. Turn flashing up minimum 8 inches and bed into mortar joint or masonry seal to sheathing over steel stud back-up.

C. Lap end joints minimum 6 inches and seal watertight.

D. Turn flashing, fold, and seal at corners, bends, and interruptions.

3.09 LINTELS

A. Install loose steel lintels over openings.

B. Maintain minimum 4 inch bearing on each side of opening.

3.10 CONTROL JOINTS

A. Do not continue horizontal joint reinforcement through control joints.

B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

3.11 CLEANING

A. Remove excess mortar and mortar smears.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with cleaning solution.

D. Use non-metallic tools in cleaning operations.

3.12 PROTECTION OF FINISHED WORK

A. Without damaging completed work, provide protective boards at exposed external corners which may be damaged by construction activities.

END OF SECTION 042113

SECTION 055113 - METAL PAN STAIRS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Preassembled steel stairs with concrete-filled treads.
2. Steel tube railings and guards attached to metal stairs.
3. Steel tube handrails attached to walls adjacent to metal stairs.

1.3 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for metal stairs, railings, and guards.

1. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, blocking for attachment of wall-mounted handrails, and items with integral anchors, that are to be embedded in concrete or masonry.
2. Deliver such items to Project site in time for installation.

C. Coordinate locations of hanger rods and struts with other work so they do not encroach on required stair width and are within fire-resistance-rated stair enclosure.

D. Schedule installation of railings and guards so wall attachments are made only to completed walls.

1. Do not support railings and guards temporarily by any means that do not satisfy structural performance requirements.

1.4 ACTION SUBMITTALS

A. Shop Drawings:

1. Include plans, elevations, sections, details, and attachments to other work.
2. Indicate sizes of metal sections, thickness of metals, profiles, holes, and field joints.
3. Include plan at each level.
4. Indicate locations of anchors, weld plates, and blocking for attachment of wall-mounted handrails.

B. Delegated-Design Submittal: For stairs, railings and guards, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

B. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification.

1. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers.
2. Protect steel members and packaged materials from corrosion and deterioration.
3. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures.

    a. Repair or replace damaged materials or structures as directed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer to design stairs, railings and guards, including attachment to building construction.

B. Structural Performance of Stairs: Metal stairs shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Uniform Load: 100 lbf/sq. ft. (4.79 kN/sq. m).
2. Concentrated Load: 300 lbf (1.33 kN) applied on an area of 4 sq. in. (2580 sq. mm).

3. Uniform and concentrated loads need not be assumed to act concurrently.
4. Stair Framing: Capable of withstanding stresses resulting from railing and guard loads in addition to loads specified above.
5. Limit deflection of treads, platforms, and framing members to L/360 or 1/4 inch (6.4 mm), whichever is less.

C. Structural Performance of Railings and Guards: Railings and guards, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

a. Uniform load of 50 lbf/ft. (0.73 kN/m) applied in any direction.
b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
b. Infill load and other loads need not be assumed to act concurrently.

D. Seismic Performance of Stairs: Metal stairs shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

2.2 METALS

A. Metal Surfaces: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

C. Steel Tubing for Railings and Guards: ASTM A500/A500M (cold formed) or ASTM A513/A513M.

D. Steel Pipe for Railings and Guards: ASTM A53/A53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.

E. Uncoated, Hot-Rolled Steel Sheet: ASTM A1011/A1011M, either commercial steel, Type B, or structural steel, Grade 30 (Grade 205), unless another grade is required by design loads.

2.3 FASTENERS

A. General: Provide [zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5] [Type 304 stainless steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5] where built into exterior walls.

1. Select fasteners for type, grade, and class required.

Retain "Fasteners for Anchoring Railings and Guards to Other Construction" Paragraph below if railings and guards are specified in this Section.

B. Fasteners for Anchoring Railings and Guards to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings and guards to other types of construction indicated and capable of withstanding design loads.

C. Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563 (ASTM A563M); and, where indicated, flat washers.

D. Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A563 (ASTM A563M); and, where indicated, flat washers.

E. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E488/E488M, conducted by a qualified independent testing agency.

1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.

2.4 MISCELLANEOUS MATERIALS

A. Welding Electrodes: Comply with AWS requirements.

B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

D. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout; recommended by manufacturer for interior use; noncorrosive and nonstaining; mixed with water to consistency suitable for application and a 30-minute working time.

E. Prefilled Concrete Treads:

1. Concrete Materials and Properties: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with minimum 28-day compressive strength of 3000 psi (20 MPa) and maximum aggregate size of 1/2 inch (13 mm) unless otherwise indicated.
2. Plain Steel Welded-Wire Reinforcement: ASTM A1064/A10645M, steel, 6 by 6 inches (152 by 152 mm), W1.4 by W1.4, unless otherwise indicated on Drawings.

3. Reinforcement Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening welded-wire reinforcement in place.

    a. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete.

2.5 FABRICATION, GENERAL

A. Provide complete stair assemblies, including metal framing, hangers, struts, railings and guards, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.

1. Join components by welding unless otherwise indicated.
2. Use connections that maintain structural value of joined pieces.

B. Assemble stairs, railings, and guards in shop to greatest extent possible.

1. Disassemble units only as necessary for shipping and handling limitations.
2. Clearly mark units for reassembly and coordinated installation.

C. Cut, drill, and punch metals cleanly and accurately.

1. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated.
2. Remove sharp or rough areas on exposed surfaces.

D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

E. Form exposed work with accurate angles and surfaces and straight edges.

F. Weld connections to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.

4. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish # 4 - Good quality, uniform undressed weld with minimal splatter.

G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible.

1. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts unless otherwise indicated.
2. Locate joints where least conspicuous.
3. Fabricate joints that will be exposed to weather in a manner to exclude water.
4. Provide weep holes where water may accumulate internally.

2.6 FABRICATION OF STEEL-FRAMED STAIRS

A. NAAMM Stair Standard: Comply with NAAMM AMP 510, "Metal Stairs Manual," for Service Class, unless more stringent requirements are indicated.

B. Stair Framing:

1. Fabricate stringers of steel channels.

a. Stringer Size: As required to comply with "Performance Requirements" Article.
b. Provide closures for exposed ends of channel and rectangular tube stringers.
c. Finish: Shop primed.

2. Construct platforms of steel channel headers and miscellaneous framing members as required to comply with "Performance Requirements" Article.

a. Provide closures for exposed ends of channel and rectangular tube framing.
b. Finish: Shop primed.

3. Weld or bolt stringers to headers; weld or bolt framing members to stringers and headers. If using bolts, fabricate and join so bolts are not exposed on finished surfaces.

4. Where masonry walls support metal stairs, provide temporary supporting struts designed for erecting steel stair components before installing masonry.

C. Metal Pan Stairs: Form risers, subtread pans, and subplatforms to configurations shown from steel sheet of thickness needed to comply with performance requirements, but not less than 0.067 inch (1.7 mm).
1. Steel Sheet: Uncoated, hot-rolled steel sheet.

2. Attach risers and subtreads to stringers with brackets made of steel angles or bars. Weld brackets to stringers and attach metal pans to brackets by welding, riveting, or bolting.
3. Shape metal pans to include nosing integral with riser.
4. At Contractor's option, provide stair assemblies with metal pan subtreads filled with reinforced concrete during fabrication.

2.7 FABRICATION OF STAIR RAILINGS AND GUARDS

A. Fabricate railings and guards to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of member, post spacings, wall bracket spacing, and anchorage, but not less than that needed to withstand indicated loads.

1. Rails and Posts: 1-1/2-inch- square top and bottom rails and 1-1/2-inch- square posts.

2. Handrails: 1-1/2-inch outside diameter pipe or tube.
3. Picket Infill: 3/4-inch-square pickets spaced to prohibit the passage of a 4-inch (100-mm) diameter sphere.

B. Welded Connections: Fabricate railings and guards with welded connections.

1. Cope components at connections to provide close fit, or use fittings designed for this purpose.
2. Weld all around at connections, including at fittings.
3. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
4. Obtain fusion without undercut or overlap.
5. Remove flux immediately.
6. Finish welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #4 - Good quality, uniform undressed weld with minimal splatter as shown in NAAMM AMP 521.

C. Form changes in direction of railings and guards as follows:
1. By bending or by inserting prefabricated elbow fittings.

D. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

E. Close exposed ends of railing and guard members with prefabricated end fittings.

F. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated.

1. Close ends of returns unless clearance between end of rail and wall is 1/4 inch (6 mm) or less.

G. Connect posts to stair framing by direct welding unless otherwise indicated.

H. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work.

1. Furnish inserts and other anchorage devices for connecting to concrete or masonry work.
2. For nongalvanized railings and guards, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors embedded in exterior masonry and concrete construction.
3. Provide type of bracket with predrilled hole for exposed bolt anchorage and that provides 1-1/2-inch (38-mm) clearance from inside face of handrail to finished wall surface.

Retain "Fillers" Paragraph below if railings are supported from plaster or gypsum board walls.

I. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, where needed to transfer wall bracket loads through wall finishes to structural supports.

1. Size fillers to suit wall finish thicknesses and to produce adequate bearing area to prevent bracket rotation and overstressing of substrate.

2.8 FINISHES

A. Finish metal stairs after assembly.

B. Preparation for Shop Priming: Prepare uncoated, ferrous-metal surfaces to comply with SSPC-SP 3, "Power Tool Cleaning."

C. Apply shop primer to uncoated surfaces of metal stair components, except those with galvanized finishes and those to be embedded in concrete or masonry unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify elevations of floors, bearing surfaces and locations of bearing plates, and other embedments for compliance with requirements.

1. For wall-mounted railings, verify locations of concealed reinforcement within gypsum board and plaster assemblies.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF METAL PAN STAIRS

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction.

1. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.

C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

D. Fit exposed connections accurately together to form hairline joints.

1. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.
2. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
3. Comply with requirements for welding in "Fabrication, General" Article.

E. Place and finish concrete fill for treads and platforms to comply with Section 033000 "Cast-in-Place Concrete."

3.3 INSTALLATION OF RAILINGS AND GUARDS

A. Adjust railing and guard systems before anchoring to ensure matching alignment at abutting joints with tight, hairline joints.

1. Space posts at spacing indicated or, if not indicated, as required by design loads.
2. Plumb posts in each direction, within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).
3. Align rails and guards so variations from level for horizontal members and variations from parallel with rake of stairs for sloping members do not exceed 1/4 inch in 12 feet (6 mm in 3.5 m).
4. Secure posts, rail ends, and guard ends to building construction as follows:
   a. Anchor handrail and guard ends to concrete and masonry with steel round flanges welded to rail and guard ends and anchored with post-installed anchors and bolts.

B. Attach handrails to wall with wall brackets.

1. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
2. Secure wall brackets to building construction as required to comply with performance requirements.

a. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
b. For hollow masonry anchorage, use toggle bolts.
c. For steel-framed partitions, use hanger or lag bolts set into fire-retardant-treated wood backing between studs. Coordinate with stud installation to locate backing members.
d. For steel-framed partitions, use toggle bolts installed through flanges of steel framing or through concealed steel reinforcements.

3.4 REPAIR

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

END OF SECTION 055113

SECTION 055213 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Steel railings.

B. Related Requirements:

1. Section 055113 "Metal Pan Stairs" for steel tube railings associated with metal pan stairs.

1.3 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.4 ACTION SUBMITTALS

A. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

B. Delegated-Design Submittal: For railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect mechanical finishes on exposed surfaces of railings from damage by applying a strippable, temporary protective covering before shipping.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer to design railings, including attachment to building construction.

B. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

a. Uniform load of 50 lbf/ ft. (0.73 kN/m) applied in any direction.
b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
b. Infill load and other loads need not be assumed to act concurrently.

2.2 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

1. Provide type of bracket with predrilled hole for exposed bolt anchorage and that provides 1-1/2-inch (38-mm) clearance from inside face of handrail to finished wall surface.

2.3 STEEL RAILINGS

A. Source Limitations: Obtain each type of railing from single source from single manufacturer.

B. Tubing: ASTM A500/A500M (cold formed) or ASTM A513/A513M, Type 5]

C. Pipe: ASTM A53/A53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.

D. Plates, Shapes, and Bars: ASTM A36/A36M.

2.4 FASTENERS

A. Fastener Materials:

1. Ungalvanized-Steel Railing Components: Plated steel fasteners complying with ASTM F1941 (ASTM F1941M), Class Fe/Zn 5 for zinc coating.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction and capable of withstanding design loads.

C. Fasteners for Interconnecting Railing Components:
1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.
2. Provide Phillips flat-head machine screws for exposed fasteners unless otherwise indicated.

D. Post-Installed Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193 or ICC-ES AC308.

1. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.

2.5 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for metal alloy welded.

B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

C. Bituminous Paint: Cold-applied asphalt emulsion, complying with ASTM D1187/D1187M.

Retain "Nonshrink, Nonmetallic Grout" or "Anchoring Cement" Paragraph below, or both, to suit Project.

D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout, complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

E. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.

2.6 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations.

1. Clearly mark units for reassembly and coordinated installation.
2. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately.

1. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated.
2. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that are exposed to weather in a manner that excludes water.

1. Provide weep holes where water may accumulate.
2. Locate weep holes in inconspicuous locations.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with welded or nonwelded connections unless otherwise indicated.

H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.
4. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" Finish # 4 - Good quality, uniform undressed weld with minimal splatter.

I. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

J. Form changes in direction as follows:
1. By bending or by inserting prefabricated elbow fittings]

K. Bend members in jigs to produce uniform curvature for each configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

L. Close exposed ends of hollow railing members with prefabricated cap and end fittings of same metal and finish as railings.

M. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch (6 mm) or less.

N. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.

O. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work.

1. Fabricate anchorage devices capable of withstanding loads imposed by railings.
2. Coordinate anchorage devices with supporting structure.

P. Toe Boards: Provide toe boards at railings around openings and at edge of open-sided floors and platforms. Fabricate to dimensions and details indicated.

2.7 STEEL AND IRON FINISHES

A. For nongalvanized-steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves; however, hot-dip galvanize anchors to be embedded in exterior concrete or masonry.

B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 3.

C. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1 for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements are clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 INSTALLATION, GENERAL

A. Perform cutting, drilling, and fitting required for installing railings.

1. Fit exposed connections together to form tight, hairline joints.
2. Install railings level, plumb, square, true to line; without distortion, warp, or rack.
3. Set railings accurately in location, alignment, and elevation; measured from established lines and levels.
4. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
5. Set posts plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).
6. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (6 mm in 3.5 m).

B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

C. Adjust railings before anchoring to ensure matching alignment at abutting joints.

D. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 RAILING CONNECTIONS

A. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article, whether welding is performed in the shop or in the field.

3.4 ANCHORING POSTS

A. Form or core-drill holes not less than 5 inches (125 mm) deep and 3/4 inch (20 mm) larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Leave anchorage joint exposed with anchoring material flush with adjacent surface.

C. Anchor posts to metal surfaces with flanges, angle type, or floor type, as required by conditions, connected to posts and to metal supporting members as follows:

1. For steel railings, weld flanges to post and bolt to metal supporting surfaces.

3.5 ATTACHING RAILINGS

A. Anchor railing ends to concrete and masonry with brackets on underside of rails connected to railing ends and anchored to wall construction with anchors and bolts.

B. Attach handrails to walls with wall brackets. Provide brackets with 1-1/2-inch clearance from inside face of handrail and finished wall surface.

1. Use type of bracket with predrilled hole for exposed bolt anchorage.
2. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

C. Secure wall brackets to building construction as follows:

1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
2. For hollow masonry anchorage, use toggle bolts.

3. For steel-framed partitions, use hanger or lag bolts set into fire-retardant-treated wood backing between studs. Coordinate with stud installation to locate backing members. OR
4. For steel-framed partitions, use toggle bolts installed through flanges of steel framing or through concealed steel reinforcements.

3.6 REPAIR

A. Touchup Painting:

1. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

    a. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

3.7 CLEANING

A. Clean by washing thoroughly with clean water and soap and rinsing with clean water.

3.8 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period, so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 055213

SECTION 057313 – GLAZED DECORATIVE METAL RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Interior post-supported railings with glass-infill panels.

1.3 DEFINITIONS

A. Railings: Guards, handrails, and similar devices used for protection of occupants at open-sided floor and exterior deck areas and for pedestrian guidance and support, visual separation, or wall protection.

1.4 COORDINATION AND SCHEDULING

A. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver items to Project site in time for installation.

1.5 ACTION SUBMITTALS

A. Product Data:

   1. Metal railings assembled from standard components.
   2. Glass products.

B. Shop Drawings: Include plans, elevations, sections, and attachment details.

C. Samples for Initial Selection: For products involving selection of color, texture, or design, including mechanical finishes.

D. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.6 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1.
2. Build mockups for each form and finish of glass-infill panel railing consisting of two posts, top rail, handrail, glass-infill panel, and anchorage system components that are full height and are not less than 24 inches (600 mm) in length.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication and indicate measurements on Shop Drawings.

1.8 WARRANTY

A. Manufacturer's Special Warranty for Laminated Glass: Glazed decorative metal railing manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Blum, Julius & Co., Inc.

2. C.R. Laurence Co., Inc.
3. Hollaender Mfg. Co.
4. Livers Bronze Co.

B. Source Limitations for Laminated Glass: Obtain from single source from single manufacturer.

C. Source Limitations for Decorative Metal Railing Components: Obtain from single source from single manufacturer for each component and installation method.

D. Product Options: Information on Drawings and in the Specifications establishes requirements for railing system's aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.

1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

2.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer to design glazed decorative metal railings, including attachment to building construction.

B. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:
1. Stainless Steel: 60 percent of minimum yield strength.
2. Glass: 25 percent of mean modulus of rupture (50 percent probability of breakage), as listed in "Mechanical Properties" in AAMA CW-12, "Structural Properties of Glass."

C. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

a. Uniform load of 50 lbf/ft. (0.73 kN/m) applied in any direction.
b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Glass-Infill Panels:

a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
b. Infill load and other loads need not be assumed to act concurrently.

2.3 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Same metal and finish as supported rails unless otherwise indicated.

2.4 STAINLESS STEEL

A. Tubing: ASTM A554, Grade MT 304.

B. Pipe: ASTM A312/A312M, Grade TP 304.

C. Castings: ASTM A743/A743M, Grade CF 8 or Grade CF 20.

D. Sheet, Strip, Plate, and Flat Bar: ASTM A666 or ASTM A240/A240M, Type 304.

E. Bars and Shapes: ASTM A276, Type 304.

2.5 GLASS AND GLAZING PRODUCTS, GENERAL

A. Glazing Publications: Comply with written instructions of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. NGA/GANA Publications: "GANA Laminated Glazing Reference Manual" and "GANA Glazing Manual."

B. Safety Glazing: Glazing shall comply with 16 CFR 1201, Category II.

C. Safety Glazing Labeling: Permanently mark glass with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

D. Clear Annealed Float Glass: ASTM C1036, Type I, Class 1 (clear), Quality-Q3.

E. Heat-Strengthened Float Glass: ASTM C1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

2.6 GLASS HANDRAILS AND GUARDS

A. Laminated Glass Handrails and Guards: ASTM C1172, Type II with two plies of glass bonded together by an interlayer.

1. Construction: Laminate glass with polyvinyl butyral interlayer or ionoplast polymer interlayer to comply with interlayer manufacturer's written instructions.
2. Interlayer Thickness: 0.060 inch (1.52 mm).
3. Kind: LHS (laminated heat strengthened) or laminated tempered as required to meet performance critiria.
4. Glass Color: Inner-ply clear; outer-ply clear.
5. Interlayer Color and Pattern: Clear.
6. Glass Plies for Glass-Infill Panels: Thickness required by structural loads, but not less than 5.0 mm each.

2.7 FASTENERS

A. Fastener Materials: Unless otherwise indicated, provide the following:
   1. Stainless Steel Components: Type 304 stainless steel fasteners.

B. Fasteners for Anchoring to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

C. Provide concealed fasteners for interconnecting railing components and for attaching railings to other work unless exposed fasteners are unavoidable.

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1. Provide Phillips flat-head machine screws for exposed fasteners unless otherwise indicated.

2. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/ASTM F1941M, Class Fe/Zn 5, unless otherwise indicated.

2.8 MISCELLANEOUS MATERIALS

A. Handrail Brackets: Cast stainless steel, center of rail 2-1/2 inches from face of glass balusters.

B. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

2.9 FABRICATION OF METAL RAILINGS

A. Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

F. Mechanical Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

G. Form changes in direction as follows:
   1. By bending or by inserting prefabricated elbow fittings.

H. Bend members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

I. Close exposed ends of hollow railing members with prefabricated end fittings.

J. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, handrail brackets, miscellaneous fittings, and anchors to interconnect railing members to other work where indicated.

   1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers, or other means to transfer loads through wall finishes to structural supports and to prevent bracket or fitting rotation and crushing of substrate.

K. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

2.10 FABRICATION OF GLASS PANELS AND BALUSTERS

A. Fabricate glass to sizes and shapes required; provide for proper edge clearance and bite on glazing panels.

B. Glass-Infill Panels: Provide laminated, heat-strengthened or laminated, tempered glass-infill panels.

1. Edge Finish: Clean-cut or flat-grind edges to produce smooth, square edges with slight chamfers at junctions of edges and faces.

2.11 METAL FINISH REQUIREMENTS, GENERAL

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipment.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.

2.12 STAINLESS STEEL FINISHES

A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.

1. Run grain of directional finishes with long dimension of each piece.
2. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

C. Stainless Steel Tubing Finishes:

1. 180-Grit Polished Finish: Uniform, directionally textured finish.

D. Stainless Steel Sheet, Strip, Plate, and Bar Finishes:

1. Directional Satin Finish: ASTM A480/A480M, No. 4.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Comply with Drawings and manufacturer's written instructions for installing glazed decorative metal railings, accessories, and other components.

B. Perform cutting, drilling, and fitting required for installing metal railings.

1. Fit exposed connections together to form tight, hairline joints.

2. Install railings level, plumb, square, true to line; without distortion, warp, or rack.
3. Set railings accurately in location, alignment, and elevation; measured from established lines and levels.
4. Do not weld, cut, or abrade surfaces of metal railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
5. Set posts plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).
6. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (5 mm in 3 m).

C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

D. Adjust railings before anchoring to ensure matching alignment at abutting joints.

E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.2 METAL RAILING CONNECTIONS

A. Nonwelded Connections:

1. Use mechanical or adhesive joints for permanently connecting railing components.
2. Use wood blocks and padding to prevent damage to railing members and fittings.
3. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.

3.3 METAL ANCHORING POSTS

A. Anchor posts to metal surfaces with flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:
1. For stainless steel railings, weld flanges to posts and bolt to metal-supporting surfaces.

3.4 INSTALLATION OF GLASS BALUSTERS

A. Post-Supported Railings with Glass-Infill Panels:

1. Install assembly to comply with railing manufacturer's written instructions and with requirements in other Part 3 articles.
2. Erect posts and other metal railing components, and set factory-cut glass-infill panels.
3. Do not cut, drill, or alter glass-infill panels in field. Protect edges from damage.

3.5 FIELD QUALITY CONTROL

3.6 CLEANING

A. Clean stainless steel by washing thoroughly with water and soap, rinsing with clean water, and wiping dry.

B. Clean and polish glass as recommended in writing by manufacturer. Wash both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion.

3.7 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 057313

SECTION 074213.19 - INSULATED METAL WALL PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Foamed-insulation-core metal wall panels.

B. Related Requirements:

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems.

C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.

D. Samples for Verification: For each type of exposed finish, prepared on Samples of size indicated below.

1. Metal Panels: 12 inches (305 mm) long by actual panel width. Include fasteners, closures, and other metal panel accessories.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal panels during installation.

1.7 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.8 COORDINATION

A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including rupturing, cracking, or puncturing.
b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: Two years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E72:

1. Wind Loads: As indicated on Drawings.
2. Other Design Loads: As indicated on Drawings.
3. Deflection Limits: For wind loads, no greater than 1/180 of the span.

B. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. (0.3 L/s per sq. m) when tested according to ASTM E283 at the following test-pressure difference:

1. Test-Pressure Difference: 1.57 lbf/sq. ft. (75 Pa).

C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E331 at the following test-pressure difference:

1. Test-Pressure Difference: 2.86 lbf/sq. ft. (137 Pa).

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

E. Fire-Test-Response Characteristics: Provide metal wall panels and system components with the following fire-test-response characteristics, as determined by testing identical panels and system components per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

1. Fire-Resistance Characteristics: Provide materials and construction tested for fire resistance per ASTM E119.
2. Surface-Burning Characteristics: Provide wall panels with a flame-spread index of 25 or less and a smoke-developed index of 450 or less, per ASTM E84.

2.2 FOAMED-INSULATION-CORE METAL WALL PANELS

A. General: Provide factory-formed and -assembled metal wall panels fabricated from two metal facing sheets and insulation core foamed in place during fabrication, and with joints between panels designed to form weathertight seals. Include accessories required for weathertight installation.

1. Insulation Core: Modified isocyanurate or polyurethane foam using a non-CFC blowing agent, with maximum flame-spread and smoke-developed indexes of 25 and 450, respectively.

a. Closed-Cell Content: 90 percent when tested according to ASTM D6226.
b. Density: 2.0 to 2.6 lb/cu. ft. (32 to 42 kg/cu. m) when tested according to ASTM D1622.
c. Compressive Strength: Minimum 20 psi (140 kPa) when tested according to ASTM D1621.
d. Shear Strength: 26 psi (179 kPa) when tested according to ASTM C273/C273M.

B. Concealed-Fastener, Foamed-Insulation-Core Metal Wall Panels: Formed with tongue-and-groove panel edges; designed for sequential installation by interlocking panel edges and mechanically attaching panels to supports using concealed clips or fasteners.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. CENTRIA Architectural Systems.
b. Kingspan Insulated Panels.
c. MBCI.
d. Metl-Span.

2. Metallic-Coated Steel Sheet: Facings of zinc-coated (galvanized) steel sheet complying with ASTM A653/A653M, G90 (Z275) coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A792/A792M, Class AZ50 (Class AZM150) coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A755/A755M.

    a. Nominal Thickness: 0.028 inch (0.71 mm).
    b. Exterior Finish: Two-coat fluoropolymer.

        1) Color: Match Architect's samples.

    c. Interior Finish: Siliconized polyester.

        1) Color: As selected by Architect from manufacturer's full range.

3. Backer Board: On back side of exterior facing at column wrap locations.
4. Panel Coverage: 36 inches nominal.
5. Panel Thickness: 2.0 inches.
6. Thermal-Resistance Value (R-Value): Minimum R5.0 per inch, according to ASTM C1363.

2.3 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet, ASTM A653/A653M, G90 (Z275 hot-dip galvanized) coating designation or ASTM A792/A792M, Class AZ50 (Class AZM150) aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.

1. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal panels.
2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

E. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
2. Joint Sealant: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

2.4 FABRICATION

A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

C. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.

D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
3. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.

5. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

    a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.5 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Panels and Accessories:

1. If indicated on Drawings: Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
2. Basis-of-Design: Metallic Fluoropolymer: AAMA 2605. Three-coat fluoropolymer finish with suspended metallic flakes containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
3. If indicated on Drawings: Exposed Anodized Finish:
    a. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.

2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.

    a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal panel manufacturer's written recommendations.

3.3 METAL PANEL INSTALLATION

A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal panels.
2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Steel Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

D. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weathertight performance of metal wall panel assemblies. Provide types of gaskets, fillers, and sealants indicated by metal panel manufacturer; or, if not indicated, provide types recommended by metal wall panel manufacturer.

1. Seal metal wall panel end laps with double beads of tape or sealant, full width of panel. Seal side joints where recommended by metal wall panel manufacturer.

3.4 INSULATED METAL WALL PANEL INSTALLATION

A. General: Apply continuous ribbon of sealant to panel joint on concealed side of insulated metal wall panels as vapor seal; apply sealant to panel joint on exposed side of panels for weather seal.

1. Fasten foamed-insulation-core metal wall panels to supports with fasteners at each lapped joint at location and spacing and with fasteners recommended by manufacturer.
2. Apply panels and associated items true to line for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.
3. Provide sealant tape at lapped joints of insulated metal wall panels and between panels and protruding equipment, vents, and accessories.
4. Apply a continuous ribbon of sealant tape to panel side laps and elsewhere as needed to make panels weathertight.

B. Foamed-Insulation-Core Metal Wall Panels: Fasten metal wall panels to supports with concealed clips at each joint at location and spacing and with fasteners recommended by manufacturer. Fully engage tongue and groove of adjacent panels.

1. Install clips to supports with self-tapping fasteners.

C. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.

D. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level. Install work with laps, joints, and seams that are permanently watertight.

1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to achieve waterproof performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

3.5 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074213.19

SECTION 095426 - WOOD CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Solid-wood, linear-panel ceilings for exterior applications.
   2. Wood-veneer, linear-plank ceilings for interior applications.

1.3 DEFINITIONS

A. NRC: Noise Reduction Coefficient.

1.4 COORDINATION

A. Coordinate layout and installation of wood ceilings and suspension systems with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For suspended wood ceilings.

   1. Include reflected ceiling plans, sections, and details, drawn to scale, showing the following:

      a. Wood ceiling patterns and joints.
      b. Ceiling suspension members.
      c. Method of attaching hangers to building structure and locations of cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.
      d. Ceiling-mounted items including, but not limited to, light fixtures, diffusers, grilles, speakers, sprinklers, and access panels.
      e. Ceiling perimeter and penetrations through ceiling; trim and moldings.

C. Samples: For each exposed product and for each type, color, and finish specified, 12 inches (305 mm) long by 12 inches (305 mm) wide or full width in size.

D. Samples for Initial Selection: For units with factory-applied colors and finishes.

1. Include Samples of accessories involving color and finish selections.

E. Samples for Verification: For the following products:

1. Wood Ceilings: 12-inch- (305-mm-) long by 12-inch- (305-mm-) wide or full-width Samples of each type, color, and finish.
2. Suspension-System Members: 12-inch- (305-mm-) long Sample of each type.
3. Exposed Molding and Trim: 12-inch- (305-mm-) long Samples of each type, color, and finish.
4. Veneer Edge Banding: Applied to a cut end of a wood-ceiling Sample for each type, color, and finish.
5. Filler Strips: 12-inch- (305-mm-) long Samples of each type, color, and finish.
6. Sound Absorbers: 12 inches (305 mm) long by full width.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver ceiling components and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they are protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

1. Store materials flat and level, raised from the floor.

B. Handle ceiling components and accessories in a manner that prevents damage.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not install interior ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.

1. Store and acclimatize wood products in the spaces where they will be installed for a minimum of 72 hours immediately before ceiling installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements" to design seismic restraints and attachment devices.

B. Structural Performance: Exterior suspended wood ceilings shall withstand exterior exposure, the effects of gravity loads, and the following loads and stresses without showing permanent deformation of ceiling system components or permanent damage to fasteners and anchors:

1. Wind Load: Uniform pressure indicated on Drawings, acting inward or outward.

Retain one option in "Seismic Criteria" Paragraph below or revise to suit Project. Verify requirements of authorities having jurisdiction.

C. Seismic Criteria: Provide suspended wood ceilings designed and installed to withstand the effects of earthquake motions in accordance with ASCE/SEI 7 and requirements of authorities having jurisdiction.

2.2 SOLID-WOOD, LINEAR-PANEL CEILING

A. Linear Ceiling Panels: Manufacturer's standard linear panels fabricated from kiln-dried solid-wood planks with up to 1/2-inch- (13-mm-) diameter knots and without finger joints, cracks, checks, or warp. Planks run parallel to panel length.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Armstrong World Industries, Inc.
    b. Norton Industries Inc.
2. Plank Species: Western hemlock.
3. Plank Cut: Manufacturer's standard.
4. Plank Width: 5-1/4 inches.
5. Plank Depth: 3/4 inch.
6. Plank Length: 96 inches.
7. Plank Edges: Square.
8. Reveal/Plank Spacing: 3/4 inch between long edges of planks.
9. Backing Boards: Manufacturer's standard, solid-wood boards.
10. Panel Module: 12 by 96 by 1-1/4 inches.
11. Panel Attachment: Provide black, zinc-aluminum coated steel sheet metal screws recommended in manufacturer's written installation instructions through factory pre-drilled holes in backing boards for attaching panels to grid suspension system, spaced to support ceiling and in accordance with manufacturer's written installation instructions.

12. Factory Finish: Manufacturer's standard exterior sealer and finish; applied on every wood surface.

    a. Surface-Burning Characteristics: Provide manufacturer's standard intumescent finish system with the following characteristics when tested in accordance with ASTM E84:

        1) Flame-Spread Index: 25 or less.
        2) Smoke-Developed Index: 450 or less.

    b. Plank Stain: Match Architect's sample.
    c. Plank Gloss: Manufacturer's standard.
    d. Backing Board Gloss and Color: Flat black.

B. Linear-Ceiling-Panel Accessories: Linear-ceiling-panel manufacturer's accessories required to provide a complete installation of ceiling in accordance with manufacturer's written installation instructions.

1. Wood Trim: As indicated on the Drawings; manufacturers standard solid wood finished to match planks; with trim connectors recommended in writing by ceiling and suspension-system manufacturers.

C. Grid Suspension System: ASTM C635/C635M; recommended in writing by ceiling and suspension-system manufacturers for applications indicated; main- and cross-runner system complete with suspension-system components required to support ceiling units and other ceiling-supported construction.

1. Material: ASTM A653/A653M, hot-dip galvanized, cold-rolled sheet steel, G60 (Z180) coating designation.
2. Structural Classification: Heavy-duty system.
3. Face Width: 15/16 inch.
4. Finish: Flat black.

2.3 WOOD-VENEER, LINEAR-PLANK CEILING

A. Linear Ceiling Planks: Manufacturer's standard planks consisting of wood veneer adhered to backs and exposed surfaces of manufacturer's standard composite-wood cores; with square-cut ends.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Armstrong World Industries, Inc.
    b. ASI Architectural.
    c. Norton Industries Inc.
    d. USG Corporation.

2. Surface-Burning Characteristics: Provide products with the following characteristics when tested in accordance with ASTM E84:

    a. Flame-Spread Index: 25 or less.

b. Smoke-Developed Index: 450 or less.

3. Veneer Face Grade: Manufacturer's standard.
4. Veneer Species: Maple.
5. Veneer Cut: Manufacturer's standard.
6. Nominal Plank Width: 6 inches.
7. Plank Depth: 3/4 inch.
8. Plank Length: 96 inches.
9. Plank Long Edge: Square.

    a. Reveal/Plank Spacing: 3/4 inch between long edges of planks.
    b. Reveal Filler Strip: Black felt.

10. Plank End Joints: Butt.
11. Veneer Adhesive: Manufacturer's standard that complies with requirements in "Performance Requirements" Article.
12. Factory Finish: Manufacturer's standard finish; applied on every wood surface.
    a. Stain: Match Architect's sample.
    b. Gloss: Manufacturer's standard.

B. Linear-Ceiling-Plank Accessories: Linear-ceiling-plank manufacturer's accessories required to provide a complete installation of ceiling in accordance with manufacturer's written installation instructions.

1. Attachment Clips: Manufacturer's standard metal clips for attaching planks to suspension system.
2. Plank Leveling Splines: Manufacturer's standard for aligning ends of planks.
3. Plank Splice Plates: Manufacturer's standard.
4. Acoustic Infill Panels: Manufacturer's standard to provide NRC rating indicated, with flame-spread index of 25 or less and smoke-developed index of 50 or less as determined by testing in accordance with ASTM E84.

    a. NRC: 0.50 when tested in accordance with ASTM C423.

5. Veneer Edge Banding: Manufacturer's standard matching planks for treating cut edges; with pressure-sensitive adhesive backing.
6. Trim: At exposed perimeter of ceilings; with trim connectors recommended in writing by ceiling and suspension-system manufacturers.

    a. Material: Wood-veneered composite wood, finished to match planks.

C. Grid Suspension System: ASTM C635/C635M; recommended in writing by ceiling and suspension-system manufacturers for applications indicated; main- and cross-runner system complete with suspension-system components required to support ceiling units and other ceiling-supported construction.

1. Material: ASTM A653/A653M, hot-dip galvanized, cold-rolled sheet steel, G60 (Z180) coating designation.
2. Structural Classification: Heavy-duty system.

3. Face Width: 15/16 inch.
4. Finish: Flat black.

D. Linear-Carrier Suspension System: ASTM C635/C635M and recommended in writing by ceiling and suspension-system manufacturer for applications indicated; complete with factory-applied linear clips spaced to match plank modules, splice sections, stabilizer, and suspension-system components required to support ceiling units and other ceiling-supported construction.

1. Material: ASTM A653/A653M, hot-dipped galvanized, cold-rolled sheet steel, G60 (Z180) coating designation.
2. Structural Classification: Heavy-duty system.
3. Carrier Splices: Same metal, profile, and finish as for carriers.
4. Stabilizer Channels, Tees, and Bars: Manufacturer's standard components for stabilizing main carriers.
5. Finish: Flat black.

2.4 SUSPENSION-SYSTEM HANGERS, BRACES, AND TIES

A. Attachment Devices: Size for 5 times the design load indicated in ASTM C635/C635M, Table 1, Direct Hung, unless otherwise indicated.

1. Cast-in-Place and Postinstalled Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to 5 times that imposed by ceiling construction as determined by testing in accordance with ASTM E488/E488M or ASTM E1512, as applicable, conducted by a qualified testing and inspecting agency.

a. Type: Postinstalled expansion or Postinstalled bonded anchors.
b. Corrosion Protection:

1) For interior applications: Carbon-steel components zinc plated to comply with ASTM B633, Class Fe/Zn 5 (0.005 mm) for Class SC service condition (mild).
2) For exterior applications: Stainless steel components complying with ASTM F593 and ASTM F594, Group 1 Alloy 304 or 316 for bolts; Alloy 304 or 316 for anchors.

B. Wire Hangers, Braces, and Ties: Provide wire complying with the following requirements:

1. For interiors applications: Zinc-Coated, Carbon-Steel Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper.
2. For exterior applications: Stainless Steel Wire: ASTM A580/A580M, Type 304, nonmagnetic.

3. Size: Select wire diameter so its stress at 3 times the hanger design load indicated in ASTM C635/C635M, Table 1, Direct Hung is less than yield stress of wire, but provide not less than 0.106-inch- diameter wire.

C. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.

D. Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.

E. Angle Hangers: Angles with legs not less than 7/8 inch (22 mm) wide; formed from 0.04-inch- (1.0-mm-) thick, galvanized-steel sheet complying with ASTM A653/A653M, G90 (Z275) coating designation; with bolted connections and 5/16-inch- (8-mm-) diameter bolts.

F. Seismic Stabilizer Bars: Grid-suspension-system manufacturer's standard perimeter stabilizers designed to accommodate seismic forces.

G. Seismic Struts: Suspension-system manufacturer's standard compression struts designed to accommodate seismic forces.

H. Exterior Bracing: Cold-rolled steel channels and angles, hot-dip galvanized to comply with ASTM A653/A653M, G60 (Z180) coating designation; size and profile as required to withstand wind load.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing and substrates to which suspended wood ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage, and with requirements for installation tolerances and other conditions affecting performance of suspended wood ceilings.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of suspended wood ceilings.

1. Balance border widths at opposite edges of each ceiling.
2. Avoid using less-than-half-width units.

3.3 INSTALLATION

A. Comply with ASTM C636/C636M and seismic requirement indicated, in accordance with manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns in 3 inches (76 mm). Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate to which hangers are attached and for type of hanger involved.
5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both structure to which hangers are attached and type of hanger involved. Install hangers in a manner that does not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts or postinstalled mechanical or adhesive anchors that extend through forms into concrete.
7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
8. Do not attach hangers to steel deck tabs.
9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
10. Space hangers not more than 48 inches (1219 mm) o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches (203 mm) from ends of each member.
11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

C. Install edge moldings and trim at perimeter of ceiling area and where necessary to conceal edges and ends of wood units.

1. Screw-attach metal moldings to substrate at intervals of not more than 16 inches (406 mm) o.c. and not more than 3 inches (76 mm) from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet (3 mm in 3.7 m). Miter corners accurately and connect securely.
2. Do not use exposed fasteners on moldings and trim.

D. Grid Suspension Systems: Space main beams at 48 inches (1219 mm) o.c.

1. Install cross tees to form modules sized in accordance with manufacturer's written installation instructions.
2. Remove and replace dented, bent, or kinked members.

E. Linear-Carrier Suspension Systems: Install carriers at no more than 24 inches o.c. aligned and securely interlocked with one another.

1. Install stabilizer channels, tees, and bars at regular intervals to stabilize carriers and at light fixtures, air-distribution equipment, access doors, and other equipment; spaced as standard with manufacturer for use indicated.
2. Remove and replace dented, bent, or kinked members.

F. Install wood components and accessories in accordance with manufacturer's written instructions and to accommodate natural expansion and contraction of wood products resulting from fluctuations in humidity.

G. Cut wood components for accurate fit at borders and at interruptions and penetrations by other work through ceilings.

1. Stiffen edges of cut wood components as required to eliminate variations in flatness.

H. Treat field-cut edges of wood components in accordance with manufacturer's written recommendations; finish exposed field cuts to match factory finish.
1. Wood-Veneer Units: Edge band exposed field-cut edges.

I. Install wood components in coordination with suspension system and moldings and trim.

1. Install wood components in patterns indicated on Drawings.

J. Install field-constructed access panels in locations indicated on Drawings.

3.4 CLEANING

A. Clean exposed surfaces of ceilings, including trim and edge moldings. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage, including dented units.

END OF SECTION 095426

SECTION 115213 – PROJECTION SCREENS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Provide project screen units as shown and indicated.

B. Type of project screens include:

1. Motorized Unit

1.03 QUALITY ASSURANCE

A. Provide each type of project screen as a complete unit produced by a single manufacturer, including necessary mounting brackets, accessories, fittings and fastenings.

1.04 SUBMITTALS

A. Shop Drawings: Submit shop drawings showing surrounding construction, mounting, wiring, switch locations, etc.

1.05 DELIVERY, STORAGE AND HANDLING

A. Do not deliver projection screens until building is enclosed and ready for screen installation. Protect screens from damage during delivery, handling, storage and installation.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Bretford Series 750 motorized screen 110V with designer slat and low voltage controls.

B. Draper.

C. Basis-of-Design: Da-Lite Advantage, Matte White, 110V with LVC.

1.03 MOTORIZED SCREEN

A. Provide motorized projection screen units for type of mounting shown, housed in baked enamel finished metal case with universal mounting brackets.

B. Designed for permanent recessed in ceiling installation

C. Electronically operated to raise or lower the screen to the desired height. An adjustable up and down limit switches to set the points at which the screen extends and retracts. Provide low voltage control and coordinate with the Crestron controls being utilized.

D. Steel case finished in WHITE powder-coat paint.

E. Screen Fabric: Manufacturer's standard, flame and mildew resistant, and as follows:

1. Matte white fabric

2. 2" black border.

F. Size 96” x 96” or as called out on the Drawings

PART 3 – EXECUTION

3.01 INSTALLATION

A. Install project screen units and accessories at locations shown in accordance with manufacturer's instructions. Install level, plumb, secure and at proper height. Coordinate with other trades for securing projection screen units to finished surfaces.

B. Repair or replace damaged units as directed by Architect.

C. Provide protection for installed units so that they will be in perfect operating condition, without damage, at completion of project.

END OF SECTION 115213

SECTION 116133 – RIGGING SYSTEMS

Part 1. General

A. GENERAL REQUIREMENTS

RELATED DOCUMENTS

1. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

GOVERNING CLAUSE

2. For the sake of brevity, these specifications shall omit phrases such as "Contractor shall furnish and install", "unless otherwise indicated or specified", etc., but these phrases are nevertheless implied. Mention of materials and operations requires the Contractor to furnish and install such materials and perform such operations completely to the satisfaction of the owner's representative.

SCOPE OF WORK

3. One company shall be responsible for the installation of all aspects of the stage rigging equipment. Work under this section shall include furnishing all labor, materials, tools, transportation services, supervision, etc., necessary to complete installation of the stage rigging equipment as well as any other items as herein listed, all as described in these specifications, as illustrated on the accompanying drawings; or as directed by the Owner's Representative. Work includes the following:

   a. Motorized Rigging

SUBSTITUTIONS:

4. Specific items of equipment are specified by trade names. It has been determined by the systems designer that these are the particular items desired by the Owner and establish a standard of quality, equipment function and/or process. It is not the purpose or intent of these documents to eliminate competitive bids. In order to allow proper and fair comparison of pricing, contractors are required to submit their base bid price on the specified equipment. A contractor may submit an alternate bid based on equipment different from that specified only if that Contractor has received prior approval in writing from the Architect at least 10 days prior to bid. Accompanying each request shall be a letter specifically detailing each substitution including catalog data, specifications, operative samples, technical information, drawings, performance and test data, and complete descriptive and functional information to assist in a fair evaluation. Failure to submit any substitution for prior approval or not providing sufficient data for evaluation shall require the exact item specified to be furnished. Architect's approval of a substitution for bid purposes will not relieve the contractor from the responsibility of meeting all specification criteria. If an approval of a substitution is granted, the Contractor shall be fully responsible for any and all changes (wiring, power, distribution, support structure, etc.) such substitution shall require.

DEFECTIVE OR NON-APPROVED MATERIALS

5. Should any equipment be found defective, not meeting specifications, or that which has not been approved in writing by the Architect shall, upon discovery (including any time within the period of the guarantee), be replaced with the specified equipment or material at no additional cost.

GUARANTEE

6. The Contractor shall guarantee all of the work that is performed under this contract, including all materials, and workmanship, for a period of three (3) years from the date of full acceptance of the work in accordance with the following conditions.
7. Warranty shall be in effect on materials and equipment for three years from the date of system commissioning under the following conditions:
    a. Maintaining the warranty in effect requires annual inspection of the system by a factory trained and certified contractor. Continuing annual inspection is strongly encouraged.
    b. The three year warranty is contingent upon annual inspection at the end of the first and second years of service. The end user is responsible for making arrangements for each inspection with the contractor identified on the Motor Controller or a factory certified inspector/installer.
    c. In the event annual inspection is not requested and performed at the end of the first or second year of service, the warranty shall become void at the end of that year of service.
    d. Each warranty inspection report must be sent to the factory by the inspecting contractor within 10 days of completing the inspection.

8. Nothing in this guarantee shall cause repair or replacement by the Contractor where negligence, neglect or improper operation by the Owner has caused the failure of any equipment installed under this contract.

DISCREPANCIES

9. All equipment shall be sized to fit properly. The exact measurements are the responsibility of the Contractor. If there are discrepancies in the specifications, the Contractor shall ask for a clarification from the Architect. If no clarification is requested, the Architect's judgment shall rule.

SYSTEM INTEGRATOR

10. The Contractor may utilize a System Integrator to coordinate and assist in the installation of all aspects of the motorized rigging equipment as specified in this section. This shall include but not be limited to all motorized rigging and miscellaneous equipment. The following companies have prior approval as System Integrator:
    1) Beck Studios, Milford OH
    2) Scenic Solutions, Dayton OH
    3) Vincent Lighting Systems, Erlanger KY

11. In order to be considered as a System Integrator on this project, each Contractor requesting approval must submit to the Architect at least ten (10) days prior to the date of bid opening a letter expressing his intent to bid. This letter shall include a list of at least five (5) projects of similar size and scope completed by this firm within the last five (5) years. Inspection of one completed installation may be requested by the Architect/Engineer's Representative prior to consideration of request to bid. The System Integrator shall have been in business under the same name for five (5) full years preceding the date of this bid doing work similar to the type specified. ETCP certification in theatre rigging is required by the lead installer or project manager of the System Integrator to receive approval to bid. Verification of this certification must be provided to be considered for approval. The decision of the Architect as to the capability of the Bidder to successfully complete and maintain the system based on this pre-qualification information shall be final.
12. Pre-Bid request letter shall include a statement that all major items of equipment shall be bid and supplied as specified, or shall contain details of all proposed substitute equipment for review by the Architect/Engineer's Representative. Substitute equipment items to include specifications, parts numbers, and details of interconnection to proposed system. The decision of the Architect as to the acceptability of substitute equipment shall be final.
13. The System Integrator shall employ only fully trained stage riggers and mechanics, for the erection of the stage equipment. The stage riggers shall be completely familiar with the type of equipment to be installed. A competent job superintendent shall be on the job at all times when work is in progress. The job superintendent must be ETCP certified in theatre rigging. A copy of the certification must be furnished to the General Contractor prior to the start of the installation.

ACCEPTABLE EQUIPMENT MANUFACTURERS

14. For the purposes of establishing a standard of quality desired on this project, the rigging hardware products of Electronic Theatre Controls of Middleton, Wisconsin are specified.
15. All other companies must receive prior approval to bid this project. Please refer to the section regarding substitutions.

DOCUMENTATION

16. SHOP DRAWINGS: Shop drawings and equipment data sheets shall be submitted to the Architect under general provisions within 45 days after award of the contract. Failure to comply with this 45 day requirement shall be cause for disqualification of the selected Contractor and cancellation of contract without cost to the owner, on the basis that the selected Contractor does not have the ability or intention to comply with the specifications. Approval of submitted equipment shall be obtained prior to equipment purchase or fabrication. If shop drawings are rejected, correct and resubmit in the manner specified. All shop drawing information shall be submitted at the same time; no partial submittal shall be accepted. Drawings shall indicate complete details, dimensions, product types and locations of all equipment, clearances required, guides, cables, sets, Contractor fabricated equipment, and all other details required to completely describe the work to be performed. Submittals drawings shall be presented at a scale not less than 1/4" for equipment layouts and ½" = 1'-0" for equipment details, mounting and other details. Each sheet shall allow space for approval stamps and have the name of the project, the contractors and/or the supplier's name, address telephone number, and the date submitted. Submit the following items for Architect's approval, prior to fabrication:

    a. Stage plan view

b. Stage side section view
c. Gridiron layout indicating all stage equipment
d. Electrical riser diagrams indicating the necessary power and control wiring for all rigging equipment and systems
e. Plan and elevation views indicating all power, motor and control hardware locations and layout
f. Provide full dimensions for panel layouts with finishes and materials for all custom panels
g. Details of installation and erection, including adjoining conditions and necessary clearances
h. Indication by arrow and boxed caption of each variation from contract drawing and specifications, except those indicated as acceptable in specifications or on drawings

17. RECORD DRAWINGS AND DATA: Submit in accordance with General Provisions. Within 30 days of final test and completion of the installation, submit the following to the Architect:

a. Three (3) complete sets of "as built and approved" drawings showing systems and elements as installed, including field modifications and adjustments
b. Three (3) sets of maintenance data including a list indicating replacement parts lists for all items of equipment, wiring diagrams, control diagrams, any and all keys for cabinets, racks, key operated switches etc. and complete operation manuals.
c. Three (3) Certificates of Guarantee

18. INSTRUCTION OF OWNER PERSONNEL: This contractor or his representative, fully knowledgeable and qualified in systems operation, shall provide four (4) hours of instruction to the Owner-designated personnel on the use and operation of this System. Designated instruction times shall be arranged through the Architect.
19. PERMITS: Obtain all permits necessary for the execution of any work pertaining to the installation, and conform in all trades with all applicable local codes and national codes. Obtain all permits necessary for operation of any equipment by the Owner.
20. CLEAN UP: It shall be the responsibility of this Contractor to remove all debris from the building or site caused by his operations to a common trash point or receptacle on the job site, as determined by the General Contractor.

RIGGING HOISTS

General

21. Hoists shall be purpose-designed and fabricated for overhead lifting of theatre lights, equipment, curtains and scenic elements, whether used on stage, in the auditorium or other places of public assembly where people shall move beneath the suspended or moving load. The systems shall incorporate mechanical, electrical and safety features that shall be inherent to this equipment; they shall provide an engineered, efficient device for overhead lifting. The mechanical, electrical and safety features of this hoisting and control system shall establish the standard of quality, performance and safety by which hoisting systems of other manufacture shall be evaluated.

22. Each hoist shall be fully tested under full rated load throughout its full travel distance with all its lift lines terminated to the hoist before the hoist is shipped from the manufacturer. Only hoists that successfully pass the following pre-shipment testing shall be sent to any job site. Hoists that are not tested as a complete system with the wire rope and loft blocks that will install with the hoist in the field shall not be acceptable. Testing shall include:

    a. Hoist operation
    b. Hoist/motor speed
    c. Lift line terminations under load
    d. Braking and stopping under load
    e. Load cell functions
    f. Slack line detection
    g. Position sensing
    h. Hoist noise

23. A record of testing and its results shall be available for review at the manufacturer's facility.
24. A copy of all testing results must be furnished by the installing contractor to the architect or owner representative at the time of system commissioning. Manufacturers who cannot provide testing results shall not be acceptable.
25. Paint as required under this section shall be the manufacturer's standard finish and color except as noted.
26. All equipment items shall be new and conform to applicable provisions of Underwriters' Laboratories (UL), American Standards Association (ASA), American National Standards Institute (ANSI), National Fire Protection Association (NFPA) Life Safety Code 01, National Electric Code (NEC) and PLASA.

    a. Where acceptable equipment items are specified by catalog number only, device shall meet all published manufacturer's specifications. Where quantities or sizes are not given, refer to drawings. Where two or more products are listed, contractor may use either, at his discretion. Equipment shall not be substituted without specific written approval by the Architect under the substitution paragraphs of these specifications.
    b. All pipe battens shall be fabricated from 1.5" Schedule 40 pipe.
    c. All turnbuckles and cable clips shall be drop forged.
    d. All turnbuckles and clips, tracks, chains and other items of incidental hardware shall be furnished plated or painted. Wire rope shall be galvanized. Fasteners, chain, and other miscellaneous hardware shall be either cadmium or zinc plated.
    e. All materials used in this project shall be new, unused and of the latest design. Refurbished materials are not permitted.
    f. In order to establish minimum standards of safety, a minimum factor of 10 shall be required for all equipment and hardware used on this project. In addition, the following factors shall be used:

Cables and fittings	10 Design Factor
Cable bending ratio	26 times diameter
Max. fleet angle	2 degrees
Steel	1/5 of yield
Bearings	Two times required load at full for 2000 hours

HOISTS

27. Each wire rope lift line shall adhere to a design factor of 10:1 with an ultimate strength of 4200 pounds. All load path components between the building structure and the batten shall exceed the breaking strength of the wire rope. The motor brake shall be rated at least at 125% of the motor torque.
28. Hoists shall be capable of supporting the following loads:
    a. General purpose Variable Speed 0-180 fpm, 1200 pound capacity in standard configuration. Powerhead shall measure no more than 16” high x 16” w x 55 ¼” long and weigh 495 pounds
    b. General purpose 30 fpm 900 pound capacity in standard configuration. Powerhead shall measure 16” high x 16” w x 47 1/2” long and weigh 395 pounds
    c. General purpose 30 fpm 1400 pound capacity in standard configuration. Powerhead shall measure 16” high x 16” w x 47 1/2” long and weigh 395 pounds
    d. General purpose 30 fpm 2000 pound capacity in standard configuration. Powerhead shall measure 16” high x 18” w x 53 1/2” long and weigh 580 pounds
    e. Stage Electric 30 fpm 650 pound capacity in standard configuration. Powerhead shall measure 16” high x 16” w x 47 1/2” long and weigh 395 pounds
    f. Stage Electric 30 fpm 1000 pound capacity in standard configuration. Powerhead shall measure 16” high x 16” w x 47 1/2” long and weigh 395 pounds
    g. Stage Electric 30 fpm 1500 pound capacity in standard configuration. Powerhead shall measure 16” high x 18” w x 53 1/2” long and weigh 580 pounds
29. The standard general purpose hoist shall consist of the following major components: 1) Powerhead, 2) Right Angle Cable Adjuster (RACA) and 3) pipe batten.
30. The standard stage electric hoist shall consist of the following major components: 1) Powerhead, 2) cable management system, loft blocks, lift line and lift line terminations Right Angle Cable Adjuster (RACA), 3) pipe batten and power/control distribution strip
31. The hoist shall include the following features:
    a. A Powerhead containing the following elements: the gear motor, motor brake, load brake, limit switches operating electronics, load cell, slack line detector, absolute position sensors, cable drum assembly, and wire rope.
    b. The hoist shall incorporate a built-in load cell.
    c. The hoist shall incorporate a built-in slack line sensor.
    d. The hoist shall include the emergency contactor built into the hoist.
    e. Hoists that do not include built-in load cell, built-in slack line detection, and an emergency contactor shall not be acceptable.
    f. Hoists that do not use absolute position encoders shall not be acceptable.
32. The hoist shall be manufactured from UL Listed components and shall be UL Listed and tested as a complete system (not just UL listed parts).

POWERHEAD

33. The Powerhead shall be a fully enclosed, powder coated sheet metal housing that shall prevent contact with moving and electrical parts and shall provide protection against dirt, dust and debris.
34. Hoist assemblies that do not have metal housings prohibiting access to moving parts shall not be acceptable.

35. For setup and maintenance, the following functions shall be available from the Powerhead: power and operating switches, address setting knobs, limit switch setting knobs, limit switch override button, indicators for power, status and communication. Each of these functions shall be clearly labeled.

GEARMOTOR AND MOTOR BRAKE

36. The gear motor and motor brake shall be an integral unit from a single manufacturer. It shall operate on 208 Volt or 480 Volt 60 Hz, 3 phase current for fixed speed units and 480 Volt, 60 Hz, 3 phase current for variable speed hoists.
37. The motor brake shall be integral to the gear motor and shall be capable of holding 125% of the motor full load torque.
38. The motor brake shall be spring actuated to apply and hold braking force.
39. The motor brake shall be magnetically released and held open upon actuation.

LOAD BRAKE

40. Fixed Speed Hoists
    a. The rotary disk load brake shall bring the moving load to a complete stop and shall hold the load in position in the event of a mechanical failure of the motor, motor brake or gearbox.
    b. Noise from the load brake shall be minimally audible at any time in the operational cycle.
    c. Normal hoist operation shall not be limited by heat or noise caused by the load brake.
    d. The load brake shall be electrically released when the load is moving in the up direction. The load brake shall always be engaged when the load has stopped moving either up or down.

41. Variable Speed Hoists
    a. The rotary disk load brake shall open upon activation of hoist movement and shall close after the load has come to a stop; it shall hold the load in position.
    b. Noise from the load brake shall be minimally audible at any time in the operational cycle.
    c. Normal hoist operation shall not be limited by heat or noise caused by the load brake.
    d. The load brake shall be electrically released when the load is moving either up or down. The load brake shall always be engaged when the load has stopped moving either up or down.

WIRE ROPE DRUM

42. The drum shall be capable of wrapping up to eight 3/16” diameter 7 x 19 galvanized aircraft (utility) wire rope lift lines up to 50’ long in a compact manner. They shall be managed by a wire rope (cable) keeper integral to the Powerhead. The drum design shall prevent wire rope from tangling or crossing over itself.

LIMIT SWITCH

43. A limit switch assembly shall be mounted within the Powerhead for hard “normal” and “ultimate” end of travel limits. Hard end of travel limits shall be set/adjusted at the time of installation aided by an indicator light visible on the bottom panel of the Powerhead cover. Any system that indicates that the limit has been set by audible or tactile means only shall not be acceptable.

LOAD SENSOR/LOAD PROFILING.

44. A load sensor shall be built into the Powerhead to create a profile of the actual load on the hoist as it travels through its normal cycle. The profile may be changed by “re-training” the profiling system whenever the suspended load is changed on the batten by activating a key-switch operated training cycle on the motor controller. The load sensor shall continuously monitor the load when load sensing is turned on.

POSITION SENSOR

45. A position sensing system shall be built into the Powerhead to provide accurate position information. The system shall consist of two absolute sensor types that provide accurate position information for each batten at power-up of the system. Hoisting systems that require re-homing shall not be acceptable. Incremental encoders shall not be acceptable for position readout purposes.

SLACK LINE DETECTOR

46. The slack line detector shall be built into the Powerhead. When a slack line condition in excess of 15” develops in a lift line, the slack line detector shall remove power from the hoist. The batten shall be allowed to move only in the upward direction to allow removal of the cause of the slack line fault.

LOCAL USER INTERFACE TO POWERHEAD

47. User interface at the Powerhead control panel at the rear of the hoist shall include:

    a. Hoist Up/Down Control
    b. Limit Switch override buttons (tool accessible)
    c. Address switches
    d. Status LED’s

INFORMATION STORAGE WITHIN POWERHEAD

48. Record of severe fault conditions with date and time stamp
49. Record of E-stops, overloads, moves and power cycles
50. Record of travel distance and peak loads since installation/inspection
51. Hoist systems that do not record the above data shall not be acceptable.

LOFT BLOCKS

52. Each loft block shall be an assembly of steel side plates, a wire rope idler, sheave, bearings, shaft locked against rotation and support hardware. The blocks shall be positioned no closer than 4’-0” from each other, unless muled.
53. Loft block sheaves shall measure 5” in diameter and contain a pair of press fit sealed ball bearings. Lift lines shall travel in a groove shaped and sized for 3/16” diameter wire rope per the latest edition of the Wire Rope Users’ Manual as published by the Wire Rope Technical Board. The loft block sheave shall be concentric about the hub and shall be evenly balanced for ease of rotation.

54. An idler shall be incorporated into the top assembly of the loft block to guide and support lift lines as they pass the block.
55. Hoisting systems requiring the loft blocks to be mounted directly to the facility structure shall not be accepted for this project.

LIFT LINE TERMINATIONS

56. Each lift line shall be terminated in the Powerhead via a standard copper oval compression sleeve installed/crimped at the factory.
57. Lift lines shall be terminated at the load hanger with a low profile Right Angle Cable Adjuster (RACA) ™, thimble and copper oval compression sleeve. The RACA and cable terminations at the batten shall be installed at the time of hoist installation.
58. Batten trim shall be adjustable up to 6” via the RACA.
59. Systems utilizing turnbuckles or chain to trim the batten shall not be accepted for this installation.

HANGERS

60. Raceway hangers shall be specially shaped flat bar that shall support the wire rope termination hardware and secure the raceway and the pipe batten.

CABLE MANAGEMENT FOR ELECTRICS

61. TRADITIONAL CABLE MANAGEMENT FOR ELECTRICS
    a. Load circuits and data wiring shall be fed to a standard stage distribution trough by multi-conductor SO cable supported by cable cradles suspended from one of the Prodigy hoist lift lines. The SO cable shall be held in place at the distro by means of a dedicated strain relief assembly.
    b. Single or multiple multi-conductor SO cables and multiple cable cradles can be suspended from a single lift line so long as the Working Load Limit (WLL) of the lift line is not exceeded. PIPE BATTEN

62. The pipe batten shall be 1½” schedule 40 grade A, seamless pipe fabricated in the largest possible lengths without splices. Battens of greater length shall be spliced by means of .120 x 1 9/16 dia. DOM tube 18” long with 9” of tube inserted into each half of the splice. The tight fitting splice tube shall be held in place by a pair of 3/8 x 2 ½” grade 5 hex bolts on each side of the joint. The bolts shall pass through the pipe at an angle of 90° to each other. There shall be two bolts on each side of the joint spaced 1” and 8” from the joint. Alternatively, one pair of bolts on one side of the joint may be replaced with either plug welds or tight fitting steel rivets. Pipes shall be straight and painted flat black.
63. A safety-yellow batten cap shall be installed at each end of each pipe batten.
64. The manufacturer shall provide up to four self-adhesive labels for each batten on which the rated batten load shall be written by the installer.

POWER AND CONTROL DISTRIBUTION (PCD)

65. Each hoist shall receive power and control via a pair of 8’-0” long cables extending from the Powerhead to the source outlets. Receptacles shall be installed in a sheet metal junction box or trough with outlets. Each outlet shall be located no more than 6’-0” away from the rear face of each hoist.

66. Each Powerhead shall include a power cord hardwired to the hoist with an appropriately sized grounded twist-lock connector at the PCD end and a removable control cable with a circular 9 pin connector at each end. An appropriately rated 3 phase breaker in the PCD is included. The wiring and connectors shall be barriered between high and low voltage.
67. The power/distribution channel shall be UL LISTED for this application.

Part 2. Rigging Motorized Hoists

GENERAL

1. Hoists shall be purpose-designed and fabricated for overhead lifting of theatre lights, equipment, curtains and scenic elements, whether used on stage, in the auditorium or other places of public assembly where people shall move beneath the suspended or moving load. The systems shall incorporate mechanical, electrical and safety features that shall be inherent to this equipment; they shall provide an engineered, efficient device for overhead lifting. Hoists shall be FlyPipe by ETC, Inc., or approved equal
2. Anodization as required under this section shall be the manufacturer's standard finish and color except as noted
3. All equipment items shall be new and conform to applicable provisions of Underwriters' Laboratories (UL 1340), American National Standards Institute (ANSI E1.6-1:2018, and C63.4:2014), and the National Fire Protection Association (NFPA 70)
4. Where acceptable equipment items are specified by catalog number only, device shall meet all published manufacturer's specifications. Where quantities or sizes are not given, refer to drawings. Where two or more products are listed, contractor may use either, at his discretion. Equipment shall not be substituted without specific written approval by the Architect under the substitution paragraphs of these specifications
5. Provided wire rope shall be galvanized
6. All materials used in this project shall be new, unused and of the latest design. Refurbished materials are not permitted
7. In order to establish minimum standards of safety, a minimum design factor of 10 shall be required for all equipment and hardware used on this project. In addition, the following factors shall be used:

    a. Cables and fittings 10:1 Design Factor
    b. Cable bending ratio 25 times diameter
    c. Maximum fleet angle 0 degrees

HOISTS

8. Hoist shall be self-climbing with a maximum supported travel of 50’

    a. Hoists which are not self-climbing shall not be acceptable

9. Each dual 1/8” wire rope lift line sets shall adhere to a design factor of 10:1 with an ultimate combined strength of 4,200 pounds
10. Configured hoists components shall be capable of supporting a total live load of 500 pounds suspended from the batten as follows:

    a. General purpose FlyPipe Drive Section shall measure 26.25” high x 14” w x 11’-0.5” long and weigh 140 pounds
    b. General purpose FlyPipe End Section shall measure 12” high x 5.5” w x 7’-1.5” long and weigh 40 pounds

c. General purpose FlyPipe Span Section shall measure 12” high x 5.5” w x 10’0” long and weigh 60 pounds

11. The FlyPipe self-climbing hoist shall consist of the following major components:

a. Motor Section
b. Span Sections (if required)
c. End Section
d. A set of TwinLines (dual 1/8” GAC lift lines) per section
e. One TwinLine Clamp per set of lift lines
f. Pipe batten (if required)

12. Integrated into the bottom of the FlyPipe sections will be an aluminum strut-compatible channel. The channel shall support point loads up to 250 punds

a. Hoists which do not support direct connection of stage equipment or lighting fixtures shall not be acceptable

13. The hoist shall be manufactured from UL Listed components and shall be UL Listed and tested as a complete system (not just UL listed parts)

DRIVE SECTION

14. The Drive Section shall include a fully enclosed, powder coated sheet metal housing that shall prevent contact with moving and electrical parts and shall provide protection against dirt, dust and debris
15. The Drive Section shall contain the following elements: the gear motor, motor brake, limit switches, remote operating electronics, slack line detector, position sensor, cable drum assembly, and wire rope
16. The hoist shall incorporate a built-in slack line sensor
17. The hoist shall include the emergency contactor built into the hoist
18. The following functions shall be available: operating switches, address setting knobs, limit switch override buttons, indicators for power, status and communication. Each of these functions shall be clearly labeled

GEARMOTOR AND MOTOR BRAKE

19. The gear motor and motor brake shall be an integral unit from a single manufacturer. It shall operate on 208 Volt or 480 Volt 60 Hz 3-phase power
20. The motor brake shall be integral to the gear motor and shall be capable of holding 125% of the motor full load torque
21. The motor brake shall be electro-magnetically held open, and spring actuated to apply and hold braking force

Over Speed Load Arrest Brake

22. The over speed mechanism shall detect a runaway condition and trigger a load arresting device to stop the load
23. Noise from the over speed brake shall not be audible at any time in the operational cycle of the hoist
24. Normal hoist operation shall not be limited by heat or noise caused by the load brake

WIRE ROPE DRUM

25. Each Drive, Span, and End Section shall contain one drum

26. Each drum shall accommodate two, 1/8” diameter 7 x 19 galvanized aircraft (utility) wire rope lift lines up to 50’ long in a compact manner on the cable drum. The drum design shall prevent wire rope from tangling or crossing over itself

LIMIT SWITCH

27. A limit switch assembly shall be mounted within the Drive Section for hard “normal” and “ultimate” end of travel limits. Hard end of travel limits shall be set/adjusted at the time of installation

    a. Installation shall be aided by an indicator light visible on a panel of the Drive Section enclosure. Any system that indicates that the limit is set only by audible or tactile means only shall not be acceptable

POSITION SENSOR

28. A position sensing system shall be built into the Drive Section to provide accurate position information. The system shall consist of an encoder sensor that provides accurate position information for each batten at power-up of the system, and continually throughout its normal operation. Hoisting systems that require re-homing shall not be acceptable

SLACK LINE DETECTOR

29. The slack line detector shall be built into the Drive Section. When a slack line condition in excess of 24” develops in a lift line, the slack line detector shall remove power from the hoist. The hoist shall be allowed to move only in the upward direction to allow removal of the cause of the slack line fault

LOCAL USER INTERFACE

30. User interface located on the Drive Section shall include:

    a. Hoist Up/Down Control
    b. Limit Switch Override buttons (tool accessible)
    c. Address switches
    d. Status LED’s

INFORMATION STORAGE WITHIN DRIVE SECTION

31. Record of severe fault conditions with date and time stamp
32. Record of E-stops, overloads, moves and power cycles
33. Record of travel distance since installation/inspection

HOIST POWER AND CONTROL CABLES

34. Each Drive Section shall require a power cord and Cat 5e (or better) connected between receptacles mounted in the hoist and hoist power and communication distribution (PCD) equipment by ETC. Inclusion of a 20 amp 3-phase breaker in the PCD is optional. PCD equipment shall incorporate a barrier between high and low voltage components. Proper strain relief at the Drive Section shall be provided

PIPE BATTEN

35. A pipe batten with a 48.3mm outside diameter constructed of 3.8mm extruded aluminum with a 3.8mm vertical web shall be available for use with the hoist
36. The pipe batten shall be extruded with a witness line to indicate the position of the web
37. The pipe batten shall support a maximum distributed load of 150lb / 68kg over a 10ft / 305cm span
38. The pipe batten shall support a maximum point load of 65lb / 29kg over a 10ft / 305cm span
39. The pipe batten shall weigh no more than 1.5lbs/ft, battens that weighs more than 1.5lbs/ft shall not be acceptable
40. The pipe batten shall be designed to a 10:1 safety factor
41. The pipe batten shall be finished with black hardcoat anodization

POWER AND CONTROL DISTRIBUTION

42. The hoist and hoist cable management system shall allow for the attachment of dedicated circuit and data distribution equipment
43. The circuit and data distribution equipment shall be UL Listed for this application

CABLE MANAGEMENT

44. Supplied motor power and control wiring shall be fed to the motor control enclosure by multi-conductor SO cable and Cat 5e (or better) cable. Each cable shall be held in place at the enclosure by means of a dedicated strain relief assembly

HELIX CABLE MANAGEMENT FOR ELECTRICS

a. The load circuits and data wiring shall be fed to the power distribution equipment by one or more UL Listed helix cable management systems. The helix shall allow the feeder cable and data wiring to stack and store without imposing a direct physical load on the connector strip
b. The helix shall consist of a series of steel ribs connected to each other with nylon straps to allow the entire distance of travel required by the batten, up to 50’
c. The nylon straps shall attach directly to building structure. At the bottom, the helix shall be attached to a steel plate in a manner that imposes no additional physical load on the power distribution equipment
d. The helix shall support two pairs of cables:
    1) One hoist power and data pair with factory-installed connectors at each end
    2) One distribution power and data pair which shall be unterminated. Distribution power cable shall support either three or six 20A circuits. Circuits may be 120V, 208V, or a combination of the two. Data distribution cable shall be a single Cat 5e which may be used to transmit either DMX or Ethernet
    3) Hoist power and distribution equipment power cables be multi-conductor SO cable. The SO cables and data cables shall be held in place by means of a dedicated strain relief assembly.
    4) All cables shall be UL LISTED
e. The helix shall support each pair on opposite ends of each steel rib, managing the cables within required NEC bending radii
f. The ribs shall stack/separate as the batten is lowered/raised and shall not impede the movement of the line set

g. Cables supported by the helix shall never heat in excess of the rated temperature maximum of the cable when all circuits are loaded at maximum electrical capacity
h. Circuit and data terminations between the helix and distribution equipment shall be performed in the field.

a. RIGGING MOTORIZED HOISTS
   i. General
      1. Hoists shall be the ETC Prodigy P2 as manufactured by ETC, Inc or equal.
      2. Hoists shall be purpose-designed and fabricated for overhead lifting of theatre lights, equipment, curtains and scenic elements, whether used on stage, in the auditorium or other places of public assembly where people shall move beneath the suspended or moving load. The systems shall incorporate mechanical, electrical and safety features that shall be inherent to this equipment; they shall provide an engineered, efficient device for overhead lifting. The mechanical, electrical and safety features of this hoisting and control system shall establish the standard of quality, performance and safety by which hoisting systems of other manufacture shall be evaluated.
      3. Each hoist shall be fully tested under full rated load throughout its full travel distance with all its lift lines terminated to the hoist before the hoist is shipped from the manufacturer. Only hoists that successfully pass the following pre-shipment testing shall be sent to any job site. Testing shall include:
         A. Hoist operation
         B. Hoist/motor speed
         C. Lift line terminations under load
         D. Braking and stopping under load
         E. Load cell functions
         F. Slack line detection
         G. Position sensing
         H. Hoist noise
      4. A record of testing and its results shall be available for review at the manufacturer’s facility.
      5. A copy of all testing results must be furnished by the installing contractor to the architect or owner’s representative at the time of system commissioning. Manufacturers who cannot provide testing results shall not be acceptable.
      6. Paint as required under this section shall be the manufacturer's standard finish and color except as noted.
      7. All equipment items shall be new and conform to applicable provisions of Underwriters' Laboratories (UL), American Standards Association (ASA), American National Standards Institute (ANSI), National Fire Protection Association (NFPA) Life Safety Code 01, National Electric Code (NEC) and PLASA.
         A. Where acceptable equipment items are specified by catalog number only, device shall meet all published manufacturer's specifications. Where quantities or sizes are not given, refer to drawings. Where two or more products are listed, contractor may use either, at his discretion. Equipment shall not be substituted without specific written approval by the Architect under the substitution paragraphs of these specifications.
         B. All pipe battens (if used) shall be fabricated from 1.5" Schedule 40 pipe.
         C. All turnbuckles and cable clips (if used) shall be drop forged.

D. All turnbuckles and clips, tracks, chains and other items of incidental hardware shall be furnished plated or painted. Wire rope shall be galvanized. Fasteners, chain, and other miscellaneous hardware shall be either cadmium or zinc plated.
E. All materials used in this project shall be new, unused and of the latest design. Refurbished materials are not permitted.
F. In order to establish minimum standards of safety, a minimum factor of 10 shall be required for all equipment and hardware used on this project. In addition, the following factors shall be used:

1) Cables and fittings 10 Design Factor
2) Cable bending ratio 26 times diameter
3) Maximum fleet angle 2 degrees
4) Bearings Two times required load at full for 2,000 hours

ii. HOISTS

1. Each wire rope lift line shall adhere to a design factor of 10:1 with an ultimate strength of 4200 pounds. All load path components between the building structure and the batten shall exceed the breaking strength of the wire rope. The motor brake shall be rated at least at 125% of the motor torque.
2. Hoists shall be capable of supporting the following loads:
   A. General purpose P2-EXO 25 fpm 650 pound capacity in standard configuration. Powerhead shall measure 16” high x 13-1/2” wide x 45-1/2” long and weigh 300 lbs where compression tube is not used.
3. The standard general purpose hoist shall consist of the following major components: 1) Powerhead, 2) Head block (if used), 3) Loft blocks, 4) Lift lines, 5) Right Angle Cable Adjuster (RACA), and 6) pipe batten.
4. The hoist shall include the following features:
   A. A Powerhead containing the following elements: the gear motor, motor brake, secondary load arrest device, limit switches, operating electronics, load cell, slack line detector, incremental position sensors, cable drum assembly, and wire rope.
   B. The hoist shall incorporate a built-in load cell.
   C. The hoist shall incorporate a built-in slack line sensor.
   D. The hoist shall include the emergency contactor built into the hoist.
   E. Hoists that do not include built-in load cell, built-in slack line detection, and an emergency contactor shall not be acceptable.
   F. Hoists that do not use position encoders shall not be acceptable.
5. The hoist shall be manufactured from UL Listed components and shall be UL Listed and tested as a complete system (not just UL listed parts).

iii. POWERHEAD

1. The Powerhead shall be a fully enclosed housing that shall prevent contact with moving and electrical parts and shall provide protection against dirt, dust and debris. An exo-skeleton frame surrounding the hoist allows for multiple mounting options including: upright, underhung and vertical.
2. Hoist assemblies that do not have housings prohibiting access to moving parts shall not be acceptable.
3. For setup and maintenance, the following functions shall be available from the Powerhead: power and operating switches, address setting knobs, limit switch adjustment mechanism, limit switch override button, indicators for power, status and communication. Each of these functions shall be clearly labeled.

iv. GEARMOTOR AND MOTOR BRAKE

1. The gear motor and motor brake shall be an integral unit from a single manufacturer. It shall operate on 208 Volt or 480 Volt 60 Hz, 3 phase, or 400 Volt 50 Hz, 3 phase.

2. The motor brake shall be integral to the gear motor and shall be capable of holding 125% of the motor's lifting capacity.
3. The motor brake shall be spring actuated to apply and hold braking force.
4. The motor brake shall be magnetically released and held open upon actuation.

v. SECONDARY LOAD ARREST DEVICE

45. Hoist shall include redundant load arrest device utilizing a dynamically self-locking gearbox in addition to primary electro-mechanical motor brake.
46. The dynamically self-locking gearbox shall bring the moving load to a complete stop and shall hold the load in position in the event of a mechanical failure of the motor or motor brake.
    1. Noise from the load arrest device shall be minimally audible at any time in the operational cycle.

47. Normal hoist operation shall not be limited by heat or noise caused by the secondary load arrest device.

vi. WIRE ROPE DRUM
    1. The drum shall be capable of wrapping up to eight 3/16" diameter 7 x 19 galvanized aircraft (utility) wire rope lift lines up to 50' long in a compact manner. They shall be managed by a wire rope (cable) keeper integral to the Powerhead. The drum design shall prevent wire rope from tangling or crossing over itself.

vii. LIMIT SWITCH
    1. A limit switch assembly shall be mounted within the Powerhead for hard "normal" and "ultimate" end of travel limits. Hard end of travel limits shall be set/adjusted at the time of installation aided by an indicator lights visible on the Powerhead cover. Any system that indicates that the limit has been set by audible or tactile means only shall not be acceptable.

viii. LOAD SENSOR/LOAD PROFILING.

48. A load sensor shall be built into the Powerhead to facilitate a profile of the actual load on the hoist as it travels through its normal cycle. The profile may be changed by "re-training" the profiling system whenever the suspended load is changed on the batten by activating a key-switch operated record cycle, or the appropriate password-protected account type on the motor controller. When Load Profiling is turned on for that hoist, the load sensing system shall continuously monitor the load, regardless of whether the hoist is in a dynamic or static state.

ix. POSITION SENSOR
    1. A position sensing system shall be built into the Powerhead to provide accurate position information. The system shall consist of an incremental encoder that provides accurate position information for each batten at power-up of the system. Hoisting systems that require re-homing shall not be acceptable.

x. SLACK LINE DETECTOR

49. The slack line detector shall be built into the Powerhead. When a slack line condition in excess of 15" of travel develops in a lift line, the slack line detector shall remove power from the motor and engage the primary brake. The batten shall be allowed to move only in the upward direction to allow removal of the cause of the slack line fault.
50. Notification of a fault state will be indicated on the hoist via diagnostic indicators, and in plain language at the hoist controller.
51. Once the cause of the slack line fault has been removed, normal operation will automatically be restored without additional action by the operator.

xi. LOCAL USER INTERFACE TO POWERHEAD
1. User interface at the Powerhead control panel at the rear of the hoist shall include:
A. Hoist Up/Down Control
B. Limit Switch override buttons (tool accessible)
C. Address switches
D. Status LED's

xii. INFORMATION STORAGE WITHIN POWERHEAD

52. The hoist system shall record the following information into non-volatile memory, and be available for analysis via log files:

a. Severe fault conditions with date and time stamp
b. E-stops, overloads, moves and power cycles
c. Cumulative travel distance, hours of operation and peak loads since installation/last inspection
d. Record of last known position

1) Hoist systems that do not record the above data into non-volatile memory shall not be acceptable.

B. LIFT LINE TERMINATIONS

1. Each lift line shall be terminated in the Powerhead via a standard copper oval compression sleeve installed/crimped at the factory.
2. Lift lines shall be terminated at the load hanger with a low profile Right Angle Cable Adjuster (RACA)™, thimble and copper oval compression sleeve. The RACA and cable terminations at the batten shall be installed at the time of hoist installation.
3. Batten trim shall be adjustable up to 6" via the RACA.
4. Systems utilizing turnbuckles or chain to trim the batten shall not be accepted for this installation.

PIPE BATTEN

1. The pipe batten shall be 1½" schedule 40 grade A, seamless pipe fabricated in the largest possible lengths without splices. Battens of greater length shall be spliced by means of .120 x 1 9/16 dia. DOM tube 18" long with 9" of tube inserted into each half of the splice. The tight fitting splice tube shall be held in place by a pair of 3/8 x 2 ½" grade 5 hex bolts on each side of the joint. The bolts shall pass through the pipe at an angle of 90° to each other. There shall be two bolts on each side of the joint spaced 1" and 8" from the joint. Alternatively, one pair of bolts on one side of the joint may be replaced with either plug welds or tight fitting steel rivets. Pipes shall be straight and painted flat black.
2. A safety-yellow batten cap shall be installed at each end of each pipe batten.
3. The manufacturer shall provide up to four self-adhesive labels for each batten on which the rated batten load shall be written by the installer.

POWER AND CONTROL DISTRIBUTION (PCD)

1. Each hoist shall receive power and control via a pair of 8'-0" long cables extending from the Powerhead to the source outlets. Receptacles shall be installed in a sheet metal junction box or trough with outlets. Each outlet shall be located no more than 6'-0" away from the rear face of each hoist.

2. Each Powerhead shall include a power cord hardwired to the hoist with an appropriately sized grounded twist-lock connector at the PCD end and a removable control cable with a circular 9 pin connector at each end. An appropriately rated 3 phase breaker in the PCD is included. The wiring and connectors shall be barriered between high and low voltage.
3. The power/distribution channel shall be UL LISTED for this application.

QUICKTOUCH+ FIXED AND VARIABLE SPEED CONTROL SYSTEM

GENERAL

1. The entire motor system shall be operated by a QuickTouch+ fixed and variable speed controller. It shall be purpose-designed and fabricated to manage and operate motors specifically designed for overhead lifting. Each system shall incorporate mechanical, electrical and safety features that shall be inherent to this equipment and shall provide an engineered, efficient device to control the equipment. The mechanical, electrical and safety features of this control system shall establish the standard of quality, performance and safety by which motor systems of other manufacture shall be evaluated.
2. The QuickTouch+ Control System shall consist of a surface, flush or rack mounted primary control panel and up to three remote E-stop stations.
3. The motor system shall also include one Fixed Speed Remote control device with 30’ of flexible cable that may be attached to the system at the QuickTouch+ control panel.
4. The controller shall include the following features:

    a. Key operated power switch
    b. LCD display for feedback/operating information
    c. Key operated motor load profile training/enable switch
    d. Latching motor selection buttons with rear illuminated naming tabs
    e. Rear illuminated hold-to-operate (dead-man) up and down operation buttons
    f. Recessed speed adjustment slide-pot
    g. Rotary data entry encoder
    h. Dedicated E-stop button
    i. Outlet for wired remote
    j. Optional door
    k. Optional rack mount kit

5. The control system shall only employ the QuickTouch+ controller, a power and control distribution infrastructure and the motors. A System that requires separate drive cabinets or motor-starters shall not be acceptable.
6. The controller shall be UL LISTED and shall be fabricated from UL LISTED components.

ENCLOSURE

1. The back box and face panel shall be fabricated from 16ga powder coated sheet steel specially formed to provide support for installation as well as support for all components installed within the housing.
2. The QuickTouch+ face panel shall be printed with complete labeling information to identify the function of each of the buttons in the control station.
3. The face panel shall identify the system as a QuickTouch+ controller for stage rigging.
4. The face panel shall be shades of grey. The ring surrounding the E-stop button shall be safety yellow and shall be rear illuminated
5. The steel panel to which all switches are mounted shall be removable via screws in the surface located underneath the face panel film.

LCD SCREEN

6. The liquid crystal display shall be purpose designed to communicate all information in human readable text.
7. The screen shall be rear illuminated and shall be dimmable.
8. During system start up the screen shall show the progress of the motor diagnostics self-tests. Upon completion of the startup sequence the screen shall indicate that the system is “OK” or shall provide specific information should a fault be detected. Fault conditions shall be reported in human readable text. Systems that report fault conditions in a series of blinking lights shall not be acceptable for this installation.
9. When a motor is selected the LCD screen shall readout the motor name and number, the current batten position above the floor, the amount of weight suspended from the batten, the trim position that is recorded, as well as two bar graph scales that show the current position of the batten, top and bottom limits and the current weight suspended from the batten.

MOTOR SELECTION/OPERATION BUTTONS

10. There shall be rear illuminated motor selection buttons. Buttons shall remain illuminated until de-selected.
11. Up to four motors may be selected to move at one time. When the up or down button is pushed and held, each motor shall move to its next stop location. If the stop location is the adjustable trim position, the motor can be made to continue to travel in the selected direction by releasing and re-pressing the up or down hold-to-operate button until the next stop for the motor(s) is reached.
12. A maximum of four motors may move at one time and only in one direction at a time.
13. Although four motors moving at one time is the factory default, it shall be possible to increase the quantity of simultaneously moving motors to eight or reduce it to one.
14. The system software will limit the number of simultaneous moving motors. As a backup, there shall be dedicated hardware to detect and disable the system if the system attempts to move more than the configured maximum quantity of motors.
15. All buttons shall fit neatly within each of the cover panel cutouts on the controller.

KEY SWITCHES

16. A key switch shall control power to the control system. The key must be in the lock and the key turned to the on position for the motor system to operate.
17. A separate key is required to turn on the load profiling system. That key must be in the lock and turned to the “ON” position for load profiling to function.
18. When load profiling is turned on the motor shall know the amount of weight that is supposed to be supported by the batten at any location in the path of travel. Should the weight exceed or be reduced below the profiled weight by a preset value, the motor shall stop operation until the fault is cleared.

SLACK LINE DETECTOR

19. The slack line detector is located in the Powerhead. When a slack line condition occurs, it shall cease motor movement and result in a fault message on the LCD screen on the controller. Movement in the upward direction shall be possible to clear the fault.

E-STOP

20. The E-stop button on the QuickTouch controller shall be a mushroom button with a rear illuminated ring surrounding the button. During normal operation the E-stop button shall be in the out position. An E-stop can be activated via this button by firmly pressing the button in. The button shall latch and immediately cause a class zero stop of all fixed speed motors and a class one stop of all variable speed motors in the system. The LCD screen shall report this as an E-stop condition. To continue system operation the E-stop button must be cleared by twisting the button to release the latch. Power to the control station must be cycled off/on to re-initiate the system. This action shall also initiate a self-test of the entire control system and contactors.
21. The illuminated ring around each E-stop button shall be dimmable. The status of the lighted ring shall provide additional information about the state of the system as follows:

    a. Ring at low intensity: no motor moving
    b. Ring at high intensity: motor(s) moving
    c. Ring blinking: system in E-stop condition

22. Up to three remote E-stop stations may be connected to the system. Each additional E-stop station shall operate in the same way as the primary E-stop at the QuickTouch control panel.

SYSTEM DIAGNOSTICS

23. Upon energization the control system shall perform an automatic series of diagnostic tests that assure that all system safety functions are working. Should an error in the safety functions be determined, the controller shall report back a fault condition in the LCD display window and shall identify the nature of the fault.
24. Monthly, the system automatically shall perform an additional series of diagnostic tests to determine if there are any problems with any portion of the motor control system safety features. In the event of a problem, the controller shall report back a fault condition in the LCD display window and shall identify the nature of the fault.
25. Eleven months after a system inspection has been performed, the system shall remind the user to schedule a full system maintenance/inspection. The reminder shall remain in the system with a count-down calendar until it is turned off by the factory authorized and trained inspector.
26. The installing contractor shall be able to leave contact information within the system. This information shall be displayed at power up and in the event of severe fault conditions.

REMOTE CONTROL PENDANT

27. An optional remote control pendant with 30’ long attached cable and plug shall be provided for the system. The remote control must be plugged to the QuickTouch control panel. When the remote control is plugged in the E-stop on the remote is active. Systems requiring “shunt plugs” to bypass an unplugged remote control connector shall not be acceptable.
28. The remote control provides up/down control for those motors that have been preselected at the QuickTouch controller.

TRIM POSITIONS

29. It shall be possible easily to store (and delete) up to five (5) Trim positions per motor
30. The user shall be able to utilize three of these positions as general purpose trim positions, one as user programmable upper limit and one as user programmable lower limit

31. During normal operation, the hoist shall stop at every trim position, but it shall also be possible to select a specific trim position as the target position for the next move.

SPEED CONTROL

32. The motor controller shall provide a recessed speed adjustment slider
33. It shall be possible to adjust the speed of a running variable speed motor via this slider. During movement the LCD screen shall show the actual speed of the selected motor
34. It shall be possible to pre-set the speed for the next move for the selected motors. The LCD screen shall display the pre-set speed for the selected motors.

SYSTEM COMMISSIONING

35. It shall be possible to commission basic functionality of the system without a laptop computer or additional software.
36. A trained installer shall commission the full system via a laptop computer connected via the built-in USB port in the controller. USB connectivity shall not require special USB drivers.
37. Commissioning software shall feature an inspection report generator that allows a step by step inspection of the control system. Upon completion, the system shall generate an inspection report in PDF format.

    a.

LOCKING RAIL

38. Provide a reaction bar at on stage face of rail for Capstan Winch. Reaction bar to 3” x 5” x ¼” steel rectangle steel tube.

    a.

MOBILE CAPSTAN HOIST

1. The capstan hoist shall have a capacity of 1500 lbs (680.4 KG) and an operating speed of approximately 35 fpm (0.17 mps).
2. It shall consist of a steel framed caster cart for mobility, and a steel capstan drum coupled directly to the output shaft of the gearbox.
3. The motor, primary brake, and gearbox shall be an integrated unit. No couplings will be permitted between the motor and gear reducer.
4. Motors shall be totally enclosed fan cooled (TEFC).
5. The motor shall have a minimum NEMA service factor of 1.0 for constant operation.

6. The primary brake shall be an integral part of the motor, mounted directly on the motor's armature shaft.

7. Brake shall be spring applied, direct acting, electrically released, and equipped with a manual release.

8. The gear reducer shall be a combination Helical/Bevel reducer with a cast iron gear case for protection against shock damage.

9. The gearing service factor shall be a minimum of 1.0 with a mechanical strength service factor of 1.25.

10. The reducer output shaft shall have double lip oil seals to prevent leaks.

11. The mobile base shall be equipped with stationary casters in front and swivel casters in the rear.

12. Hoist shall have a non-locking interface to transmit loading safely and efficiently to the reaction bar.

13. A forged cleat shall be integrated to permit rope tie-off.

14. The unit shall incorporate a full voltage reversing starter with overload and a directional footswitch to allow handsfree control of operation and direction.

15. Unit will be equipped with 40 feet of type SO power cord with a locking electrical connector and mating receptacle.

16. Cart shall include separate storage hooks for included electrical cordage and haul line.

LIGHT LAB STUDIO GRID, TRACK & CURTAINS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Provision and installation of all equipment as required for complete and fully operational systems.

Where equipment, components, materials, hardware and/or services have been omitted from the drawings and specifications, but are required for fully functional systems, they shall be assumed to be included and shall be provided without claim for change to the Contract price.

B. Field verification of dimensions, conditions and obstructions at the job site. Field coordination with other trades and General Contractor.

C. Submission of shop drawings.

D. Delivery, unloading, unpacking and removal of all related packaging and debris form the job site.

E. Inspection, alignment and final adjustment of completed installation, demonstration for approval

and instruction for operating personnel.

F. The System shall basically be comprised of the following:

1. Pipe grid

2. Curtain tracks

3. Studio drapery

1.3 RELATED WORK

A. Related work specified under other sections of the specifications:

1. Structural support steel

2. Electrical Systems

1.4 QUALITY ASSURANCE

A. Work shall be done by people skilled in this trade in strict accordance with the requirements and/or specification of the manufacturers of the material being used.

B. Qualifications:

1. Contractor shall have been involved in stage rigging and drapery system installations for a period of ten years or more and shall have completed at least ten installations of this type and scope. The Architect shall be the final judge of suitability of experience.

2. This Contractor shall maintain and operate his own shops and fabricate or assemble all components with the exception of standard hardware, materials and equipment.

3. The Architect shall have the right to inspect any previous equipment or systems as furnished or installed by this Contractor. In addition, the right is reserved by the Architect to reject a Contractor who has failed in any respect to comply with every provision of any previous contract.

C. A single Contractor who shall be responsible for the proper installation, functioning and compatibility of system equipment shall supply equipment, including required modification.

D. The safety parameters set forth herein are intended to reflect safeguards and precautions related not only to normal use of the equipment under ideal operating and lading conditions but, additionally, to anticipate equipment misuse, human error and misjudgment.

1.5 REFERENCES

A. Regulatory Agencies:

1. American Institute of Architects

2. American Institute of Steel Construction

3. American Institute of Timber Construction

4. American National Standards Institute

5. American Welding Society

6. Associated Wire Rope Fabricators

7. Construction Specification Institute

8. Iron Casting Society

9. National Electrical Manufacturers Association

10. National Fire Protection Association

11. Underwriter's Laboratories

12. United States Institute of Theatre Technology

13. Occupational Safety and Health Act of 1970

14. Additional applicable codes, standards, regulations and guidelines shall be adhered to in both spirit and letter of intent.

INTERFACE WITH ADJACENT SYSTEMS

A. The systems described in this section shall in no way damage or adversely effect architectural or structural systems, components or construction.

B. Rigging system installation shall be coordinated with the requirement of all adjacent and intersecting systems, including but not limited to: Electrical Systems, Sound, Video and Intercommunications Systems, Stage Lighting, Flooring and Mechanical Systems.

C. Notwithstanding the detailed information contained in this Specification, it is the responsibility of this Contractor to supply working overall systems. This Contractor shall be responsible, prior to bidding, for verifying the completeness of the parts list, the correctness of the type numbers and the overall suitability of the systems to meet the purposes of the Contract Documents.

D. Provide all additional components or auxiliary steel needed in order to meet the requirement stated above. Even if not specifically mentioned herein or on the Drawings, this contractor without claim for additional payment shall supply additional components and auxiliary steel.

E. The Contractor shall in no way be relieved of the primary responsibility to provide a safe, fully functional system.

SUBMITTALS

1. Submit shop drawings and samples for approval prior to fabrication. Site dimensions and conditions affecting the Work shall be verified prior to commencement of Shop Drawings.

2. Shop drawings shall be made in conformity with the best modern practice and all design shall reflect a requirement for minimizing institutional maintenance.

3. Submit electronic shop drawings to the Architect for approval. All drawings shall be produced on AutoCAD or compatible system to ensure legibility and quality of submission. Obtain approval of the drawings prior to proceeding with manufacture and fabrication. Shop and field connections of auxiliary steel items shall be clearly distinguished and complete information on connections to other work shall be given. Complete shop drawings shall include:

a. Mechanical assembly drawings (1/2” = 1’ minimum)

b. Mechanical detail drawings. (1” = 1’ minimum)

c. Component equipment drawings. (1” = 1’ minimum)

d. General arrangement plans and diagrams. (1/4” = 1’ minimum)

e. Miscellaneous Details and Assembly Drawings. (as necessary)

f. Component equipment drawings shall be Manufacturer’s approval drawings or catalogs cuts showing weight, dimensions and capacities of mechanical components.

g. Erection plans and diagrams shall give relative locations of various members and overall dimensions with reference to the preliminary drawings including auxiliary structure.

h. Miscellaneous details and assembly drawings shall give lengths, widths and sizes of all members, connection details, location, type and size of bolts, rivets, welds, and other connections together with materials to be used.

B. As-Builts and Manuals:

1. Within thirty days of the Acceptance Tests, this Contractor shall furnish the following:

a. Four copies of a layout of the systems giving the essentials of the installation and their maximum load limitations.

b. Four copies of a complete instruction, operations and maintenance book, including all layouts, sizes and technical descriptions of components. These books shall be durable plastic, 3-ring binder. Drawings excepted, all sheet sizes shall be 8-1/2” x 11”.

c. Four copies of as-built and installed shop drawings. AutoCAD copies of general arrangement, elevations and connection details shall be provided on disk to Owner as part of the As-built drawing submission.

1.9 TRAINING AND SERVICE

A. This Contractor shall provide training sessions for the Owner and Owners representatives. Training session shall cover operational procedures, safety systems, control systems, maintenance of system and troubleshooting.

PART 2 – PRODUCTS

2.1 MANUFACTURERS AND CONTRACTORS

A. Rigging systems shall be installed by one of the following Stage Rigging Contractors:

1. Beck Studios, Milford, OH

2. Scenic Solutions, Dayton OH

3. Vincent Lighting System, Erlanger KY

B. Curtain tracks, machines and related components shall manufactured by:

1. ADC, Allentown, PA

2. H&H Specialties, South El Monte, CA

C. Curtain Fabrics

1. Crescent, KM Mills, Greenville, SC

2. Prism, Fred Krieger Fabrics, Jericho, NY

3. Encore, Milligan, Spartanburg, SC

D. Draperies shall be fabricated by:

1. Beck Studios Inc., Milford OH

2. Stage Decorations, Greensboro, NC

2.1 MATERIALS and COMPONENTS

A. General: Items, materials and equipment shall be new and undamaged. Assemblies, cable components, connections, equipment, hardware and linkages employed in supporting, in whole or in part, overhead loads shall be rated and designed for that application.

B. Rolled Steel Plates, Shapes and Bars: Domestic Steel ASTM A-36-74 unless otherwise noted.

C. Shackles: Shackles shall be appropriately sized for the intended application. Shackles shall be forged steel with alloy steel pins. Shackles shall be heat treated and tempered. Pins shall be provided with a locking cotter pin to prevent the bolt from loosening. The bolt pin shall be sized to insure the bearing surface of the bolt is on its shaft. Shackles shall meet or exceed the latest requirement of Federal Specification RR-C-27lb.

D. Turnbuckles: Turnbuckles shall be sized appropriately for the cable construction and diameter of the cable with which they are employed. Turnbuckles shall be Jaw-Jaw type unless otherwise noted in the Contract Documents. Jaw ends shall be furnished with round pins and cotter keys. Turnbuckles shall be dropped forged carbon steel with a galvanized finish. Turnbuckles shall meet or exceed the latest requirement of Federal specification FF-T-79lb Type 1, Form 1, Class 8.

E. Formed Steel Batten Clamps: 12 gauge 1 ½” formed steel plate with (2) bolt holes for 3/8” hex bolts and (1) top mount hole for ½” connection hardware.

F. Compression Sleeves: Compression sleeves shall be sized appropriately for the cable construction and diameter of the cable with which they are employed. Sleeves shall be oval for cable connections and cylindrical for stop sleeves. Sleeves shall be copper. After application sleeves shall meet or exceed the latest requirements of Military Specification MIL-W-83420.

2.2 CURTAIN FABRICATION

A. Studio Curtains: Provide curtains (Verify track height in Field prior to fabrication of curtain). Panels shall be sewn flat (0% fullness). The curtains shall be provided with heavy 3 inch flame retardant polypropylene webbing along the top with BLACK grommets at 12” O.C for acceptance of black spring snaps to connect to track carrier. Grommets shall not break stitching. Provide 2” wide side hems with Velcro to allow attachment to adjacent curtain panels.. Provide 5” bottom hems with a separate pocket filled with continuous #8 plated jack chain sewn in.

1. Provide (4) Black curtain panels to fully encompass the Lab.

2.3 STUDIO PIPE GRID

A. Pipe Grid: Pipes shall be 1-1/2” Schedule 40 carbon steel pipe (maximum 1.92” OD) with grid spacing 4’ 0” O.C. Pipe batten splice joints shall be 18” long, with sleeve equally spaced each side of joint. Splice sleeve shall be secured to pipe batten four 3/8” grade 5 hex bolts and low profile nylon insert lock nuts. Bolts shall be set 90 (deg) from each adjacent bolt. .Length of grid pipes shall be as shown on the drawings. Each pipe shall incorporate full pipe sections (21’-0” long) with only the minimum number of partial sections required by the necessary length. Grid pipes shall be painted flat black.

B. Pipe Grid Cross Clamps: Cross clamps shall rigidly secure the grid pipes at intersecting points. Clamps shall be fabricated from two minimum 1/8” steel plates with four (4) 3/8"grade 5 bolts and lock nuts. Cross clamps shall be located at every crossing point of two pipes. Cross clamps shall be painted flat black.

C. Hanging Assembly: Grid hanging assembly shall utilize formed steel batten clamps, 3/8” B-7 all thread and custom hanging mounting bracket as required by field conditions. Verify hanger locations and connection assembly prior to fabrication. Anchor the grid to the underside of the deck as required by field conditions. All hardware to be black.

2.4 CURTAIN TRACK

A. Walk Along, Curved Curtain Track:

1. Provide Model BLACK anodized 142 Rig-I-Flex curtain track by ADC with #1408 track hanger and 1-1/2 inch pipe clamp assemblies for attaching to pipe grid. Hanger assemblies to be spaced a maximum of 4 foot on center. Track to be one continues length around perimeter Provide with #4201 single carriers spaced 1 foot O.C..

2. Provide (1) curved track to fully encompass the Lab. See drawings for locations.

PART 3 – EXECUTION

3.1 INSPECTION

A. Examine all work prepared by others to receive work of this Section and report defects affecting installation to the Owner's Representative for correction. Commencement of the work shall be construed as complete acceptance of preparatory work by others. The sphere of inspection shall include but not be limited to:

1. Assurance all mounting surfaces are ready to accept the Work.

2. Verification of flatness, plumb and level of mounting conditions.

3. Inspection of all components of the Work to insure no damage has occurred during shipping or storage.

3.2 PREPARATION

A. The Contractor shall verify field measurement at the site prior to installation and modify the system accordingly.

B. The Contractor shall coordinate the Work with related trades and the Owner's Representative. This shall include the preparation of schedules and coordination of equipment delivery and storage.

C. Storage at the site shall be coordinated with the Owner's Representative and shall insure the materials and components are undamaged. Any material stored at the site shall be protected from damage by the work.

D. Appropriate signage shall be furnished during overhead work to caution of personnel working above.

3.3 INSTALLATION AND ERECTION

A. The installation workmanship shall provide straight, plumb, true and aligned components throughout. All connections shall be tight fitting with a minimum safety factor of eight and all arranged in an orderly manner. The mechanical installation shall possess the necessary properties to withstand stresses of tension, compression, flexure, shear, and torsion which may be anticipated being imposed on one or more of the components; and shall be related to 1) safety, 2) ease of operation, 3) quietness of operation, and 4) service life. The standards of quality and design covering the equipment and fabrication plus the installation technique required are established on this basis. The decision of the Architect in determining the acceptability of equipment items, installation technique and workmanship shall be final.

B. This Contractor shall conform to the best trade practices, fabricating and installing all items in accordance with manufacturer's recommendation and Architect direction, and shall coordinated with trades doing adjoining work.

C. During the course of his work, this Contractor shall daily remove to collection points at the job site, all loose trash and scrap materials. At the completion of his work, he shall leave all related work areas broom clean.

D. Installation shall be complete with all members and materials, and all blots, nuts, washers, clips, fittings, supports, or other items required for attaching all equipment specified to the existing construction.

E. This contractor shall do all required cutting, drilling, tapping and fitting to properly install and secure his work in place. Cutting or drilling existing structural or finishing work shall have the prior approval of the Architect.

F. The mechanical fabrication and workmanship shall incorporate neat and mechanically acceptable practices such as clean drilled and punched holes without flash, hard smooth finish for all sheared machines, and cut edges, and proper fit of components and contiguous parts without irregularity where marching is intended. Welding shall meet qualifications of A.I.S.C. manual and shall be without spatter and other evidence of poor practice. All moving parts shall have specified tolerance, shaft sizes, bearings, mounting, connections, and accessories coordinated into the work in a manner acceptable to the Architect. No wood construction or equipment shall be incorporated into the work excepting as may be set forth in the Specifications.

G. The fabrication of all equipment shall incorporate only new and unused materials. This includes all metal components in various shapes required such as plate, bar, rod, castings, structural, stampings, forgings, clamps, bolts, bearings, chain, sleeves, slips, cable and all other accessories not mentioned.

H. The installation costs included in this proposal shall be based upon the use of experienced riggers.

I. It shall be part of this scope of work to install, adjust and demonstrate operation of all stage curtains. Adjustment shall include leveling, cleaning and repair if necessary.

3.4 INSPECTION AND TESTING

A. The Architect or his appointed representative, following receipt in writing or notification from this Contractor that the installation is completed shall make final inspection. If inspection reveals any detail of construction, fabrication, or installation not in strict accord with the specification and contract requirements, approval shall be withheld and Contractor shall be given thirty days to replace the rejected items with those conforming to specification requirements. In addition to the final inspection of various equipment components the Architect shall have the right of inspection during the course of the installation, and he shall be allowed access to materials at the side for eventual incorporation in the work. Preliminary inspection shall not be constructed as eliminating the possible rejection of various components during the final inspection detailed above.

B. The completed installation of the stage rigging system shall be tested and operated for the approval of the Architect or his representative by the Rigging Contractor prior to approval.

C. Final tests and inspections are approved when:

1. Punchlist items complete.

2. Submittal of three copies of warranty.

3. Submittal of record drawings and flame test certificates.

INSTALL

B. GENERAL

Installation of this equipment shall only be performed by ETC approved and factory trained theatrical rigging installers. Installation shall be performed in a workmanlike manner and shall strictly adhere to the standards of these specifications and ETC's installation requirements. Where necessary, the installer may make adjustments to accommodate unforeseen impediments to installation. The completed work must achieve all electrical, safety and appearance requirements as established in these specifications.

Work shall be performed in accordance with OSHA and local codes.
On site welding shall only be performed per AWS D1.1 standards and with advanced approval from the architect or Owner's representative.

DIVISION OF RESPONSIBILITIES

The RIGGING contractor shall be responsible for providing and installing:

A. Powerhead

B. Supplementary steel and/or mounting adapters for the hoisting systems, if required.
C. Loft blocks
D. Wire rope lift lines and terminations
E. On electrics line sets: Cable Management system for distribution raceways, including low-voltage, ground and data wiring
F. On electrics line sets: Factory prewired electrical termination boxes that are part of the cable management system.
G. On electrics line sets: Factory prewired distribution raceway mounted at the bottom of the wire rope on the stage electrics sets
H. Pipe batten attached to RACAs or Hanger Brackets
I. Batten end caps
J. Batten labels
K. Attachment of the prewired twist-lock connector to the Power and Control Distribution outlet
L. Attachment of the prewired circular pin connector data wire to the mating outlet on the Powerhead and on the Power and Control Distribution box
M. Termination of the low voltage data wiring at the controller and at all power and control distribution boxes and at each E-stop station
N. Face plates for all Control Stations, E-stop Stations and Power and Control Distribution Boxes
O. Set limit switches

The ELECTRICAL contractor shall be responsible for providing and installing:

A. All pipe, wiring and termination providing line voltage to all the Power and Control Distribution boxes
B. All pipe and wiring connecting data lines between the first Power and Control Distribution Box and the Control station
C. Pipe and wiring connecting data lines between Control Station and first E-Stop Station
D. All pipe and wiring connecting data lines between all E-Stop Stations.
E. Back boxes for all Power and Control Distribution Boxes, the Control Stations and all E-Stop Stations.

END OF SECTION

BOX	Location	Description	Supply	Install	Line Voltage Termination	Supply	Install	Low Voltage Termination
		RIGGING - RIGGING BASE BID						
1A	FOH 1	ETC Fly-Pipe Hoist			X	X	X	X
		ETC Fly - Pipe Power & Control Junction Box		X	X	X		X
		P1000 Mounted to Ceiling for Fly Pipe Mounting				X	X	
1B	FOH 1	ETC Fly-Pipe Hoist			X	X	X	X
		ETC Fly - Pipe Power & Control Junction Box		X	X	X		X
		P1000 Mounted to Ceiling for Fly Pipe Mounting				X	X	
2A	FOH 2	ETC Fly-Pipe Hoist			X	X	X	X
		ETC Fly - Pipe Power & Control Junction Box		X	X	X		X
		P1000 Mounted to Ceiling for Fly Pipe Mounting				X	X	
2B	FOH 2	ETC Fly-Pipe Hoist			X	X	X	X
		ETC Fly - Pipe Power & Control Junction Box		X	X	X		X
		P1000 Mounted to Ceiling for Fly Pipe Mounting				X	X	
3A	FOH 3	ETC Fly-Pipe Hoist			X	X	X	X
		P1000 Mounted to Ceiling for Fly Pipe Mounting				X	X	
		ETC Fly - Pipe Power & Control Junction Box		X	X	X		X
3B	FOH 3	ETC Fly-Pipe Hoist			X	X	X	X
		ETC Fly - Pipe Power & Control Junction Box		X	X	X		X
		P1000 Mounted to Ceiling for Fly Pipe Mounting				X	X	
4A	FOH 4	Dead Hung Batten				X	X	
4B	FOH 4	Dead Hung Batten				X	X	
5	1ST LX	ETC P1900						
	Motor Hoist				X	X	X	X
	Power & Control Junction Box			X	X	X		X
	1-1/2 Schedule40 Batten					X	X	
	Loft Blocks					X	X	
6	2ND LX	ETC P1900						
	Motor Hoist				X	X	X	X
	Power & Control Junction Box			X	X	X		X
	1-1/2 Schedule40 Batten					X	X	
	Loft Blocks					X	X	

BOX	Location	Description	Supply	Install	Line Voltage Termination	Supply	Install	Low Voltage Termination
7	DropBox Multicable 1	Drop Box						
	Cable Cradle					X	X	
	Manual Synthetic Lift Line					X	X	
	Wall Cleat					X	X	
8	DropBox Multicable 2	Drop Box						
	Cable Cradle					X	X	
	Manual Synthetic Lift Line					X	X	
	Wall Cleat					X	X	
9	DropBox Multicable 3	Drop Box						
	Cable Cradle					X	X	
	Manual Synthetic Lift Line					X	X	
	Wall Cleat					X	X	
10	DropBox Multicable 4	Drop Box						
	Cable Cradle					X	X	
	Manual Synthetic Lift Line					X	X	
	Wall Cleat					X	X	
11	DropBox Multicable 5	Drop Box						
	Cable Cradle					X	X	
	Manual Synthetic Lift Line					X	X	
	Wall Cleat					X	X	
12	DropBox Multicable 6	Drop Box						
	Cable Cradle					X	X	
	Manual Synthetic Lift Line					X	X	
	Wall Cleat					X	X	
21	SR Box Boom	Torm Pipe - 8"				X	X	
	18" Side Arms	Qty 4				X	X	
22	SL Box Boom	Torm Pipe - 8"				X	X	
	18" Side Arms	Qty 4				X	X	
40	SR Tab	ETC Fly-Pipe Hoist			X	X	X	X
		ETC Fly - Pipe Power & Control Junction Box		X	X	X		X
41	US Hoist	ETC P650						
	Motor Hoist				X	X	X	X
	Power & Control Junction Box			X	X	X		X
	1-1/2 Schedule40 Batten					X	X	
	Loft Blocks					X	X	
42	SL Tab	ETC Fly-Pipe Hoist			X	X	X	X
		ETC Fly - Pipe Power & Control Junction Box		X	X	X		X
	LAB CURTAINS AND TRACKS							
	Suspended from Existing Ceiling	Full Single Track to encompass Lab				X	X	
	Black Curtain (4 Panels) with Carriers 1'0" O/C	Hung from Track Above				X	X	
	RIGGING - RIGGING ADD ALTERNATE #4							
	1*1/2" Schedule 40 Pipe Grid					X	X	
	Suspended from Existing Ceiling					X	X	

BOX	Location	Description	Supply	Install	Line Voltage Termination	Supply	Install	Low Voltage Termination
	Suspend Curtain Track from Pipe Grid if Add Alternate #4 is accepted					X	X	

SECTION 122413 - ROLLER WINDOW SHADES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Manually operated roller shades with single rollers.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

   1. Include construction details, material descriptions, dimensions of individual components and profiles, features, finishes, and operating instructions for roller shades.

B. Shop Drawings: Show fabrication and installation details for roller shades, including shadeband materials, their orientation to rollers, and their seam and batten locations.

C. Samples: For each exposed product and for each color and texture specified, 10 inches (250 mm) long.

D. Samples for Initial Selection: For each type and color of shadeband material.

   1. Include Samples of accessories involving color selection.

E. Samples for Verification: For each type of roller shade.

   1. Shadeband Material: Not less than 3 inches (76 mm) square. Mark interior face of material if applicable.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For roller shades to include in maintenance manuals.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver roller shades in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Do not install roller shades until construction and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain roller shades from single source from single manufacturer.

2.2 MANUALLY OPERATED, SINGLE-ROLLER SHADES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Draper Inc.
2. Hunter Douglas Contract.
3. Levolor.
4. Mechoshade.

B. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.

1. Bead Chains: Stainless steel.

a. Loop Length: Full length of roller shade.
b. Limit Stops: Provide upper and lower ball stops.
c. Chain-Retainer Type: Chain tensioner, jamb mounted.

2. Spring Lift-Assist Mechanisms: Manufacturer's standard for balancing roller shade weight and for lifting heavy roller shades.

    a. Provide for shadebands that weigh more than 10 lb or for shades as recommended by manufacturer, whichever criterion is more stringent.

C. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.

1. Roller Drive-End Location: Right side of interior face of shade.
2. Direction of Shadeband Roll: Regular, from back (exterior face) of roller.
3. Shadeband-to-Roller Attachment: Manufacturer's standard method.

D. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.

E. Shadebands:

1. Shadeband Material: Light-filtering fabric.
2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.

    a. Type: Enclosed in sealed pocket of shadeband material.

F. Installation Accessories:

1. Front Fascia: Aluminum extrusion that conceals front and underside of roller and operating mechanism and attaches to roller endcaps without exposed fasteners.

    a. Shape: L-shaped.
    b. Height: Manufacturer's standard height required to conceal roller and shadeband assembly when shade is fully open, but not less than 3 inches.

2.3 SHADEBAND MATERIALS

A. Shadeband Material Flame-Resistance Rating: Comply with NFPA 701. Testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

B. Light-Filtering Fabric: Woven fabric, stain and fade resistant.

1. Source: Roller shade manufacturer.
2. Type: PVC-coated fiberglass.
3. Weave: Mesh.
4. Thickness: 0.017 inch.

5. Weight: Minimum 11.6 oz./sq. yd..
6. Roll Width: 84 inches or greater.
7. Orientation on Shadeband: Up the bolt or Railroaded; consistent for all shades.
8. For offices and other areas - Openness Factor: 3 percent.
9. For classrooms and TV Studio - Openness Factor: 1 percent.
10. Color: As selected by Architect from manufacturer's full range.

2.4 ROLLER SHADE FABRICATION

A. Product Safety Standard: Fabricate roller shades to comply with WCMA A 100.1, including requirements for flexible, chain-loop devices; lead content of components; and warning labels.

B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F (23 deg C):
   1. Outside of Jamb Installation: Width and length as indicated, with terminations between shades of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.

C. Shadeband Fabrication: Fabricate shadebands without battens or seams to extent possible, except as follows:

   1. Vertical Shades: Where width-to-length ratio of shadeband is equal to or greater than 1:4, provide battens and seams at uniform spacings along shadeband length to ensure shadeband tracking and alignment through its full range of movement without distortion of the material.
   2. Railroaded Materials: Railroad material where material roll width is less than the required width of shadeband and where indicated. Provide battens and seams as required by railroaded material to produce shadebands with full roll-width panel(s) plus, if required, one partial roll-width panel located at top of shadeband.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, locations of connections to building electrical system, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ROLLER SHADE INSTALLATION

A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions.

1. Opaque Shadebands: Located so shadeband is not closer than 2 inches to interior face of glass. Allow clearances for window operation hardware.

B. Roller Shade Locations: At exterior windows.

3.3 ADJUSTING

A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION

A. Clean roller shade surfaces, after installation, according to manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.

C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

END OF SECTION 122413

SECTION 126600 – TELESCOPING STANDS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Manufacture, deliver and install Telescopic Seating Systems in accordance with applicable codes, the following specifications, and approved drawings.

1.02 RELATED WORK BY OTHERS

A. Adequate floor levelness and strength for operation of telescopic seating.

B. Adequate wall strength for attachment and operation of wall attached telescopic seating.

C. Electrical wiring within the building as required for power operated telescopic seating.

1.03 SYSTEM DESCRIPTION

A. Telescopic seating system shall be multiple tiered seating rows comprised of seat and deck components, risers, and supportive understructure.

B. Telescopic seating shall be operable on the telescopic principle, stacking vertically in minimum floor area when not in use.

C. The first moving row, on manual sections, shall be secured with release lever. All other rows shall be mechanically locked, operable only upon unlocking and cycling of first row. Power sections shall be secured with mechanical locks as well as the power system, operable upon activating the pendant control.

1.04 QUALITY ASSURANCE

A. DESIGN LOAD CRITERIA (STRUCTURAL): International Building Code Standard: Comply with requirements of IBC / ICC 300, Chapter 4 "Standard for Bleachers, Folding and Telescopic Seating and Grandstands Assembly Seating," except where other requirements are indicated by the architect/owner.

B. Partial Loading Requirements: Telescopic seating governed by IBC 2018, ICC-300 2017, NFPA 102 2016 or NFPA 5000 2018 shall all comply with ASCE 2016, Section 4.3.3 Partial Loading.

C. Manufacturer: Company specializing in telescopic seating with a minimum of 25 years' experience in manufacturing telescopic seating.

D. Engineer Qualifications: Manufacturer to employ a registered, licensed Professional Engineer to certify that the equipment to be supplied meets or exceeds the design criteria of this specification.

E. Installation: Shall be handled directly by the manufacturer or by a factory certified installation subcontractor.

F. Product Liability: Certification of insurance coverage of not less than $5,000,000.

G. Welding Processes: To be performed by certified professional welding operators in accordance with American Welding Society – Certified Welding Fabricator, (AWS-CWF), D1,1 "Structural Welding Code-Steel."

H. Product Improvements: Equipment provided shall incorporate manufacturer's design improvements and materials current at time of shipment, provided that such improvements and materials are consistent with the intent of these specifications.

1.05 SUBMITTALS

A. BID SUBMITTALS

1. Manufacturer's descriptive literature and specifications.
2. List of deviations from these specifications, if any.
3. Certification of Insurance.

B. JOB SUBMITTALS

1. Shop Drawings showing all equipment to be furnished with details of accessories to be supplied including necessary electrical service to be provided by others. All electrical submittals must include U.L. listing number.
2. Samples of material and color finish as requested by Architect.
3. Warranty, operation and maintenance instructions to the owner upon completion.

1.06 DESIGN CRITERIA

A. Telescopic seating shall be designed to support, in addition to its own weight, and the weight of added accessories, a uniformly distributed live load of not less than 100 lbs. per sq. ft. (4.8 kN per sq. m.) of gross horizontal projection. Seat boards and footrest shall be designed for a live load of not less than 120 lbs. per linear foot (1.751 kN per linear m).

B. Sway force applied to seats shall be 24 lbs. per linear ft. (350 N per linear m.) parallel to the seats and 10 lbs. per linear ft. (146 N per linear m.) perpendicular to the seats. Sway forces shall not be considered simultaneously applied.

C. Railings, posts and sockets designed to withstand the following forces applied separately.

D. Handrails shall be designed and constructed for:

1. A concentrated load of 200 lbs. (890 N) applied at any point and in any direction.
2. A uniform load of 50 lbs. per ft. (730 N/m) applied in any direction. The concentrated and uniform loading conditions shall not be required to be applied simultaneously.

E. Guards shall be designed and constructed for:

1. A concentrated load of 200 lbs. (890 N/m) applied at any point and in any direction along the top railing member and; a uniform load of 50 lbs. per ft. (730 N/m) applied horizontally at the required guardrail height and simultaneous uniform load of 100 lbs. per ft. (1460 N/m) applied vertically downward at the top of the guardrail. The concentrated and uniform loading conditions shall not be required to be applied simultaneously.

F. American Institute of Steel Construction (AISC), American Iron and Steel Institute (AISI) and Aluminum Association (AA) design criteria shall be the basis for calculation of member sizes and connections.

G. Wood members shall be designed in accordance with National Forest Products Association, (NFOPA), and National Design Specification for Wood Construction.

1.07 WARRANTY

A. The manufacturer shall warrant all work performed under these specifications to be free of defects for a period of one year.

B. All understructure components shall be warranted for a period of ten years.

C. Any materials found to be defective within this period will be replaced at no cost to the owner. This warranty shall not include replacements required by Acts of God, war, vandalism, flood, fire, calamity or deliberate abuse or misuse of the equipment.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. All seating shall be VersaTract Telescopic Seating System as manufactured by Irwin Seating Company - Telescopic Division, Altamont, IL 62411 or equal, subject to prior approval and strict compliance with these specifications.

B. Hussey Seating Company Maxam+ Platform and Gallery 3 chair as represented by the Lee Company - (812) 235-8155.

C. Figueras International Seating Telescoping Seating System and Minispace 5064 Chairs - (786)331-9433.

2.02 MATERIALS

A. Seating Area: See Drawings

1. Wall Attached and Electrically Operated system

B. Dimensions:

1. Seee Drawings

2.03 FABRICATION

A. Understructure System:

1. Steel supports and rolling frames shall be constructed from formed steel of the size and shape necessary to support the design loads. All support bracing shall begin at Row 2 and be of diagonal or "knee" type for rigidity. Diagonal bracing to be minimum 1-1/2” x 1-1/2" 14-gauge square tubing. Bracing fabricated from open-sided channel, angle iron or flat strap "X" type bracing is unacceptable.

2. Wheels shall not be less than 5" diameter x 1-3/8" non-marring soft rubber face to protect wood or synthetic floor surfaces. Each operating row shall have a minimum of 6 wheels.

3. Each fully skirted wheel channel shall be formed 12-gauge steel and continuously in contact with adjacent channels by means of an Integral Alignment System (IAS) and include nylon glides to eliminate any metal to metal contact. The IAS maintains proper alignment between adjacent wheel channels for smooth and consistent operation while eliminating the potential for accidental row separation. Wheel channel alignment systems with metal to metal contact requiring periodic lubrication or that utilizes a guide rod system that can be bent or damaged will not be acceptable.

4. Each cantilever arm shall be triple-formed 10-gauge steel, securely welded to the post assembly and include a nylon cantilever pad to ensure smooth operation. The cantilever pad shall also provide a firm base when in the occupied position and provide a solid feel when walked on.

5. Vertical columns shall be high tensile steel structural tube to meet design criteria. Minimum column size to be 2” x 3” 14-gauge structural tube, welded to a 2’ wide wheel channel using 360 degrees of weldment.

6. Deck support members shall be double formed 14-gauge steel and connect the front nosing and rear riser members. Each deck support shall include a unique dual-purpose roller that provides smooth support during operation. The deck support roller shall also include a 3/4” wide shoulder that’s encapsulated by the deck support on the row above in order to maintain proper upper alignment while delivering consistent, repeatable operation.

B. Seat Systems:

1. Integra Chair: Supply fold-down chairs on telescoping platforms with seats, backs, and a full complement of standards, fold-down mechanism and all support structure required for a fully functional seating system.

   a. Platform chairs shall have a modern look with complementary style lines, comfortable contours and subtle texture to achieve maximum spectator comfort.

   b. Each chair to be constructed from durable, scuff resistant injection molded high density polypropylene plastic, designed to support over 700 pounds per chair.

   c. Seat heights shall be maintained at a minimum of 17-1/2". Lower seat heights which detour from spectator comfort will not be accepted.

   d. Actual seat width shall not be less than 17-1/4”.

   e. Back heights to be a minimum of 31-1/2" and designed to fold within the depth of the deck when in the stored position. Chairs extending beyond the face of the unit when closed will not be acceptable.

   f. Chairs shall be rail mounted and allow for complete flexibility in chair layout. Seat spacing to be available from 18” to 24”, and field adjustable.

   g. Each chair shall have the capability of using seat numbers and row letters at the aisle locations. Seat numbers and row letters to have a stylish round design to enhance the aesthetic value of the seat, and be recessed to protect against vandalism.

   h. Select seating colors from manufacturer’s 15 standard colors. Custom colors available as an option.

   i. Securely fasten each chair and arm assembly to a heavy-duty, black anodized aluminum rail using locking hardware.

2. Chair Fold-Down System:

   a. Semi-Automatic Operation with Foot Release: The raising and lowering of up to 12 chairs per operation shall be accomplished with an internal spring assist system. Locking of chairs in the use position shall be totally independent of platform operation. Lowering of each row of chairs shall be done by simply depressing a foot release lever allowing the chairs to fold flat on the deck surface. Locking and hinge system shall be shrouded over their total length to simplify cleaning and prevent debris from interfering with the latching mechanism.

3. Chair Type:

   a. Platform chairs shall have a modern look with complementary style lines, comfortable contours and subtle texture to achieve maximum spectator comfort.

   b. Each chair to be constructed from finished wood veneer outer panel on the seat and back with upholstered pads.

   c. Wood veneer outer panels to be 1/2" thick finished material with 1-1/2” foam on the seat and 1” on the back for added comfort. Finished and fabric to be selected from manufacturers standard offering.

   d. Seat heights shall be maintained at a minimum of 17-1/2”. Lower seat heights which detour from spectator comfort will not be accepted.

   e. Back heights to be a minimum of 31-1/2” and designed to fold within the depth of the deck when in the stored position. Chairs extending beyond the face of the unit when closed will not be acceptable.

f. Chairs shall be rail mounted and allow for complete flexibility in chair layout. Seat spacing to be available from 18” to 24”, and field adjustable.

g. Each chair shall have the capability of using seat numbers and row letters at the aisle locations. Seat numbers and row letters to have a stylish round design to enhance the aesthetic value of the seat, and be recessed to protect against vandalism.

h. Securely fasten each chair and arm assembly to a heavy-duty, black anodized aluminum rail using locking hardware.

4. Armrest Type:

a. Tablet Arm: Supply Scribe folding tablet arm in accordance with these specifications and the architect’s plans. Tablet arms shall operate independent of the chair with the ability to be located on all or partial chairs and be available in right-handed model. Each chair must have a usable armrest while the tablet arm is in the non-use, stored position. Tablet arm operation shall require only one movement to return to the stored position and be mechanically dampened to fold in a controlled manner. The writing surface shall be constructed of 1/2” thick molded thermoset resin, providing 124” of usable space, not including the forearm area.

C. Deck System:

1. Carpeted decking shall be supplied using 26 oz. commercial grade, low level, looped olefin fiber carpet with low maintenance polypropylene backing. Carpet to be applied over carpet 3/4" grade plywood. Color to be selected from manufacturer’s standard.

D. Nosing shall be one piece, formed, 14-gauge steel with a black powder coated epoxy finish.

E. Rear riser shall be one piece, formed, 14-gauge steel with a black powder coated epoxy finish.

F. Chair rail to be extruded structural aluminum with a black anodized finish.

G. For rust resistance in standard conditions all painted surfaces shall be finished in textured Epoxy Powder Coated Semi-Gloss Black.

2.04 ACCESSORIES

A. Aisles at the footrest level shall include non-slip treads on the top front edge.

B. Intermediate aisle steps shall be provided. Steps are permanently attached closed design. Steps shall be constructed from 14 ga. steel, finished in a Black powder coated epoxy, and designed to eliminate any possible toe catch between the top of the intermediate step and the bottom of the nose beam per ADA or other applicable codes. Front step shall be removable and interlock to the front row eliminating any possibility of accidental disengagement, and store on the front row when not in use.

C. Aisle handrails:

1. Smart Rail EX aisle handrails shall be provided for 28” to 36” row spacing. Aisle railings shall quickly and easily rotate 90 degrees to the locked position and store parallel to the front of the aisle. Railings that require removal from the pocket or the use of tools for storage will not be acceptable. Aisle railings shall be an individual rail design, located on every other row starting at row two (2). Railing to be constructed of 1 1/2” 11 ga. round steel tubing, finished in a textured powder coated epoxy. For safety, railings designed without a full return of the handrail will not be acceptable.

D. Seat numbers and row letters shall be supplied in a contrasting, but complementary color for easy seat identification. Layout of numbering to be coordinated with the architect/owner.

2.05 PROPULSION SYSTEM

A. FRICTION POWER: Integra Drive System (IDS) shall be furnished on each seating group to open and close the telescopic units. Each individual section shall include 2 IDS friction drive systems integrated into the first moving row of understructure to achieve smooth and efficient operation. Operation of the seating shall be accomplished with the use of a walk along pendant control.

1. Each IDS power system shall include large 6 1/2" diameter friction rollers to develop tractive force adequate to open and close the system. Each roller to include non-marring 1/2" thick rubber covering.
2. Electrical motors for each section shall be heavy-duty and high efficiency gear reduction motors. The shaft diameter for the gear motor and rollers shall be a minimum of 1” and be connected by a 1” schedule 40 drive shaft.
3. All roller chain and sprockets used throughout the drive system shall be a minimum of #40 in size. Each drive unit shall be designed to include a safety shroud around the chain and sprocket for overall safety.
4. The power units shall develop tractive forces adequate to operate the seating units under normal conditions but inadequate to operate should significant obstacles be encountered.

B. Manufacturer shall provide all wiring from power source within bleacher seating including pendant control. Removable pendant control shall be handheld with forward and reverse button, plugging into a single receptacle. Electrical contractor shall provide a 60 HZ power source (as specified below) behind each group of seating. Amperage to be as specified by seating manufacturer depending on the number of power units required. For wall-attached installations, power source to terminate in a surface mounted junction box above floor. For reverse units, power source to terminate in a junction box, flush mounted under first seating row in center of group. Electrical contractor shall perform the connections to the seating equipment at the junction box. All electrical parts and wiring shall be installed in complete accord with the National Electric Code. U.L. Listing FHJU.E479554. Supply power system with 208/230V, 5 wire 3-phase system.

PART 3 - EXECUTION

3.01 REVIEWS AND APPROVALS

A. Shop drawings shall be approved and job site field measurements taken prior to installation and telescopic gym seating shall be installed in conformance therewith.

3.2 INSTALLATION

A. The installation of the telescopic gym seating will be handled directly by the manufacturer or by a factory authorized installation subcontractor qualified to perform the installation function.

3.3 PROTECTION

A. The manufacturer’s representative shall transmit instructions in both operation and maintenance to the owner.

B. Maintenance and operation of the telescopic gym seating shall be the responsibility of the owner or his duly authorized representative, and shall include the following:

1. During operation of the telescopic gym seating, the opening and closing shall be supervised by responsible personnel who will assure that the operation is in accordance with the manufacturer's instructions.
2. Only attachments specifically approved by the manufacturer for the specific installation shall be attached to the telescopic gym seating.
3. An annual inspection and required maintenance of all telescopic gym seating shall be performed to assure safe conditions. At least bi-annually, the inspection shall be performed by a Professional Engineer or factory service personnel.

END OF SECTION 126600

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SECTION 28 13 00 – ELECTRONIC ACCESS CONTROL (EAC) SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes the Security and Database Management System consisting of computer hardware, software, and associated licensing and equipment for monitoring, recording, and managing Electronic Access Control System (EACS) and Integrated Systems (IS) data and functionality.

B. The system shall monitor and control facility access, and shall perform alarm monitoring, camera and video monitoring (when integrated with a compatible integrated Video Monitoring System), communications loss monitoring, and temperature monitoring. The system shall also maintain a database of system activity, personnel access control information, and system user passwords and user role permissions. The system shall be controlled from a web browser and require no software installation or client licenses. The system shall provide control and access to users on Local Area Networks (LAN), Wide Area Networks (WAN), wireless networks, and the Internet. The system shall provide email and/or text message alerts for all alarm conditions and threats.

C. The system includes the following sub-components:

1. Operating Systems (OS) software and firmware
2. Application Software
3. Database Software
4. Network connected Security Management Servers
5. Network connected field level panels

D. Provide system complete as indicated.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including:

1. Drawings:

   a. Division 27 and 28 drawings.

2. Related Specification Sections:

   a. Division 27 and 28 specifications.

1.3 DEFINITIONS

A.	API:	Application Programming Interface
B.	AVI:	Audio Video Interleave
C.	CA:	Certificate Authority
D.	CAC:	Common Access Card
E.	CE:	European Union Conformity
F.	CPU:	Central Processing Unit
G.	CSV:	Comma Separated Values
H.	DNS:	Domain Name Server
I.	DSM:	Door Status Monitor
J.	DVR:	Digital Video Recorder
K.	EACS:	Electronic Access Control System
L.	FCC:	Federal Communications Commission
M.	FIPS:	Federal Information Processing Standard
N.	FIFO:	First In – First Out
O.	FTP:	File Transfer Protocol
P.	FRAC:	First Responder Authentication Credential
Q.	GB:	Gigabyte
R.	GSOC:	Global Security Operations Center
S.	HA:	High Availability
T.	HTML:	Hypertext Markup Language
U.	H.264:	Video Compression Standard
V.	I^2C:	Inter-Integrated Circuit
W.	IEEE:	Institute of Electrical and Electronics Engineers
X.	I/O:	Input / Output
Y.	IP:	Internet Protocol
Z.	IS:	Integrated System
AA.	JPEG:	Joint Photographic Experts Group
BB.	LAN:	Local Area Network
CC.	LDAP:	ightweight Directory Access Protocol
DD.	MB:	Megabyte
EE.	MJPEG:	Motion JPEG
FF.	MSATA:	Mini-Serial Advanced Technology Attachment
GG.	MSP:	Mobile Security Professional
HH.	MTBF:	Mean-Time Between Failure
II.	NAS:	Network Attached Storage
JJ.	NAT:	Network Address Translation
KK.	NBAPI:	NetBox Application Programming Interface
LL.	NECA:	National Electric Code Association
MM.	NFPA:	National Fire Protection Association
NN.	NVR:	Network Video Recorder
OO.	ODBC:	Open Database Connectivity
PP.	OS:	Operating System
QQ.	OVID:	Open Video Integration Driver
RR.	PDF:	Portable Document Format
SS.	PIN:	Personal Identification Number
TT.	PIV:	Personal Identity Verification
UU.	PoE:	Power over Ethernet

VV.	PTZ:	Pan-Tilt-Zoom
WW.	RAID:	Redundant Array of Independent Disks
XX.	RAM:	Random Access Memory
YY.	REX:	Request to Exit
ZZ.	RFID:	Radio Frequency Identification
AAA.	RoHS:	Restriction of Hazardous Substances
BBB.	ROM:	Read Only Memory
CCC.	RU:	Rack Unit
DDD.	SFTP	Secure File Transfer Protocol
EEE.	SHA:	Secure Hash Algorithm
FFF.	SIO:	Serial Input / Output
GGG.	SLA:	Sealed Lead-Acid
HHH.	SYSTEM:	Security Management System or Short Message Service (text messaging)
III.	SSL:	Secure Sockets Layer
JJJ.	SUSP:	Software Upgrade and Support Plan
KKK.	TCP:	Transmission control protocol - connects hosts on the Internet
LLL.	TIA:	Telecommunications Industry Association
MMM.	TLS:	Transport Layer Security
NNN.	TWIC:	Transportation Worker Identification Credential
OOO.	UI:	User Interface
PPP.	UPS:	Uninterruptible Power Supply
QQQ.	UTP:	Unshielded Twisted Pair
RRR.	VMS:	Video Management System
SSS.	WAN:	Wide Area Network
TTT.	Wi-Fi:	Wireless Network

1.4 PERFORMANCE REQUIREMENTS

A. The system shall be certified to meet the following standards:

1. ISO 9000
2. System shall be RoHS (Restriction of Hazardous Substances) compliant and meet proposed amendments to the reduction of toxic substances in manufacturing as stated in the Environmental Design of Electrical Equipment Act (EDEE)
3. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency and marked for intended location and application
4. Installation shall comply with NECA 1-2010 “Standard Practice of Good Workmanship in Electrical Construction”
5. Installation shall comply with NEC/NFPA 70E “Standard for Electrical Safety in the Workplace”
6. Electronic data exchange between Video Surveillance System and an Access Control System shall comply with SIA TVAC
7. Installation shall comply with FCC CFR 47 Part 15 Class A "Telecommunications, Radio Frequency, Digital Device Emission”
8. Installation shall comply with federal, state, and local codes and Authority Having Jurisdiction (AHJ)

1.5 ACTION SUBMITTALS

A. Product Data: Provide details and technical specifications for each product indicated. Include physical dimensions, features, performance, electrical characteristics, ratings, software versions, and operating system details.

B. Shop Drawings: Include system line diagrams, equipment locations, installation details, and system integration plans.

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
2. Functional Block Diagram: Show single-line interconnections between components for signal transmission and control. Show cable types, quantities, and sizes.
3. Plans and Elevations: Dimensioned plans and elevations of equipment racks, enclosures, and conduit interconnections, including access and workspace requirements.
4. Data Calculations: Provide data bandwidth and storage calculations, including data backup and archive configuration details meeting the minimum project requirements as described herein.
5. Power and Heat Load Calculations: Provide power and heat load calculations for all hardware, including UPS capacity calculations.
6. Wiring Diagrams: For power and signal wiring.

C. Equipment and Software List: Include each piece of equipment and software by product/model name and/or number, manufacturer, serial number, and revision number.

1.6 INFORMATIONAL SUBMITTALS

A. ISO9000 Listing Certificates

B. CE and FCC Compliance Certificates

C. Field quality-control reports

D. Current Integrator Certification Letter

E. Current Training Certificates (listing expiration dates) for technicians from the supporting office

F. Warranty: Software support and warranty information for all components, including Service Level Agreement (SLA) details, and duration of agreement from date of system acceptance by Owner

1.7 CONTRACTOR REQUIREMENTS

A. The Contractor shall have a supporting office within (75) miles of the project location

B. Certifications: Technicians from the supporting office shall hold current certifications with the manufacturer

C. On-site maintenance and repair service shall be available locally and within (4) hours of notification of condition

D. On-site Contractor personnel shall hold all required local, state, and federal licenses

E. On-site Contractor personnel shall hold current certifications with the manufacturer

1.8 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For all components and software to include in emergency, operation, and maintenance manuals.

1. Extra Materials:

   a. Return all left-over (unused) product and materials to the Owner

2. Applicable operating system, database, client, and application software on portable storage media

3. Full System Backup as of closeout date on portable storage media

4. Submit one (1) printed and one (1) electronic copy of project binder in final form. This copy shall contain as a minimum:

   a. Table of Contents for each element
   b. Contractor information - names phone numbers, and email for sales, technical support, and consumables reordering
   c. Lists of spare parts and replacement components recommended to be stored at the site for ready access
   d. Datasheets for all equipment
   e. Operation and maintenance manuals for all equipment
   f. Operation and maintenance procedures not covered in manufacture’s manuals
   g. Training:

      1) Program Syllabus.
      2) Manual(s) and Material(s).

1.9 QUALITY ASSURANCE

A. Installation shall comply with federal, state, and local codes and Authority Having Jurisdiction (AHJ).

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Install and program all software and hardware in accordance with manufacturer's specifications.

D. All equipment shall be new, in current production, and the standard products of a manufacturer of ESS equipment.

E. Manufacturer shall guarantee availability of parts, for a minimum of (7) years from date of shipment.

F. On-site maintenance and repair service shall be available locally and within (4) hours of notification of condition.

G. Contractor shall review drawings and specifications.

H. Test and certify all software integration between all integrated systems for interoperability by the manufacturer of each system.

I. Software integration between the system, VMS, and all other integrated system components shall be tested and certified for interoperability by the manufacturers of each system.

1.10 PERMITS

A. All permits required for the specified performance and completion of the work shall be secured by the Contractor.

1.11 PROJECT CONDITIONS

A. Environmental Conditions: System components shall withstand the following environmental conditions without mechanical or electrical damage or degradation of operating capability:

1. Facilities

a. Interior Environmentally Controlled Space: Rated for continuous operation in ambient temperatures of 32° to 95° F (0° to 35° C) dry bulb and a relative humidity of 20 to 80 percent, noncondensing.
b. Power: Electrical power will be supplied by Owner to the extent that the usage is compatible with available facilities in the vicinity of the work.

c. Rest room Facilities: Contractor may use existing Rest room facilities designated by Owner.
d. Parking: Owner reserves the right to limit or restrict Contractor parking based upon the daily requirements of the other contractors on site.
e. Dust Control: Make provisions to control all dust, dirt, and foreign material caused by the performance of the Work.
f. Use of explosive type fastening equipment is prohibited.
g. Notify Owner immediately of any damage or possible damage to any other equipment

2. Clean-Up

a. Contractor shall clean up, daily as the Work progresses, all dirt, dust and debris caused by Contractor's operations. Clean up shall be completed by the end of each workday to the satisfaction of Owner's on-site representative.
b. If Contractor fails to clean up, Owner may elect to have clean up performed by others, with the costs of such clean- up being charged to the Contractor.

3. Construction Aids

a. Definition: Construction Aids are facilities and equipment required by personnel to facilitate the execution of the Work. Construction Aids include scaffolds, staging, ladders, platforms, hoists, cranes, lifts, trenchers, core drillers, protective equipment, and other such facilities and equipment.
b. Contractor shall provide all Construction Aids required in the execution of the Work. Construction Aids that are the property of Owner or other contractors shall not be used without permission.
c. Storage of Construction Aids shall be coordinated with Owner's on-site representative.

4. Safety

a. The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work.
b. Contractor shall comply with all local, state, and federal regulations and laws for the safety of the workplace.

5. Accident Reports: Serious or fatal accidents shall be reported immediately by telephone or radio to the Owner's Project Manager.

1.12 SEQUENCING

A. Description: This implementation plan describes the general approach that shall be followed in order to minimize the time for the video surveillance system to be operational.

B. Approach: Contractor shall plan and schedule all work in such a sequence as to minimize the time before the system is operational. The following is a suggested work sequence:

1. Order all equipment needed and notify any subcontractors to schedule their participation.
2. Perform all system layout work.
3. Insure there are an adequate number of power receptacles available to operate all security equipment and coordinate with Owner as to where power is available.
4. Provide shop drawings to verify location of all equipment, conduit runs, power connections, etc. Submit shop drawings to Owner Project Manager.
5. Coordinate with Owner to provide space for the placement of all monitoring, control and recording equipment.
6. Prepare and pre-test all equipment to the greatest extent possible.
7. Install all equipment.
8. Test and inspect all systems.
9. Perform all other Work as required.
10. Provide as-built drawings.
11. Perform the Acceptance Test.
12. Provide training

1.13 SCHEDULING

A. The Contractor, immediately after being awarded the contract, shall prepare and submit an estimated progress schedule for the Work. The progress schedule shall be related to the entire project and shall indicate start and completion dates.

1.14 WARRANTY

A. Manufacturer's standard form in which manufacturer agrees to service, repair or replace system components as needed for proper system operation as specified herein.

B. Warranty Period: a 2-year warranty on hardware and a 1-year warranty on labor and software from date of date of Owner Acceptance.

PART 2 - PRODUCTS

2.1 GENERAL

A. Contractor Responsibility

B. All products not provided by Owner shall be new and unused and shall be of manufacturer’s current and standard production. Where two or more equipment items of the same kind are provided, all shall be identical and provided by the same manufacturer. Drawings and Specifications indicate major system components, and

may not show every component, connector, module, or accessory that may be required to support the operation specified. Contractor shall provide all components needed for complete and satisfactory operation.

C. Contractor, prior to submitting a proposal, shall determine product availability and delivery time, and shall include such considerations into his proposed Contract Time.

D. Certain products specified may only be available through factory-authorized dealers and distributors. Contractor shall verify his ability to procure the products specified prior to submitting a proposal.

E. Approved manufacturers:

1. Lenel/S2
2. RS2 Technologies
3. S2 Netbox

2.2 WIRE AND CABLE

A. ANSI/TIA 568 Category 6A Compliant horizontal structured cabling system with a fiber backbone is currently being installed under a separate section. Connect system components to this cabling system utilizing required patch cables. Provide patch cables as necessary for system connectivity plus ten percent spare. Provide patch cable color and lengths as directed by Owner.

B. All exterior doors are equipped with electronic hardware as follows: Door Position Switch, Latch Retraction, Request-To-Exit, Electronic Power Transfer, and Power Supply above door. Provide all required system wiring to these devises as well as the card reader. In addition, provide wiring of electronic hardware at interior doors equipped with card readers.

2.3 OPERATIONAL REQUIREMENTS

A. The system shall be implemented through network appliance architecture with a three-tier modular hardware hierarchy and embedded three-tier software architecture.

1. The network appliance shall be capable of running on an existing TCP/IP network and shall be accessible, configurable, and manageable from any network-connected PC with a browser.
2. Browser access for configuration and administration of the system shall be possible from a PC on the same subnet, through routers and gateways from other subnets, and from the Internet. Control and management of the system shall therefore be geographically independent.
3. Security of the data communicated over the network to and from the browser, system Controller, and Field Panels shall be protected by TLS protocol encryption. The connection shall use TLSv1.2, GCM mode and a 2048-bit RSA key.

4. The top hardware tier shall be the system Controller. Embedded on the system Controller shall be an operating system, a web server, security application software, and the database of personnel and system activity. Converged Video Access systems shall also include fully functional network video recorder.
5. The middle hardware tier shall be the Field Panel. The Field Panel shall make and manage access control decisions with data provided by the system Controller, and it shall manage the communication between the system Controller and Application Blades connected to the system's inputs, outputs, and readers. This modular design shall make it possible, even during network downtime, for the system to continue to manage access control and store system activity logs. When network connectivity is re-established, the system activity logs shall be automatically re-integrated.
6. The bottom hardware tier shall be the Application Blades. Four unique Application Blades shall be available:

    a. Access Control Blade: shall support two readers, four supervised inputs, and four relay outputs.
    b. Alarm Input Blade: shall support eight supervised inputs.
    c. Relay Output Blade: shall support eight relay outputs.
    d. Temperature Blade: shall support eight analog temperature sensor inputs.

B. The system shall integrate, within a browser interface, access control, alarm monitoring, video monitoring, and temperature monitoring applications. These applications shall be embedded in a three-tier software architecture.

1. The database tier shall use PostgreSQL. PostgreSQL is a full featured, high performance database management system that supports ODBC. This shall provide a small footprint, low administration, and a high reliability relational database that is embedded without requiring the use of a separate PC server.
2. The web server tier shall be based on an Apache™ embedded web server. This shall provide a graphically rich security management application through a standard web browser.
3. The security application software tier contains the business logic. This application shall also be embedded on the system Controller and requires no additional memory or processing power.
4. This three-tiered embedded software design runs within an embedded Linux Ubuntu 16.04 LTS operating system and shall require no client-side software other than a web browser.

C. All equipment and materials used shall be standard components, regularly manufactured, and regularly utilized in the manufacturer's system.

D. All systems and components shall have been thoroughly tested and proven in actual use.

2.4 FUNCTIONAL REQUIREMENTS

A. The system shall support Centralized Management and Replication Server as a global security operations center (GSOC) application, enabling system operators and administrators to monitor and control multiple distributed system Controller installations simultaneously. The system Controller can be configured to use Network Address Translation (NAT) to communicate with a Centralized Management and Replication Server.

B. The system shall support a high availability (HA) option. The HA Solution includes an HA server pair consisting of two Premium Enterprise system Controllers running high availability virtualization software. They act as a platform for the software and operating system as a virtual machine on one server, which is continually backed up on the other server.

C. Widget Desktop: The system shall provide a widget-based user interface that enables users to create custom monitoring layouts by selecting and arranging widgets on a desktop.

1. Each widget shall provide easy access to a frequently used function—allowing users to, for example, view an Activity Log, a camera view, or real-time web content.
2. System administrators can save custom layouts for subsequent call up by users, who can then arrange the widgets as desired on their desktops. The administrator shall determine which widgets are available in a layout and the extent to which users can customize the layout. Setup privileges shall enable administrators to switch from “Compose Mode” to “Monitoring Mode” from the desktop menu.
3. When composing layouts, system administrators shall have the ability to display a grid overlay on the Widget Desktop background. Whenever a widget is moved or resized, it will align with (or “snap to”) the nearest intersection of lines in the grid. If the grid is saved with the layout, it will appear in the background when users view the layout.
4. The widgets that shall be available for layouts are: Activity Log, Alarm Workflow, Auto-Monitor, Camera View, Clock, Duty Log Entry, Elevator Status, Events, Explorer, Floorplans, Intrusion Panel, Passback Grace, Photo ID History, Portal Status, Portal Unlock, Statistics Block, Status, and Threat Level.

D. System Partitioning: The system administrator shall have the ability to divide the system into partitions, allowing subsets of the overall population and/or resources to be managed separately.

1. From the default Master partition, one or more additional partitions can be created.
2. Each partition shall contain some number of administrators, card holders with their credentials and resources.
3. When performing administrative functions, the administrator of a partition shall have the ability to affect only the cardholders and resources in that partition.

However, resources can be shared across partitions through the access level assignments in another partition.

4. System partitioning shall have a precision feature that allows administrators in one or more partitions to view and perform edit functions on person records that belong to another partition.
5. Administrators shall have the ability to search for person records across all partitions to which they have access. The system administrator shall have the ability to make such cross-partition searches the default for users who have access to multiple partitions.
6. After finding a person record located in another partition, an administrator shall be able to click a button to switch to that partition directly from the person record—and possibly edit the record, depending on his or her access rights in that partition. Alternatively, provide the option for making every person record seamlessly visible across all partitions.

E. The system shall provide the following Access Control capabilities:

1. Login throttling, which can be enabled for the system to limit the number of login attempts from the same IP address for a selectable duration.
2. Integrated photo ID creation capability.
3. Photo ID and video verification during access control monitoring.
4. User interface secured access under encrypted password control.
5. System-wide timed anti-passback function.
6. Regional anti-passback with mustering and roll call functions.
7. Region occupancy counting and control.
8. “First-in-unlock” rule enforcement.
9. Multiple access levels and cards per person.
10. 128-bit card support for Wiegand card readers.
11. Detailed time specifications.
12. Simultaneous support for multiple card data formats.
13. Elevator control with or without floor selection tracking.
14. Access privileges variable by threat level.
15. Scheduled portal unlocks by time and threat level.
16. Card Format Decoder to quickly discover unknown card formats.
17. Card enrollment by reader or keyboard.
18. Compatibility with various input devices, including biometric readers.
19. Activation/expiration date/time by person with one-minute resolution.
20. Access level disable for immediate lockdown.
21. Use of Threat Levels to alter security system behavior globally.
22. Duress PINs, which can be enabled for the system to allow a valid user to raise an alarm if compelled under duress to use his or her credentials (card and PIN) to allow access for another person.
23. Multiple holiday schedules.
24. Timed unlock schedules.
25. Scheduled actions for arming inputs, activating outputs, and locking and unlocking portals.
26. Optional two-man access restriction for portals, requiring two valid card reads from two separate cardholders within a specified amount of time for portal entry.
27. Card enrollment reader support.

28. Dual-reader portal support.
29. Wiegand Reader support.
30. Magnetic-stripe reader support with cards using ABA Track 2 format for up to 200 bits.
31. Wiegand keypad PIN support for 4-digit or 6-digit PINs.
32. 8-bit and 4-bit burst keypad support for 4-digit or 6-digit PINs.
33. Integration with supported alarm panels.
34. Support for up to 200 DMP and 255 BOSCH intrusion panels with high-level TCP/IP integration.
35. Optional storage and recall of ID photos and personal/emergency data.
36. Unlimited person records.
37. Credentials are stored locally at the Field Panel. An unlimited number of credentials may be authenticated with the system Controller, caching the most frequently used credentials on the Field Panel. In an instance where the credential is not stored locally at the Field Panel, the Field Panel will attempt to confirm access by verifying the existence of the credential with the system Controller.
38. Unlimited number of scheduled actions, with the system Controller downloading up to 16 per Field Panel per day of the soonest-to-activate actions applying to that Field Panel, with any others that remain in the database as candidates for downloading later. Expired scheduled actions are removed automatically.
39. The system shall support tracing a person's activity in the current partition if the "Trace this person" check box is selected on the person record.
40. Search for person records using a credential scan.

F. The system shall provide the following Monitoring capabilities:

1. The Monitoring Home page shall allow users to view a full system summary, including the Activity Log, Auto-Monitor, and links to frequent User Tasks.
2. Common alarm panel integration for disarm on access, and arm on egress.
3. Support for the direct viewing of IP cameras.
4. Integrated real-time IP-based NVR systems and compatible third-party NVR systems with stored video replay for events.
5. Provides alarms on video loss, video motion detection, and video restore events.
6. Virtual inputs for video fail, camera normal, video motion, and building occupancy limits exceeded.
7. Provides alarms on communication loss and temperature variation.
8. Support for the creation of custom sets of alarm event actions.
9. Provides the ability to record video and link to video for alarm events based on access control activity.
10. Available video control and playback through the system user interface.
11. Provides the ability to assign threat levels to various alarm events according to severity.
12. Provides the ability to select up to 20 levels of priority for event actions.
13. Provides the ability to enter a duty log comment into the Activity Log, or to append a unique or preset comment to a particular log entry while viewing the Activity Log.

14. Support for the display of Activity Log entries that include both the time the event occurred on the Field Panel and the time it was reported to the SYSTEM Controller.
15. Support for electronic supervision of alarm inputs.
16. Support for the use of output relays for enabling circuits under alarm event control.
17. A monitoring desktop that integrates video, system Activity Logs, floorplans, ID photos, threat level control, and alarm notifications.
18. Support for the creation of unlimited customized monitoring layouts through the use of widgets, including layouts sized for the iPad or MacBook Air.
19. Graphic floorplans with active icons of security system resources.
20. System user permissions to grant whole or partial access to system resources, commands, and personal data.
21. Secure access to the user interface under encrypted password control.
22. Delivery of alerts via browsers, email, and text messages.
23. Remote Logging of system messages to remote host.
24. System health and maintenance:

    a. Provides the ability to manage system health alerts generated by the SYSTEM when it detects error conditions at applicable health monitoring points.
    b. For a given system, the health monitoring points may include the system license, disks, RAID drives, FTP, NAS, Backup, Archive, Disk Usage, and VMS.
    c. If a user configures notifications for a selected email group, group members shall receive a message whenever an error condition is detected at a health monitoring point. If the user has chosen to include a health summary, each notification shall include status information for all of the system's health monitoring points.

G. The system shall provide the following Video Management capabilities:

1. Real-time video monitoring displays, including multiple cameras simultaneously.
2. Pan, Tilt, and Zoom control of capable cameras.
3. Playback of video and access control event-related video.
4. Video switching and video widget pop-ups based on access activity or event activation.
5. Integrated alarm inputs from the Video Management System (VMS).
6. Digital playback of video events.
7. Linking of video and events based on triggers provided by the SYSTEM or VMS.
8. Support for multiple DVR and NVR systems.
9. Multiple pre-programmed supported cameras.
10. Recall of photo ID and real-time video feed for video verification and comparison of card holder.
11. Monitoring and control through a web browser interface.
12. System user permissions to grant whole or partial access to system cameras and video resources.

13. Full integrated operation with a Unified Management Client for live, recorded, forensic, and life safety notification over existing TV's and Monitors.
14. Ability to use the SYSTEM web interface to review the status of system and storage drives, and to adopt physical and virtual drives into an integrated NVR so it can begin using them for video storage.

H. The system shall provide the following Security Database capabilities:

1. Maintain data of system activity, personnel access control information, system user passwords and custom user role permissions for whole or partial access to system resources and data.
2. Partitions: It shall be possible to partition the system to create independent, virtual security management systems for multiple populations.
3. Support for the sharing of user privileges across partitions in a system.
4. Support for the grouping of multiple access levels across partitions in a system.
5. Built-in Open Database Connectivity (ODBC) compliant database for personal data.
6. LDAP, SLDAP, and Microsoft Active Directory integration for single-user logon authentication.
7. Microsoft Active Directory integration to allow the synchronization of cardholder data between Active Directory servers and the system.
8. Unlimited person records.
9. Network-secure API for external application integration.
10. Extensive and easy to use custom report generator.
11. User-defined data fields in personnel records.
12. Record recall by vehicle tag, name, or card.
13. An API for adding to, deleting from, and modifying the database.
14. Storage of system user passwords and permissions.
15. Storage and recall of ID photos and emergency personal information.
16. Pre-defined reports on system configuration, system activity history, and people.
17. A Used By feature for listing all correlations between specific card readers, keypads, inputs, and outputs, against groups, portals, elevators, access levels, access level groups, and other configured access control features. This feature may be useful for quickly determining I/O associations when editing and/or deleting system I/O points.
18. An Audit Trail report that shows changes made to the security database over a specified period of time.

    a. For each transaction listed in the report results, information is available on when the transaction occurred, who made the changes, the fields that were modified, and the original and new values.
    b. Search criteria can be applied to filter the report results, either by the person whose record was changed or by the area of the system configuration that was modified.

19. A Credential Audit report that shows all existing access cards by their current status settings and provides the ability to search for cards that have not been used for an operator-entered number of days. The report also shows for each card the name of the person to whom it was issued and the card number.

20. A Duty Log report shows duty log comments residing in the current security database, including archives.

    a. For each duty log comment included in the report results, information is available on when the comment was entered, who entered it, the date and time of the logged event associated with the comment, the name of the logged event, and the specific comment text.
    b. Search criteria can be applied to filter the report results, either by Operator (the user who entered the duty log comment) or by Event type.

21. Custom report writer interface that allows the interactive creation of custom reports. Reports may be saved for later reuse. No third party software (such as Crystal Reports) shall be necessary.
22. Custom report scheduling and distribution of report via email.
23. Selectable custom report output formats, including PDF, CSV, and HTML (default).
24. Custom report repository location. Users shall be able to review, cancel and delete reports from this data storage location.
25. Seamless search capability for access history reports. The reporting function shall search the database and archive simultaneously for matching report parameters.
26. Column sorting. Custom reports output shall be user configurable to sort individual columns in both ascending and descending order.
27. Periodic backup to on-board flash ROM and optional Network Attached Storage (NAS), or including FTP / SFTP servers.
28. Periodic archive creation for historical custom reporting and improved on-board database performance.
29. Email and text messaging alert notifications.
30. Custom Menu capabilities allowing a user to create a custom menu containing a specific set of options, which can be assigned to users and will then appear in their navigation palettes.

2.5 HARDWARE REQUIREMENTS

A. The system shall employ a modular hardware concept that enables simple system expansion and utilizes a three-tiered hardware hierarchy:

1. At the top tier is the system Controller, which shall contain the database engine, web server, application software, and configuration data. It is at this level that System Users, through a browser interface, shall interact with the system, set configurations, monitor activities, run reports, manage alarms, and manage cameras and video and storage.
2. At the second tier is the Field Panel, an intelligent device with native TCP/IP support, which shall make and manage access control decisions.
3. At the third tier are the application extension blades. Each of these blades shall connect to and manage a set of inputs, outputs, readers, or temperature monitoring points.

4. The system Controllers and Field Panels shall run on existing building TCP/IP networks and shall be configurable for access from separate subnets, through gateways and routers and from the Internet.
5. A PoE Plus powered Field Panel, which combines an Access Control blade and a CPU board, shall also be available.

B. The system Controller shall contain the operating system, database engine, web server, application software, and configuration data. The system Controller shall be available in configurations to support small to medium, large, and ultra-large systems.

C. An Entry-Level Controller shall contain a processor, flash memory, and a network switch. The Controller shall be supplied with 12V DC at a minimum of 5 amps. Internal battery backup shall supply sufficient power to provide for an orderly shutdown of the system in case of loss of external power. External battery backup shall be used to provide uninterrupted operation in the event of external power loss. The SYSTEM Controller is accompanied by a Field Panel. The Field Panel shall contain I^2C for communication with the Application Blades and a network interface port.

D. The Mid-Level Controller shall be available in wall-mount or 2RU rack-mount enclosure. It shall contain a motherboard with an Intel® Atom™ processor and solid-state disk drive. An Ethernet connector shall be provided for network connection.

E. The Enterprise Controller shall consist of a 1RU rack-mounted controller with additional processing power, memory and solid-state disk drive.

F. The Premium Enterprise Controller shall consist of a 1RU rack-mounted controller with additional processing power and memory, RAID-1 solid state disk drive array, serial port and network connections.

G. The Field Panel shall make and manage access control decisions with data provided by the Controller, and it shall manage the communication between the Controller and Application Blades connected to the system's inputs, outputs, and readers. The Field Panel shall be supplied with 120V AC at a minimum of 2.3 amps. The Field Panel can optionally be powered by 12V DC at a minimum of 7Ah. Internal SLA battery backup shall supply sufficient power to provide for an orderly shutdown of the system in case of loss of external power. External battery backup shall be used to provide uninterrupted operation in the event of external power loss. Each PoE Plus powered Field Panel shall support up to seven Application Blades. Communications between the Field Panel and the Controller shall be encrypted and authenticated using TLS digital certificates.

H. The Data Gathering Panel with embedded NVR shall make and manage access control decisions with data provided by the Controller, provide recording, live streaming and playback of IP cameras connected to it. The Data Gathering Panel with embedded NVR shall also manage the communication between the Controller and Application Blades connected to the system's inputs, outputs, and readers. The Unit shall be supplied with 120V AC at a minimum of 2.3 amps. The Field Panel can optionally be powered by a 12V 7Ah SLA battery. Internal SLA battery backup shall supply sufficient power to provide for an orderly shutdown of the system in case of loss of external

power. External battery backup shall be used to provide uninterrupted operation in the event of external power loss. Each Field Panel with the embedded NVR shall support up to four Application Blades. Communications between the Field Panel and Controller shall be encrypted and authenticated using TLS digital certificates. Each Data Gathering Panel with embedded NVR shall contain a video management appliance that is designed to be integrated with a Controller. The integration provides a single user interface for the access control and monitoring capabilities and the NVR video surveillance capabilities.

I. The Application Blades shall interface with the Controller through the Field Panel. The Application Blades shall be blade-style circuit cards. There shall be four types of Application Blades:

1. Access Control Blade - The access control blade shall receive power via the ribbon cable bus directly from the Field Panel. The access control blade shall supply up to 500 mA of power to one reader or 250 mA of power to each of two readers.
2. Supervised Input Blade - The input blade shall receive power via the ribbon cable bus directly from the Field Panel. It shall support a wide variety of input supervision types including normally open circuit and normally closed circuits, and zero, one or two resistor configurations.
3. Relay Output Blade - The output blade shall receive power via the ribbon cable bus directly from the Field Panel. Both normally open circuit and normally closed-circuit output devices shall be supported. The relay outputs shall support any output devices that operate on the following maximum electrical ratings: 30 Volts DC or AC, 2.5 Amps inductive or 5.0 Amps non-inductive.
4. Temperature blade - The temperature blade shall receive power via the ribbon cable bus directly from the Field Panel blade.

J. The PoE Plus powered Field Panel shall combine a CPU board and an Application Blade capability into a single enclosure. In addition, each PoE Plus powered Field Panel shall support one temperature input. The PoE Plus powered Panel may be supplied with 12VDC at 5 amps. With a 12VDC 5A power supply the total power available for all external output is 2000mA (24 watts). Alternatively, it shall also be possible to power the PoE Plus powered Field Panel from PoE switch that conforms to the IEEE 802.3af standard, or from PoE Plus switch which conforms to the IEEE 802.3at standard. With PoE (802.3af) as the power source the total power available for all external 12V output is 500mA (6 watts @12VDC). With PoE Plus (802.3at) as the power source the total power available for all external 12V output is 1000mA (12 watts @ 12VDC).

K. All wall-mount enclosures shall have a lock requiring a key, and a cabinet door tamper switch.

2.6 SOFTWARE REQUIREMENTS

A. Operating System and Application Software:

1. The embedded operating system for the system is Linux Ubuntu 16.04 LTS (long term support) as the operating platform. The operating system kernel shall be open-source and no operating system training or certification shall be necessary.
2. The application software shall be embedded in the system. The database shall be an embedded PostgreSQL relational database requiring a small footprint and provides high reliability. The web server shall be based on an embedded Apache™ web server enabling users to access and operate the system using a standard web browser.
3. The system shall support the following web browsers:

    a. Internet Explorer 11
    b. Chrome 70
    c. Firefox 63
    d. Safari 8, 9

B. Software Licensing:

1. Software licensing shall be based upon the number of portals, cameras, and select features for one Controller. Software license upgrades shall be available if system portal and camera capacity must be increased. The user license shall be valid in perpetuity and shall include one year of software updates from the date of shipment from the factory.
2. Licensing shall be controlled by a Product Key and an Activation Key. The Product Key contains the licensed system features and limits. To upgrade your system license to enable more cameras or more portals you will need a new Product Key. The Activation Key contains the software support expiration date. The keys are locked to the system license number. The system license number shall be viewable on-screen on the About page

C. Software upgrades shall be possible from a browser on any network-connected PC by uploading a software update to the Controller. The Controller shall automatically upgrade all connected Field Panels. No client software installation shall be necessary.

D. Online Help and Documentation - The system shall be provided with complete embedded documentation. The online documentation shall include:

1. Context-sensitive online Help - (The Help displayed is specifically relevant to the current screen.) The online Help system shall provide explanations and procedures for all monitoring, administrative, and system configuration and maintenance functions. The Help system shall have linked table of contents, a linked index, and frequently asked questions pages. Each topic shall also have links to related topics. Each Help topic shall be printable.
2. Technical Support Notes - These documents shall be in PDF format, shall be printable, and shall be linked to from the Help system table of contents, index, and related topics.
3. Installation Guides - These documents shall be in PDF format, shall be printable, and shall be linked to from the Help system table of contents, index, and related topics.

4. Video Integration Guides - These documents shall be in PDF format, shall be printable, and shall be linked to from the Help system table of contents, index, and related topics.
5. End-User Task Guide - This document shall be in PDF format, shall be printable, and shall be linked to from the Help system table of contents, index, and related topics

E. Support Collaboration - It shall be possible, by the use of a network Support Collaboration Tool, for a technical support specialist to connect to the system and assist on-site technicians from remote network-connected locations. It shall only be possible for an on-site system administrator or technician to initiate this connection. There shall be no way to initiate this connection from outside of the secure network.

F. Language Support - The system shall be provided with multiple language support. The ability to switch from one language to another shall be accomplished through the user interface. Translation of the user interface, online help and documentation into other languages shall be available.

G. Date Formats - The system shall support global date formats.

H. Floorplans - The system shall provide graphic floorplan capability including graphic display of links to other floorplans, alarms and system resources such as portals, IP video cameras, inputs, outputs, and temperature monitoring points.

1. The Network Administrator holding at least a Setup user role shall be able to graphically configure device icons onto the floorplan images, and to upload additional floorplan images. JPEG images shall be supported, and the maximum size for a floorplan image shall be 256K.
2. It shall be possible to create floorplan groups for the purpose of assigning or withholding assignment of these groups to system user permissions known as custom user roles. If a floorplan group is assigned to a particular system user then the floorplans in that group shall be viewable by that system user.

I. Personnel Data - The system shall maintain person data relating to access control, system user privileges, photo identification, system activity, and contact information.

1. All person data in the system shall be integrated onto one tabbed page for viewing, editing, and deletion by system users.
2. A system user holding at least an Administrator user role shall be able to create, delete, and modify person records, including access levels and access level groups.
3. A system user holding at least a Setup user role shall be able to configure the display of person records. For example, the user shall be able to hide various tabs, and configure the User-defined tab by changing the tab label and customizing any of the 20 data fields that appear on the tab. The user shall be able to enter text, numbers, Boolean expressions, or user-defined list information into these data fields. The user shall also be able to define UDF value lists, which can be displayed as pre-entered drop-down lists for user-defined data fields.

4. The Person page shall contain a Journal tab, allowing the operator to enter and save a journal entry associated with the person.

J. Browser Based Data Import and Export - A Data Operations Tool shall be provided that supports, via an API, the import and export of personnel data. This tool shall make possible the pre-populating and ongoing populating, of cardholders into the system database. Data that shall be importable and exportable shall include:

1. Controller
2. Partition
3. FirstName
4. LastName
5. MiddleName
6. Deleted

7. Credentials [list]

    a. HotStampNum
    b. EncodedNum
    c. CardFormat
    d. Status
    e. ExpirationDate
    f. RemoteLockUserType
    g. Profile

8. AccessLevels [list]

    a. AccessLevelName
    b. ActivationDate
    c. ExpirationDate
    d. AutoRemove

9. PersonID
10. PIN
11. ExemptFromPin
12. UDF1-20
13. Notes
14. ActivationDate
15. ExpirationDate
16. BadgeLayout
17. PictureFile
18. Phone
19. Email
20. Email2
21. Location
22. OtherContactName
23. OtherContactPhone1
24. OtherContactPhone2
25. Vehicles [list]

a. Color
b. Make
c. Model
d. State
e. Licnum
f. Tagnum

26. AntiPassBackPriv
27. ExemptFromNonUse
28. TracePerson
29. UseExtendedUnlock
30. LoginUserName
31. LoginUserPassword
32. LoginUserRole
33. LastModDateTime
34. LastModUser

K. Data Security:

1. Administrative access to the security management application and the personnel data shall be password protected and controlled by roles-based authorizations.
2. In addition, it shall be possible to enable secure communications between the Controller and web browsers, and between the Controller and Field Panels.
3. Communication between the Controller and browsers shall be secured using TLS digital certificates. The available options are:

    a. Generate a self-signed certificate that is signed with your web server's own private key. This certificate shall provide encryption but not authentication.
    b. Upload a certificate that is signed by a certificate authority (CA) to the SYSTEM Controller. This certificate shall provide both encryption and authentication.
    c. Upload your organization's own certificate and matching key to the SYSTEM Controller.

4. Communication between the Controller and the Field Panels shall be encrypted and authentication/tamper detection shall be done using TLS digital certificates. Authentication will occur when the Field Panel connects to the SYSTEM Controller. The available options are:

    a. Use a default self-signed certificate installed on the SYSTEM Controller and the Field Panel. The default built-in certificate for Field Panel communication shall use 2048-bit RSA key with SHA1 signature. The cipher mode to encrypt the data shall be AES256-GCM with SHA384 hash function.
    b. Generate a self-signed self-signed certificate, which is signed with the Controller's private key. This certificate shall provide encryption but not authentication.
    c. Generate an SSL certificate that is signed by a certificate authority (CA). This certificate shall provide both encryption and authentication.

d. Upload your organization's own SSL certificate and matching key to the Controller.

5. Communication between the Controller and other systems (when using the API) shall be secured using SSL and authentication/tamper detection shall be done using the SHA-1 algorithm.

L. Data Backups - It shall be possible to configure regular automatic database backups.

1. It shall be possible to back up a solid-state Entry-Level SYSTEM Controller or Mid-Level SYSTEM Controller to a built-in solid state hard drive.
2. It shall be possible to back up an Enterprise Controller or a Premium Enterprise SYSTEM Controller to a built-in solid state hard drive.
3. It shall be possible to save backups from any Controller to separate network attached storage (NAS) and file transfer protocol (FTP or SFTP) servers.
4. It shall also be possible to setup regular automatic creation of database archive files.

M. On-board Data Management - Each night the system shall truncate a sufficient number of the oldest records held on-board to reduce the database to its set limit, if required. This shall create the needed storage space for additional system activity records. Truncation will be performed on a First-in, First-out (FIFO) basis.

N. Partitions - It shall be possible to create multiple partitions for the management of multiple security systems or multiple populations.

1. It shall be possible to limit access to the data and resources of one partition to those with permissions for that partition.
2. It shall be possible for each partition to have its own population, resources, rules, events, video management, log data, reports and network resources.
3. It shall be possible to grant Monitor, Administrator and Setup privileges for multiple partitions to the same user. It shall also be possible to create custom user roles for each partition.
4. A Field Panel can reside in only one partition. It shall be possible to create partitions without Field Panels.

O. User Roles and Permissions - There shall be four pre-programmed levels of user roles, and custom user roles can be configured in the system with different permissions for each user:

1. Master Partition Monitor - These users may use the functions in the Monitor menu only within the Master (default) partition. Monitor functions shall include viewing the Activity Log, cameras, and floorplans.
2. Master Partition Administrator - These users may use the functions of both the Administration and Monitor menus only within the Master (default) partition. Administrative functions shall include adding and editing person information in the enrollment database, issuing and revoking cards, generating reports, and performing database backups.

3. Master Partition Setup - These users may use the functions of the Setup, Administration, and Monitor menus only within the Master (default) partition. Setup functions shall include defining access control, alarm event behavior, camera settings, floorplan images and configurations, holiday and time specifications. Setup functions shall also include: designation of network resources such as time and DNS servers, email and network storage settings; performance of system maintenance such as database backup and restore, software updates and file cleanups; designation of time zone, daily backup schedule and enrollment readers.
4. Full System Setup - These users may use the functions of all menus in all partitions.
5. Custom User Roles - In addition to the roles above the system shall also support the creation of detailed user permissions regarding which data operations, cameras, floorplans, elevators, events, access levels, access level groups, portals, reports, and personal data fields the system user may see, edit, delete, or control.

P. Alarm Panels - The system shall interface with alarm panels via wiring to an input point and an output point on each panel. This provides the ability to arm and disarm the panels, and to trigger events based upon alarm panel status.

Q. Intrusion Panels – The system shall integrate with the following intrusion panels:

1. BOSCH B and G Series control panels running with firmware version 3.03.014 or later.

2. Digital Monitoring Products (DMP) XR150, XR500 and XR550 Command Processor Panels.
3. Security administrators can use events on an intrusion panel, such as a zone going into an alarm state, to trigger events in the system. They can also use events in the system to control operations on an intrusion panel, such as the arming or disarming of an area.
4. Monitors can use the Intrusion Panel widget to view configuration and status information for an intrusion panel. They can also arm and disarm areas, bypass and reset zones, and activate and deactivate outputs associated with the panel.
5. The intrusion panels shall communicate their status to the system using port 6000-6063 (DMP), or port 7700 (BOSCH).
6. Intrusion panel system messages shall identify the panel that generated the message.
7. The system shall support at least 200 DMP panels and at least 255 BOSCH panels.
8. For DMP panels only: The system shall assign precedence to arm/disarm commands sent from the UI to the DMP panels.
9. Communication errors between DMP panels and the system shall be retried after one minute. Communication errors between BOSCH panels and the system shall be retried after two minutes, but this default retry time is configurable.

R. Alarm Events - The system shall manage alarm events.

1. It shall be possible to delay an input's change to the Alarm state by a specified number of seconds. The range of delay options shall be 0.5 seconds or from 1 to 120 seconds.
2. It shall be possible to associate specific actions with each alarm event. These actions may include, but are not limited to:

    a. Lock and Unlock portals.
    b. Activate and Deactivate relay outputs.
    c. Arm and Disarm input groups.
    d. Pulse outputs or output groups.
    e. Arm and Disarm alarm panels.
    f. Send emails and system messages.
    g. Move cameras to preset positions.
    h. Switch to a video monitor.
    i. Record video.
    j. Momentarily unlock portals.
    k. Change the threat level for a location, and (optionally) for its sub-locations.
    l. Make entries in the Activity Log.
    m. Play a digital sound file; it shall be possible to specify that it play in a loop until cleared or acknowledged.
    n. Display alarms in different colors.
    o. Set a priority for an alarm (one of 20 levels, with 1 being the highest).
    p. Require a duty log entry.
    q. Clear an alarm automatically or require an acknowledgement.
    r. Push a View to a Unified Management Client.
    s. Push a View to a group of Unified Management Clients.
    t. Push an NVR camera stream to a Unified Management Client.
    u. Push an NVR camera stream to a group of Unified Management Clients.

3. A system user holding at least a Setup user role shall be able to create, delete, and modify alarm system inputs, input groups, outputs, output groups, alarm panels, and events.
4. It shall be possible to trigger events based on system activity such as:

    a. Failed login attempts.
    b. Video motion detection.
    c. Camera failure and camera restore events.
    d. Valid or Invalid card reads.
    e. Portals held or forced open.
    f. Valid card reads with a specified access level.
    g. Inputs entering an alarm state.
    h. High and low temperature events.
    i. Low batter voltage and low battery capacity events.
    j. Alarm panel arming failures.
    k. Alarm panel zone faults.
    l. Tailgating and passback violations.
    m. Occupancy limit exceeded
    n. Region empty violations.

o. Field Panel power failure, communication failure, timeout, and tamper events.

5. It shall be possible to clone an event which creates an event with all attributes of the original, needing to change only the event's name and any attributes it will not have in common.

S. Activity Monitoring:

1. The system shall support a Monitoring Desktop that integrates video, system Activity Logs, floorplans, threat level control, ID photos, and alarm notifications.
2. Activity Log viewing includes one-click navigation to person records.
3. The system shall support a Widget Desktop that allows the creation of custom monitoring layouts. Within a custom layout, widgets display live video, system Activity Logs, alarm notifications, ID photos, floorplans, duty log entries, portal status displays, and intrusion panels.
4. The system shall support specific alarm events in the Events and Alarm Workflow widgets in one of the following three modes:

   a. Activations do not display alarms – No alarm events shall be displayed in either widget when such events are configured in this mode. All settings shall be disabled in the Acknowledgements section of the page.
   b. Multiple activations display a single alarm – Alarm events shall appear in both widgets each time the alarm input is triggered. Each subsequent trigger of the same input shall display a new alarm event which shall replace the previous one.
   c. Multiple activations display multiple alarms – Alarm events shall appear in the Events widget as described in item b above. The Alarm Workflow widget shall simultaneously display a separate alarm event for each alarm trigger.

5. Many widgets support multiple partition viewing and filtering. For example, the Activity Log widget can display data from multiple partitions and data filtered by event type or reader group, and/or based on the text content of the event. Additionally, the system shall support the use of category filters, including Access Control, Alarms and Events, Threat Levels, System Admin, Devices, Field Panels, Access Granted, and Access Denied.
6. It shall also be possible to view cameras, Activity Logs, and floorplans on separate monitoring pages within the application.
7. The system shall support tracing a person's activity in the current partition if the "Trace this person" check box is selected in the person record.

   a. The traced activity is displayed in bold in the color selected for "Trace person log color" on the Controller page.
   b. In addition, if an event is selected for "Trace person event" on the Controller page, the event is triggered each time a traced person makes an access attempt. These event activations can be reported using a Trace people filter in a custom history report.

c. When a user opens a person record in which “Trace this person” is enabled, a dialog box shall indicate that the person’s activity is being traced.

8. The Activity Log shall be capable of displaying additional cardholder information, including “Hot Stamp”, “Encoded Number”, and “Company ID”.
9. The system shall include a Photo Display Widget, which allows operators to display a current ID photo based on the most recent access request.
10. It shall be possible for a system user to place restrictions on the retention and tracking of access activity by setting options on the Controller page.

    a. The user can set an option to show Access Granted events in the Activity Log only when both a credential and PIN are used for access.
    b. The user can set an option to have the system retain Access Granted and Access Denied events only for a specific number of days. Once an Access activity record has been stored for the specified number of days, it shall be purged from the database. Access activity records shall not be included in archives.

T. Network-based Cameras and Video Surveillance - The system shall provide live IP video surveillance capability. The number of supported cameras shall be limited only by license. The system’s video capabilities shall include video monitor switching based on access activity. The system shall provide monitoring, configuration, and administration of IP video. Cameras can be separately monitored or monitored in groups.

1. Presets - The system shall support the creation, deletion, and editing of camera preset positions in the system. It shall also be possible to save changes in preset positions directly to a camera.
2. Views - The system shall support the creation, deletion, and editing of multiple camera views, specifically Quad views (four cameras), NVR 2x2 view and NVR 1+7 views. The application shall provide a drop-down pick list for selecting current views or naming of new views.

U. Access Control:

1. The system shall be able to make access control decisions, define a variety of access levels and time specifications, write system activity into a log file, maintain a personnel enrollment database, receive signals from input devices such as door switch monitors, card readers and motion detectors, energize devices such as door locks and alarms via outputs.
2. Time Specifications: Each time specification must be assigned a unique alphanumeric name of up to 64 characters. The definition of a time specification shall require the assignment of both a start time and an end time.

    a. Each day of the week shall be individually assignable for inclusion in time specifications.
    b. Up to eight holiday groups per partition shall be assignable for inclusion in time specifications. If no holidays are assigned to a time specification then

no holiday access shall be allowed. It shall be possible for users to change the default holiday group names (hol1 through hol8) to more meaningful names.

c. Time specifications shall be assignable to access levels, output groups, portal groups, input groups, and alarm events.
d. Time specifications shall function appropriately per Field Panel for the time zone specified for that Field Panel.

3. Card Formats - The system shall support the use of readers that use the Wiegand Reader Interface. The system shall support but not require the use of the card facility code. The system shall also support the use of the Magnetic Stripe ABA track 2 card data formats.

a. It shall be possible to create new card formats, designate start bits and bit lengths for facility codes and card ID numbers, and designate parity bits. The system shall support up to 64 different card formats, and 32 formats can be enabled at a time. With compatible Mercury boards the system shall allow for up to 16 card formats to be designated as Mercury-supported. These Mercury-supported formats will be enabled on Mercury panels.
b. It shall be possible to reverse the read order of the bits in the facility code and/or card ID portions of a card format.
c. It shall be possible to view and change the default parity bit definitions for a card format.
d. A card formats shall be disabled by default. Once enabled, the format appears in the card format dropdown within the credential section of a person record.
e. The system shall support the use of a concatenated version of the FIPS 201 format (Federal Information Processing Standard Publication 201)
f. FIPS 201 128-bit format. This system-owned credential format is based on Federal Information Processing Standard (FIPS) 201. It can be enabled and disabled, but it cannot be modified. The credential number is a Federal Agency Smart Credential-Number (FASC-N) containing 32 characters, encoded as binary-coded decimal (BCD) digits. When issuing a credential using this format, a user can either enroll the credential via an enrollment reader or use a dialog box to enter a value for each of the fields that make up the 32 BCD string
g. Administrators shall be able to specify a specific number of days of non-use that will be allowed before unused cards will be disabled. Administrators shall be able to exempt individual users from this non-use rule.
h. The system shall support the Southwest Texas Regional Advisory Council (STRAC) UUID format of 128 bits displayed as 32 hexadecimal characters.

4. Access Levels - The system shall be capable of storing unlimited access levels in each partition.

a. Each access level must be assigned a unique alphanumeric name of up to 64 characters.

b. The definition of an access level shall require the assignment of a reader or reader group, and a time specification.
c. It shall be possible to also assign an elevator floor group to an access level.
d. It shall be possible to create a temporary access level by assigning an activation date and/or expiration date for any of a person's assigned access levels. It shall also be possible to have the system automatically remove a temporary access level once it has expired.

5. Access Level Groups – The system shall support the creation of access level groups, which will allow users to assign multiple access levels at once. Users with at least a Setup user role can create single-partition access level groups that can be viewed and assigned within the partition in which they were created. Users with the Full System Setup role can also create multi-partition access level groups, which can be viewed and assigned across partitions, and can contain access levels from multiple partitions, depending on the user's permissions.
6. First-in Unlock Rule: The system shall support the use of a First-in unlock rule. It shall be possible to use this rule to control the unlock behavior of portal groups with assigned unlock time specs.

a. The First-in unlock rule shall require a card read of a specified access level. The portals in the group shall unlock only when the rule is satisfied and the unlock time spec is valid.
b. There can be up to 64 First-in unlock rules in the system at a time.

7. Double Card Presentation - The system shall support the use of a Double Card Presentation mode. This mode shall allow the presentation of a card twice in quick succession at a designated reader. Such a "double read" shall change the locked portal to an unlocked state until a subsequent relock event or user-designated timeout occurs. The double card presentation mode shall be enabled on an individual portal basis and shall also require a designation on the access level assigned to the cardholder. The mode shall adhere to time spec and threat level restrictions.
8. Keypad timed unlock - It shall be possible to enable a timed unlock feature for a portal that has a combination reader/keypad device. Once this feature is enabled, any cardholder with valid access to the portal shall be able to specify how long the portal will remain unlocked.

a. A cardholder presents his or her card and then enters the associated PIN, followed by the number sign (#) and the number of minutes (1-99) the portal should remain unlocked.
b. The portal will remain unlocked for the specified number of minutes; unless it is closed before the timer expires. If the portal remains open after the timer has expired, a [Door Held Open] alarm will be activated.
c. If reader/keypad devices are located on both sides of the portal, cardholders will be able to use either device to initiate a timed unlock.

9. Keypad Commands - For Field Panel connected access control keypads and combination card reader/keypads, users having the authorized access levels

shall be capable of executing keypad initiated commands based on pre-defined two-digit number codes.

a. Keypad commands shall be defined by mapping one or more two-digit codes to events defined in the system using the “Setup: Alarms: Keypad Commands” page.
b. Keypad commands shall be assigned to specific keypads using the “Setup: Access Control: Readers/Keypads” page.
c. Keypad commands shall be assigned to specific access levels using the “Setup: Access Control: Access Levels” page.

10. Holidays - The system shall support up to 30 holidays Field Panel. Each holiday must be assigned a unique alphanumeric name of up to 64 characters. The definition of a holiday shall require a start date and an end date. Holidays shall have the ability to span several days using only one holiday slot. Holiday definitions shall support the designation of a start time and an end time. If no start time is designated, then the system shall default to 00:00 (start-of-day). If no end time is designated, then the system shall default to 24:00 (end-of-day). Holidays shall require the use of 24-hour time format, e.g. 17:00 is 5:00PM.
11. Portals - A portal is a configurable object which can contain a reader or two readers, with or without keypads; a door status monitor (DSM); a request to exit (REX) device; and a lock. A system user with at least the Setup role shall be able to view current portal definitions, change portal definitions, delete portals, and create new portals. Creating a portal defines the access and alarm behavior of the access point. This can include:

a. Card readers and keypads.
b. Output for locking.
c. Input for monitoring the door switch.
d. Input for a Request-to-Exit function.
e. Local alarm outputs and system alarm events.

12. Portal Groups - It shall be possible to create groups of portals and to assign an unlock time specification to the entire group. All the portals in the group shall remain unlocked during the time specified.

a. It shall be possible to use portal groups for assigning or withholding assignment of these groups to system user permissions known as custom user roles. If a portal group is assigned to a system user then the portals in that group shall be viewable and unlockable by that system user.

13. Portal Alarm Conditions – Depending on the device type, system-wide events can be configured for up to seven portal alarm conditions. The seven alarm conditions are as follows:

a. Forced: When a portal is opened and there has been no card read, nor request to exit.
b. Held: When a portal is held open past the expiration of the shunt timer.

c. Invalid: When the portal reader reads a card for which there is no entry in the database.
d. Valid: When the portal reader reads a card for which there is a valid entry in the database.
e. Duress: A card has been presented to the reader, followed by an entry of the cardholder's duress PIN into the keypad.
f. Double Card Presentation: For a portal with Double Card Presentation enabled, a qualified user has performed a double read to unlock the portal.
g. Unlock: The state of the portal's RU (Remote Undog) exit device has changed from DNE (Dog On Next Exit) to Dogged (unsecured).

14. Two-man entry restriction: It shall be possible to require two valid card reads by different cardholders within a specified number of seconds for entry to a specific portal.
15. Escort Rule - The system shall support escorted access control rules by assigning one of the following two escort types to each cardholder:

    a. Escort - Cardholders with this access level shall enable access for persons requiring escorted access by presenting their credential at a card reader within 15 seconds after those requiring escorted access.
    b. Requires Escort - Cardholders with this access level shall be unable to access the portal unless a valid "Escort" cardholder presents their credential at the card reader within fifteen seconds after the "Requires Escort" credential has been presented. Otherwise, access will be denied, and the Activity Log shall display a message with the reason code {NO ESCORT}.

16. With compatible Mercury boards, the system shall support Facility Code Mode for reader/keypads, with the following available options.

    a. None (the default): The facility code is treated as part of the overall encoded credential number. A card matching only the facility code will not be granted access.
    b. Configuration: Facility-code only checking is turned on only while the complete set of credentials is being downloaded to the Mercury panel. Once the credential download is complete, the behavior is the same as for the "None" setting.
    c. Offline: Facility-code only checking is turned on only when the SIO is disconnected from its Mercury panel (via the RS-485 link). When the SIO is connected to the panel, the behavior is the same as for the "None" setting.
    d. Configuration and Offline: Facility-code only checking is turned on both during the credential download and when the SIO is disconnected from its Mercury panel. At all other times, the behavior is the same as for the "None" setting.
    e. Permanent: Facility-code only checking is always turned on.

17. Anti-passback - The system shall support both regional and timed anti-passback access control. For anti-passback functions, it shall be possible to configure regions, assign readers to those regions, and specify events for response to

tailgate, passback, and occupancy limit violations. It shall also be possible to designate parent regions for hierarchical anti-passback.

a. Grace: It shall be possible for a system Monitor or Administrator to Grace Card holders from passback and tailgate violations.
b. It shall also be possible to set a specific time for all cardholders to be graced daily.
c. The system shall be able to automatically place the cardholder in a predefined region upon the selection of the grace option.

18. Mustering - To aid in evacuation management it shall be possible to designate a region or regions for mustering. It shall be possible to quickly get an occupancy count and occupant list for any region.
19. Scheduled Actions - It shall be possible to specify system actions to occur at scheduled times. When scheduling an action, it shall be possible to specify whether the time specifications for the scheduled action will be based on the time zone set for the local Field Panel or the time zone set for the SYSTEM Controller. Scheduled actions can include:

    a. Arming and disarming inputs and input groups.
    b. Activating and deactivating outputs and output groups.
    c. Locking and unlocking portals and portal groups.
    d. Locking and unlocking elevator floors and floor groups.

20. Floorplans - The system shall support displaying of active graphic floorplans and configuring each floorplan with icons representing system resources: cameras, portals, temperature points, and alarms. A network administrator holding at least a Setup user role shall be able to upload floorplan images and graphically configure device icons onto the floorplan images. Viewing floorplans will require the Adobe Flash Player plug-in for the browser.

    a. It shall be possible to create floorplan groups for assigning or withholding assignment of these groups to system user permissions known as custom user roles. If a floorplan group is assigned to a system user then the floorplans in that group shall be viewable by that system user.

21. Elevator Control - The system shall be capable of controlling elevator access to floors. The system shall control up to 52 floor buttons per Field Panel, or up to 28 floors with floor selection tracking. With compatible Mercury boards, the system shall control up to 128 floor buttons per elevator cab, with or without floor selection tracking.

    a. It shall be possible to create, change, or delete floor groups, and to assign a free access time specification to a floor group. The floors in this group will be freely accessible during the times defined by the chosen time specification.
    b. It shall be possible to create elevator groups for assigning or withholding assignment of these groups to system user permissions known as custom

user roles. If an elevator group is assigned to a system user then the elevators in that group shall be viewable by that system user.

c. Users assigned to custom user roles for one or more elevator groups may be given Free Access privileges to manage access to the elevators in those groups by using the Scheduled Actions page or an Elevator Status widget to:

1) Momentarily enable free access for an elevator floor button. This will allow persons to temporarily access one or more floors without the need for an access control transaction such as a card read.
2) Schedule an extended period of free access to one or more floors. This will allow persons to access the floors without constraints for the duration of the free access schedule.

d. Floor Tracking - Users may configure optional inputs on the system that shall change state when a corresponding floor selection button on an elevator is pushed, enabling the system to monitor the status of each floor selection button in relation to specific access credential transactions.

e. The system shall support Elevator Floor Tracking

1) The system shall support optional inputs that change state when the corresponding floor-select buttons are pushed, allowing the system to detect each button's status.
2) The system shall support an optional input that will change state and trigger an event, when the elevator's duress/emergency button is pushed.

f. Users may configure an optional input for each elevator and corresponding event on the system when the elevator's duress/emergency button is pressed.

V. Threat Levels:

1. It shall be possible to configure up to eight threat levels per partition. It shall be possible to alter security system behavior using threat levels. Groups of threat levels may be created and assigned to portal groups, access levels, input groups, output groups, floor groups, and event actions. The behavior of groups, access levels, and event actions with assigned threat level groups shall change based upon the current system threat level.
2. The system shall support 32 threat level groups.
3. It shall also be possible to change the system threat level in response to an alarm event.
4. The current system threat level shall display in the title bar of the security application interface and on floorplans.

W. Location-based threat levels - The system administrator shall have the ability to define locations. This allows for threat levels to be assigned to individual locations.

1. Within each parent location, sub-locations can be created, and additional sub-locations can be created within each of these, and so on. This creates a location hierarchy.
2. Locations shall contain portals.
3. Threat levels can be applied to any location within the hierarchy.

X. Appropriate Use banner - The system administrator shall have the ability to enter text (such as an appropriate use statement) to be displayed on the login page.

Y. Reports:

1. The system shall support a variety of predefined reports regarding software and security hardware configuration, event history, and the administration of people within the system.
2. It shall also be possible to produce reports directly from the system Controller based on data in archive files on FTP or SFTP servers, network attached storage, or the built-in hard drive.
3. The system shall support a graphic interface for interactively building custom reports from either historical or personnel data. These reports shall be savable for later reuse. Parameters can be inserted into reports to prompt for data input at report runtime. Report results can be printed, output to a PDF file or put into a spreadsheet.
4. It shall also be possible to group reports for assignment to custom user roles. Any reports not grouped and assigned to a custom user role shall not be viewable by that system user.
5. The system shall be capable of sorting users by various criteria, including email address, and allow for email groups to be selected for auto-distribution.
6. Report generation shall not affect the real-time operation of the system.
7. The specific reports provided shall include the following:

    a. Configuration Reports

        1) As Built - A graphical report that displays an image of each Application Blade in a Field Panel and the specific resources (inputs, outputs, readers, etc.) configured for that blade. The network settings for the Field Panel shall also be included. This report shall display an image of each Mercury panel being used and specific resources configured on those panels.
        2) Cameras - Displays all camera configuration information including control address, IP port, and camera type.
        3) Camera Presets - Displays configured presets for each camera in the system.
        4) Elevators - Displays elevator configuration information including Field Panel, reader, floor to output mappings, floor select, and duress/emergency inputs.
        5) Floor Groups - Displays all configured floor groups for use in elevator control.
        6) Holidays -Displays holiday specification information.

7) Portals - Displays portal definition information including reader, DSM input, REX input, alarm outputs, and events.
8) Portal Groups - Displays a list of all defined portal groups.
9) Reader Groups - Displays defined groups of readers.
10) Remote Locksets - Available if the Remote Locksets feature is licensed for the system. Displays the following information for each remote lockset: name, IP address, synchronization status, serial number, last completed update time, firmware version, battery voltage, assigned remote lockset profile, and number of stored cardholders. The report can be sorted by any of the columns.
11) Resources - Displays all configured system resources including readers, inputs, outputs, elevators, and temperature points.
12) Threat Level Groups - Displays all configured threat level groups and the threat levels assigned to them.
13) Threat Levels - Displays all configured threat levels including the description and color assignment.
14) Time Specs - Displays all configured time specs currently in the system. Time specs, which define allowed access times, are used as part of access level definitions.

b. History Reports

1) Access History - Displays access history based on an entered query. The system user can specify the query using either the keyboard or point-and-click selection. Access history reports shall include the ability to include elevator access requests.
2) Alarm Resolution – Provides a report that tracks alarm duration. This is the period between the activation of an alarm and its resolution. Alarms are individual activations of events defined in the system. For an alarm to be resolved, it must be acknowledged (if acknowledgement is required according to the associated event definition) and its underlying cause must be cleared.
3) Custom Report - Provides the capability to create custom reports of historical data. A graphic interface provides the user with the ability to interactively create and save reports for later use. Parameters can be inserted into reports to prompt for data input at report runtime. Custom report output shall be user selectable for HTML, PDF or CSV format. Custom report configuration shall include page size, orientation, and column width and shall automatically notify the user if the selected configuration exceeds the selected page size.
4) General Event History - Displays time, type of activity, and activity details for a variety of event types. The system user can select the specific event types for the report.
5) Portal Access Count - Display how many times users have used a portal.
6) Audit Trail - Displays an audit trail of system changes and the name of the system user that made the changes. It shall be possible to specify the dates and times covered in the report.

7) Duty Log - Displays duty log comments residing in the current security database, including archives. For each duty log comment, the report shows the date and time the comment was entered, the person who entered the comment, the date and time of the logged event associated with the comment, and the Activity Log message followed by the specific comment text.

c. People Reports

1) Access Levels - Displays all access levels entered into the system including time specification, reader/reader group, and floor group.
2) Credential Audit - Lists existing credentials by their status settings (such as Active, Damaged, Lost, or Not Used). Before running the report, users can filter the data to see only credentials with a status setting, or only credentials that were not used with a specific number of days from the date they were issued.
3) Current Users - Displays a list of all security system users currently logged in to the security system website.
4) Custom Report - This provides the capability to create custom reports of personnel data. A graphic interface provides the user with the ability to interactively create and save reports for later use. Parameters can be inserted into reports to prompt for data input at report runtime. Custom report output shall be user selectable for HTML, PDF or CSV format. Custom report configuration shall include page size, orientation, column width, and shall automatically notify the user if the selected configuration exceeds the selected page size.
5) Occupancy - Displays a list of defined regions with the number of people currently occupying each region and the maximum number of occupants allowed, if a maximum has been specified.
6) Photo ID Gallery - Displays all the photo ID pictures in the system and the person's name.
7) Photo ID Requests -Displays all outstanding badge print requests and lists ID, name, badge layout, activation date, request date.
8) Portal Access - Lists people with access for a selected portal.
9) Roll Call - Allows you to select a defined Region from the drop-down and see a list of people currently in that region.
10) Roster - Displays every person entered into the system and it lists name, ID photo, expiration date, username, and access level.

Z. Administration - The system shall provide for the performance of system administration tasks from any network-connected computer with a browser. Most of the administrative, maintenance, and configuration utilities and functions shall require a SYSTEM user with at least a Setup user role. Information from the network administrator shall, in many cases, also be required. These administrative tasks shall include but not be limited to:

1. Generating reports:

a. The system shall support a variety of predefined reports regarding software and security hardware configuration, event history, and the administration of people within the system.
b. Alternatively, the system shall support a graphic interface for interactively building custom reports from either historical or personnel data. These reports shall be savable for later reuse. Parameters can be inserted into reports to prompt for data input at report runtime. Report results can be printed, output to a pdf file or put into a spreadsheet.
c. It shall also be possible to group reports for assignment to custom user roles. Any reports not grouped and assigned to a custom user role shall not be viewable by that system user.
d. A system user holding All Administration permissions, or permissions to view and edit specific types of reports, shall be able to view and create reports.

2. Database backups:

a. The system shall create database, or full system data backups, each night at 00:15 hours. These backups shall be stored in ROM and written to the drive on the disk-based controller.
b. It shall also be possible for system users to create such database backups at any time. Any database backups onboard the Controller may also be downloaded to off controller storage by the system user at any time.
c. Backups shall also be written to network attached storage (NAS), or to an FTP or SFTP server if such storage has been configured in the system.
d. A user with at least a Setup user role shall have the ability to schedule a time for the daily transfer of backups to NAS. The user can specify that the transfer will occur after the daily backup or at a specific time of day.

3. System restore:

a. The system shall be able to restore its database, or the full system data, from a backup. Restoration of the system shall only be possible from a backup copy onboard the Controller. It shall, therefore, be possible to upload a copy of a database backup from any network attached storage.
b. It shall be possible to review backups by date and description and select the desired backup for upload to the Controller or restoration as the current system database.

4. Software updates:

a. Software updates, upgrades and patches shall be provided from time to time. The system shall be able to update its software from these .upg files. Update of the application software shall only be possible from an update file onboard the Controller. It shall, therefore, be possible to upload a copy of the software update from any network attached storage or from any PC drive or desktop.

b. Software updates may involve the Controller only or may include updates for the Field Panel(s) also. The monitoring of the security system may be unavailable for several minutes during this process.

5. File upload - The system shall support uploads of files for use in and with the system. Supported files include:

   a. Floorplans in .jpg format
   b. Badge layouts
   c. ID photos in .jpg format
   d. Database backups
   e. Software license files
   f. Software updates
   g. Threat level icons in .jpg format
   h. Sound files (.wav) for use in event alerts

6. Setting system time, time zones, and time servers:

   a. The system shall support the setting of time zones by selection of a drop-down pick list. Time zones shall be separately settable for the Controller and for each Field Panel in the system. An extensive list of world-wide time zones shall be provided. Adjustments for daylight saving time (summertime) shall be automatic.
   b. The system shall support the use of network time servers. Up to three-time servers can be designated. Use of a network time server ensures that the Controller and its Field Panels are regularly synchronized with the exact time used by all other network resources.
   c. It shall also be possible to manually set the system date and time.

7. Changing passwords:

   a. Person data maintained in the system may also contain a username and password for logging on to the security application website as a system user. The system shall support the changing of administrator passwords. It shall be required to enter the password twice for verification purposes.
   b. Administrators shall be able to specify a minimum number of characters that users must include in their login passwords.
   c. Administrators shall be able to specify that users' login passwords must contain a combination of letters, numbers, and special characters.
   d. Administrators shall be able to set a password expiration period in months (from 1 month to 12 months) for all passwords in the current partition. Whenever a user changes his or her password, it will remain in effect for the selected number of months.
   e. It shall also be possible to integrate an LDAP or SLDAP server for single-user logon authentication. This will reference the LDAP-stored password for use by the system.

8. Issuing and revoking cards (credentials):

a. Access cards shall be assignable by the system user either by entering card data directly into the person record or by use of an enrollment reader. Access levels shall be assignable through the user interface by selection from the list.
b. Access cards shall be revocable at any time. A system user holding at least an Administrator user role may perform this action. Revoked cards shall stop functioning immediately.
c. A system user holding at least the Administrator role may also disable an access card by changing its Active status to Clear, Damaged, Disabled, Expired, Forgotten, Lost, Missing Active, Missing Disabled, Not Returned, Not Used Not Validated, Returned, Stolen, Suspended or Temporary Expired. The card will not function with any of these status settings (unless the setting has been customized, as described below). Running a Credential Audit report shall allow existing cards to be viewed by their status settings.
d. A system user holding at least the Administrator role may customize any of the following access card status settings: Clear, Damaged, Forgotten, Lost, Not Returned, Not Validated, Returned, Stolen or Suspended. The user can change the name and/or description of the status setting, and can specify that a card to which the setting is applied will continue to function.
e. A maximum number of active cards per person can be enabled for the system. Once a person has reached the system limit, a new card can be added for that person only if one of his or her active cards is revoked or disabled.
f. When “Enable credential profiles” is selected on the Controller page, it shall be possible to assign credential profiles to individual credentials to determine the number of days of non-use before they expire.
g. It shall be possible to set expiration dates for individual credentials in a person record. When a Controller encounters an expired person record during its nightly system check, it shall modify that person record from “Active” to “Expired”. Similarly, if an expired person record is set to “Temporary”, it shall be changed to “Temporary Expired”.

    1) To reactivate “Expired” and “Temporary Expired” credentials, a system user with appropriate user role permissions may edit the person record in the User Interface, and modify the expiration date to a future date/time. Once the record is saved, the person record status will be changed to “Active” or “Temporary”.

h. It shall be possible to specify that any credential not used within a specific number of days from the date it was issued will be disabled automatically.
i. To ensure that all new and modified credentials have expiration dates, a user with Setup privileges can enable a credential expiration requirement option for the system. When this option is enabled, users will be prevented from saving new and modified credentials that do not have expiration dates. The API shall enforce this by requiring that a valid expiration date be passed when a command is issued to add or modify a credential.
j. The “First Name”, “Middle Initial”, and “Last Name” fields of each Person Record shall allow for up to 50 characters each.

k. The system shall provide for a workflow to be configured to facilitate processing of lost and/or forgotten credentials.
l. The system shall track credential status information and make it available for use in creating up-to-the-minute credential status reports.

9. Enrolling new people:

a. All person data entered into the system shall be held in the system database and shall be available only to system users holding at least an Administrator user role.
b. Person data can be added, deleted, and edited by users holding at least an Administrator user role.
c. The system shall support person record templates.

1) Each template defines values for specific fields, such as a default set of access levels.
2) These values will be filled in automatically in any person record created from the template.
3) When adding a person to the system, a user shall be able to use one of the available templates in the active partition to create the person record, or create it without a template.
4) Person Record Templates shall be available for use in custom People report definitions and in person search criteria.

10. Creating Photo IDs - The system shall include an integrated photo ID function. It shall be possible:

a. To design badge layouts.
b. To upload badge layouts for badge printing.
c. To capture ID photo images, print badges, and delete uploaded badge layouts.
d. For the system user to manage all photos ID functions entirely from within the browser.
e. To track the number of times a badge has been printed.
f. To print multiple badges at once using the Badge Print Workflow.
g. To enroll a person’s card number manually or through a reader and save the new credential from the Badge Print Workflow.
h. The system shall be capable of automatically generating auto-incremental encoded credential numbers. Each new encoded credential number shall be increased by one over the next highest number in the system.

11. Configuring network resources:

a. Remote Health Monitoring Service registration – The system shall support the registration of a system with the Remote Health Monitoring Service to support cloud-based monitoring and administration of the system from a single management dashboard.
b. Active Directory data synchronization – It shall be possible to configure a Microsoft Active Directory server for data synchronization:

1) Each Controller shall support up to 10 Active Directory server connections.
2) A user with the Full System Setup role shall have the ability to create up to 10 configurations for synchronizing data, with the same Active Directory server or with different Active Directory servers.
3) Each configuration shall allow the synchronization of: (1) person attribute values stored on the Active Directory server with values displayed in person records on the Controller, and (2) security group assignments on the Active Directory server with access level assignments on the Controller.

c. Active Directory user authentication – It shall be possible to configure an Active Directory server for user authentication:

1) The configuration shall provide single user-login capability.
2) Password rules and authentication will be governed by the Active Directory server.

d. Domain Name Servers (DNS) - The system shall support setting IP addresses for up to two domain name servers.

e. Email settings - The system shall support the use of email notifications of alarm events.

1) The system user must setup the email server IP address or DNS name and the email address of the SYSTEM Controller.
2) A network administrator must setup the network mail server to relay email for the IP address of the Controller.
3) When setting up an email relay, users shall be able to select a port number other than 25 to indicate that the system should attempt to use encrypted SSL connections for the outgoing messages. If an encrypted connection is not available, then the system will fall back to port 25 for an unencrypted connection.

f. File Transfer Protocol (FTP) - The system shall support the use of an FTP or SFTP Server for backups. Once configured, backups are automatically saved to the FTP server on a daily basis.

g. Network Attached Storage (NAS) - The system shall support the use of NAS for network storage of backups and Data Operations Import files. Once configured, the system data is saved to a network storage location on a daily basis.

1) The network administrator must create a domain user account for the Controller and a password.
2) The system user must configure the network attached storage in the system, including the domain name, server IP address, share name, and the directory where the Controller may store data.
3) The system user can select a security protocol (ntlm, ntlmi, ntlmv2, ntlmv2i, ntlmssp, or ntlmsspi) to be used for authentication when communicating with the remote server.

4) The system user can also select the version of the Server Message Block (SMB) network file sharing protocol the NAS is set to use.

h. Time sever – It shall be possible for a system user to set up a primary Network Time Protocol (NTP) server and, optionally, secondary and tertiary NTP servers. The Controller's use of an NTP server will ensure the system will be synchronized regularly with the exact time used by all other network resources.

i. Remote logging – It shall be possible for a system user to set up remote logging. This will ensure that messages generated by the system will be forwarded to a remote host running the Rsyslog daemon.

j. A system user holding at least a Setup user role shall be able to configure network resources. Configuring an Active Directory server for data synchronization requires the Full System Setup user role.

12. Data Operations:

a. View – Users having the "Data Operations: View" user role permission shall be able to view the results of data operations. Depending on which other user permission roles assigned to them, they may also be able to add person records (including access level, credential, and user defined person record information) to the SYSTEM, and modify and delete existing person records.

b. Import File – Shall enable the user to manually upload (import) tab-separated or comma-separated (CSV) text files.

c. Export File – Shall enable the user to manually download (export) CSV text files.

d. Automatic Import – Shall enable the system to process an Import File at scheduled intervals from a pre-configured NAS location.

e. Automatic Backups – Shall support the use of network attached storage (NAS) devices for automatic backup of Data Operations Import files to a network storage location.

f. Person Record Management – Data Operations shall provide the user interface to import person record CSV data to the Controller. Data Operations shall also be the interface for exporting the complete set of current access level and credential configuration of existing person records from a Controller to an external target system.

2.7 UNIFIED MANAGEMENT CLIENT INTEGRATION

A. The Unified Management Client shall provide a single client management application for the security system.

B. Unified Management Client shall integrate with security systems.

C. Unified Management Client software shall be available to be installed as a native client.

1. Supported Operating Systems

a. Windows 10
b. macOS Sierra
c. macOS High Sierra

D. The Unified Management Client appliance shall be available as a single monitor/TV appliance or a multi-monitor solution.

E. The Unified Management Client solution shall provide the ability to operate in a secure access mode that requires the application to use existing credentials from the Controller or Controller with integrated NVR and shall not require duplication of users

1. Login credentials shall be able to be managed as a single credential over the video, access-control and Unified Management Client operations.
2. Unified Management Client software shall provide a standalone mode with no requirement to authenticate with the system and shall provide the ability to add network video recorders and access controllers with local credentials.
3. Security of the data communicated over the network to and from the Unified Management Client software shall be protected by encryption (SSL 128-bit) or authentication (TLS).
4. Unified Management Client shall provide the ability to be set as an active client for video, access control and event management or as a standalone remote managed screen for video and public safety notifications.

F. Unified Management Client shall provide the ability to search for person records in SYSTEM systems, and to view, edit, and add person records, based on the user's permissions on these systems.

G. Unified Management Client shall provide live real-time monitoring of access-control activity data, and video verification in real time over local and wide area networks.

H. Unified Management Client shall provide the ability to view recent activity at a portal defined on a system, and to momentarily unlock a portal, based on the user's permissions on the system.

I. Unified Management Client shall provide the ability to show video based on access control activity, live or recorded, and the option to view image from the card holder database based on the access control activity.

J. Unified Management Client shall support simultaneous access to video, data, alarms and events from multiple servers.

K. Unified Management Client shall support ability to span client into multiple direct attached monitors.

L. Unified Management Client shall show live operation video, access control data, pop up events and push notifications, and life safety or any other digital signage graphics.

M. Unified Management Client shall allow for the creation of custom layouts, including up to 400 cells.

N. Unified Management Client shall be able to manage multi-media content:

1. Video Streams
2. Access Control Activity
3. Cardholder Images
4. Images to be used in digital signage [.jpg and .png]
5. Video Clips [MP4 and MOV]
6. Date and Time
7. Weather
8. Traffic
9. Information from private and public RSS feed
10. Twitter® feeds
11. Pandora® Radio
12. YouTube TV
13. Web content
14. Text

2.8 VIDEO MANAGEMENT SYSTEM INTEGRATION

A. General: The system shall support the integration of certain Network Video Recorders (NVR). This integration shall allow the viewing of live streaming video in the browser interface and recorded video playback. Viewing live streaming video shall require the Java™ 2 Runtime Environment version 1.4.2 or version 5.0.

1. Events in the alarm subsystem can initiate video recording. Video motion detection and camera up/camera down messages from the VMS can initiate alarms.
2. It shall be possible to monitor DVR and NVR cameras in the same views as direct IP cameras. VMS events shall be logged in the system Activity Log. It shall be possible to view recorded video of events from the Activity Log.
3. It shall be possible to view live cameras through floorplans, on the camera view pages, on the Monitoring and Widget Desktops.
4. It shall be possible to pull up recorded video through reports.

B. NVR Appliances (standalone NetVR and NVR integrated into the system):

1. NVR appliances must integrate with the system access control, event monitoring, and video management into a single user interface for: live viewing, forensic searching and video exporting.
2. Access Control Appliance NVR combined unit should be a fully self-contained video management appliance or a one box unit with both an access control system and video management appliance, also containing a database, an operating system and application software, as well as raw video storage.
3. Multiple NVR appliances can be connected to Controllers as follows:

    a. Up to 4 subordinate NVRs supporting up to 256 cameras, with one Entry-Level SYSTEM Controller

b. Up to 3 subordinate NVRs supporting up to 16 cameras with one Converged SYSTEM Controller/NVR unit
c. Up to 16 subordinate NVRs supporting up to 1024 cameras with one Mid-Level SYSTEM Controller
d. Up to 64 subordinate NVRs supporting up to 4,096 cameras with one Enterprise SYSTEM Controller
e. Up to 128 subordinate NVRs and 4,096 cameras with one Premium Enterprise SYSTEM Controller

4. Shall use browser-based functionality with the use of an installed video accelerator
5. Natively supports up to 128 cameras
6. Shall support video surveillance features, including:

a. Real-time surveillance video integrated on the home page, the Monitoring Desktop, and the Widget Desktop
b. Viewer-adjustable single camera and multi-camera views (2x2 or 1+7), presets, and camera tours
c. Calling up cameras through events and through floorplans
d. Adjust camera with PTZ controls, enabled through UI controls, using mouse or joy stick
e. Adjust video quality and frame rate in video viewer
f. Browse video from anywhere that has permitted access to the network and has the accelerator installed
g. Displays a blue border by default or custom color border when there is motion in the frame
h. Provides the ability to organize surveillance tools using favorite cameras, camera categories, and change sort order.

7. Network Address Translation (NAT): System users shall be able to configure NAT settings for an NVR that is behind a NAT device. NAT allows multiple devices on a private network to be mapped to a single IP address.
8. Disk Management: System users shall be able to view storage drives that have been installed in an NVR appliance, and adopt drives into the NVR so it can begin using them for video storage.

C. Third-party DVR/NVR Systems:

1. Third party VMS integration shall be performed by using the Open Video Interface Document (OVID)
2. A TCP/IP connection shall be established between the system and the third-party VMS.
3. The Integration shall support:

a. Trigger video recordings
b. Trigger preset commands
c. PTZ control
d. Recalling recorded video
e. Motion events

f. Video loss events
g. Video restore events

4. Integrated DVR/NVR Systems:

a. Cisco – VSOM
b. Exacq – exacqVision – 8.4.1
c. Milestone Systems – Professional, Expert & Corporate 2016 and 2017
d. OnSSI – Ocularis 5.3
e. Salient Systems - CompleteView NVR 3.5.2
f. Video Insight - Enterprise Video Management Software 4.3
g. Avigilon - Avigilon Control Center (ACC) 6

5. Open Video Interface Driver (OVID) API:

a. This specification defines an API to implement the integration of video surveillance systems with the SYSTEM.
b. The OVID API shall allow users to monitor and control one or more video servers along with their associated video cameras, to augment the physical security devices (door locks, card readers, etc.) controlled by the system.
c. The integrated system shall be controlled through a web browser user interface which presents an integrated view of both the system and the video surveillance system.

2.9 MERCURY AND MERCURY POWERED HARDWARE INTEGRATION

A. The system shall support the integration of access control hardware from Mercury Security Corp.

B. Mercury EP Series Devices: The following hardware components shall work with the SYSTEM Controller:

1. Supported Mercury EP-Series Panels:

a. EP2500: Intelligent Controller: 32MB RAM, Ethernet
b. EP1502: Intelligent Dual Reader Controller: 16MB RAM, Ethernet, 2 readers) 8 inputs, 4 relays
c. EP1501: Intelligent Single Door Controller: PoE, single door, 2 readers, 2 inputs, 2 outputs
d. Mercury firmware version 1.23.6 is supported on the above panels.

2. Supported Mercury Interface Boards (SIOs):

a. MR-50 Reader Interface Module (Series 2 and 3): 1 reader (magnetic stripe or Wiegand), 2 inputs, 2 relays
b. MR-52 Reader Interface Module (Series 2 and 3): 2 readers (magnetic stripe or Wiegand), 8 inputs, 6 relays
c. MR-16in Input Monitor Module (Series 2 and 3): 16 inputs (zones), 2 relays
d. MR-16out: Relay Output Control Module (Series 2 and 3): 16 relays

C. Mercury M5 Bridge Devices: The Mercury M5 Bridge hardware platform uses legacy Mercury Casi Micro/5 enclosures retrofitted with Mercury M5 and MR devices to replace existing Casi devices. The following Mercury hardware components shall work with the SYSTEM Controller:

1. Supported Mercury M5 Bridge Panel:

    a. M5-IC - intelligent control device for the replacement of the Casi PX, PXN, and PXNplus CPU controllers

2. Supported Mercury Interface Boards (SIOs):

    a. MR-50 Reader Interface Module (Series 2 and 3): 1 reader (magnetic stripe or Wiegand), 2 inputs, 2 relays
    b. MR-52 Reader Interface Module (Series 2 and 3): 2 readers (magnetic stripe or Wiegand), 8 inputs, 6 relays
    c. MR-16IN Input Monitor Module (Series 2 and 3): 16 inputs (zones), 2 relays
    d. MR-16OUT: Relay Output Control Module (Series 2 and 3): 16 relays
    e. M5-2K - multi-device interface panel for the replacement of the Casi M2000 reader controller
    f. M5-2RP - multi-device interface panel for the replacement of the Casi 2RP reader control device
    g. M5-2SRP - multi-device interface panel for the replacement of the Casi 2SRP reader control device
    h. M5-8RP - multi-device interface panel for the replacement of the Casi 8RP reader control device
    i. M5-16DO - multi-device interface panel for the replacement of the Casi 16DO output control device
    j. M5-16DOR - multi-device interface panel for the replacement of the Casi 16DOR input control device
    k. M5-20IN - multi-device interface panel for the replacement of the Casi 20DI input control device
    l. MUX8 – multi-device interface panel for the replacement of the Casi M Series 8RP to a single communications port
    m. CASI F2F readers and keypads shall be supported for Mercury M5 Bridge 2RP, 2SRP, and 8RP panels

3. Schlage Wireless Devices: Mercury connected Schlage AD-400 wireless locks and WRI400 wireless access point modules via PIM-400 module.
4. Honeywell PW-Series Devices: Mercury powered PW-Series devices controlled and connected to intelligent control module PW6K1IC.

D. Support for OSDP readers: When configuring readers for Mercury SIOs, users can enable the Open Supervised Device Protocol (OSDP). For readers that support AES 128-bit encryption, users shall be able to enable encryption as well. OSDP shall allow for tamper and disconnect actions, which can trigger events.

E. Support for alternate readers: When configuring a reader, a user shall be able to specify that it will be used only as an alternate reader for an elevator on a Mercury

board. Although access to the elevator will be associated with the elevator's primary reader, cardholders will be able to request access at either of the elevator's readers.

2.10 OTIS ELEVATOR COMPASS SYSTEM INTEGRATION

A. The system shall support the integration of the Otis Elevator Compass™ Destination Entry System with the Controller. The Compass system is designed to optimize the use of elevators in large office buildings.

1. The boundary between the Compass network and the system network is a Layer 3 switch. This switch routes two-way data traffic between the Controller and the nodes in the Compass system, using the TCP/IP networking protocol.
2. The Controller acts as the central processor for the security system. A single Controller can supervise the operation of many Compass nodes. It also manages all communication between the system and the Compass system.
3. The Field Panel is a peripheral processor which handles building security hardware such as card readers. A Compass node can control many readers.
4. Once the system has been initialized to support an interface to the Compass system, standard system configuration pages can be used to configure the Compass system:

    a. The Status page lets users view the Compass IP network configuration information, such as Compass node status.
    b. The Floor Map page lets users configure the floor mapping needed to identify the building floors by name and floor.
    c. The Configuration page lets users configure the destination entry server (DES) nodes, destination entry director (DER) nodes, and destination entry computer (DEC) nodes in the Compass system.
    d. The Events page lets users view the IP address, name, node type, and status of each node in the Compass system.
    e. The Reader Groups and Access Levels pages let users configure reader groups and their associated access levels within the Compass system.

2.11 ALLEGION ENGAGE REMOTE DEVICE INTEGRATION

A. The SYSTEM shall support the integration of the following Allegion ENGAGE devices:

1. Schlage NDE Series (cylindrical) and LE Series (mortise) Wireless Locksets – used for access control in commercial, institutional, and multi-family facilities.
2. Schlage BE Series (deadbolt only) and FE Series (lever and deadbolt) Control Locksets – used for access control in residential properties.
3. Von Duprin RM/RU (Remote Monitor/Remote Undog) exit devices – used for mass access control, and do not have physical readers or user databases.

B. Schlage Wireless Locksets are managed by the system through the ENGAGE Gateway. Locks communicate to the ENGAGE gateway using Bluetooth.

1. The following resource limits shall be supported:

a. Access levels 16
b. Credentials
c. NDE/LE Locksets: 5,000
d. Control Locksets: 500
e. Portal group unlock time specs 8 per week (NDE/LE Locksets only)

2. The system shall support 1000 ENGAGE locksets; each Controller configuration shall be rated for the number of Locksets it can support.
3. Once an ENGAGE Lockset is installed and linked to the ENGAGE Gateway, and the Controller has connected to the ENGAGE Gateway, the Lockset appears in the system web interface as a “remote lockset”, which can be enabled and configured to work with the Controller.
4. When an ENGAGE Gateway connects to the Controller, it shall report its serial number and firmware version. It shall also report its linked Locksets, the battery voltage of each Lockset, and the signal quality between the Lockset and the Gateway.
5. The ENGAGE Gateway shall connect to the Controller via IP and shall not require the use of third-party hardware as an intermediary between the ENGAGE Gateway and the Controller.
6. It shall be possible to configure the reader and portal that were automatically created for an ENGAGE Lockset.
7. It shall be possible to specify special-use formats for access cards to be used with ENGAGE Locksets.
8. Supported credential modes shall include:

    a. Emergency Open. A cardholder with an Emergency Open credential can open any ENGAGE Lockset portal to which he or she has access when the portal is in Lockdown mode. The cardholder can also use the credential to open any regular portal to which he or she has access, if access is not constrained by a portal unlock time spec.
    b. Toggle Passage Mode. A cardholder with a Toggle Passage Mode credential can toggle any ENGAGE Lockset to which he or she has access between the locked and unlocked states. The cardholder can also use the credential to open any regular portal to which he or she has access, if access is not constrained by a portal unlock time spec.

9. The ENGAGE Lockset shall be able to send high priority events to the Controller.
10. It shall be possible to schedule an automatic unlock period for ENGAGE Lockset portals. The start of this period can be triggered by time.
11. It shall be possible to configure a Tamper event for the ENGAGE Lockset. The event will be triggered when the Lockset tampering is detected.
12. It shall be possible to configure a Magnetic Tamper event for the ENGAGE Lockset. The event will be triggered when door position sensor tampering is detected.
13. It shall be possible to configure a Critical Battery event for the ENGAGE Lockset. The event will be triggered when the battery voltage <= 4.0V.
14. It shall be possible to configure a Low Battery event for the ENGAGE Lockset. The event will be triggered when the battery voltage <= 4.5V.

15. It shall be possible to configure an ENGAGE Lockset for Office, Privacy, Apartment, or Storeroom mode as appropriate, based on the model of the Lockset.
16. ENGAGE Locksets shall have the following additional capabilities:

    a. ENGAGE Locksets can be assigned to locations; changes to a location's threat level can cause the locksets in that location to enter and exit lockdown mode.
    b. ENGAGE Locksets shall have momentary unlock capability while in lockdown mode (by means of an event action or button on the Portal Status page).
    c. ENGAGE Locksets shall be capable of persistent unlock or lock mode (by means of an event action or button).
    d. ENGAGE Locksets can be added and managed in floorplans.
    e. ENGAGE Locksets can be unlocked momentarily via event actions or from the Portal Status page, the Widget Desktop, the Monitoring Desktop, or a floorplan.
    f. ENGAGE Locksets shall perform scheduled locks or unlocks via, event actions, or from buttons on the Portal Status page, the Widget Desktop, the Monitoring Desktop, or a floorplan.
    g. ENGAGE Locksets shall be capable of being switched to a locked or unlocked state, and be disabled or enabled using buttons on the Portal Status page.
    h. ENGAGE Locksets shall be capable of being enabled and disabled via buttons on the Portal Status page.
    i. Activity associated with an ENGAGE Lockset can be viewed in real time in the Activity Log.

17. ENGAGE RM/RU exit devices shall have the following additional capabilities:

    a. A portal with ENGAGE RU exit device shall be capable of being switched to the locked or dog-on-next-exit (DNE) state from any previous state. This can be accomplished manually via a Dog the Portal action or automatically via a scheduled action or portal group time spec.

2.12 ASSA ABLOY REMOTE LOCKSET INTEGRATION

A. The system shall support the integration of ASSA ABLOY Wi-Fi enabled locksets (models v.S2, p.S2, and IN120) and PoE locksets (models v.S1, p.S1, and IN220).

1. The system shall support more than 500 remote locksets; each Controller configuration shall be rated for the number of locksets it can support.
2. Once a lockset is installed and registered with the Controller, it appears in the SYSTEM web interface as a "remote lockset" node, which can be enabled and configured to work with the SYSTEM Controller.
3. When a remote lockset connects to the Controller, it shall report its power type, which is encoded in its serial number.

a. A lockset reporting having PoE or direct hardwired power shall be treated as an online lockset and assigned the Default (Online) lockset profile.
b. A lockset reporting having only batteries as a power source (such as a Wi-Fi lockset) shall be treated as an offline lockset and is assigned the Default (Offline) lockset profile.
c. The offline remote lockset shall update the SYSTEM Controller with the current voltage level of its battery upon each connection.
d. Clearing the “Online” check box on the Advanced tab of the Field Panels page will change an online lockset communication status to offline.
e. The default lockset profile automatically assigned to the lockset the first time it connects to the system shall be editable.

4. It shall be possible to set configuration options for a remote lockset to change its call-in and unlock behaviors.
5. It shall be possible to configure the reader and portal that were automatically created for a remote lockset.
6. It shall be possible to view cached information for a remote lockset, for troubleshooting purposes.
7. It shall be possible to specify special-use formats for access cards to be used with remote locksets.
8. The remote lockset shall be able to send high priority events to the Controller.
9. It shall be possible to schedule an automatic unlock period for remote-lockset portals. The start of this period can be triggered by time or by an initial valid card read.
10. It shall be possible to select a check box when creating a magnetic stripe ABA Track 2 card format to ensure that the format will be recognized by remote locksets with magnetic stripe card readers.
11. It shall be possible to create remote lockset profiles to assist in the configuration and management of large numbers of remote locksets. A lockset profile is a defined set of attributes that affect lockset behaviors. Assigning a profile to a lockset gives it the attributes defined in the profile. Any subsequent changes made to the profile are applied to the lockset automatically.
12. Locksets shall support PIN-only credentials.
13. It shall be possible to specify a voltage level below which an offline lockset will go into power saving mode. If a Low Battery event is enabled for the lockset, the event will be triggered. Once the battery is replaced, the lockset will leave power saving mode only when the voltage level reaches 1.5 Volts higher than its current Low Voltage setting.
14. It shall be possible for a lockset to check for permissions with the host (controller) for a person that is not yet stored in the lockset.
15. Online locksets shall have the same capabilities as offline locksets with the following additional capabilities:

    a. Online locksets can be assigned to locations; changes to a location’s threat level can cause the locksets in that location to enter and exit panic mode.
    b. Online locksets shall have momentary unlock capability while in panic mode (by means of an event action or button on the portal status page).
    c. Online locksets shall be capable of persistent unlock or lock mode (by means of an event action or button).

d. Online locksets can be added and managed in floorplans.
e. Online locksets can be unlocked momentarily via event actions or from the Portal Status page, the Widget Desktop, the Monitoring Desktop, or a floorplan.
f. Online locksets shall be capable of performing scheduled locks or unlocks via, event actions, or from buttons on the Portal Status page, the Widget Desktop, the Monitoring Desktop, or a floorplan.
g. Online locksets shall be capable of being switched to a locked or unlocked state and be disabled or enabled using buttons on the Portal Status page.
h. Online locksets shall be capable of being enabled and disabled via buttons on the Portal Status page.
i. Activity associated with an online lockset can be viewed in real time in the Activity Log.

2.13 MOBILE SECURITY MANAGEMENT APPLICATION (MSMA)

A. The Mobile Security Management Application (MSMA) shall be a mobile application for use with Apple iPad tablets and Apple iPhone running iOS 10 and later, and Android devices running 4.4 and later. The MSMA shall enable wireless tablet users to monitor and control various features of the system. It shall be possible to view multiple system controllers that are connected to a single MSMA.

1. Activity Monitoring – Users shall be able to view recent activity from the system Activity Log. Users shall be able to select specific Activity Log entries to view associated records, such as person record details, play live and recorded video, and change the status of specific portals.
2. View Person Details – Users shall be able to search for persons by name and view associated person records. Users shall be able to photograph persons using the camera on their tablet or phone, and record these in the system.
3. Live Video Monitoring – Users shall be able to display thumbnail images of every NVR camera view integrated with the system. Users shall be able to select individual thumbnails, which shall display live video from the corresponding camera.
4. Mobile Mustering - The application shall support a mustering process using a mobile device to allow regional evacuation, unimpeded by access control constraints. Users shall be able to initiate and terminate multiple evacuations simultaneously. The system shall enable users to determine if all persons known to be present within a given region have been accounted for. The system shall be capable of managing mustering points simultaneously.
5. Photo ID Capture - Takes an ID photo directly from the app.
6. Portals - Enables momentary unlock of any portal in the system. Portals shall also show the live video of the camera associated with the portal.

2.14 THIRD PARTY SSL CERTIFICATE SUPPORT

A. It shall be possible to configure an SSL certificate that will provide encryption alone, or encryption plus authentication. The available options are:

1. Generating a self-signed SSL certificate, this is signed with the embedded web server's own private key. This certificate shall provide encryption but not authentication. Users will need to override their security warnings or accept the certificate as trustworthy into their browser key ring.
2. Generating an SSL certificate that is signed by a certificate authority (CA). This certificate shall provide both encryption and authentication.
3. Uploading your own SSL certificate and matching key to the SYSTEM Controller. Optionally, it shall be possible to upload a chain, or intermediate, file that links the certificate to a trusted root certificate. This provides both encryption and authentication.

2.15 PIVCHECK INTEGRATION (HID)

A. The system shall support the integration of HID's PIVCheck PIV/TWIC/CAC/FRAC. This integration allows for:

1. Support for FIPS-201 Credentials
2. Authentication of PIV, TWIC, CAC, and FRAC credentials.
3. Validation against a certificate revocation list.
4. Enrollment of information contained within the credential imported directly into the system database.

2.16 VISITOR MANAGEMENT SYSTEMS INTEGRATION

A. The system shall be able to integrate with a variety of industry leading visitor management products. The integration allows for visitor information to be shared with system, providing the ability to assign credentials to visitors as well as running reports on activity. There is no additional cost or license fee for integrating with these visitor management systems with the system application.

B. The following visitor management companies have written integrations to the system using the NBAPI:

1. Jolly - Lobby Track
2. HID - EasyLobby
3. STOPware - PassagePoint
4. Veristream – iVisitor
5. Angus
6. ProxyClick
7. Splan
8. Envoy

C. Fees associated with integration of third-party visitor management systems may be applicable, depending on the manufacturer.

2.17 API INTEGRATION

A. An application programming interface (API) is provided for the system. The API provides programmatic access to the network-connected components managed by the system.

1. Communication between the system and another application takes place through the TCP/IP networking protocol. The API is invoked by posting an HTTP message to the web server on the Controller.
2. The system database includes a table of “people” whose records act as container objects for attributes attached to people in real life. People are mapped to access levels, which specify access privileges—and to access cards, whose credentials are used for access control.
3. Access levels are created in the system using the normal web user interface for the system. People and credentials may be entered into the system either through the web user interface or through the API.
4. It shall be possible to assign a custom user role that will allow a user to log into the system only through the API.
5. The API supports commands for:

    a. Adding, modifying, removing, and retrieving data about a person, and retrieving information about one or more people based on various search criteria.
    b. Adding, modifying, and removing credentials, and retrieving a list of the names of defined card formats.
    c. Adding, modifying, and deleting access levels, and retrieving a list of the valid access levels in the system.
    d. Adding, modifying, and deleting access level groups, and retrieving a list of the valid access levels groups in the system.
    e. Pinging the system to determine its health, and retrieving the current version of the API from the server.
    f. Retrieving a history of access activity, either for all users or for a particular access card.
    g. Adding, modifying, and removing threat levels and threat level groups, and setting the threat level in the system.
    h. Retrieving a list of portals and associated card readers defined for the system.
    i. Adding, modifying, deleting, and retrieving time specifications and time specification groups.
    j. Adding, modifying, and deleting holidays, and returning a list of holiday keys or a specific holiday.
    k. Adding, modifying, and deleting readers and reader groups, and returning a list of reader group keys or information for a specific reader group.
    l. Adding, modifying, and deleting portals and portal groups, and retrieving information about a specific portal group.
    m. Requesting events from the Activity Log that occurred within a specified time period. These events are returned from the API in the CSV Export report format.

n. Activate or Deactivate Output: Requests that the output specified by an output key value be activated or deactivated.
o. Momentarily unlocking the portal specified by a portal key value.
p. Locking or unlocking the portal specified by a portal key value.
q. Support for credential IDs, which are aliases for actual credential numbers. As a security measure, credential IDs can be retrieved and stored in a client system in place of the encoded numbers and/or hot stamps.
r. Adding, modifying, and deleting UDF value lists, and retrieving a list of the UDF value lists defined for the system.
s. Recording Access Granted and Access Denied events in the Activity Log, and inserting a user-defined event that displays a text string in the Activity Log.

2.18 HIGH AVAILABILITY (HA) SOLUTION

A. The system shall a High Availability (HA) option. The HA solution includes an HA server pair consisting of two Premium Enterprise Controllers running Stratus Technologies everRun® Express high availability virtualization software. The servers act as a platform for the application software and operating system as a virtual machine on one server, which is continually backed up on the other server.

1. A Hot Standby implementation shall use a failover cluster consisting of a pair of identical co-located Controllers. One Controller shall have the primary, or active, role and the other a secondary or passive role.
2. The Hot Standby implementation shall support operation from either Controller, but not from both simultaneously. Under normal redundant operation, the primary Controller shall perform all operations and shall mirror its data onto the secondary Controller.
3. The two Controllers shall be linked by a heartbeat network connection they shall use to monitor and communicate with each other. They shall share a virtual IP address to be used for communications with Field Panels and other devices.
4. Should the primary Controller fail, the secondary Controller shall be available to provide service through a process called failover. Administrators shall be alerted that a failover has occurred so they can take appropriate measures to restore the Hot Standby implementation.

2.19 SYSTEM CONTROLLER OFFSITE RECOVERY

A. System Controller offsite recovery shall support the ability to configure two Controllers in a primary/secondary configuration.

1. On the primary Controller, all Field Panels shall be configured with a secondary Controller’s IP address.
2. The Field Panels shall initially connect to the primary Controller.
3. In a disaster recovery scenario in which the primary Controller becomes unavailable, the offsite recovery feature shall support a manual switchover command on the secondary Controller.

4. The switchover command shall only be able to be manually executed by a system administrator.

2.20 REMOTE MONITORING AND ADMINISTRATION

A. The system shall support cloud-based monitoring and administration of Controllers and video systems from a single management dashboard.

B. Remote Health Monitoring Service shall support the Entry-Level Controller, Converged Controller/NVR Unit, NVR, Centralized Management and Replication Server, and Unified Management Client.

C. Remote Health Monitoring Service shall support remote monitoring of the following:

1. The last communication with Remote Health Monitoring Service
2. Status of the CPU
3. Memory and network bandwidth usage

D. Remote Health Monitoring Service shall support the managing of system licenses, including:

1. OS version
2. Software version
3. SUSP expiration date
4. Detailed license information

E. Remote Health Monitoring Service shall support remote updating of the system's software

F. Remote Health Monitoring Service shall be accessible through an integrator portal

G. Remote Health Monitoring Service shall not require ports to be opened for communications from the Entry-Level Controller, Converged Controller/NVR Unit, NVR, Centralized Management and Replication Server, and Unified Management Client.

H. Remote Health Monitoring Service shall support the sending of email or text alerts to system users when a system has an error.

1. Alerts shall be able to be grouped together.

2.21 CARD READERS

A. Provide HID iCLASS RW100 Reader/Writer 6101 or approved equal where indicated.

2.22 CREDENTIALS

A. Provide 500 HID iCLASS smart cards or approved equal.

2.23 UNINTERRUPTABLE POWER SUPPLY (UPS)

A. Provide true online UPS system for back-up power for all central components in case of power interruption, brown-out, or fluctuations for a minimum of 30 minutes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine cable pathways including conduit, raceways, cable trays, and other pathway elements for compliance with space allocations, installation tolerances, hazards to cable installation, and other conditions affecting installation.

B. Examine rough-in for control cable and conduit systems to controllers, card readers, and other system components to verify conduit and back-box locations prior to installation of system devices

C. Examine available network capacity and support infrastructure. Consult with network administrator for compliance with network standards and capacity

D. Examine install location for compliance with space allocations, installation tolerance, hazards to safe system operation, and other conditions affecting installation

E. Examine roughing-in for LAN, WAN, and IP network before device installation

3.2 PREPARATION

A. Comply with SIA CP-01 Control Panel Standard.

B. Comply with ANSI/TIA-606-B Labelling Standard.

C. Prepare detailed project planning forms for programming and configuration of the SYSTEM. Fill in all data available from project plans and specifications and publish as project planning documents for review and approval. These may include (but are not limited to):

1. Define SYSTEM Partitions.
2. For each Location, record setup of controller features and access requirements.
3. Propose start and stop times for time zones and holidays, and match up access levels for doors.
4. Set up groups, facility codes, software triggers, and list inputs and outputs for each SYSTEM Controller.
5. Assign action message names and compose messages.
6. Set up alarms. Establish trigger actions between events and video surveillance features.
7. Prepare and install alarm graphic maps.
8. Develop user-defined fields.

9. Develop screen layout formats.
10. Discuss badge layout options; design badges.
11. Complete system diagnostics and operation verification.
12. Prepare a specific plan for system testing, startup, and demonstration.
13. Develop acceptance test concept and, on approval, develop specifics of the test.
14. Develop cable and asset-management system details; input data from construction documents. Include system schematics and technical drawings in electronic format.

D. In meetings with Architect and Owner, present Project planning documents and review, adjust, and prepare final programming and configuration documents. Use final documents to program and configure software.

3.3 WIRE AND CABLE

A. ANSI/TIA 568 Category 6A Compliant horizontal structured cabling system with a fiber backbone is currently being installed under a separate section. Connect system components to this cabling system utilizing required patch cables. Provide patch cables as necessary for system connectivity plus ten percent spare. Provide patch cable color and lengths as directed by Owner.

B. All exterior doors are equipped with electronic hardware as follows: Door Position Switch, Latch Retraction, Request-To-Exit, Electronic Power Transfer, and Power Supply above door. Provide all required system wiring to these devises as well as the card readers. In addition, provide wiring of electronic hardware at interior doors equipped with card readers.

C. Comply with NECA 1, "Good Workmanship in Electrical Construction".

D. Wiring Method: Install wiring in raceway and cable tray except within consoles, cabinets, desks, and counters. Conceal raceway and wiring except in unfinished spaces.

E. Install LAN cables using techniques, practices, and methods that are consistent with Category 6A rating of components and fiber-optic rating of components, and that ensure Category 6A performance of completed and linked signal paths, end to end.

F. Junction boxes and enclosures containing security-system components or cabling, and which are easily accessible to employees or to the public, shall be provided with tamper resistant fasteners and/or tamper detection switches. In addition, hinged enclosure doors shall be equipped with locking hardware. Boxes above ceiling level in occupied areas of the building shall not be considered accessible. Junction boxes and small device enclosures below ceiling level and easily accessible to employees or the public shall be covered with a suitable cover plate and secured with tamperproof screws.

G. Install end-of-line resistors at the field device location and not at the controller or panel location.

H. Card Readers and Keypads and Peripheral Devices:

1. Install number of conductor pairs recommended by device manufacturer for the functions specified.
2. Follow device manufacturer's installation requirements for maximum cable distances and sizes.

3.4 IDENTIFICATION

A. Label, in plain English, each end of each cable, Field Panel, patch panel, network switch, or cabinet

1. Each cable or wiring group being extended from a panel or cabinet to a building-mounted device shall be identified with the name and number of the device as shown

B. At completion, cable and asset management documentation shall reflect as-built conditions.

3.5 SEQUENCE OF OPERATIONS

A. Open hours unlocked doors:

1. Upon entering the main entry, the door can be opened manually, or the operator paddle activates the operator to open the door and the card reader has no functional use because the doors are unlocked.
2. Upon entering the main entry vestibule, the inner door can be manually opened or activated by the paddle for the inner door operator once the outer door operator has closed the door (see operator coordination). The main entry vestibule shall contain a paddle for each door or a dual paddle to active each door.

B. Closed hours locked doors:

1. Upon entering the main entry, the operator paddle does not activate the operator, but the card reader does activate the operator to open the inner and outer vestibule doors.
2. Upon entering the main entry vestibule, the inner door can be manually opened or activated by the paddle for the inner door operator once the outer door operator has closed the door (see operator coordination).

C. Exiting during all hours:

1. Upon exiting the main entry panics shall have request to exit.
2. Upon exiting the main entry door operators shall always be activated by the paddles controlling each door.

D. Operator coordination:

1. Operators shall be delayed allowing the first activated operator to open then close and seal the door completely before the next operator is activated in order to maintain the airlock in the main entry vestibule. This applies to ingress or egress.

E. Other notes:

1. All exterior door and latch positions are always monitored.
2. Mechanical keys should be provided at the Knox Box entry for the fire department.
3. All other exterior doors to be typically locked.
4. All exterior doors shall always be accessible via card reader where card readers are indicated.

3.6 SYSTEM SOFTWARE AND HARDWARE

A. Develop, install, and test software and hardware, and perform database tests for the complete and proper operation of systems involved.

B. Assign the software license(s) to Owner.

C. All default password shall be changed to those selected by the owner

1. The contractor shall retain no records of passwords for the project

3.7 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. Inspection: Confirm that units and controls are properly installed, connected, and labeled, and that interconnecting wires and terminals are identified.
2. Pretesting: Configure and pretest system components, wiring, and functions to confirm that they comply with specified requirements.
3. Operational Test: After installation of cables and connectors, demonstrate product capability and compliance with requirements.
4. Test Schedule: Schedule tests after pretesting has been successfully completed and system has been in normal functional operation for at least 14 days. Provide a minimum of 10 days' notice of test schedule.
5. Operational Tests: Perform operational system tests to confirm that system complies with Specifications. Include all modes of system operation. Test equipment for proper operation in all functional modes.

B. The system is considered defective and the project incomplete if it does not pass tests and inspections

C. Prepare test and inspection reports.

3.8 STARTUP SERVICE

A. Complete installation and startup checks according to approved procedures that were developed in "Preparation" Article and with manufacturer's written instructions.

B. Enroll and prepare badges and access cards for Owner's operators, management, and security personnel.

3.9 ADJUSTMENTS

A. Occupancy Adjustments: When requested within 30 days of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project for this purpose. Tasks shall include, but are not limited to, the following:

1. Check cable connections
2. Confirm system configuration and adjust settings needed
3. Recommend changes to the system to improve Owner's use
4. Provide a written report of adjustments and recommendations

3.10 DEMONSTRATION

A. The training of all personnel shall be performed on-site by a manufacture certified trainer.

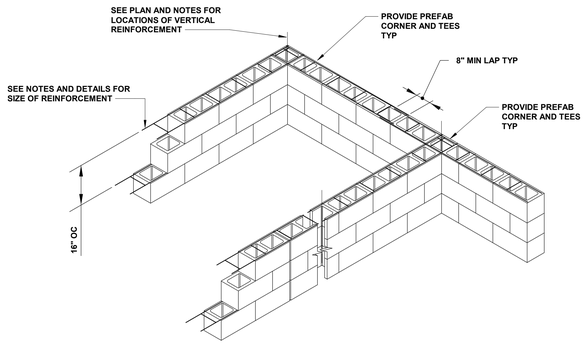
B. Provide a training tutorial and all handout material.

C. Provide a minimum of 24 hours training

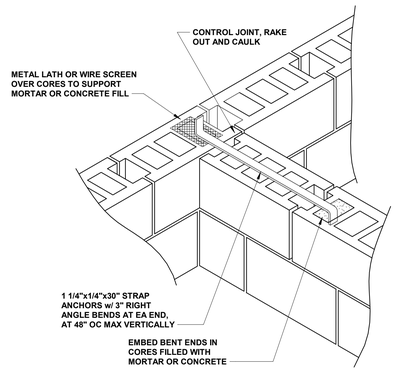
D. Develop and provide separate training modules for the following:

1. Computer system administration personnel to manage and repair the LAN and databases and to update and maintain software.
2. Operators who prepare and input credentials, monitor the system, and to enroll personnel.
3. Security personnel.
4. Hardware maintenance personnel.
5. Corporate management.

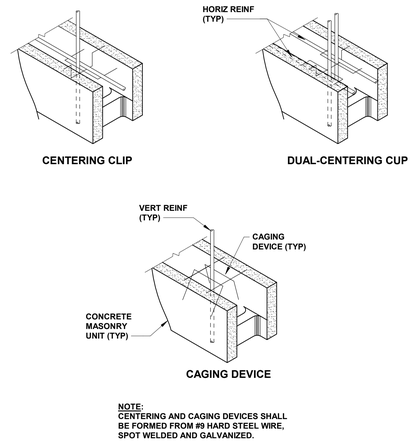
END OF SECTION



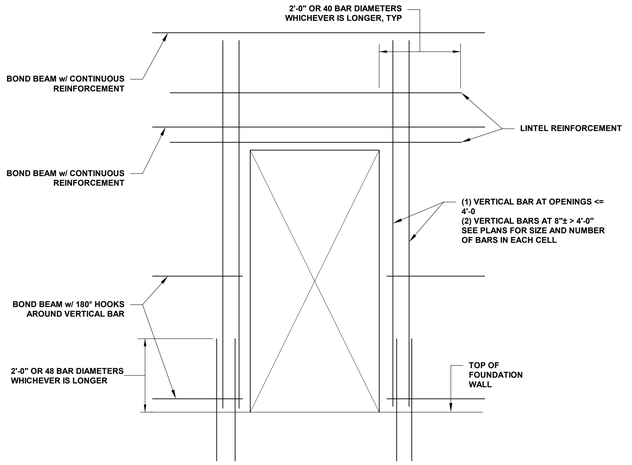
1 Detail
TYPICAL JOINT REINFORCEMENT DEATIL
S0.03 NTS



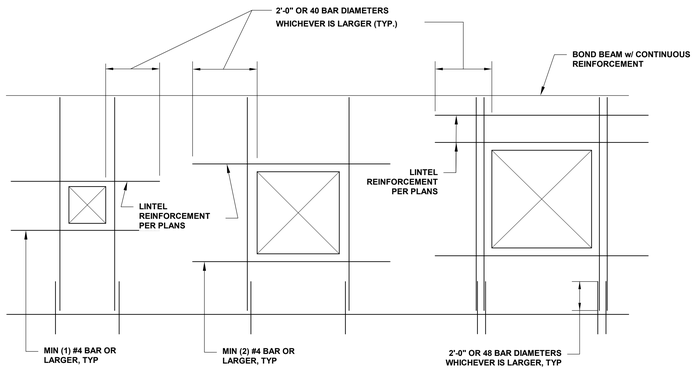
2 Detail
WALL TO WALL ANCHORAGE AT INTERSECTION OF WALLS
S0.03 1" = 1'-0"



3 Detail
CENTERING AND CAGING DEVICES
S0.03 1" = 1'-0"



4 Detail
REINFORCEMENT AROUND DOOR OPENING IN CMU
S0.03 1" = 1'-0"



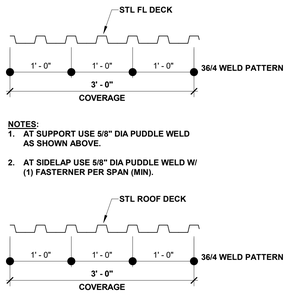
CASE 1
APPLIES TO (1) ALL OPENINGS 16" OR LARGER IN EITHER DIRECTION IN NON-STRUCTURAL PARTITIONS AND (2) ANY OPENING 16" TO 24" IN EITHER DIRECTION IN STRUCTURAL PARTITION OR EXTERIOR WALL

CASE 2
APPLIES TO STRUCTURAL PARTITION AND EXTERIOR WALLS WHEN OPENING EXCEEDS 2' BUT NOT MORE THAN 4' IN EITHER DIRECTION.

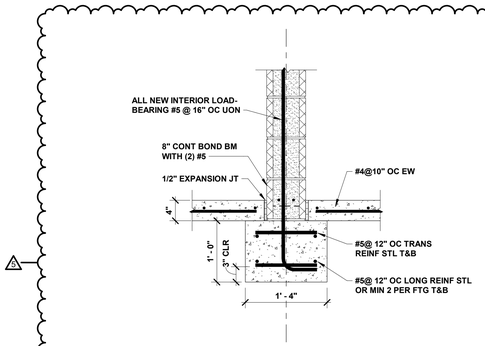
CASE 3
APPLIES TO STRUCTURAL PARTITION AND EXTERIOR WALLS WHEN OPENING EXCEEDS 4' IN EITHER DIRECTION.

NOTES:
1. FOR VERTICAL REINFORCEMENT OF BARS, EACH BAR SHALL BE PLACED IN A SEPARATE CELL.
2. VERTICAL BARS SHALL BE BARS OF THE SAME SIZE, EXTENT AND ANCHORAGE AS THE TYPICAL REINFORCEMENT IN THAT WALL UNLESS OTHERWISE NOTED.
3. VERTICAL REINFORCEMENT BARS CAN BE PART OF THE NORMAL VERTICAL REINFORCEMENT.

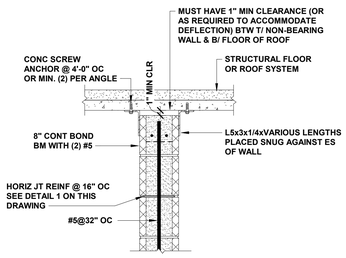
5 Detail
REINFORCEMENT AROUND WALL OPENINGS IN CMU
S0.03 1" = 1'-0"



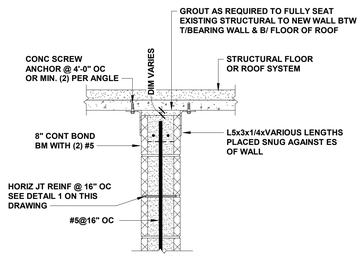
6 Detail
TYPICAL DECK FASTENER LAYOUT
S0.03 1" = 1'-0"



7 Detail
FOOTING FOR BASEMENT MASONRY WALLS
S0.03 1" = 1'-0"



8 Detail
LATERAL SUPPORT OF NON-LOAD BEARING MASONRY PARTITION
S0.03 1" = 1'-0"



9 Detail
LATERAL SUPPORT OF LOAD BEARING MASONRY WALL
S0.03 1" = 1'-0"

Dreiser Add #5

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F.A. Parikh
SEAL AFFIXED: 06-11-2020
CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

Terre Haute, Indiana 47809

Project No.: 19A052
Drawn By: J. Hand
Checked By: F. Parikh
Scale: See Drawing
Issue Date: June 5, 2020

REVISION SCHEDULE

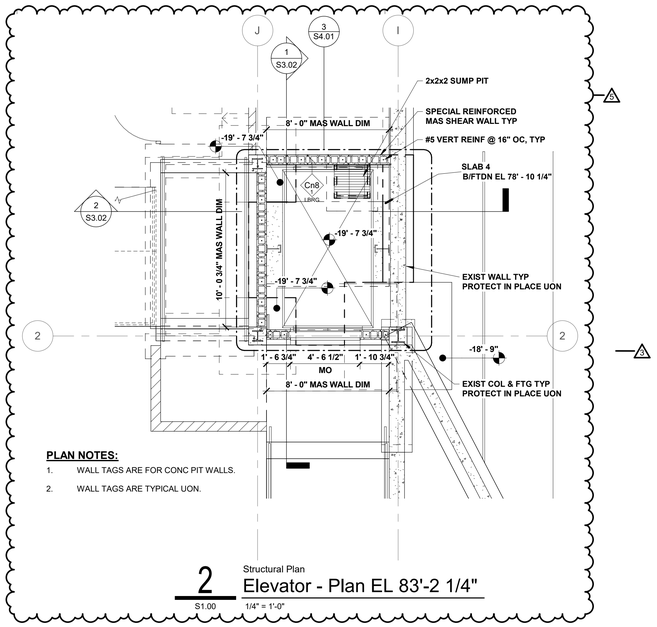
Rev. #	Revision Description	Issue Date
2	Addendum #2	6/19/2020
5	Addendum #5	7/02/2020

Standard Str. Details

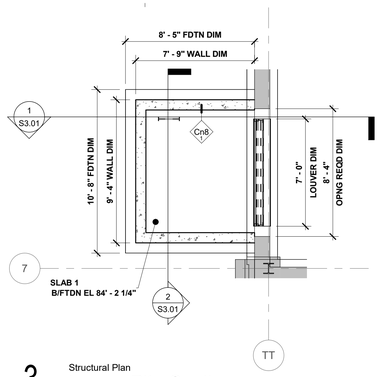
S0.03

STRUCTURAL NOTES ELEVATOR FOUNDATION

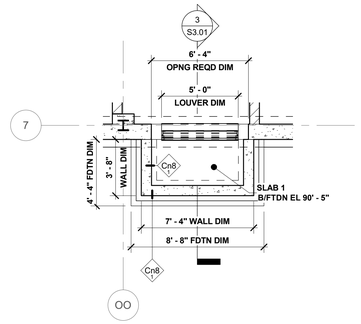
1. FIELD VERIFY ALL DIMENSIONS.
2. AFTER COMPLETION OF DEMOLITION OF EXIST FLOOR SLAB AS SHOWN ON D1.00, COORDINATE WITH ARCHITECT AND STRUCTURAL ENGINEER PRIOR TO EXCAVATION FOR NEW ELEVATOR PIT FOUNDATION.
3. CONTRACTOR IS RESPONSIBLE FOR ALL SHORING AND BRACING TO MINIMIZE SETTLEMENT OF EXISTING STRUCTURE DURING UNLOADING AND RELOADING OF FOUNDATIONS.
4. FOUNDATION SLAB DESIGN
   a. LL W/ IMPACT = 101 K
   b. TOTAL LOAD = 2,425 PSF (SERVICE)
5. SEE S0.03 & SPECIFICATIONS FOR MASONRY CONSTRUCTION.
6. ALL CMU WALLS ARE SPECIAL REINFORCED MASONRY SHEAR WALLS. CONT BOND BM REQ'D @ T/ & B/WALL IF MAS DOESN'T CLOSE FLUSH WITH EXIST BM, FILL IN WITH PLATE OR ANGLE CONNECTED TO BOTH BOND BM AND EXIST CONC BM.
7. CMU SHALL HAVE NO EXPANSION OR CONTROL JOINTS.
8. SEE DETAIL 4 ON DRAWING A4.01 FOR ADDITIONAL INFOMRATION.
9. SEE A8.01 FOR ELEVATOR DOOR INFORMATION.
10. SEE S4.01 AND S4.03 FOR FOUNDATION, FLOOR, AND WALL REEQRCEMENT INFORMATION.
11. SEE S4.01 FOR FOUNDATION & SUMP PIT DETAILS. (A)



2 Structural Plan
Elevator - Plan EL 83'-2 1/4"
S1.00 1/4" = 1'-0"



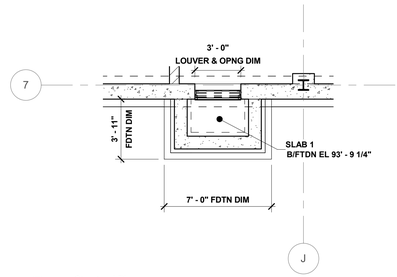
3 Structural Plan
Louver Pit - South
S1.00 1/4" = 1'-0"



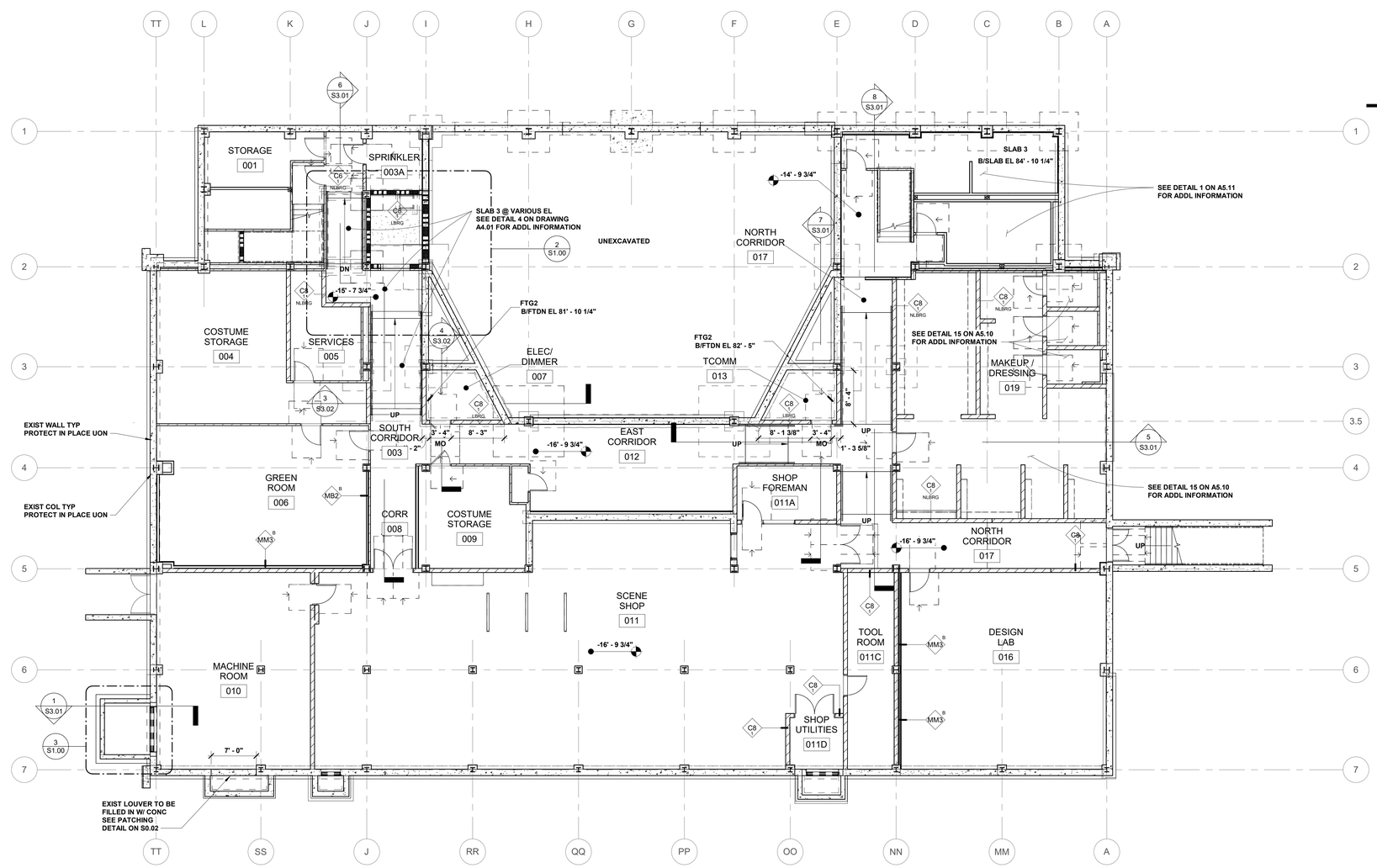
4 Structural Plan
Louver Pit - East 1
S1.00 1/4" = 1'-0"

STRUCTURAL NOTES LOUVER PITS

1. SEE MECH DRAWINGS FOR ADDITIONAL DETAILS.
2. SEE S3.01 FOR WALL REINF DETAILS.
3. WALL TAGS ARE TYPICAL UON.



5 Structural Plan
Louver Pit - East 2
S1.00 1/4" = 1'-0"



1 Structural Plan
Basement - Plan EL 83'-2 1/4"
S1.00 1/8" = 1'-0"

SYMBOL LEGEND

101	DOOR TAG: SEE SHEET A8-SERIES DRAWINGS
WW LBRG or NLBRG	WALL TAG: SEE SHEET A0.10 and A0.11 FOR WALL TYPE, FIRE RATING, AND STRUCTURAL USAGE REQUIREMENTS. SEE A4 SERIES DRAWINGS FOR WALL FINISHES.

STRUCTURAL NOTES BASEMENT

1. FIELD VERIFY ALL DIMENSIONS.
2. SEE D1.00 FOR ALL REMAINING DEMOLITIONS ITEMS.
3. WALLS MARKED FOR STRUCTURAL USAGE UON.
4. SEE S0.03 & SPECIFICATIONS FOR MASONRY CONSTRUCTION.
5. CMU SHALL HAVE NO EXPANSION OR CONTROL JOINTS.
6. NOT ALL EXISTING FOUNDATIONS ARE SHOWN, ONLY SHOWN IF THERE IS POTENTIAL FOR CONFLICT.
7. SEE A1.00 & A1.00A DRAWINGS FOR ADDL ROOM, DOOR, & DIMENSIONAL INFORMATION.
8. ALL NEW INTERIOR NON-LOAD BEARING WALL WILL BE REINFORCED W/ #5 @ 32" OC UON. CONT BOND BM REQ'D @ T/ & B/WALL IF MAS DOESN'T CLOSE FLUSH WITH EXIST BM, FILL IN WITH PLATE OR ANGLE CONNECTED TO BOTH BOND BM AND EXIST CONC BM.
9. ALL NEW INTERIOR NON-LOAD BEARING METAL STUD WALLS WILL BE FRAMED W/ STUDS @ 24" OC UON.

GENERAL STRUCTURAL NOTES

1. DO NOT SCALE DRAWINGS.
2. FOR GENERAL NOTES AND TYPICAL DETAILS SEE S0.01 TO S0.03 DRAWINGS.
3. FOR ADDITIONAL BUILDING INFORMATION SEE DRAWINGS FROM DIVISIONS A, D, M, E, T, P, & FP.

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PRAMKUMAR A. PARIKH REGISTERED No. PE 11700630 STATE OF INDIANA PROFESSIONAL ENGINEER

F.A. Parikh
SEAL AFFIXED: 06-11-2020
CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

Terre Haute, Indiana 47809

Project No.: 19A052
Drawn By: J. Hand
Checked By: F. Parikh
Scale: See Drawing
Issue Date: June 5, 2020

REVISION SCHEDULE

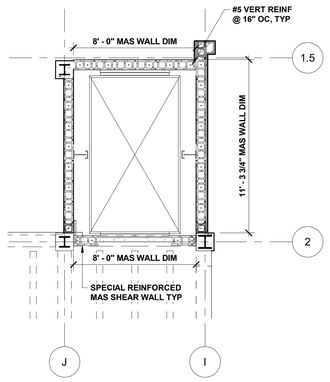
Rev. #	Revision Description	Issue Date
2	Addendum #2	6/19/2020
3	Addendum #3	6/26/2020
5	Addendum #5	7/02/2020

Str. Basement Floor Plan

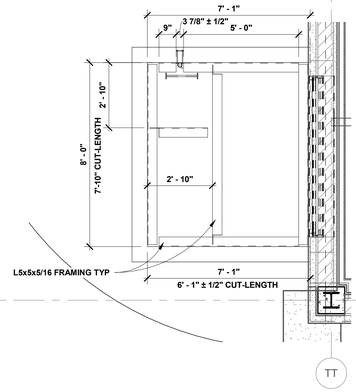
S1.00

STRUCTURAL NOTES ELEVATOR 1ST FLR

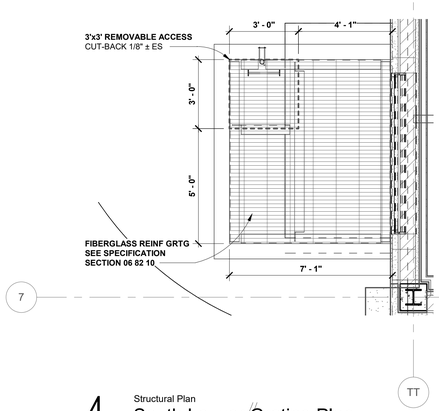
1. FIELD VERIFY ALL DIMENSIONS.
2. SEE S0.03 & SPECIFICATIONS FOR MASONRY CONSTRUCTION.
3. ALL CMU WALLS ARE SPECIAL REINFORCED MASONRY SHEAR WALLS. CONT BOND BM REQ'D @ T/ & B/WALL IF MAS DOESN'T CLOSE FLUSH WITH EXIST BM, FILL IN WITH PLATE OR ANGLE CONNECTED TO BOTH BOND BM AND EXIST CONC BM.
4. CMU SHALL HAVE NO EXPANSION OR CONTROL JOINTS.
5. SEE A8.01 FOR ELEVATOR DOOR INFORMATION.



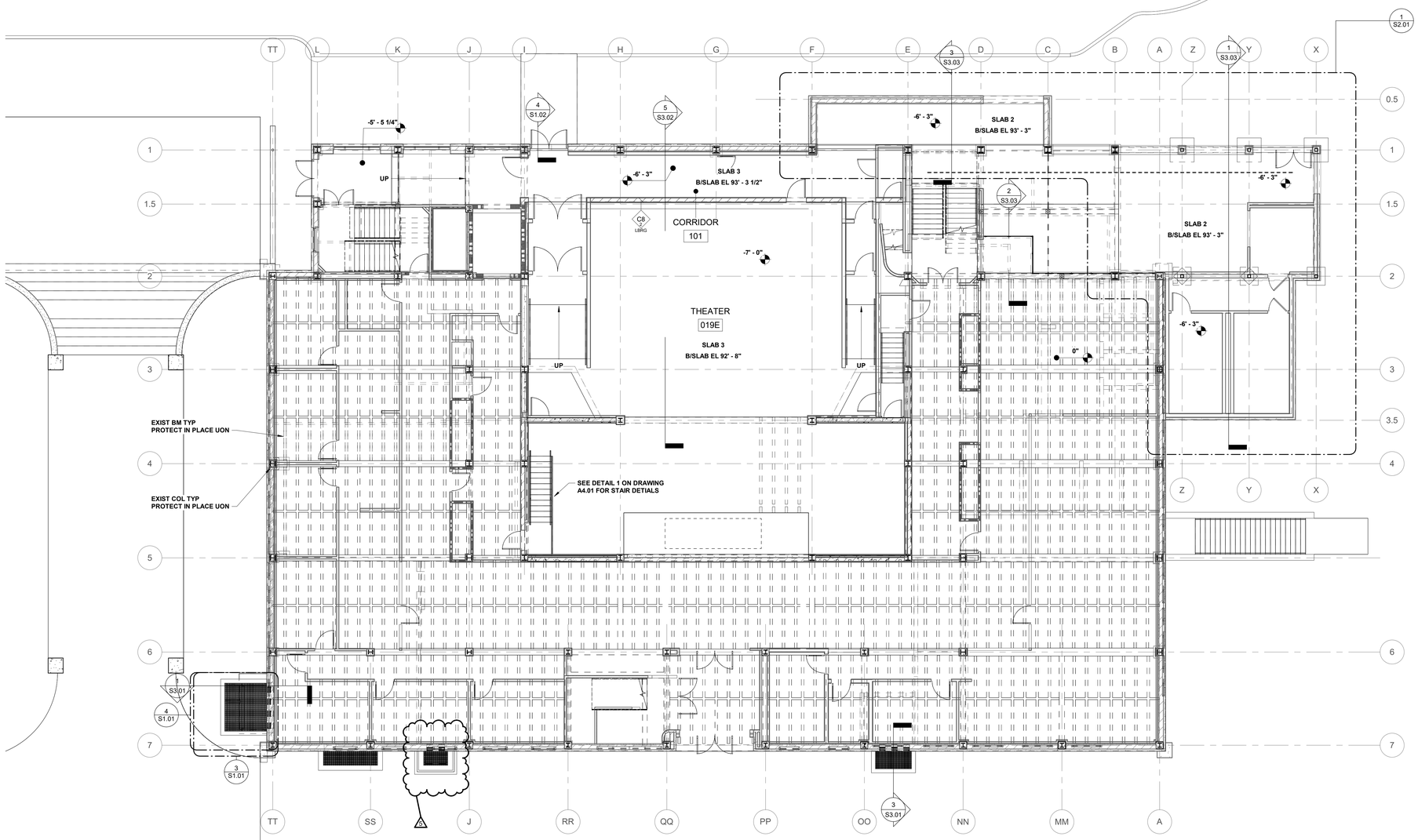
2 Structural Plan
Elevator - 1st Floor
S1.01 1/4" = 1'-0"



3 Structural Plan
South Louver Framing Plan - For Grating
S1.01 3/8" = 1'-0"



4 Structural Plan
South Louver Grating Plan
S1.01 3/8" = 1'-0"



1 Structural Plan
1st Floor - Plan EL 100'-0"
S1.01 1/8" = 1'-0"

SYMBOL LEGEND

101	DOOR TAG: SEE SHEET A8-SERIES DRAWINGS
WW 8 LBRG or NLBRG	WALL TAG: SEE SHEET A0.10 and A0.11 FOR WALL TYPE, FIRE RATING, AND STRUCTURAL USAGE REQUIREMENTS. SEE A4 SERIES DRAWINGS FOR WALL FINISHES.

STRUCTURAL NOTES 1ST FLOOR

1. FIELD VERIFY ALL DIMENSIONS.
2. SEE S4.01 FOR AUDITORIUM FOUNDATION PLAN.
3. SEE D1.01 FOR ALL REMAINING DEMOLITIONS ITEMS.
4. AFTER COMPLETION OF DEMOLITION OF EXIST AUDITORIUM FLOOR SLAB & ADJACENT HALLWAY SLAB AS SHOWN ON D1.01, COORDINATE WITH ARCHITECT AND STRUCTURAL ENGINEER PRIOR TO EXCAVATION FOR WALL FOUNDATION.
5. CONTRACTOR IS RESPONSIBLE FOR ALL SHORING AND BRACING TO MINIMIZE SETTLEMENT OF EXISTING STRUCTURE DURING UNLOADING AND RELOADING OF FOUNDATIONS.
6. FLOOR DESIGN LL
   a. AUDITORIUM SLAB = 100 PSF
   b. LOBBY ADDITION SLABS = 100 PSF
   c. ELSEWHERE = 40 PSF
7. ALL INTERIOR WALLS ARE NON-LOAD BEARING UON.
8. SEE S0.03 & SPECIFICATIONS FOR MASONRY CONSTRUCTION.
9. CMU SHALL HAVE NO EXPANSION OR CONTROL JOINTS.
10. NOT ALL EXISTING FOUNDATIONS ARE SHOWN, ONLY SHOWN IF THERE IS POTENTIAL FOR CONFLICT.
11. SEE A1.01 & A1.01A DRAWINGS FOR ADDL ROOM, DOOR, & DIMENSIONAL INFORMATION.
12. ALL NEW INTERIOR NON-LOAD BEARING WALL WILL BE REINFORCED W/ #5 @ 32" OC UON.
13. ALL NEW INTERIOR NON-LOAD BEARING METAL STUD WALLS WILL BE FRAMED W/ STUDS @ 24" OC UON.

GENERAL STRUCTURAL NOTES

1. DO NOT SCALE DRAWINGS.
2. FOR GENERAL NOTES AND TYPICAL DETAILS SEE S0.01 TO S0.03 DRAWINGS.
3. FOR ADDITIONAL BUILDING INFORMATION SEE DRAWINGS FROM DIVISIONS A, D, M, E, T, P, & FP.

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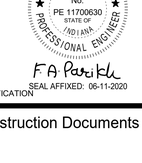

SEAL AFFIXED: 06-11-2020
CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

Terre Haute, Indiana 47809

Project No.: 19A052
Drawn By: J. Hand
Checked By: F. Parikh
Scale: See Drawing
Issue Date: June 5, 2020

REVISION SCHEDULE

Rev. #	Revision Description	Issue Date
2	Addendum #2	6/19/2020
3	Addendum #3	6/26/2020
5	Addendum #5	7/02/2020

Str. 1st Floor Plan

S1.01

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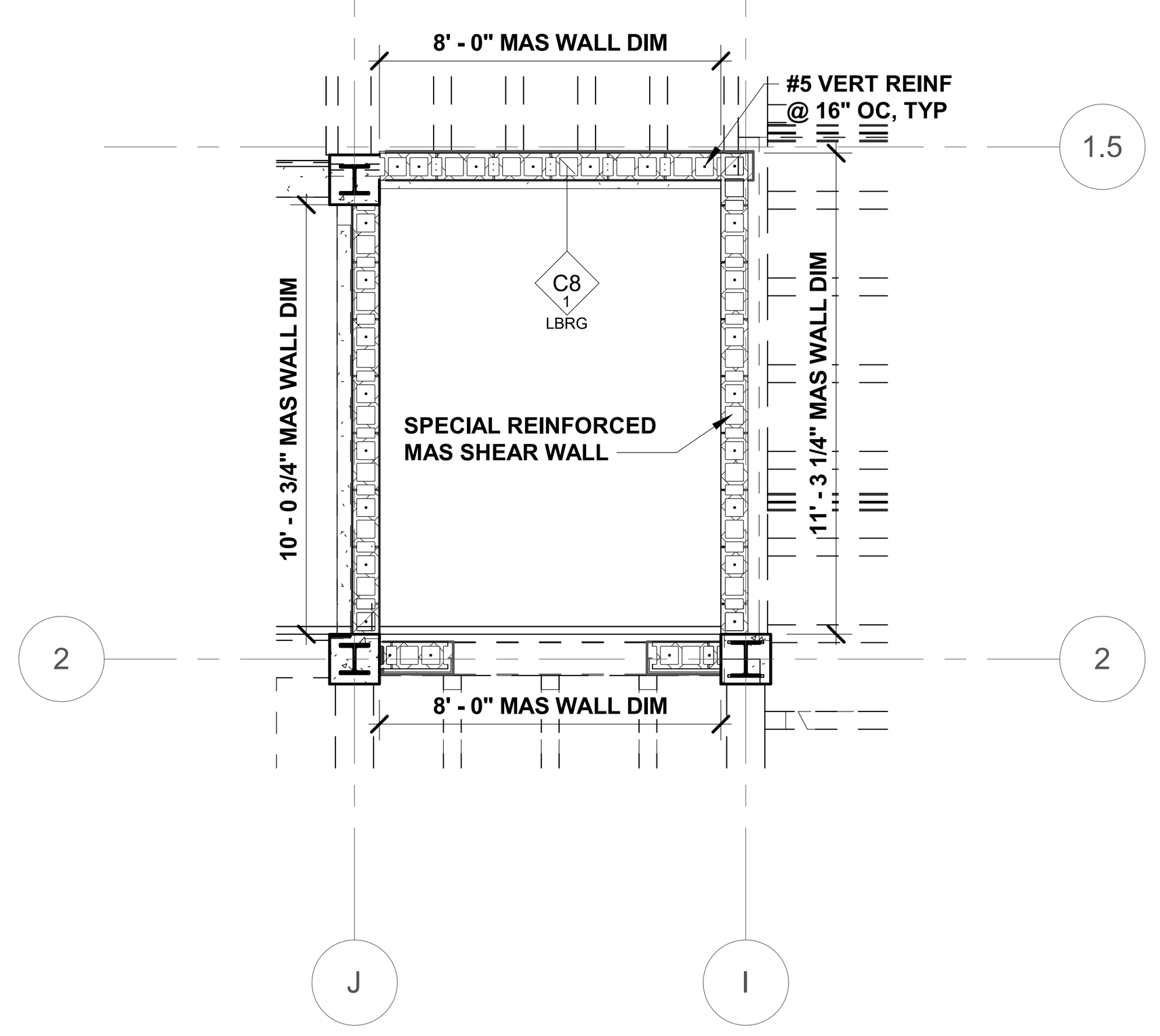
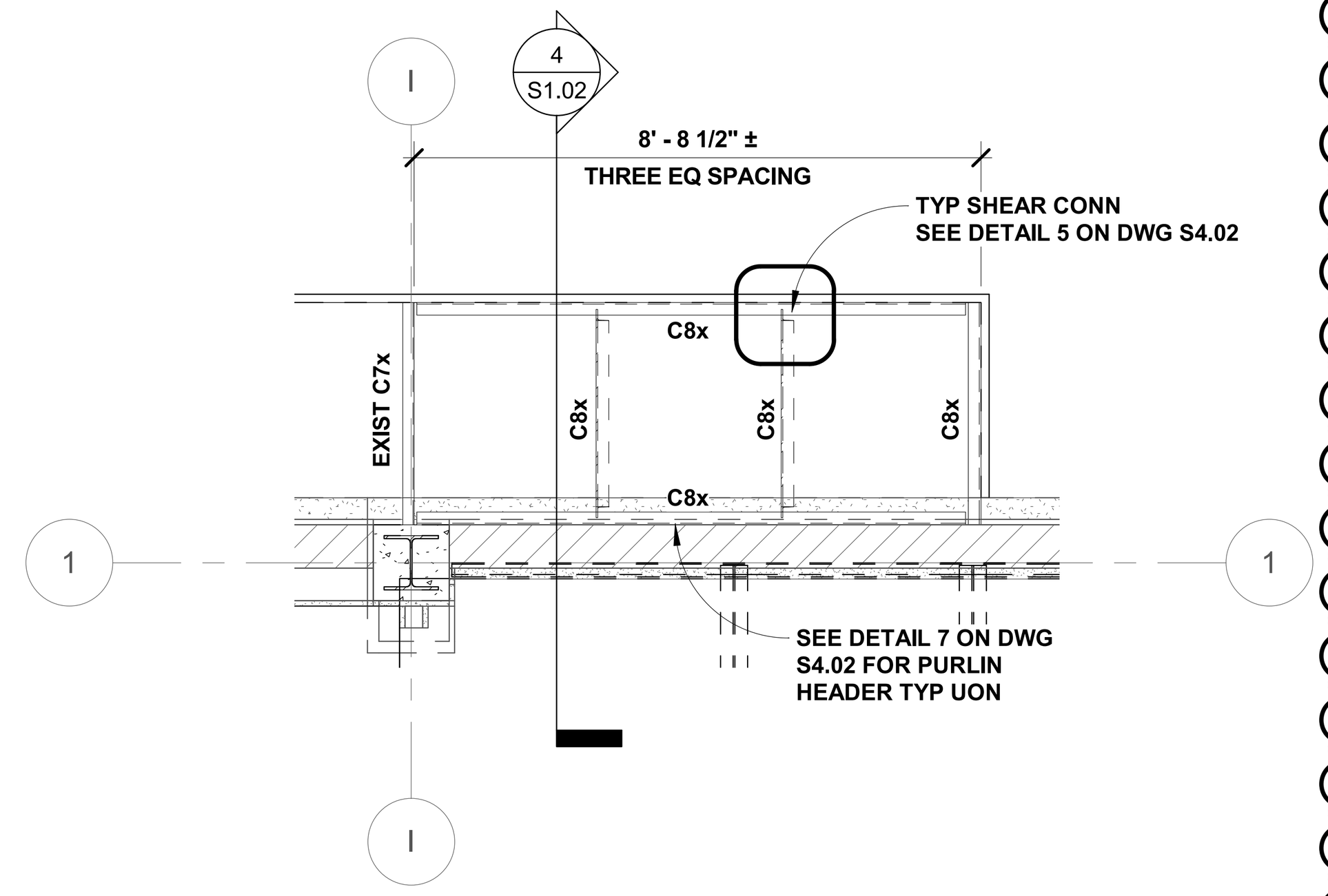
Dreiser Add #5

STRUCTURAL NOTES
ELEVATOR 2ND FLR

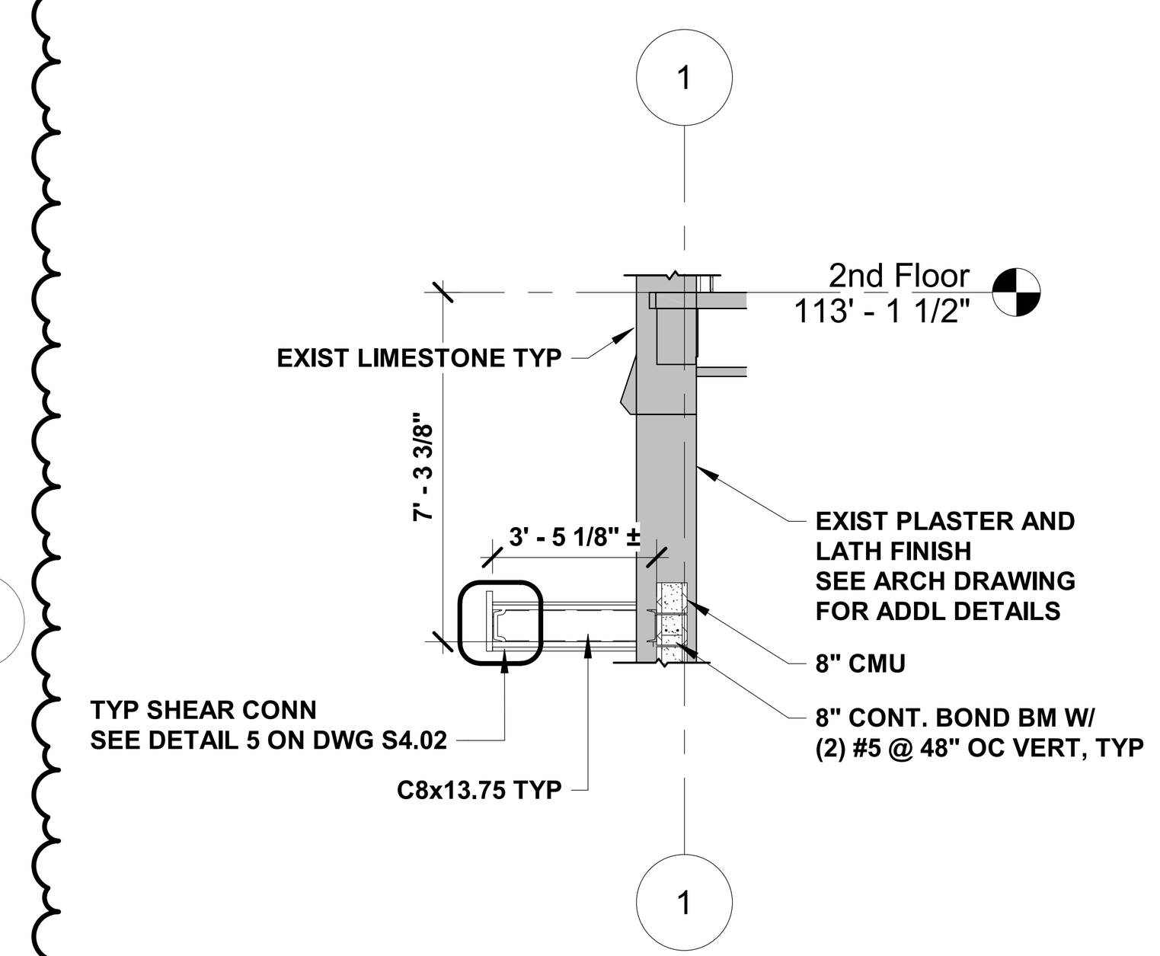
1. FIELD VERIFY ALL DIMENSIONS.
2. SEE S0.03 & SPECIFICATIONS FOR MASONRY CONSTRUCTION.
3. ALL CMU WALLS ARE SPECIAL REINFORCED MASONRY SHEAR WALLS. CONT BOND BM REQ'D @ T/ & B/WALL IF MAS DOESN'T CLOSE FLUSH WITH EXIST BM, FILL IN WITH PLATE OR ANGLE CONNECTED TO BOTH BOND BM AND EXIST CONC BM.
4. CMU SHALL HAVE NO EXPANSION OR CONTROL JOINTS.
5. SEE A8.01 FOR ELEVATOR DOOR INFORMATION.



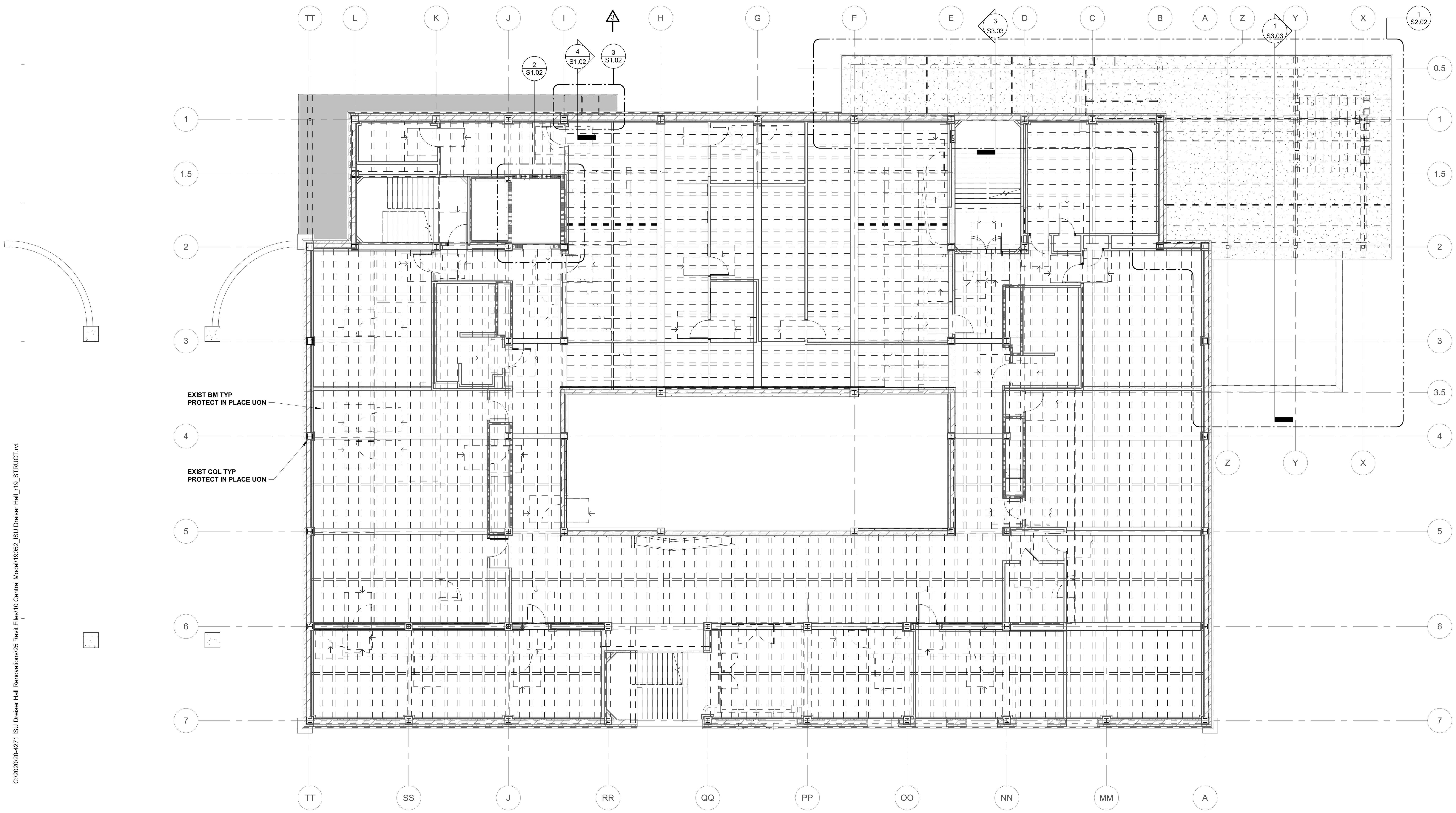
2 Structural Plan
Elevator - 2nd Floor
S1.02 1/4" = 1'-0"



3 Structural Plan
South Awning Extension
S1.02 3/8" = 1'-0"



4 Wall Section
Section - South Awning
S1.02 1/4" = 1'-0"



1 Structural Plan
2nd Floor - Plan EL 113'-1 1/2"
S1.02 1/8" = 1'-0"

SYMBOL LEGEND

101	DOOR TAG: SEE SHEET A8-SERIES DRAWINGS
WW 1 LBRG or NLBRG	WALL TAG: SEE SHEET A0.10 and A0.11 FOR WALL TYPE, FIRE RATING, AND STRUCTURAL USAGE REQUIREMENTS. SEE A4 SERIES DRAWINGS FOR WALL FINISHES.

STRUCTURAL NOTES
2ND FLOOR

1. FIELD VERIFY ALL DIMENSIONS.
2. SEE D1.02 FOR ALL REMAINING DEMOLITIONS ITEMS.
3. ROOF DESIGN LL_r = 20 PSF
4. ROOF DESIGN SL = 19 PSF (W/ RAIN-ON-SNOW SURCHARGE)
5. ALL INTERIOR WALLS ARE NON-LOAD BEARING UON.
6. SEE A1.02 & A1.02A DRAWINGS FOR ADDL ROOM, DOOR, & DIMENSIONAL INFORMATION.
7. ALL NEW INTERIOR NON-LOAD BEARING WALL WILL BE REINFORCED W/ #5 @ 32" OC UON.
8. ALL NEW INTERIOR NON-LOAD BEARING METAL STUD WALLS WILL BE FRAMED W/ STUDS @ 24" OC UON.

GENERAL STRUCTURAL NOTES

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2. FOR GENERAL NOTES AND TYPICAL DETAILS SEE S0.01 TO S0.03 DRAWINGS.
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F A Parikh
SEAL AFFIXED: 06-11-2020
CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

Terre Haute, Indiana 47809

Project No.: 19A052
Drawn By: J. Hand
Checked By: F. Parikh
Scale: See Drawing
Issue Date: June 5, 2020

REVISION SCHEDULE

Rev. #	Revision Description	Issue Date
2	Addendum #2	6/19/2020
3	Addendum #3	6/26/2020
5	Addendum #5	7/02/2020

Str. 2nd Floor Plan

S1.02

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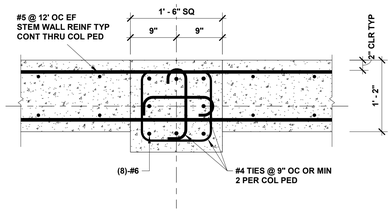
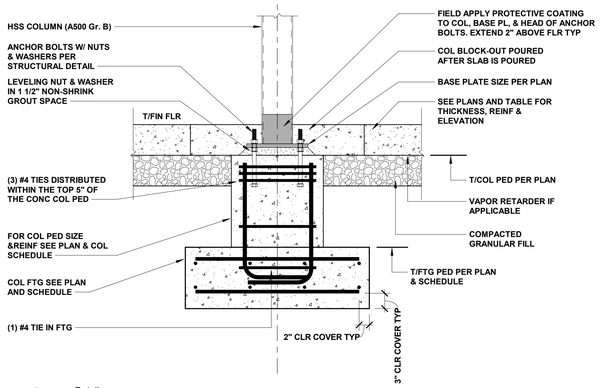


2 Detail
Typical Column Pedestal
S2.00 1" = 1'-0"



3 Detail
TYPICAL INTERIOR STEEL COLUMN AND FOOTING DETAIL
S2.00 1" = 1'-0"

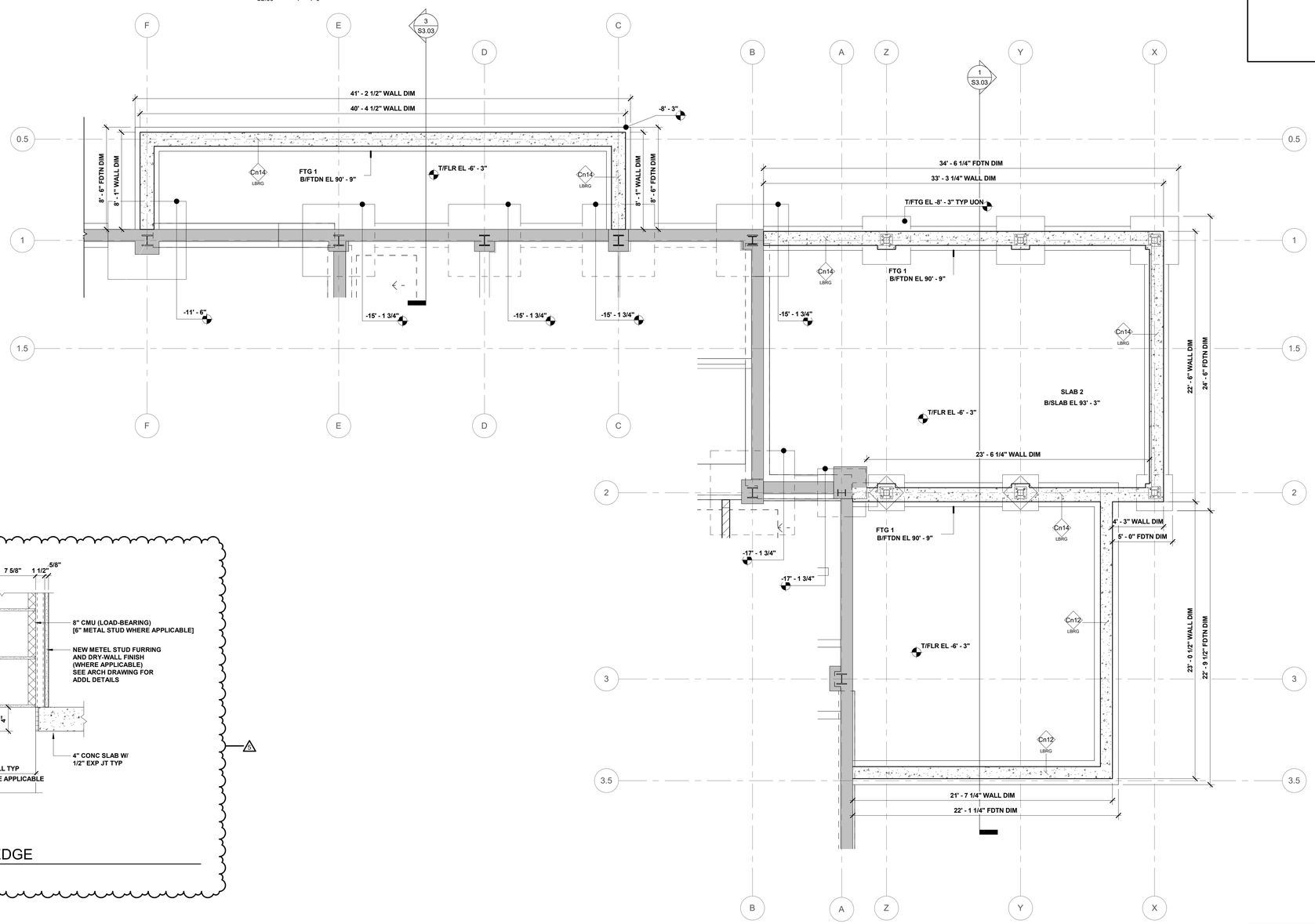
SYMBOL LEGEND

101 — DOOR TAG: SEE SHEET A8-SERIES DRAWINGS

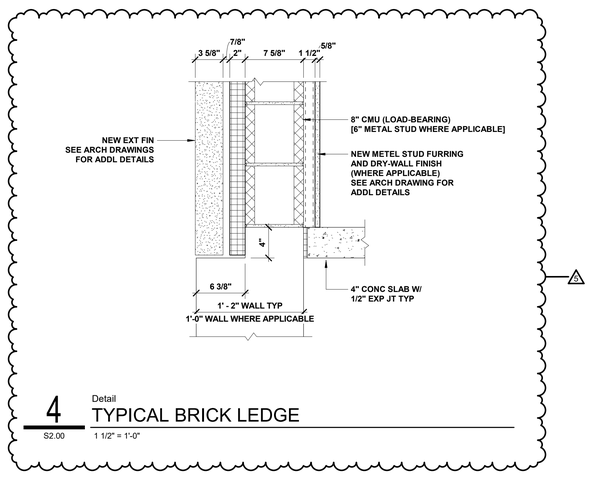
WW (8) LBRG or NLBRG — WALL TAG: SEE SHEET A0.10 and A0.11 FOR WALL TYPE, FIRE RATING, AND STRUCTURAL USAGE REQUIREMENTS. SEE A4 SERIES DRAWINGS FOR WALL FINISHES.

STRUCTURAL NOTES LOBBY FDTN

1. FIELD VERIFY ALL DIMENSIONS.
2. REVIEW ALL CIVIL DRAWINGS BEFORE EXCAVATION. SEE C2.00 SITE DEMOLITION NOTES.
3. EXISTING TUNNEL ON NORTHERN EDGE OF EXCAVATION MUST REMAIN-IN-PLACE. CONTRACTOR IS RESPONSIBLE FOR SHORING AND BRACING OF THE TUNNEL TO PREVENT DAMAGED DURING CONSTRUCTION.
4. FLOOR DESIGN LL
   a. LOBBY ADDITION SLABS = 100 PSF
   b. ELSEWHERE = 40 PSF
5. SEE S0.03 & SPECIFICATIONS FOR MASONRY CONSTRUCTION.
6. NOT ALL EXISTING FOUNDATIONS ARE SHOWN, ONLY SHOWN IF THERE IS POTENTIAL FOR CONFLICT.
7. SEE A1.01 & A1.01A DRAWINGS FOR ADDL ROOM, DOOR, & DIMENSIONAL INFORMATION.



1 Structural Plan
Lobby Addition - Plan EL 91'-9"
S2.00 1/4" = 1'-0"



4 Detail
TYPICAL BRICK LEDGE
S2.00 1 1/2" = 1'-0"

GENERAL STRUCTURAL NOTES

1. DO NOT SCALE DRAWINGS.
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F A Parikh
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Indiana State University - Dreiser Hall Renovation

Terre Haute, Indiana 47809

Project No.: 19A052
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Checked By: F. Parikh
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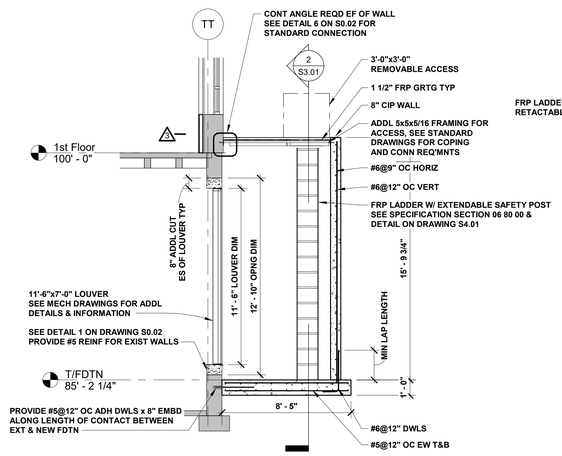
REVISION SCHEDULE

Rev. #	Revision Description	Issue Date
2	Addendum #2	6/19/2020
5	Addendum #5	7/02/2020

2

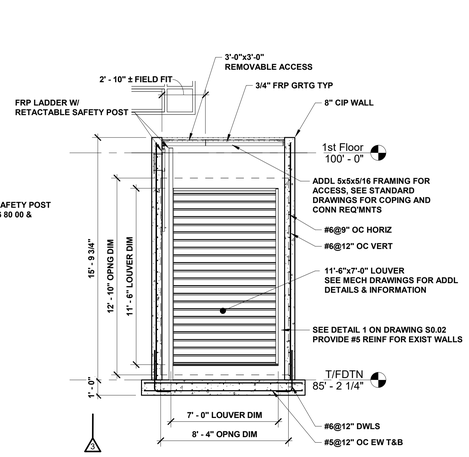
Foundation Plan - Lobby

S2.00

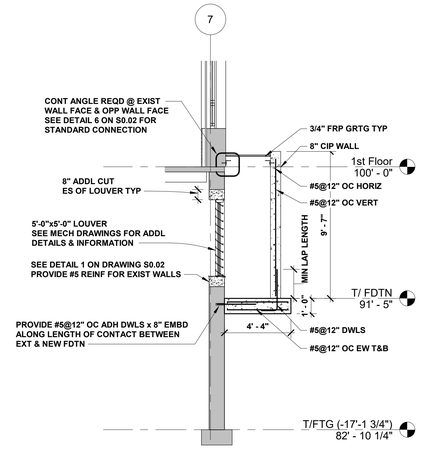


NOTE:
FOR HORIZ WALL REINF PROVIDE #6@9" OC ADH DWLS x 8" EMBD ALONG LENGTH OF CONTACT BETWEEN EXT & NEW WALL.

1 Wall Section
Section N/S - Louver Pit (South Bldg El)
S3.01 1/4" = 1'-0"

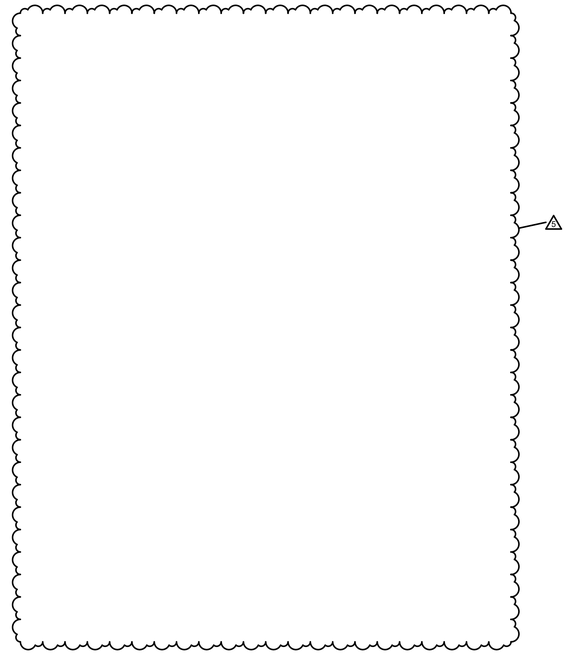


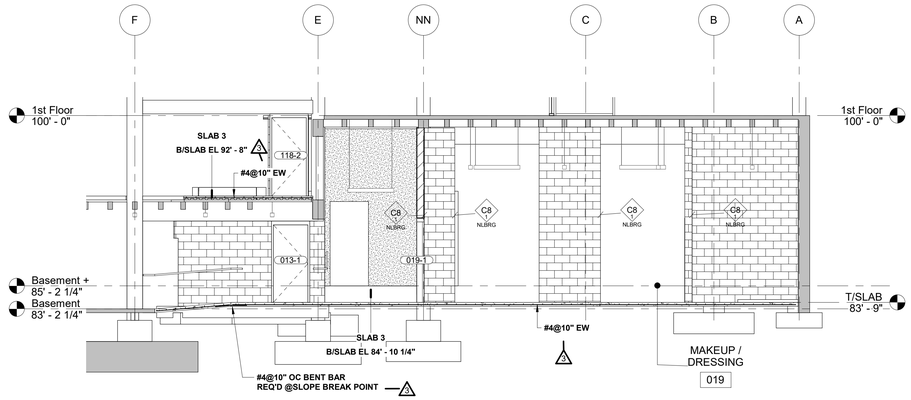
2 Wall Section
Section E/W - Louver Pit (South Bldg El)
S3.01 1/4" = 1'-0"



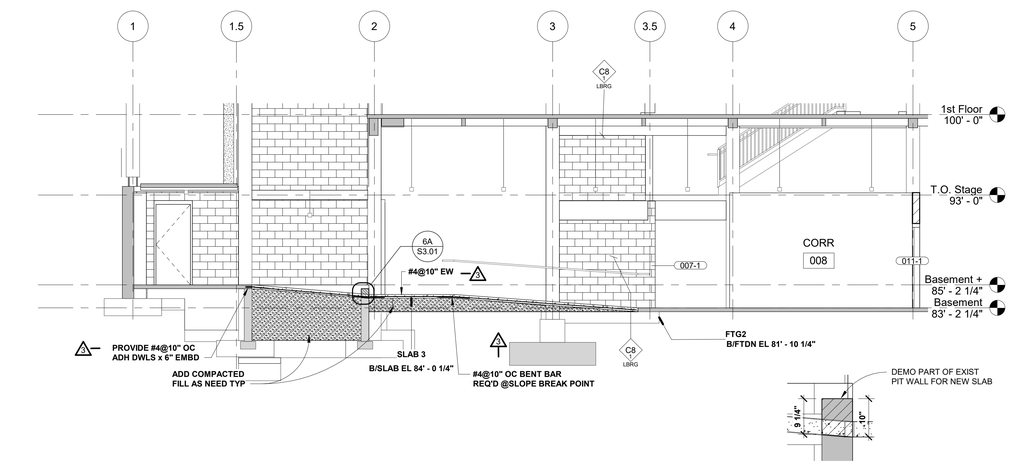
NOTE:
FOR HORIZ WALL REINF PROVIDE #5@12" OC ADH DWLS x 8" EMBD ALONG LENGTH OF CONTACT BETWEEN EXT & NEW WALL.

3 Wall Section
Section - Louver Pit (East Bldg El) 1
S3.01 1/4" = 1'-0"



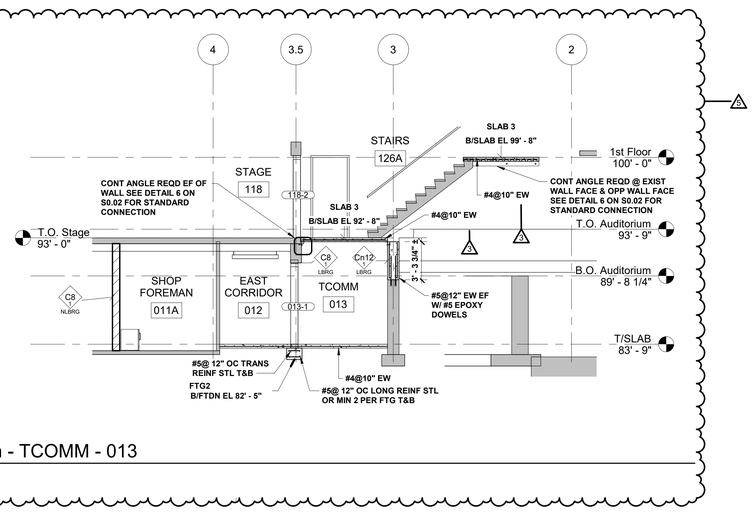


5 Wall Section
Section - Makeup/Dressing
S3.01 3/16" = 1'-0"

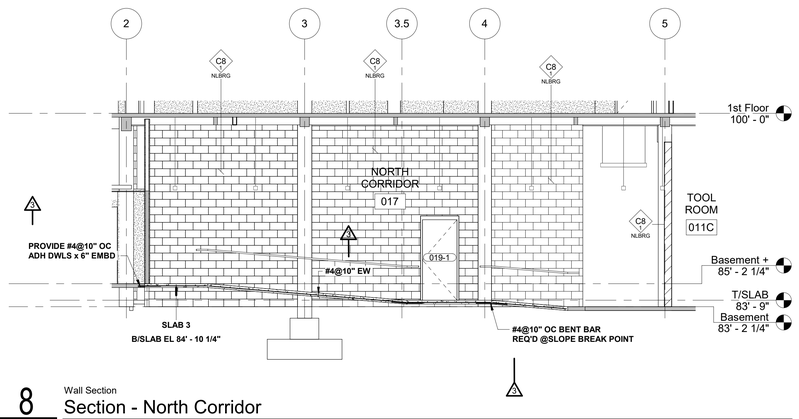


6 Wall Section
Section - South Corridor
S3.01 3/16" = 1'-0"

6A Wall Section
Callout - South Corridor
S3.01 3/4" = 1'-0"



7 Wall Section
Section - TCOMM - 013
S3.01 3/16" = 1'-0"



8 Wall Section
Section - North Corridor
S3.01 3/16" = 1'-0"

SYMBOL LEGEND

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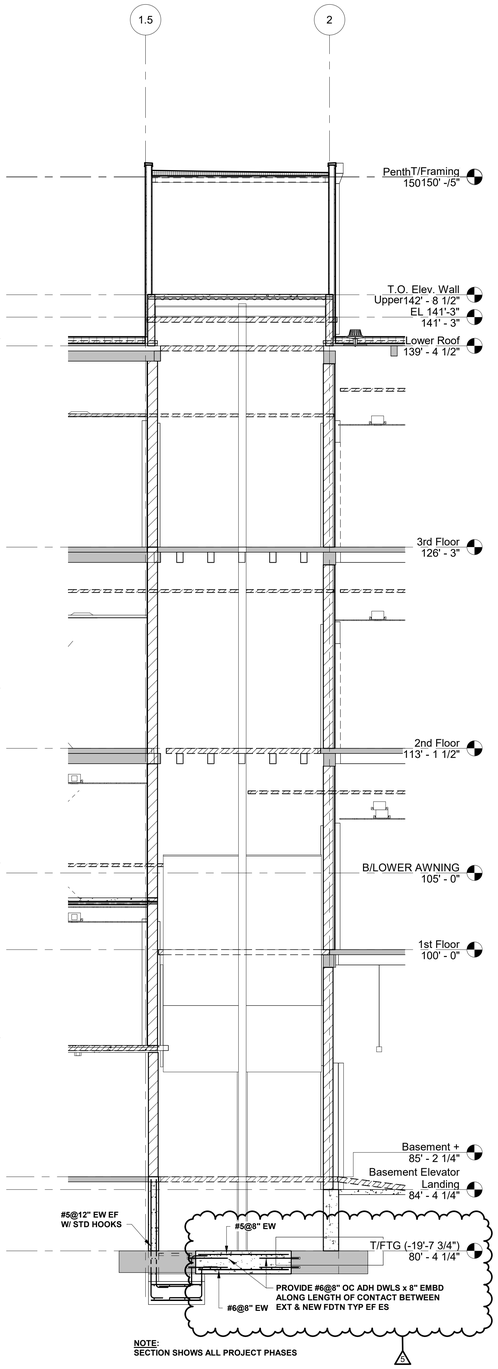
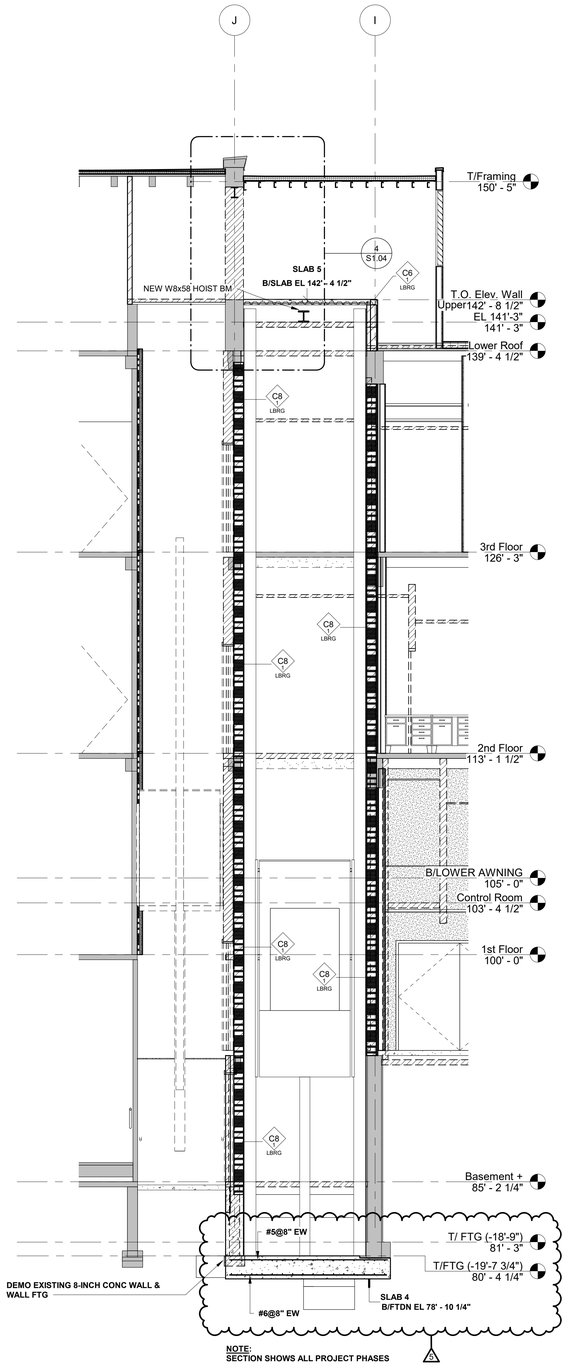
Str. Sections

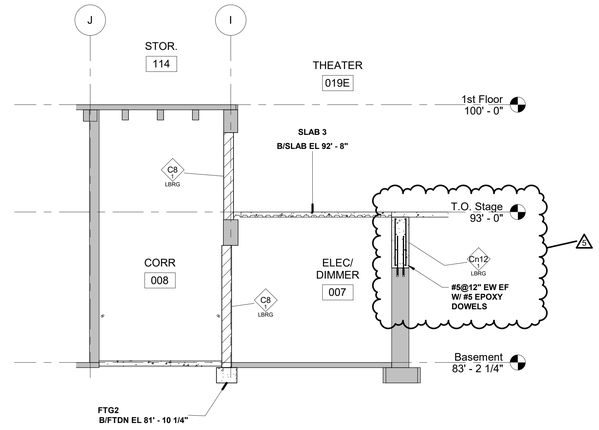
S3.01



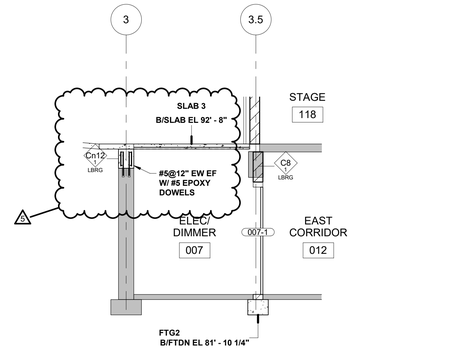
1 Wall Section
Section - Elevator N/S
S3.02 1/4" = 1'-0"



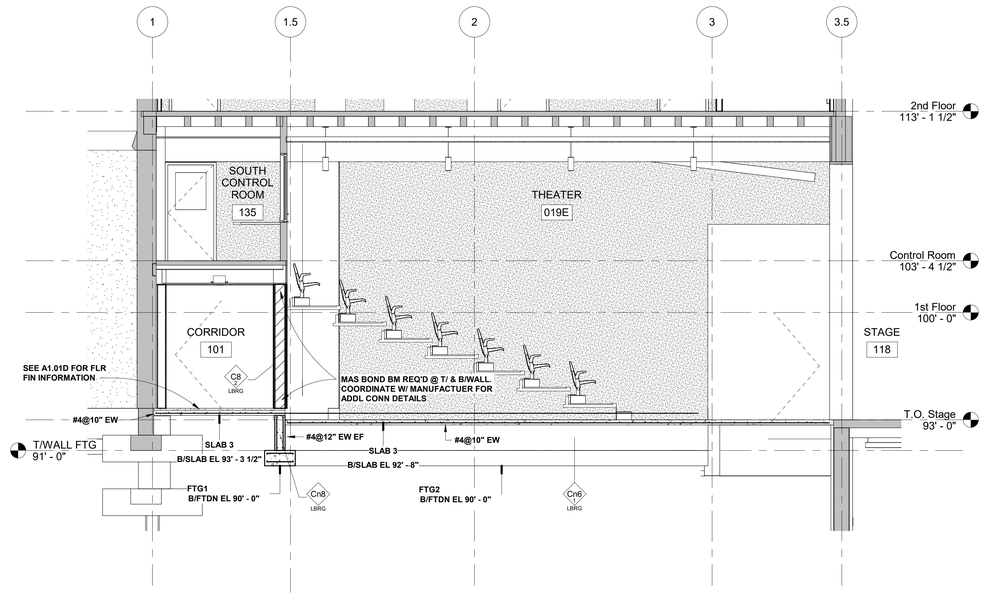
2 Wall Section
Section - Elevator E/W
S3.02 1/4" = 1'-0"



3 Wall Section
Section N/S - ELEC/DIMMER 007
S3.02 1/4" = 1'-0"



4 Wall Section
Section E/W - ELEC/DIMMER 007
S3.02 1/4" = 1'-0"



5 Wall Section
Section - Auditorium
S3.02 1/4" = 1'-0"

SYMBOL LEGEND

101 — **DOOR TAG: SEE SHEET A8-SERIES DRAWINGS**

WW (B) LBRG or NLBRG — **WALL TAG: SEE SHEET A0.10 and A0.11 FOR WALL TYPE, FIRE RATING, AND STRUCTURAL USAGE REQUIREMENTS. SEE A4 SERIES DRAWINGS FOR WALL FINISHES.**

GENERAL STRUCTURAL NOTES

1. **DO NOT SCALE DRAWINGS.**
2. **FOR GENERAL NOTES AND TYPICAL DETAILS SEE S0.01 TO S0.03 DRAWINGS.**
3. **FOR ADDITIONAL BUILDING INFORMATION SEE DRAWINGS FROM DIVISIONS A, D, M, E, T, P, & FP.**

Dreiser Add #5

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No. PE 11700630
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PROFESSIONAL ENGINEER
F A Parikh
SEAL AFFIXED: 06-11-2020
CERTIFICATION

Construction Documents

Indiana State University -
Dreiser Hall Renovation

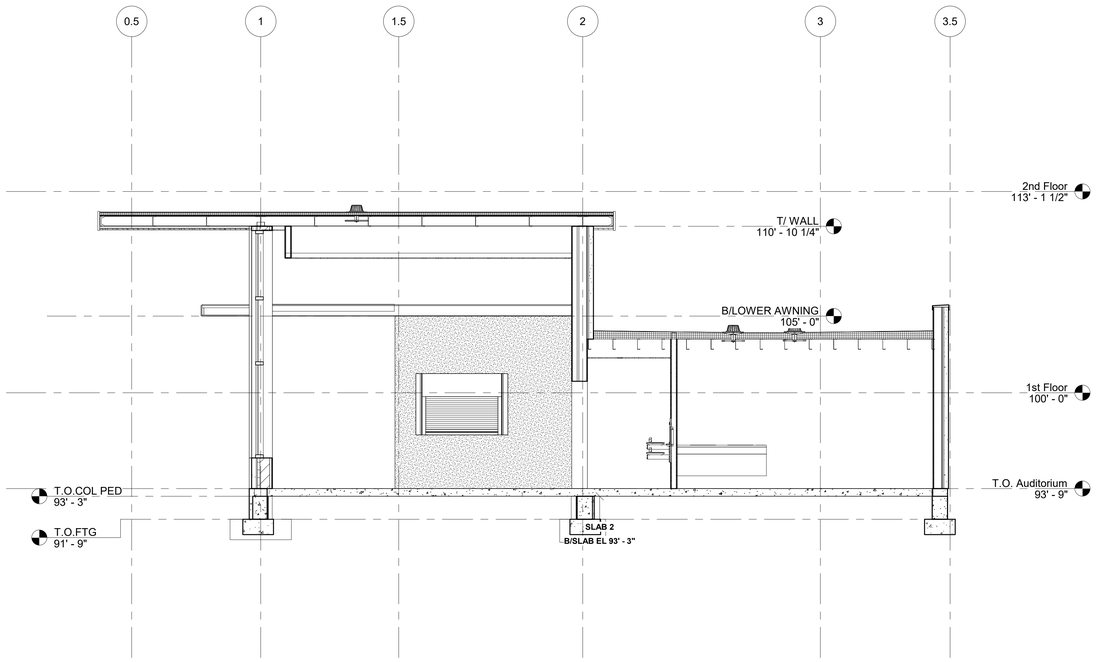
Terre Haute, Indiana 47809

Project No.: 19A052
Drawn By: J. Hand
Checked By: F. Parikh
Scale: See Drawing
Issue Date: June 5, 2020

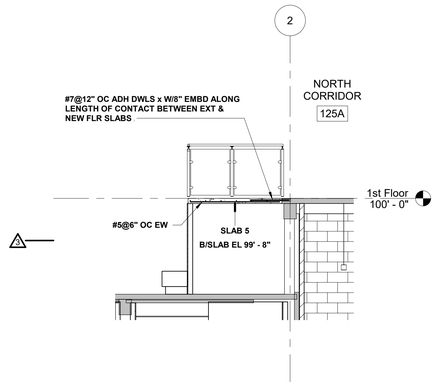
REVISION SCHEDULE		
Rev. #	Revision Description	Issue Date
2	Addendum #2	6/19/2020
5	Addendum #5	7/02/2020

Str. Sections

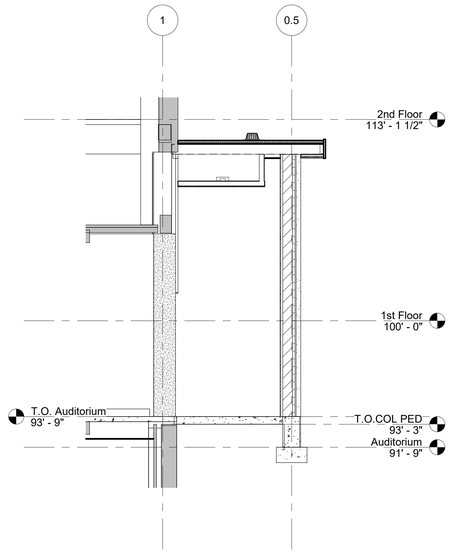
S3.02



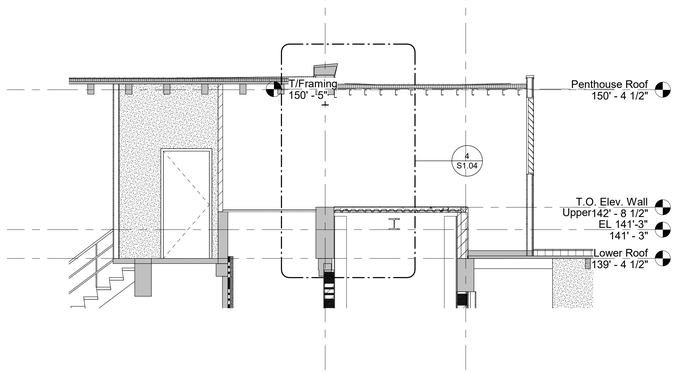
1 S3.03 — Wall Section
Section E/W - Lobby Addition
1/4" = 1'-0"



2 S3.03 — Wall Section
Section - Lobby Cantilever Slab
1/4" = 1'-0"



3 S3.03 — Wall Section
Section - Lobby (West Bldg Face)
1/4" = 1'-0"



4 S3.03 — Wall Section
Section - Penthouse Extension
1/4" = 1'-0"

SYMBOL LEGEND

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WW (8) LBRG or NLBRG — **WALL TAG: SEE SHEET A0.10 and A0.11 FOR WALL TYPE, FIRE RATING, AND STRUCTURAL USAGE REQUIREMENTS. SEE A4 SERIES DRAWINGS FOR WALL FINISHES.**

GENERAL STRUCTURAL NOTES

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PRABHUMAR A. PARIKH — REGISTERED No. PE 11700630 STATE OF INDIANA — PROFESSIONAL ENGINEER
F.A. Parikh
SEAL AFFIXED: 06-11-2020
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Construction Documents

Indiana State University -
Dreiser Hall Renovation

Terre Haute, Indiana 47809

Project No.: 19A052
Drawn By: J. Hand
Checked By: F. Parikh
Scale: See Drawing
Issue Date: June 5, 2020

REVISION SCHEDULE		
Rev. #	Revision Description	Issue Date
2	Addendum #2	6/19/2020
3	Addendum #3	6/26/2020
5	Addendum #5	7/02/2020

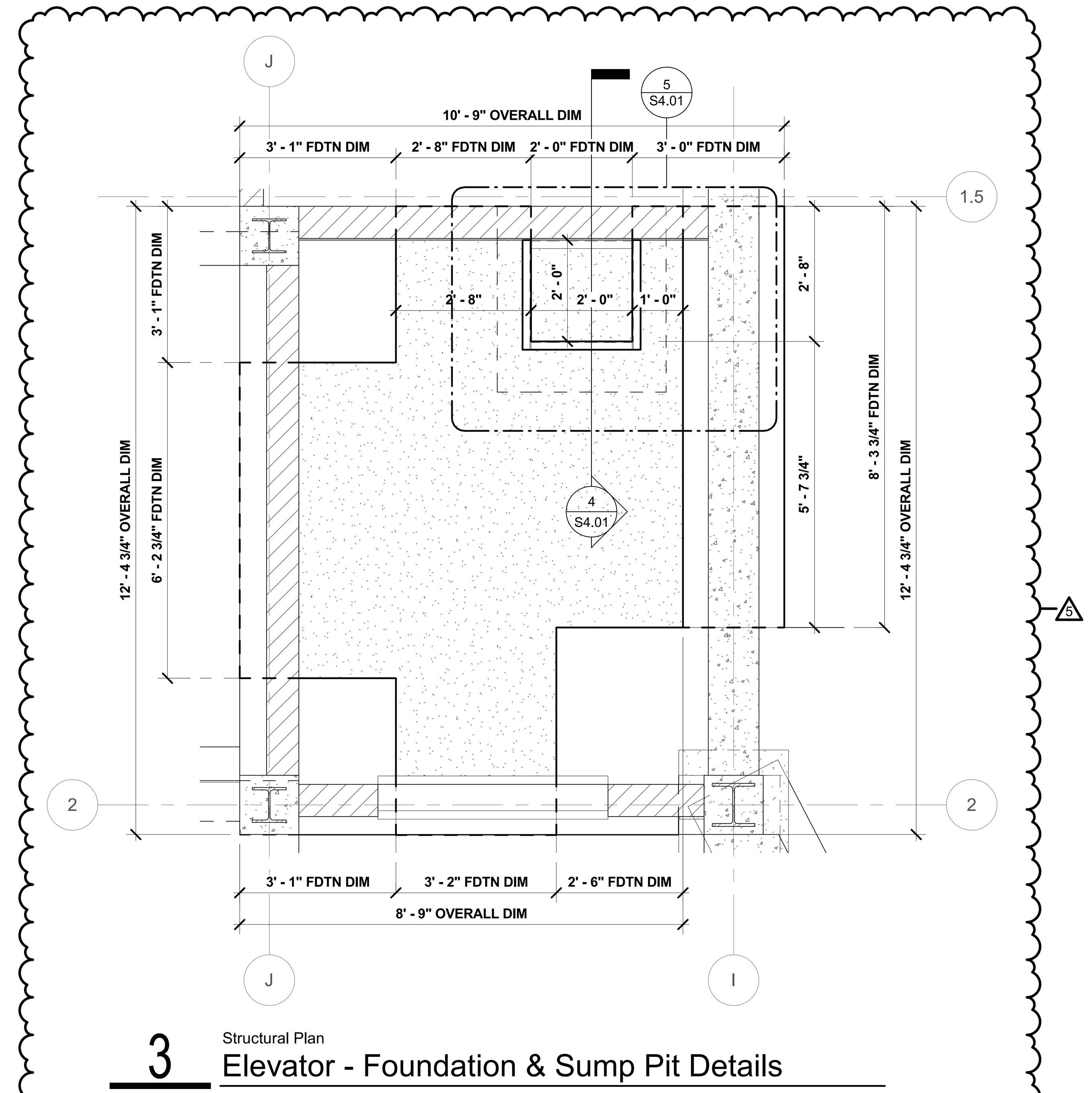
Str. Sections

S3.03

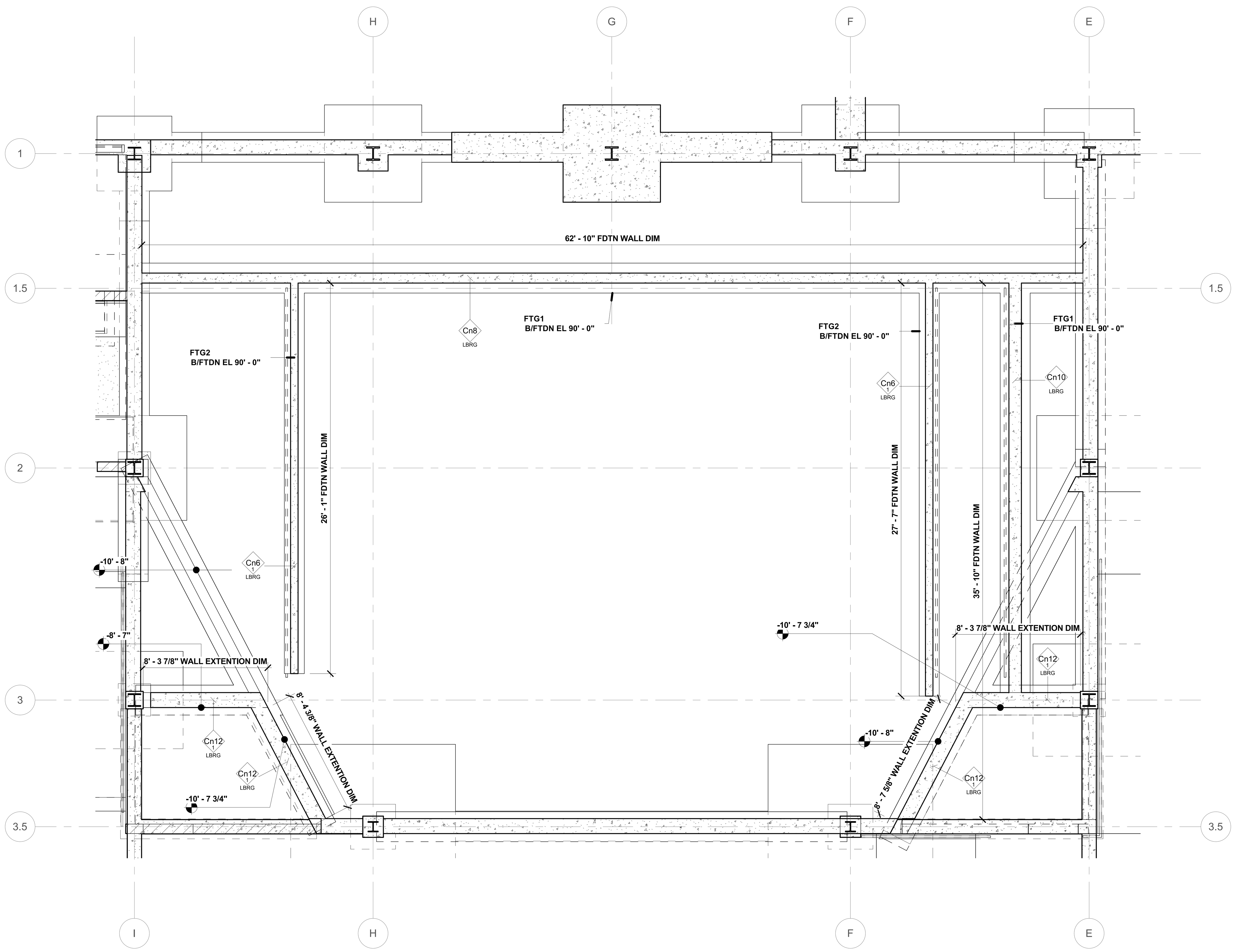
FOUNDATION & SLAB SCHEDULE

MARK	LOCATION	TOP OF FOOTING (ELEV. RANGE)	SIZE		REINFORCING								REMARKS
					BOT STL LONG.		BOT STL TRANS.		TOP STL LONG.		TOP STL TRANS.		
			TNK	WTH	NO. OF BARS	SIZE	SPA (INCH, OC)	SIZE	NO. OF BARS	SIZE	SPA (INCH, OC)	SIZE	
FTG1	Grid Line F	91'-9"	12"	24"	3	#5	12	#5	3	#5	12	#5	New Lobby Addition
FTG1	Grid Line 0.5	91'-9"	12"	24"	3	#5	12	#5	3	#5	12	#5	New Lobby Addition
FTG1	Grid Line C	91'-9"	12"	24"	3	#5	12	#5	3	#5	12	#5	New Lobby Addition
FTG1	Grid Line 1	91'-9"	12"	24"	3	#5	12	#5	3	#5	12	#5	New Lobby Addition
FTG1	Grid Line X	91'-9"	12"	24"	3	#5	12	#5	3	#5	12	#5	New Lobby Addition
FTG1	Grid Line 2	91'-9"	12"	24"	3	#5	12	#5	3	#5	12	#5	New Lobby Addition
FTG1	New Bathroom Area	91'-9"	12"	24"	3	#5	12	#5	3	#5	12	#5	New Lobby Addition, Both Walls
FTG1	Grid Line 1.5	91'-0"	12"	24"	3	#5	12	#5	3	#5	12	#5	Auditorium Area
FTG2	Grid Line 3.5	81'-2 1/4"	12"	16"	2	#5	12	#5	2	#5	12	#5	Basement for Room 007 & 013. For new 8" masonry wall
FTG2	Grid Line I	81'-2 1/4"	12"	16"	2	#5	12	#5	2	#5	12	#5	Basement for Room 007 & 013. For new 8" masonry wall
FTG2	Grid Line E	81'-2 1/4"	12"	16"	2	#5	12	#5	2	#5	12	#5	Basement for Room 007 & 013. For new 8" masonry wall
SLAB 1	New Pits (East)	VARIES SEE SECTIONS	12"	-	#5 at 12" Eachway for Bottom and #5 at 12" Eachway for Top Reinforcement								Slab-on-Grade. This is the smaller pits on east side of the building. Connect with existing wall with epoxy filled drilled holes.
SLAB 1	New Pit (South)	84'-10 1/4"	12"	-	#5 at 12" Eachway for Bottom and #5 at 12" Eachway for Top Reinforcement								Slab-on-Grade. This is the new pit on south side as well as east side of the building. Connect with existing wall with epoxy filled drilled holes.
SLAB 2	New Lobby Addition	93'-9"	4"	-	#4 at 10" Eachway (one layer only)								Slab-on-Grade
SLAB 3	Auditorium Area, Basement, & In Corridor	VARIES SEE SECTIONS	4"	-	#4 at 10" Eachway (one layer only)								Slab-on-Grade as well as slab on form deck. Corridor area behind the elevator adjacent to control room.
SLAB 4	New Elevation Shaft	80'-4 1/2"	18"	-	#6 at 8" Eachway for Bottom and #5 at 8" Eachway for Top Reinforcement								Slab-on-Grade. Connect with existing column footings by epoxy filled drilled holes.
SLAB 5	New Elevation Shaft & Lobby Area		4"	-	#5 at 6" Eachway (one layer only)								Slab on roof for new elevator shaft area. New cantilever slab in new lobby area for overlook.

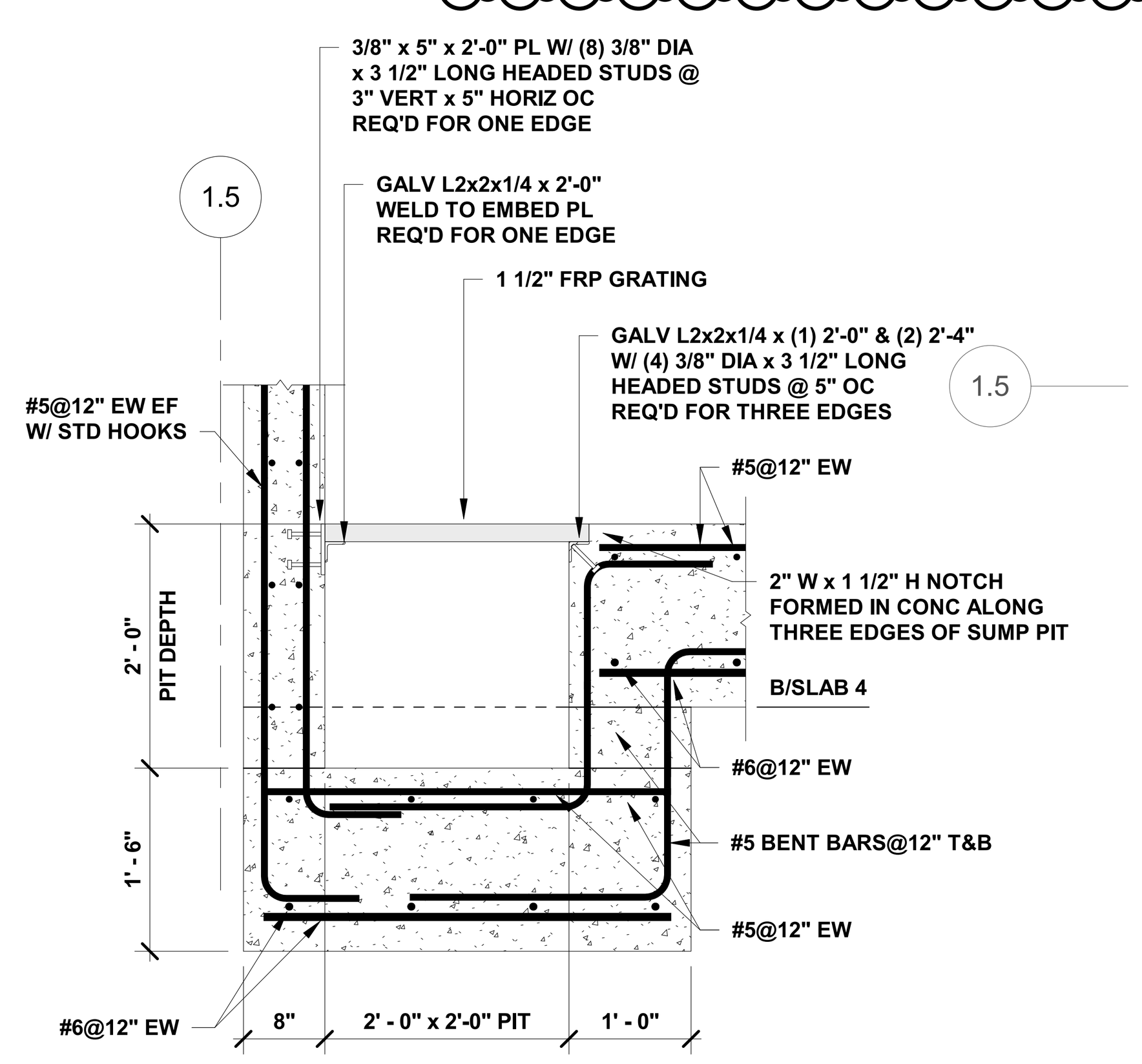
1 Detail
FOUNDATION & SLAB SCHEDULE
S4.01 3/4" = 1'-0"



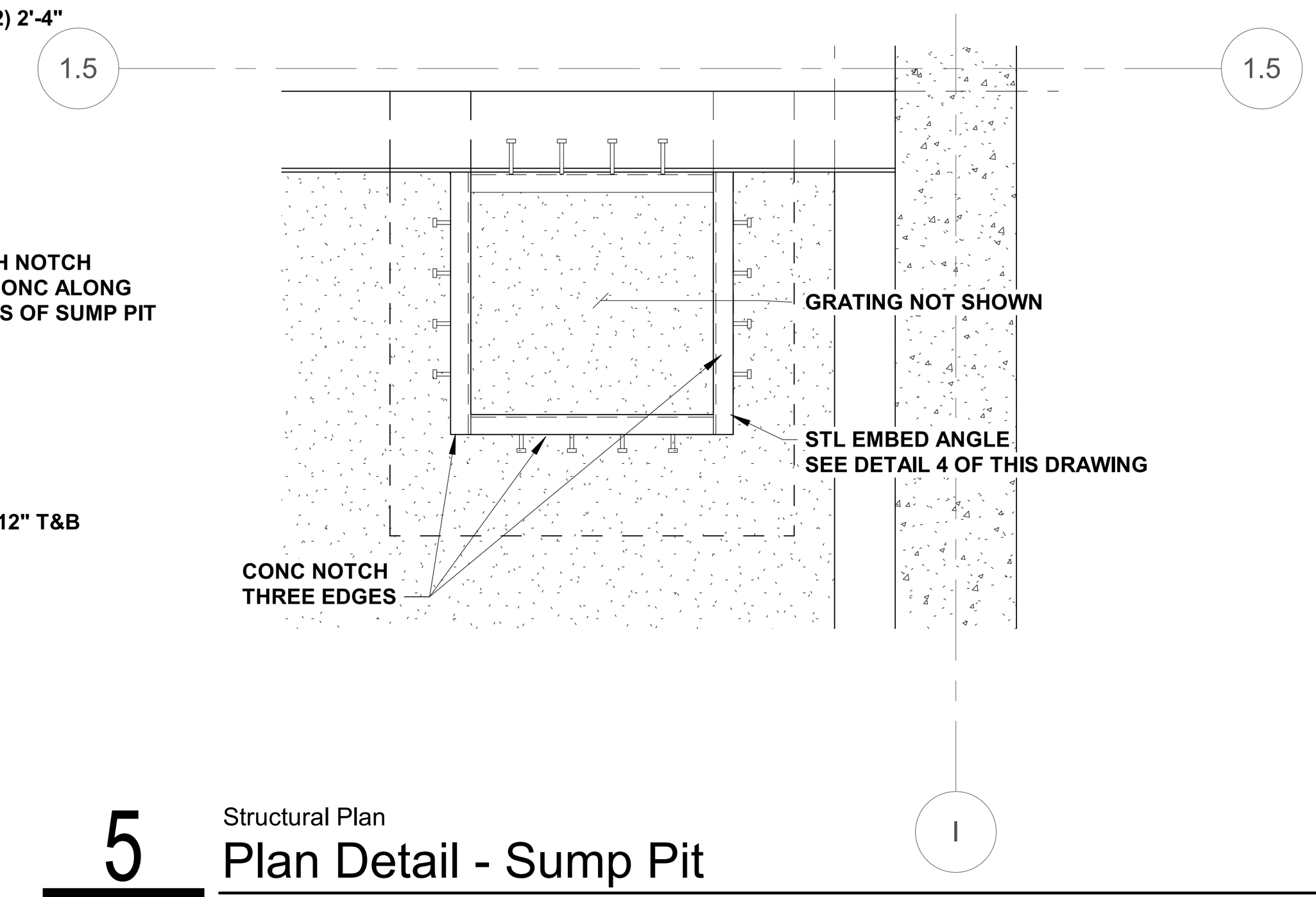
3 Structural Plan
Elevator - Foundation & Sump Pit Details
S4.01 1/2" = 1'-0"



2 Structural Plan
Auditorium - Foundation Plan
S4.01 1/4" = 1'-0"



4 Wall Section
Section - Sump Pit
S4.01 3/4" = 1'-0"



5 Structural Plan
Plan Detail - Sump Pit
S4.01 3/4" = 1'-0"

SYMBOL LEGEND

101 — DOOR TAG: SEE SHEET A8-SERIES DRAWINGS

WW — WALL TAG: SEE SHEET A0.10 and A0.11 FOR WALL TYPE, FIRE RATING, AND STRUCTURAL USAGE REQUIREMENTS. SEE A4 SERIES DRAWINGS FOR WALL FINISHES.

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Dreiser Add #5

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PRAMKUMAR A. PARIKH REGISTERED No. PE 11700630 STATE OF INDIANA PROFESSIONAL ENGINEER

F A Parikh
SEAL AFFIXED: 06-11-2020
CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

Terre Haute, Indiana 47809

Project No.: 19A052
Drawn By: J. Hand
Checked By: F. Parikh
Scale: See Drawing
Issue Date: June 5, 2020

REVISION SCHEDULE

Rev. #	Revision Description	Issue Date
2	Addendum #2	6/19/2020
3	Addendum #3	6/26/2020
5	Addendum #5	7/02/2020

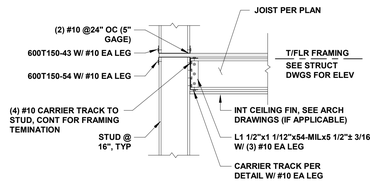
Str. Details

S4.01

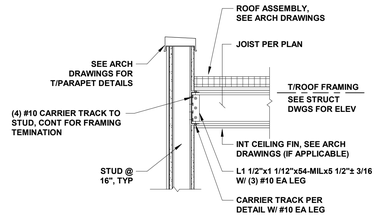
WALL SCHEDULE

MARK	LOCATION	TOP OF WALL (ELEV. RANGE)	SIZE	REINFORCING	REMARKS
			TNK		
Cn14	Grid Line F	93'-9"	14"	#5 at 12" Vertical & #5 at 12" Horizontal Each Face	New Lobby Addition
Cn14	Grid Line 0.5	93'-9"	14"	#5 at 12" Vertical & #5 at 12" Horizontal Each Face	New Lobby Addition
Cn14	Grid Line C	93'-9"	14"	#5 at 12" Vertical & #5 at 12" Horizontal Each Face	New Lobby Addition
Cn14	Grid Line 1	93'-9"	14"	#5 at 12" Vertical & #5 at 12" Horizontal Each Face	New Lobby Addition
Cn14	Grid Line X	93'-9"	14"	#5 at 12" Vertical & #5 at 12" Horizontal Each Face	New Lobby Addition
Cn14	Grid Line 2	93'-9"	14"	#5 at 12" Vertical & #5 at 12" Horizontal Each Face	New Lobby Addition
Cn12	New Bathroom Area	93'-9"	12"	#4 at 12" Vertical & #4 at 12" Horizontal Each Face	New Lobby Addition, Both Walls
Cn12	Where noted		12"	#5 at 12" Vertical & #5 at 12" Horizontal Each Face	Auditoriam Area & Elevator Pit (2)
Cn10	Where noted		10"	#4 at 12" Vertical & #4 at 12" Horizontal Each Face	Auditoriam Area
Cn8	Grid Line 1.5	93'-9"	8"	#4 at 12" Vertical & #4 at 12" Horizontal Each Face	Auditoriam Area
Cn8	Grid Line 3.5	83'-2 1/4"	8"	#4 at 12" Vertical & #4 at 12" Horizontal Each Face	Basement for Room 007 & 013. For new 8" masonry wall support.
Cn8	Grid Line I	83'-2 1/4"	8"	#4 at 12" Vertical & #4 at 12" Horizontal Each Face	Basement for Room 007 & 013. For new 8" masonry wall support.
Cn8	Grid Line E	83'-2 1/4"	8"	#4 at 12" Vertical & #4 at 12" Horizontal Each Face	Basement for Room 007 & 013. For new 8" masonry wall support.
Cn8	New Pits (East)	VARIES SEE SECTIONS	8"	#5 at 12" Vertical & #5 at 12" Horizontal Each Face	This is the smaller pits on east side for new addition. Connect with existing wall with epoxy filled drilled holes..
Cn8	New Pit (Elevator Shaft)	84'-2 1/4"	8"	#5 at 12" Vertical & #5 at 12" Horizontal Each Face	From base slab of the new elevator pit to landing level.
Cn8	New Pit (South)	101'-0"	8"	#6 at 12" Vertical & #6 at 9" Horizontal Each Face	Use the similar reinforcement for other east side New pit. Connect with existing wall with epoxy filled drilled holes.
Cn6	Where noted		6"	#4 at 12" Vertical & #4 at 12" Horizontal Each Face	Auditoriam Area
C8	Grid Line F	111'-0 1/8"	8"	#5 at 16" Vertical for grouting	New Lobby Addition
C8	Grid Line 0.5	111'-0 1/8"	8"	#5 at 16" Vertical for grouting	New Lobby Addition
C8	Grid Line C	111'-0 1/8"	8"	#5 at 16" Vertical for grouting	New Lobby Addition
C8	Grid Line 1	95'-9"	8"	#5 at 16" Vertical for grouting	New Lobby Addition
C8	Grid Line 1.5	101'-10"	8"	#5 at 16" Vertical for grouting	Auditoriam Area
C8	Grid Line 3.5	93'-0"	8"	#5 at 16" Vertical for grouting	Basement for Room 007 & 013. New 8" masonry wall support.
C8	Grid Line I	93'-0"	8"	#5 at 16" Vertical for grouting	Basement for Room 007 & 013. New 8" masonry wall support.
C8	Grid Line E	93'-0"	8"	#5 at 16" Vertical for grouting	Basement for Room 007 & 013. New 8" masonry wall support.
C8	New Elevator Area	142'-4 1/2"	8"	#5 at 16" Vertical for grouting	New Elevator Area

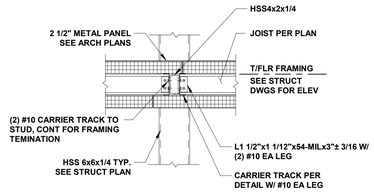
1 Detail
WALL SCHED
S4.03 1" = 1'-0"



MULTI-FLOOR

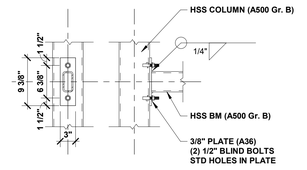


ROOF/PARAPET

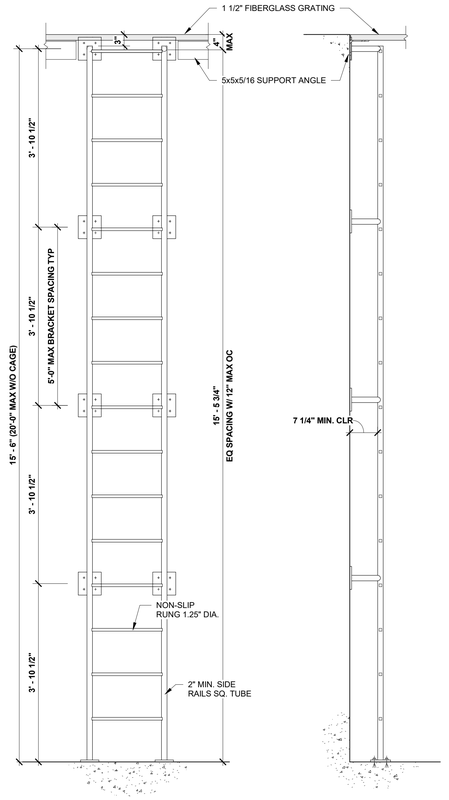


HEADER ABOVE DOOR 134-1

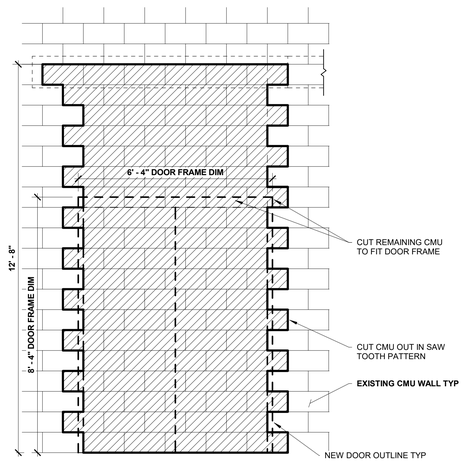
2 Detail
Ledger for Joist Framing
S4.03 1" = 1'-0"



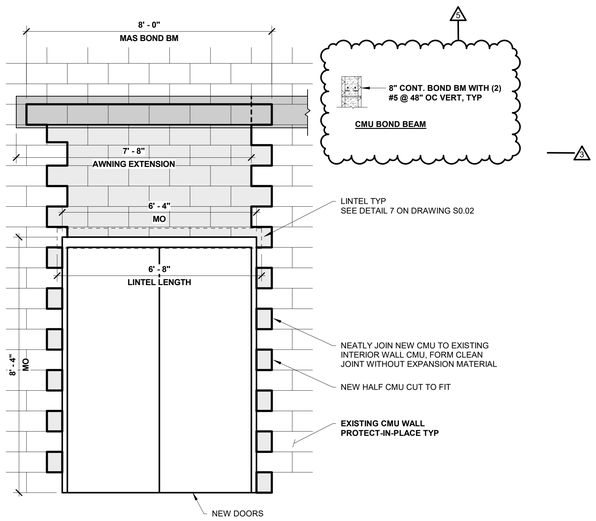
4 Detail
Header Column Connection
S4.03 1" = 1'-0"



5 Detail
Ladder Details - South Louver Pit
S4.03 3/4" = 1'-0"



DEMOLITION



NEW CONSTRUCTION

3 Detail
CMU Cut-Out Detail
S4.03 1/2" = 1'-0"

C:\2020\20-4271 ISU Dreiser Hall Renovations\25 Revit Files\10 Central Model\19052_ISU Dreiser Hall_r19_STRUCT.rvt
7/2/2020 11:13:49 AM

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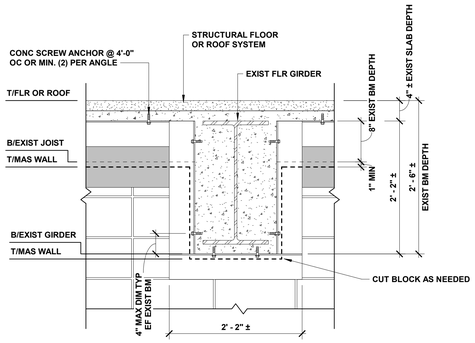
5	Addendum #5	7/02/2020

Str. Details

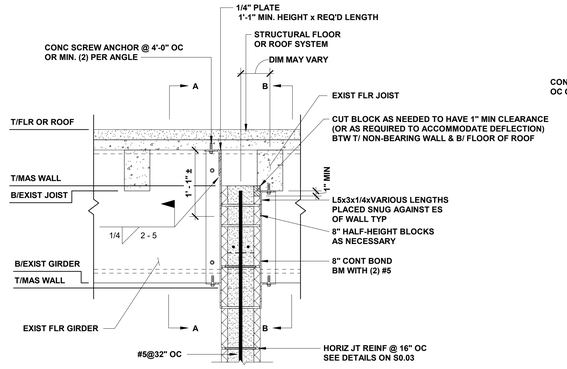
S4.03

STRUCTURAL NOTES
LATERAL SUPPORT DETAILS

1. FIELD VERIFY ALL DIMENSIONS.
2. SEE S0.03 & SPECIFICATIONS FOR MASONRY CONSTRUCTION.
3. CONFIGURATIONS WILL VARY IN THE FIELD. DETAILS ARE TO SHOW INTENT OF INSTALLATION.
4. CMU SHALL HAVE NO EXPANSION OR CONTROL JOINTS.
5. FOR LOAD-BEARING WALLS, GROUT GAP BETWEEN EXISTING STRUCTURAL MEMBERS AND NEW MASONRY WALL.



SECTION A-A



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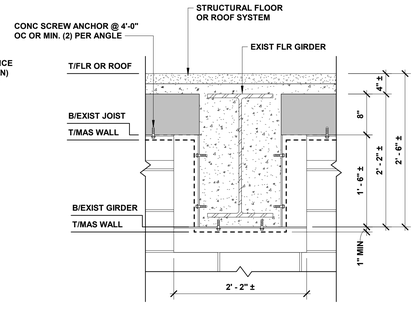

SECTION B-B

1 Detail
Lateral Support Around Existing Structural Members
S4.04 1" = 1'-0"

Dreiser Add #5

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CERTIFICATION

Construction Documents

Indiana State University -
Dreiser Hall Renovation

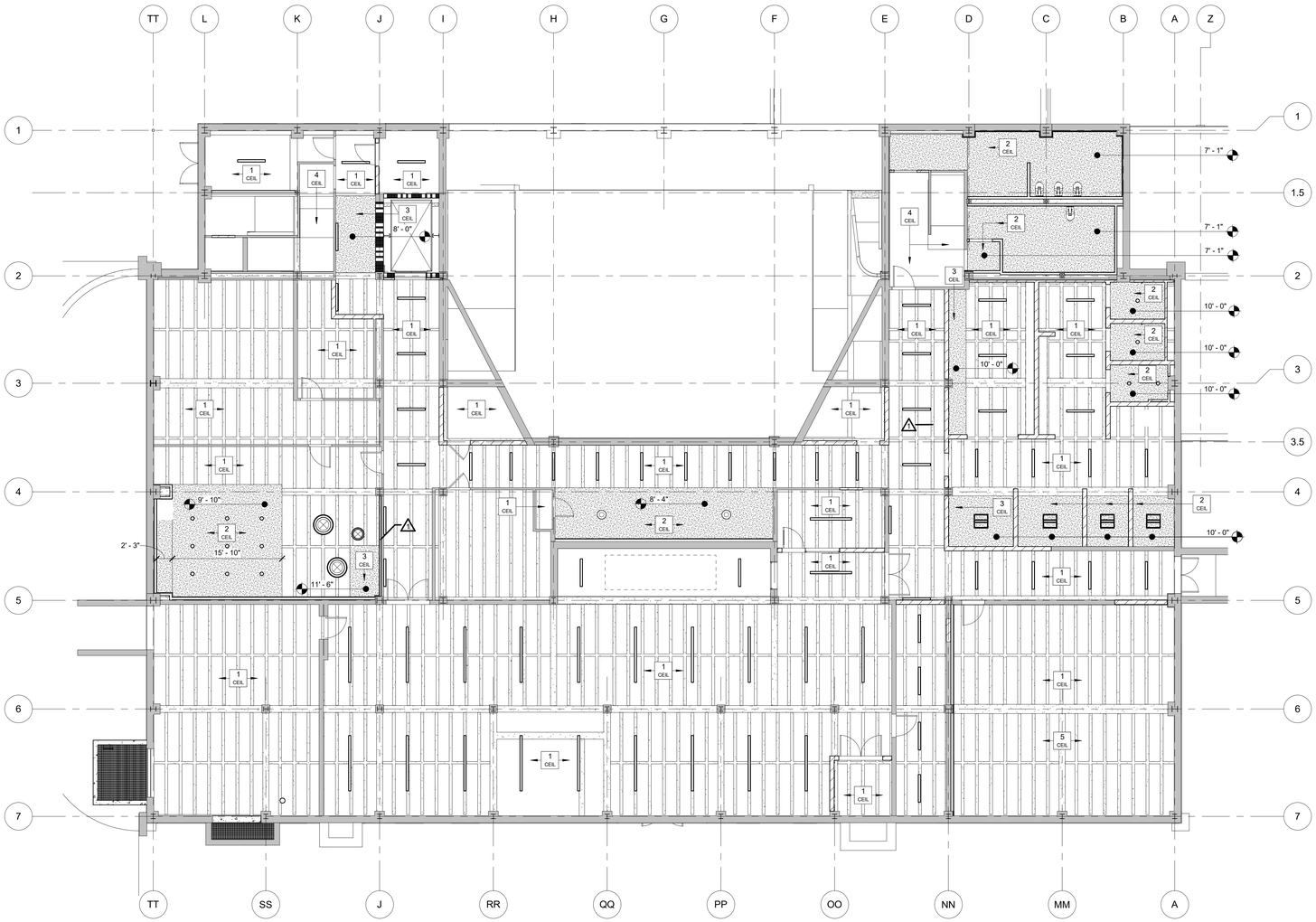
Terre Haute, Indiana 47809

Project No.: 19A052
Drawn By: J. Hand
Checked By: F. Parikh
Scale: See Drawing
Issue Date: June 5, 2020

REVISION SCHEDULE		
Rev. #	Revision Description	Issue Date
5	Addendum #5	7/02/2020

△5 Str. Details

S4.04



1 A1.00B — Reflected Ceiling Plan: Basement Reflected Ceiling Plan

1/8" = 1'-0"

CODED CEILING NOTES

NO.	NOTE
1	EXPOSED CONCRETE STRUCTURE CEILING - PAINTED. ALL HANGER WIRE, ANCHORS, MISC. HARDWARE SHALL BE REMOVED FROM THE CONCRETE STRUCTURE DURING THE DEMOLITION. EMBEDDED REMNANTS ARE TO BE GROUND FLUSH WITH THE CONCRETE.
2	GYPSUM BOARD CEILING. PAINTED.
3	2-HOUR RATED HORIZONTALLY INSTALLED SHAFT WALL SYSTEM. GYPSUM BOARD CEILING ASSEMBLY TO ENCLOSE LOWER PORTION OF 2-HOUR RATED MECHANICAL SHAFT. REPORT NUMBER AER-09038 OR EQUAL. PAINTED.
4	PATCH AND PAINT EXISTING PLASTER CEILING.
5	ALTERNATE #4 - PROVIDE PIPE GRID CEILING AND THEATRICAL LIGHTING. SEE ELECTRICAL DRAWINGS FOR MORE DETAILS. BASE BID - NO PIPE GRID OR THEATRICAL LIGHTING. PROVIDE THEATRICAL CURTAIN.
6	2' X 2' ACOUSTICAL CEILING TILE SYSTEM.
7	PROVIDE PIPE GRID AND STUDIO LIGHT FIXTURES. SEE ELECTRICAL DRAWINGS FOR DETAILS.
8	EXISTING CEILING GRID, TILE, AND LIGHT FIXTURES TO REMAIN.
9	NEW VENEERED WOOD PANEL CEILING.
10	SUSPENDED GYPSUM BOARD CLOUD CEILING. PAINTED.
11	GYPSUM BOARD BULKHEAD.
12	WOOD PANEL CEILING SYSTEM. BASIS OF DESIGN - ARMSTRONG "WOODWORKS" LINEAR, SOLID PANEL
13	SUSPENDED WOOD PLANK CLOUD CEILING.
14	2) LAYERS GYPSUM BOARD ON METAL FRAMING AND ISOLATION HANGERS (KINETICS ICC OR EQUIVALENT) WITH 3-1/2" FIBERGLASS INSULATION - SEE DETAIL 2/A1.01B
15	WOOD REFLECTOR PANELS ON METAL FRAMING / ISOLATION HANGERS (KINETICS ICC OR EQUIVALENT). BASIS OF DESIGN 'KINETICS REFLECT'
16	METAL PANEL CEILING SYSTEM TO MATCH METAL PANELS.
17	GYPSUM BOARD AND METAL FRAMING LIGHT WELL.
18	BLACKOUT ROLLER SHADE - MANUAL
19	LIGHT FILTERING ROLLER SHADE - MANUAL
20	72.5" x 116" RECESSED MOUNTED MOTORIZED PROJECTION SCREEN WITH TRIM KIT.
21	72.5" x 116" WALL MOUNTED MOTORIZED PROJECTION SCREEN.

GENERAL CEILING PLAN NOTES

1. DO NOT SCALE DRAWINGS.
2. SEE INTERIOR DRAWINGS FOR PAINT COLOR OF GYP. BD. AND EXPOSED CONCRETE STRUCTURE CEILINGS AND THEIR ASSOCIATED BULKHEADS.
3. UNLIKE FLOOR PLAN DIMENSIONS, THOSE SHOWN ON THE REFLECTED CEILING PLAN ARE FINISHED DIMINSIONS UNLESS NOTED OTHERWISE.

   CEILING ELEVATIONS ARE TO THE FINISHED FACE OF THE CEILING FINISH MATERIAL.

   BULKHEAD DIMENSIONS ARE TO THE FINISHED FACE OF GYP. BD.

   DIMENSIONS TO LIGHT FIXTURES ARE TO THE CENTERPOINT OF THE FIXTURE, THE FINISHED EDGE OF FIXTURE, OR TO THE CENTERLINE OF ASSOCIATED CEILING GRID SYSTEM.
4. LETTER DESIGNATIONS WITHIN A DIMENSION STRING (SUCH AS "A", "B", "C" AND SO ON) INDICATE THAT THE DIMENSION IS TO BE FIELD DETERMINED AND IT IS TO BE EQUAL TO OTHER DIMENSIONS OF THE SAME LETTER THROUGHOUT THAT SPECIFIC DRAWING SHEET, BUT NOT TO THE SAME DESIGNATION ON OTHER DRAWING SHEETS.
5. USE OF "EQUAL" OR "EQ" WITHIN A DIMENSION STRING INDICATES A DIMENSION THAT IS TO BE EQUAL ONLY RELATIVE TO OTHER EQUAL CALLOUTS ON THE SAME DIMENSION STRING IN WHICH IT APPEARS. DIMENSIONS CALLED OUT AS EQUAL ON TWO DIFFERENT DIMENSION STRINGS ARE NOT NECESSARILY EQUAL TO EACH OTHER.
6. ALL DESIGN TEAM DRAWINGS SHALL BE USED TO LOCATE BUILDING ELEMENTS. CONTACT THE ARCHITECT WITH CONFLICTS, DISCREPANCIES, AND OMISSIONS PRIOR TO COMMENCEMENT OF WORK. WRITTEN DOCUMENTATION SHALL BE PROVIDED BY THE CONTRACTOR REGARDING SUCH ITEMS.
7. STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING, LOW VOLTAGE AND FOOD SERVICE ELEMENTS ARE SHOWN FOR REFERENCE ONLY. VERIFY EACH ELEMENT WITH THE ASSOCIATED ENGINEER'S DRAWINGS. COORDINATE CONFLICTS WITH THE ARCHITECT.
8. REFER TO SPECIFICATIONS FOR EACH ITEM REPRESENTED WITHIN THE DRAWING SET.
9. GENERAL CONTRACTOR TO PROVIDE BACKER ROD AND SEALANT, OF A TYPE APPROPRIATE TO EACH CONDITION, BETWEEN MATERIALS BOTH SIMILAR AND DISSIMILAR THROUGHOUT THE INTERIOR AND EXTERIOR OF THE BUILDING. (COLORS TO BE SELECTED BY ARCHITECT)
10. NOT ALL LIGHT FIXTURES ARE REPRESENTED ON THE ARCHITECTURAL DRAWINGS. LIGHT FIXTURES ARE SHOWN FOR PLACEMENT LOCATION AND SIZE RELATIONSHIPS. ACTUAL FIXTURE TYPES ARE SHOWN ON ELECTRICAL DRAWINGS. SEE ELECTRICAL DRAWINGS FOR ADDITIONAL LIGHT FIXTURE TYPES AND LOCATIONS. CONFIRM ANY DESCREPANCIES BETWEEN DRAWINGS WITH THE ARCHITECT PRIOR TO COMMENCEMENT OF WORK.
11. WHERE GYP. BD. CEILINGS ARE INDICATED TO BE LOWER THAN ADJACENT ACT CEILINGS THE CONTRACTOR IS TO PROVIDE A FINISHED VERTICAL GYP. BD. BULKHEAD RETURN FROM THE LOWER FINISHED GYP. BD. CEILING TO A MINIMIMUM OF 6" ABOVE THE ADJACENT ACT CEILING UNLESS NOTED OTHERWISE. SEE FLOOR PLANS AND LIFE SAFETY PLANS.
12. WHERE GYP. BD. CEILINGS ARE INDICATED TO BE LOWER THAN ADJACENT GYP. BD. OR EXPOSED STRUCTURE CEILINGS THE CONTRACTOR IS TO PROVIDE A CONTINUOUS FINISHED VERTICAL GYP. BD. BULKHEAD RETURN TO THE ADJACENT FINISHED GYP. BD. CEILING.
13. EACH FIRE RATED BUILDING SHAFT IS TO HAVE A CLOSURE AT THE TOP AND BOTTOM OF THE SHAFT THAT MATCHES THE FIRE RATING OF THE SHAFT.

Dreiser Add #5

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GREGORY E. JACOBY REGISTERED No. AR00602208 STATE OF Indiana ARCHITECT

CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

Terre Haute, Indiana 47809

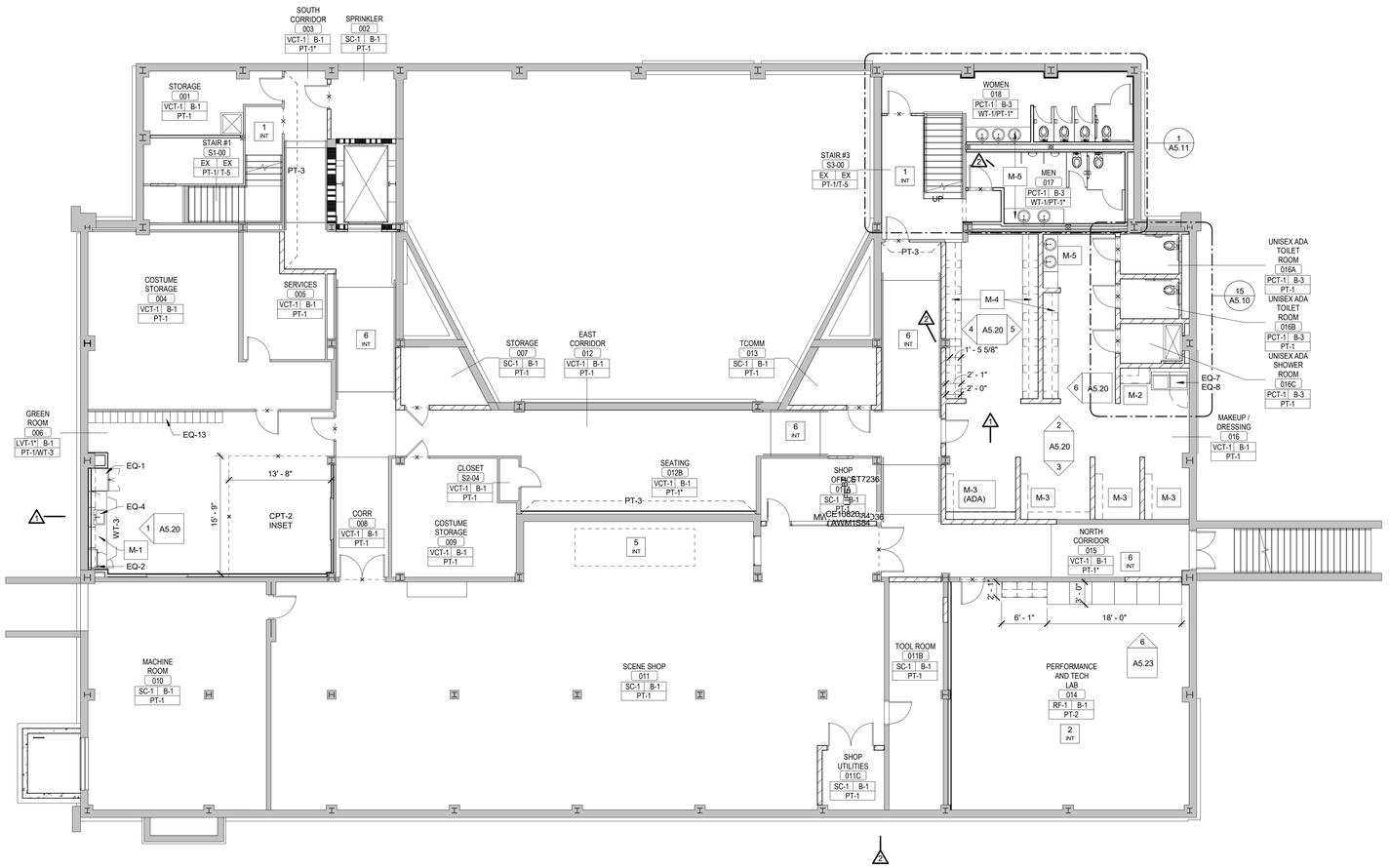
Project No.: 19A052
Drawn By: J. Young
Checked By: Checker
Scale: As Noted
Issue Date: June 5, 2020

REVISION SCHEDULE

Rev. #	Revision Description	Issue Date
1	Addendum #1	6/12/2020
3	Addendum #3	6/26/2020
5	Addendum #5	07/02/2020

Basement Reflected Ceiling Plan

A1.00B



1 A1.00C — Finish Plans — Basement - Finish Plan — 1/8" = 1'-0"

GENERAL FINISH NOTES

1. REFER TO FINISH PLAN, ROOM FINISH SCHEDULE, INTERIOR ELEVATIONS, AND REFLECTED CEILING PLANS FOR FINISH INFORMATION.
2. MATERIAL INFORMATION IS GIVEN WHEREVER POSSIBLE ON THE INTERIOR SHEETS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BRING ANY DISCREPANCIES TO THE ATTENTION OF THE ARCHITECT SO THAT THE CORRECT MATERIAL IS INSTALLED.
3. REFER TO THE SPECIFICATIONS FOR EACH MATERIAL SELECTION.
4. ALL MATERIALS ARE TO BE INSTALLED USING THE MANUFACTURER'S RECOMMENDED ADHESIVES.
5. GYP. BD. WALLS AND SOFFITS TO RECEIVE A LEVEL FOUR (4) FINISH UNLESS NOTED OTHERWISE.
6. WALLS ARE TO BE PAINTED ***[PT-1]*** UNLESS NOTED OTHERWISE.
7. GYP. BD. BULKHEADS AND CEILINGS ARE TO BE PAINTED ***[PT-7]*** UNLESS NOTED OTHERWISE.
8. BULKHEADS, SOFFITS, AND FUR-DOWNS ARE TO BE FINISHED WITH THE SAME MATERIAL AND/OR COLOR ON ALL FACES AS SPECIFIED UNLESS NOTED OTHERWISE.
9. THERE SHALL NOT BE PAINT CONDITIONS THAT OCCUR CAUSING FINISH OR COLOR TO CHANGE ON AN OUTSIDE CORNER UNLESS NOTED OTHERWISE. IF THIS CONDITION OCCURS BRING THIS TO THE ARCHITECT'S ATTENTION IMMEDIATELY.
10. INTERIOR EXPOSED STEEL OR CONCRETE STRUCTURAL COLUMNS AND FRAMING ARE TO BE PAINTED UNLESS OTHERWISE NOTED. ARCHITECT TO SELECT COLOR FROM MANUFACTURER'S FULL RANGE.
11. FIRE RESISTANT RATED INTUMESCENT PAINT FINISH EXPOSED WITHIN A ROOM IS TO HAVE A SMOOTH FINISH AND RECEIVE A FINAL PAINT COLOR SELECTED BY THE ARCHITECT.
12. EXPOSED CMU, WHICH DOES NOT HAVE A SPECIAL FINISH, INTEGRAL COLOR OR DECORATIVE FACE, IS TO BE PAINTED ULESS NOTED OTHERWISE.
13. WALL GRILLES, CEILING DIFFUSERS, AND FIRE EXTINGUISHER CABINETS ARE TO BE FINISHED IN THE SAME MATERIAL AS THE ADJACENT WALL MATERIAL.
14. METAL TRIM PIECE TO OCCUR AT ALL TILED WALL OUTSIDE CORNERS.
15. PROVIDE FRP AT SINKS IN JANITOR CLOSETS FROM FLOOR TO 6" ABOVE FAUCETS AND ON ADJACENT WALLS.
16. TRANSITIONS, REDUCER STRIPS, AND THRESHOLDS TO BE LOCATED AT CENTERLINE OF DOOR WHEN IN CLOSED POSITION. SEE DETAILS ON TRANSITIONS ON PAGE A5.20.
17. ALIGN FLOORING TRANSITIONS WITH FINISH BASE EXCEPT AT DOORS UNLESS NOTED OTHERWISE.
18. FLOORING MATERIAL SHALL BE CENTERED UNDER THE DOOR IN THE CLOSED POSITION. TRANSITIONS, IF NEEDED, ARE ALSO TO BE CENTERED UNDER THE DOOR IN THE CLOSED POSITION.
19. CARPET SEAMS TO BE LOCATED AT CENTERLINE OF DOOR IN CLOSED POSITION.
20. CARPET TILE INSTALLATION NOTED IN FINISH LEGEND ON PAGE A5.02.
21. FLOORING TO BE INSTALLED PERPENDICULAR TO ROOM WALLS UNLESS NOTED OTHERWISE.
22. RUBBER TRANSITIONS AND METAL TRANSITIONS TO OCCUR BETWEEN DIFFERENT MATERIALS AND ARE TO BE SELECTED BY ARCHITECT FROM MANUFACTURER'S FULL RANGE OF PRODUCTS.
23. PROVIDE CRACK ISOLATION MEMBRANE AT ALL CERAMIC FLOORING. FLOORING CONTRACTOR TO COORDINATE WITH SPECIFICATIONS.
24. WALL AND FLOOR GROUT COLORS TO BE SELECTED BY ARCHITECT FROM MANUFACTURER'S FULL COLOR RANGE.
25. GROUT WIDTHS TO BE MANUFACTURER'S RECOMMENDED MINIMUM WIDTH UNLESS NOTED OTHERWISE.
26. REQUIRED FLOORING UNDERLAYMENTS ARE TO BE PROVIDED AND INSTALLED BY THE FLOORING CONTRACTOR.
27. TERRAZZO STRIPS SHOULD BE AT ALL BREAKS OR SAW CUTS IN SUPPORTING SLAB. ARCHITECTS APPROVAL NEEDED BEFORE FABRICATION.

CODED INTERIOR NOTES

NO.	NOTE
1	REFERENCE TERRAZZO PLANS
2	THEATER CURTAIN ON TRACK TO GO AROUND ENTIRE ROOM. SEE SPECIFICATIONS.
3	CASEWORK IS EXISTING TO REMAIN
4	ELECTRONIC EQUIPMENT WRACKS ARE EXISTING TO REMAIN
5	EQUIPMENT, STAGE LIFT. SEE SPECFICATIONS.
6	RAMP
7	PAINTED MASONITE. USE MANUFACTURER'S RECOMMENDED FINISH FOR HIGH TRAFFIC AREAS.
8	WHITE BOARD: CLARUS - FLOAT - 4' X 8' - PURE WHITE, T-TRAY AND MAGNETIC. INSTALL: 3'-0" AFF TO BOTTOM OF BOARD. BOARDS MUST BE CENTERED ON WALL.

SYMBOL LEGEND

1 INT	CODED NOTE: SEE SCHEDULE ON THIS SHEET
PT-1	MATERIAL FINISH NOTE. SEE SHEET A5.02 OF DRAWINGS FOR DETAIL.
M-1	MILLWORK NOTE. SEE SHEET A5.02 OF DRAWINGS FOR DETAIL.
EQ-1	EQUIPMENT NOTE. SEE SHEET A5.02 OF DRAWINGS FOR DETAIL.
- - x - -	TRANSITION LOCATION MARKER. SHOWS TRANSITION BETWEEN FLOOR MATERIAL. SEE DETAILS ON PAGE A5.20.
ROOM NAME 101 / Floor / Base / Wall Finish	ROOM TAG WITH FINISHES. (*) INDICATES MORE THAN ONE FINISH IN THAT AREA. SEE PLAN/ NOTES FOR DETAILS. FLOORING (T) REFERENCE TERRAZZO PLANS.

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GREGORY E. JACOBY — REGISTERED — No. AR00002008 — STATE OF INDIANA — ARCHITECT

CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

Terre Haute, Indiana 47809

Project No.: 19A052
Drawn By: J. Starneri
Checked By: Checker
Scale: As Noted
Issue Date: June 5, 2020

REVISION SCHEDULE

Rev. #	Revision Description	Issue Date
1	Addendum #1	6/12/2020
2	Addendum #2	6/19/2020

Basement Finish Plan

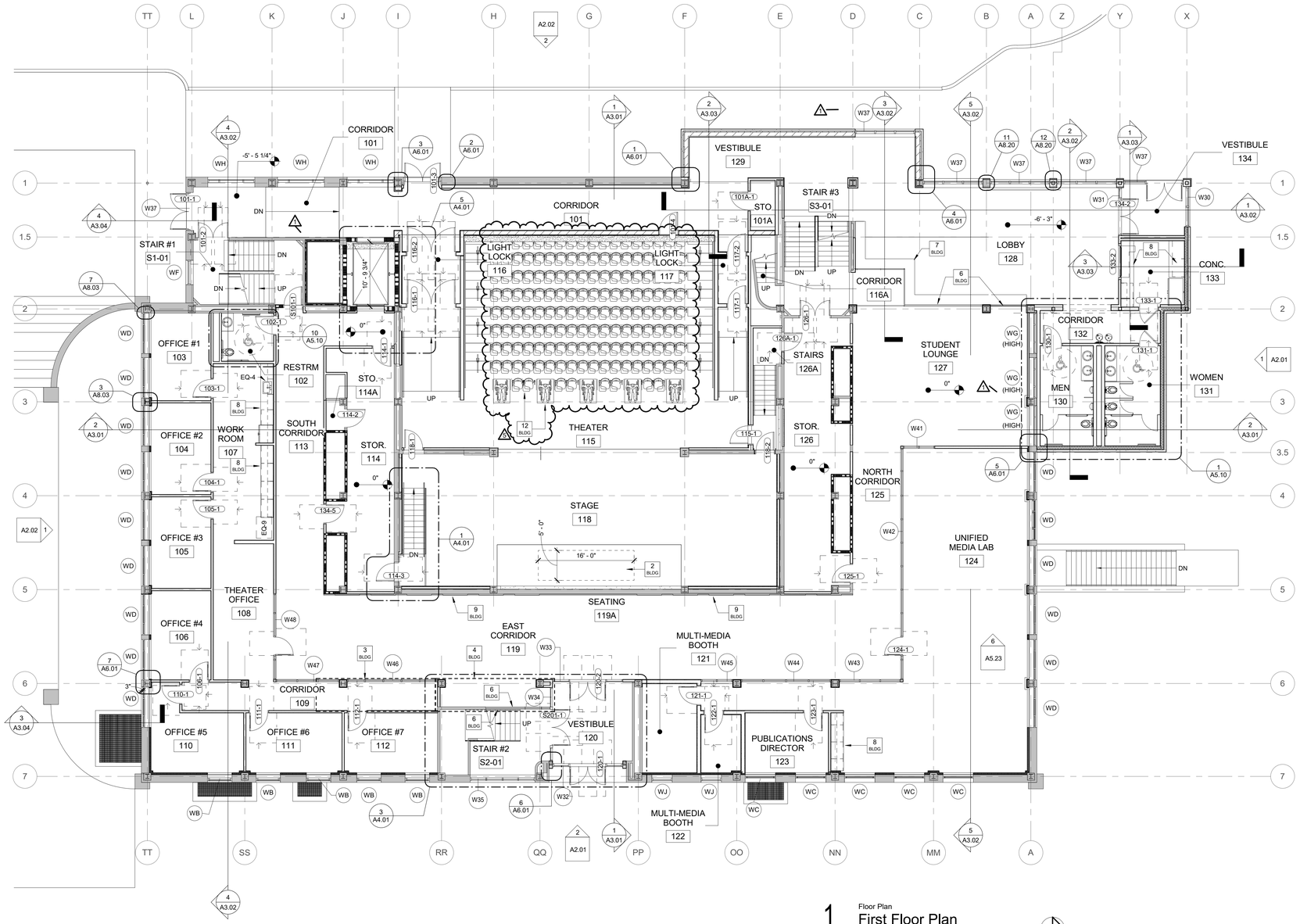
A1.00C

CODED BUILDING NOTES

NO.	NOTE
1	EXISTING TERRAZZO STAIR - CLEAN, REPAIR AND POLISH TERRAZZO PER PROJECT SPECIFICATIONS. CLEAN, REPAIR AND POLISH ALL HANDRAILS AND ALL ASSOCIATED COMPONENTS (POSTS, BRACKETS, ETC.) PER PROJECT SPECIFICATIONS
2	ALTERNATE #8 - NEW HYDRAULIC MATERIALS LIFT. LIFT TO BE RECESSED IN NEW PIT IN BASEMENT SO THAT IT IS FLUSH WITH THE ADJACENT SLAB IN THE DOWN POSITION. IN THE UP POSITION, THE LIFT IS TO FORM THE STAGE FLOOR IN AREA INDICATED. BASE BID - NO HYDRAULIC LIFT.
3	ALTERNATE #6 - NEW INTERIOR ALUMINUM STOREFRONT WALL SYSTEM. BASE BID - METAL STUD WALLS WITH GYPSUM BOARD ON BOTH SIDES (PAINTED).
4	ALTERNATE #5 - OPEN STAIR #2 AND INSTALL NEW GUARDRAIL, STOREFRONT, AND WALLS AS INDICATED. BASE BID - NOT NEW GUARDRAILS, STOREFRONT, WALLS TO BE STEEL STUD WITH GYPSUM BOARD ON BOTH SIDES (PAINTED).
5	MOP SINK - REFER TO PLUMBING DRAWINGS
6	STAINLESS STEEL / GLASS RAILING SYSTEM SEE DETAIL 5/A4.02 and 6/A4.02
7	BUILT IN BENCH SEATING - REFER TO FINISH PLANS FOR ADDITIONAL INFORMATION
8	CASEWORK / APPLIANCES - REFER TO FINISH PLANS FOR ADDITIONAL INFORMATION
9	WOOD WALL PANEL SYSTEM - REFER TO FINISH PLANS FOR ADDITIONAL INFORMATION
10	DRINKING FOUNTAINS - REFER TO PLUMBING DRAWINGS
11	RELOCATED EXISTING FURNISHINGS / EQUIPMENT
12	TELESCOPIC SEATING SYSTEM - 144 FIXED SEATS; 8 MOVABLE FLOOR SEATS AND 5 OPEN HANDICAP SPOTS.

GENERAL PLAN NOTES

1. DO NOT SCALE DRAWINGS.
2. DIMENSIONS ARE TAKEN TO FACE OF STUD, FACE OF CONCRETE, FACE OF MASONRY, FACE OF EXISTING FINISHES, AND COLUMN LINES UNLESS SPECIFICALLY NOTED OTHERWISE. FINISHED (FIN, FD) OR CLEAR (CLR) DIMENSIONS INDICATE FINISH SURFACE TO FINISH SURFACE SPANS BETWEEN WALLS OR FROM FINISH SURFACE OF WALL TO LATCH/HINGE OF ADJACENT DOOR OR CENTERLINE OF PLUMBING FIXTURES.
3. LETTER DESIGNATIONS WITHIN A DIMENSION STRING (SUCH AS "A", "B", "C" AND SO ON) INDICATE THAT THE DIMENSION IS TO BE FIELD DETERMINED AND IT IS TO BE EQUAL TO OTHER DIMENSIONS OF THE SAME LETTER THROUGHOUT THAT SPECIFIC DRAWING SHEET, BUT NOT TO THE SAME DESIGNATION ON OTHER DRAWING SHEETS.
4. USE OF "EQUAL" OR "EQ" WITHIN A DIMENSION STRING INDICATES A DIMENSION THAT IS TO BE EQUAL ONLY RELATIVE TO OTHER EQUAL CALLOUTS ON THE SAME DIMENSION STRING IN WHICH IT APPEARS. DIMENSIONS CALLED OUT AS EQUAL ON TWO DIFFERENT DIMENSION STRINGS ARE NOT NECESSARILY EQUAL TO EACH OTHER.
5. ALL DESIGN TEAM DRAWINGS SHALL BE USED TO LOCATE BUILDING ELEMENTS. CONTACT THE ARCHITECT WITH CONFLICTS, DISCREPANCIES, AND OMISSIONS PRIOR TO COMMENCEMENT OF WORK. WRITTEN DOCUMENTATION SHALL BE PROVIDED BY THE CONTRACTOR REGARDING SUCH ITEMS.
6. STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING, LOW VOLTAGE AND FOOD SERVICE ELEMENTS ARE SHOWN FOR REFERENCE ONLY. VERIFY EACH ELEMENT WITH THE ASSOCIATED ENGINEER'S DRAWINGS. COORDINATE CONFLICTS WITH THE ARCHITECT.
7. FLOORS SHALL SLOPE TO FLOOR DRAINS. SLOPES SHALL COMPLY WITH ADA ACCESSIBILITY GUIDELINES.
8. WALL FRAMING, INSULATION, SHEATHING, AND FINISHES SHALL EXTEND FROM THE TOP OF SLAB TIGHT TO THE UNDERSIDE OF THE DECK ABOVE UNLESS NOTED OTHERWISE. PARTIAL HEIGHT WALLS ARE NOTED WITH TOP OF WALL ELEVATIONS.
9. REFER TO SPECIFICATIONS FOR EACH ITEM REPRESENTED WITHIN THE DRAWING SET.
10. STUD WALL CONTRACTOR SHALL PROVIDE IN-WALL BLOCKING FOR WALL MOUNTED OWNER PROVIDED AND CONTRACTOR PROVIDED ITEMS REPRESENTED WITHIN THE DRAWINGS AND SPECIFICATIONS.
11. GENERAL CONTRACTOR TO PROVIDE BACKER ROD AND SEALANT OF A TYPE APPROPRIATE TO EACH CONDITION, BETWEEN MATERIALS BOTH SIMILAR AND DISSIMILAR THROUGHOUT THE INTERIOR AND EXTERIOR OF THE BUILDING. (COLORS TO BE SELECTED BY ARCHITECT)
12. EACH EXTERIOR STUD WALL ACROSS THE ENTIRETY OF THE BUILDING IS TO RECEIVE A MINIMUM R-19 BATT INSULATION.
13. SEE STRUCTURAL DRAWINGS FOR INFORMATION REGARDING CMU AND CAST-IN-PLACE WALLS.
14. IT IS THE GENERAL DESIGN INTENT THAT ALL NEW WALLS ALIGN WITH THE FACE OF EXISTING ADJACENT WALL CONSTRUCTION.



1 Floor Plan — First Floor Plan (A1.01) 1/8" = 1'-0"

SYMBOL LEGEND

- CODED NOTES OF VARYING TYPES: SEE SCHEDULES ON THIS SHEET
- 101 — DOOR TAG: SEE SHEET A8-SERIES DRAWINGS
- WW (B) — WALL TAG: SEE SHEET A0.10 and A0.11 FOR WALL TYPE AND FIRE RATING REQUIREMENTS. SEE A5 SERIES DRAWINGS FOR WALL FINISHES.
- [S: 101A] — SIGN TAG: SEE SIGNAGE PACKAGE
- W1 — WINDOW TAG: SEE A8-SERIES DRAWINGS

Dreiser Add #5

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GREGORY E. JACOBY REGISTERED No AR00802008 STATE OF INDIANA ARCHITECT

CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

Terre Haute, Indiana 47809

Project No.: 19A052
Drawn By: J. Starneri
Checked By: Checker
Scale: As Noted
Issue Date: June 5, 2020

REVISION SCHEDULE

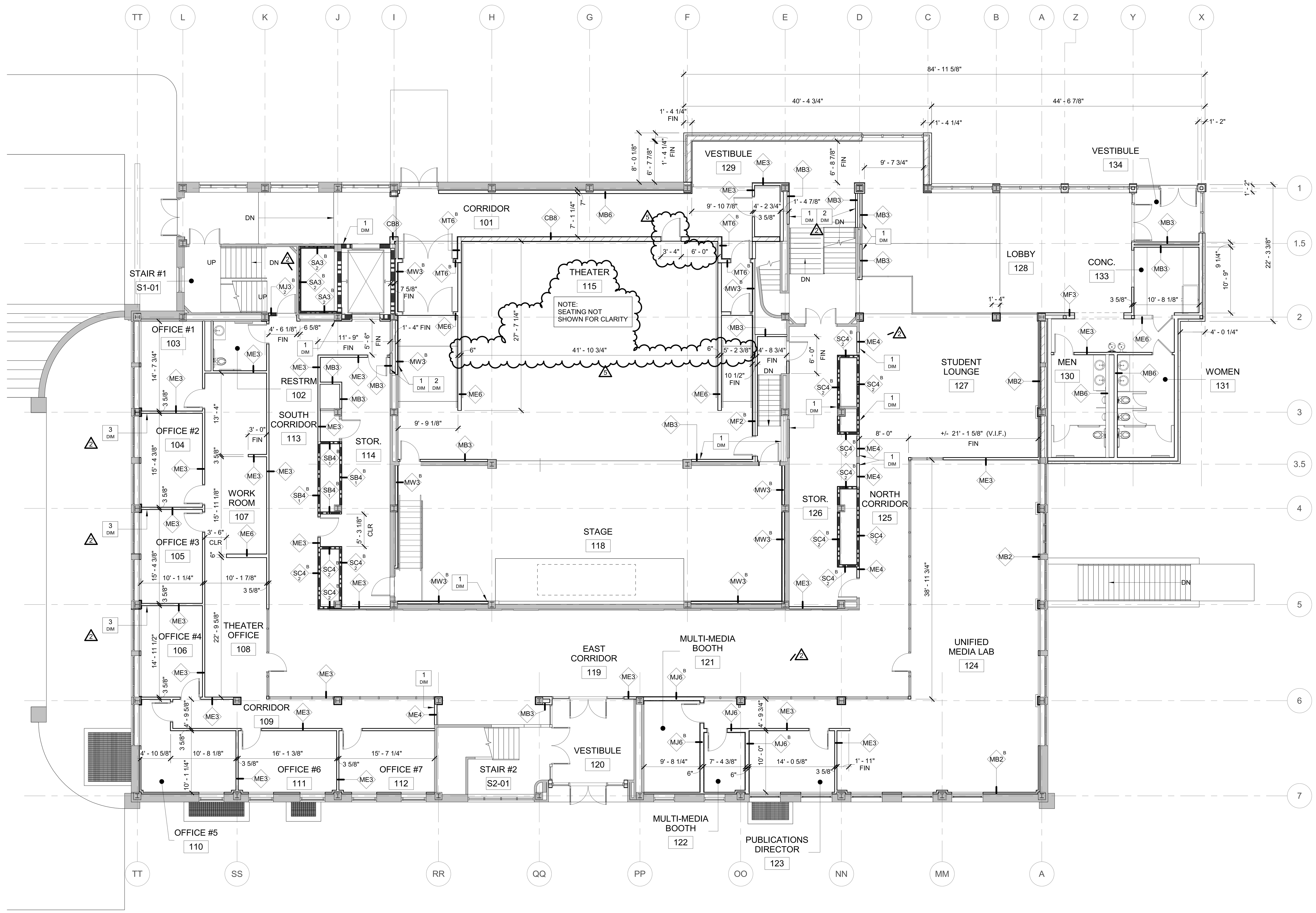
Rev. #	Revision Description	Issue Date
1	Addendum #1	6/12/2020
3	Addendum #3	6/26/2020
5	Addendum #5	07/02/2020

1st Floor Plan

A1.01

CODED BUILDING DIMENSION NOTES

NO.	NOTE
1	ALIGN FINISH FACE OF NEW WALL WITH FINISH FACE OF EXISTING ADJACENT WALL OR COLUMN
2	INFILL OR EXTEND WALL WITH LIKE MATERIAL(S). ALIGN FINISH WALL SURFACE(S) OF INFILL WITH FACE OF EXISTING FINISH FACE(S)
3	WALL CENTERED ON NEW OR EXISTING COLUMN WRAP



1
A1.01A
Floor Plan
1st Floor - Dimension Plan
1/8" = 1'-0"

GENERAL PLAN NOTES

1. DO NOT SCALE DRAWINGS.
2. DIMENSIONS ARE TAKEN TO FACE OF STUD, FACE OF CONCRETE, FACE OF MASONRY, FACE OF EXISTING FINISHES, AND COLUMN LINES UNLESS SPECIFICALLY NOTED OTHERWISE. FINISHED (FIN, FD) OR CLEAR (CLR) DIMENSIONS INDICATE FINISH SURFACE TO FINISH SURFACE SPANS BETWEEN WALLS OR FROM FINISH SURFACE OF WALL TO LATCH/HINGE OF ADJACENT DOOR OR CENTERLINE OF PLUMBING FIXTURES.
3. LETTER DESIGNATIONS WITHIN A DIMENSION STRING (SUCH AS "A", "B", "C" AND SO ON) INDICATE THAT THE DIMENSION IS TO BE FIELD DETERMINED AND IT IS TO BE EQUAL TO OTHER DIMENSIONS OF THE SAME LETTER THROUGHOUT THAT SPECIFIC DRAWING SHEET, BUT NOT TO THE SAME DESIGNATION ON OTHER DRAWING SHEETS.
4. USE OF "EQUAL" OR "EQ" WITHIN A DIMENSION STRING INDICATES A DIMENSION THAT IS TO BE EQUAL ONLY RELATIVE TO OTHER EQUAL CALLOUTS ON THE SAME DIMENSION STRING IN WHICH IT APPEARS. DIMENSIONS CALLED OUT AS EQUAL ON TWO DIFFERENT DIMENSION STRINGS ARE NOT NECESSARILY EQUAL TO EACH OTHER.
5. ALL DESIGN TEAM DRAWINGS SHALL BE USED TO LOCATE BUILDING ELEMENTS. CONTACT THE ARCHITECT WITH CONFLICTS, DISCREPANCIES, AND OMISSIONS PRIOR TO COMMENCEMENT OF WORK. WRITTEN DOCUMENTATION SHALL BE PROVIDED BY THE CONTRACTOR REGARDING SUCH ITEMS.
6. STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING, LOW VOLTAGE AND FOOD SERVICE ELEMENTS ARE SHOWN FOR REFERENCE ONLY. VERIFY EACH ELEMENT WITH THE ASSOCIATED ENGINEER'S DRAWINGS. COORDINATE CONFLICTS WITH THE ARCHITECT.
7. FLOORS SHALL SLOPE TO FLOOR DRAINS. SLOPES SHALL COMPLY WITH ADA ACCESSIBILITY GUIDELINES.
8. WALL FRAMING, INSULATION, SHEATHING, AND FINISHES SHALL EXTEND FROM THE TOP OF SLAB TIGHT TO THE UNDERSIDE OF THE DECK ABOVE UNLESS NOTED OTHERWISE. PARTIAL HEIGHT WALLS ARE NOTED WITH TOP OF WALL ELEVATIONS.
9. REFER TO SPECIFICATIONS FOR EACH ITEM REPRESENTED WITHIN THE DRAWING SET.
10. STUD WALL CONTRACTOR SHALL PROVIDE IN-WALL BLOCKING FOR WALL MOUNTED OWNER PROVIDED AND CONTRACTOR PROVIDED ITEMS REPRESENTED WITHIN THE DRAWINGS AND SPECIFICATIONS.
11. GENERAL CONTRACTOR TO PROVIDE BACKER ROD AND SEALANT OF A TYPE APPROPRIATE TO EACH CONDITION, BETWEEN MATERIALS BOTH SIMILAR AND DISSIMILAR THROUGHOUT THE INTERIOR AND EXTERIOR OF THE BUILDING. (COLORS TO BE SELECTED BY ARCHITECT)
12. EACH EXTERIOR STUD WALL ACROSS THE ENTIRETY OF THE BUILDING IS TO RECEIVE A MINIMUM R-19 BATT INSULATION.
13. SEE STRUCTURAL DRAWINGS FOR INFORMATION REGARDING CMU AND CAST-IN-PLACE WALLS.
14. IT IS THE GENERAL DESIGN INTENT THAT ALL NEW WALLS ALIGN WITH THE FACE OF EXISTING ADJACENT WALL CONSTRUCTION.

2

SYMBOL LEGEND

	CODED NOTES OF VARYING TYPES: SEE SCHEDULES ON THIS SHEET
101	DOOR TAG: SEE SHEET A8-SERIES DRAWINGS
WW B 1	WALL TAG: SEE SHEET A0.10 and A0.11 FOR WALL TYPE AND FIRE RATING REQUIREMENTS. SEE A5 SERIES DRAWINGS FOR WALL FINISHES.
[S: 101A]	SIGN TAG: SEE SIGNAGE PACKAGE
W1	WINDOW TAG: SEE A8-SERIES DRAWINGS

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CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

Terre Haute, Indiana 47809

Project No.: 19A052
Drawn By: J. Starneri
Checked By: Checker
Scale: As Noted
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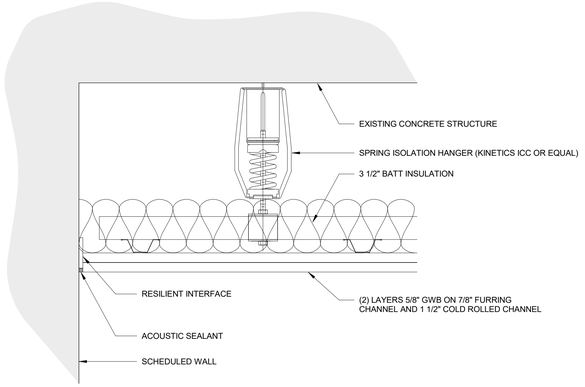
REVISION SCHEDULE		
Rev. #	Revision Description	Issue Date
1	Addendum #1	6/12/2020
2	Addendum #2	6/19/2020
5	Addendum #5	07/02/2020

1st Floor Dimension Plan

A1.01A 1



2 Detail
Ceiling Detail
A1.01B 3" = 1'-0"

CODED CEILING NOTES

NO.	NOTE
1	EXPOSED CONCRETE STRUCTURE CEILING - PAINTED. ALL HANGER WIRE, ANCHORS, MISC. HARDWARE SHALL BE REMOVED FROM THE CONCRETE STRUCTURE DURING THE DEMOLITION. EMBEDDED REMNANTS ARE TO BE GROUND FLUSH WITH THE CONCRETE.
2	GYPSUM BOARD CEILING. PAINTED.
3	2-HOUR RATED HORIZONTALLY INSTALLED SHAFT WALL SYSTEM. GYPSUM BOARD CEILING ASSEMBLY TO ENCLOSE LOWER PORTION OF 2-HOUR RATED MECHANICAL SHAFT. REPORT NUMBER AER-09038 OR EQUAL. PAINTED.
4	PATCH AND PAINT EXISTING PLASTER CEILING.
5	ALTERNATE #4 - PROVIDE PIPE GRID CEILING AND THEATRICAL LIGHTING. SEE ELECTRICAL DRAWINGS FOR MORE DETAILS. BASE BID - NO PIPE GRID OR THEATRICAL LIGHTING. PROVIDE THEATRICAL CURTAIN.
6	2' X 2' ACOUSTICAL CEILING TILE SYSTEM.
7	PROVIDE PIPE GRID AND STUDIO LIGHT FIXTURES. SEE ELECTRICAL DRAWINGS FOR DETAILS.
8	EXISTING CEILING GRID, TILE, AND LIGHT FIXTURES TO REMAIN.
9	NEW VENEERED WOOD PANEL CEILING.
10	SUSPENDED GYPSUM BOARD CLOUD CEILING. PAINTED.
11	GYPSUM BOARD BULKHEAD.
12	WOOD PANEL CEILING SYSTEM. BASIS OF DESIGN - ARMSTRONG "WOODWORKS" LINEAR, SOLID PANEL
13	SUSPENDED WOOD PLANK CLOUD CEILING.
14	(2) LAYERS GYPSUM BOARD ON METAL FRAMING AND ISOLATION HANGERS (KINETICS ICC OR EQUIVALENT) WITH 3-1/2" FIBERGLASS INSULATION - SEE DETAIL 2/A1.01B
15	WOOD REFLECTOR PANELS ON METAL FRAMING / ISOLATION HANGERS (KINETICS ICC OR EQUIVALENT). BASIS OF DESIGN KINETICS REFLECT.
16	METAL PANEL CEILING SYSTEM TO MATCH METAL PANELS.
17	GYPSUM BOARD AND METAL FRAMING LIGHT WELL.
18	BLACKOUT ROLLER SHADE - MANUAL
19	LIGHT FILTERING ROLLER SHADE - MANUAL
20	72.5" x 116" RECESSED MOUNTED MOTORIZED PROJECTION SCREEN WITH TRIM KIT.
21	72.5" x 116" WALL MOUNTED MOTORIZED PROJECTION SCREEN.

GENERAL CEILING PLAN NOTES

1. DO NOT SCALE DRAWINGS.
2. SEE INTERIOR DRAWINGS FOR PAINT COLOR OF GYP. BD. AND EXPOSED CONCRETE STRUCTURE CEILINGS AND THEIR ASSOCIATED BULKHEADS.
3. UNLIKE FLOOR PLAN DIMENSIONS, THOSE SHOWN ON THE REFLECTED CEILING PLAN ARE FINISHED DIMINSIONS UNLESS NOTED OTHERWISE.

   CEILING ELEVATIONS ARE TO THE FINISHED FACE OF THE CEILING FINISH MATERIAL.

   BULKHEAD DIMENSIONS ARE TO THE FINISHED FACE OF GYP. BD.

   DIMENSIONS TO LIGHT FIXTURES ARE TO THE CENTERPOINT OF THE FIXTURE. THE FINISHED EDGE OF FIXTURE, OR TO THE CENTERLINE OF ASSOCIATED CEILING GRID SYSTEM.
4. LETTER DESIGNATIONS WITHIN A DIMENSION STRING (SUCH AS "A", "B", "C" AND SO ON) INDICATE THAT THE DIMENSION IS TO BE FIELD DETERMINED AND IT IS TO BE EQUAL TO OTHER DIMENSIONS OF THE SAME LETTER THROUGHOUT THAT SPECIFIC DRAWING SHEET, BUT NOT TO THE SAME DESIGNATION ON OTHER DRAWING SHEETS.
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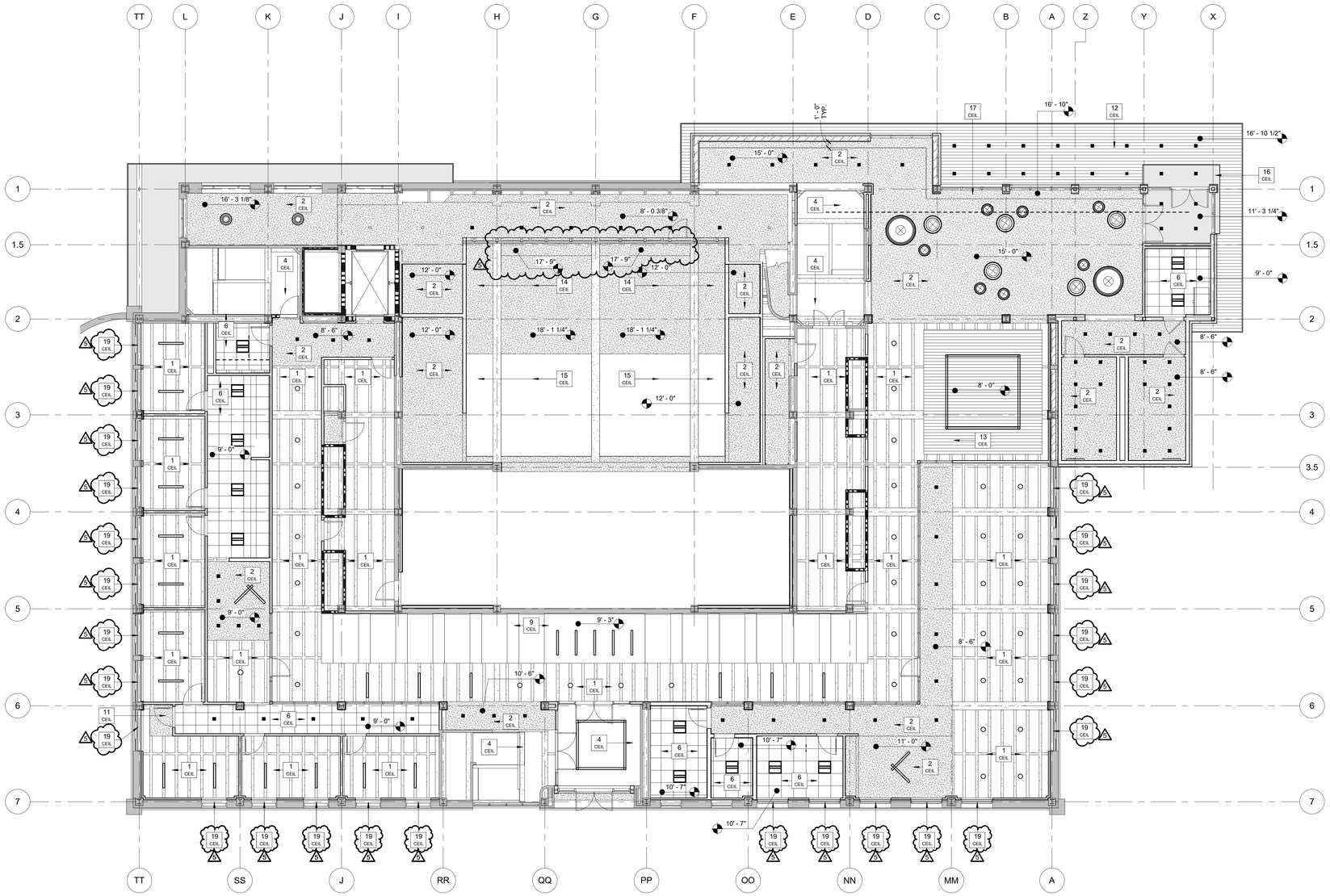
11. WHERE GYP. BD. CEILINGS ARE INDICATED TO BE LOWER THAN ADJACENT ACT CEILINGS THE CONTRACTOR IS TO PROVIDE A FINISHED VERTICAL GYP. BD. BULKHEAD RETURN FROM THE LOWER FINISHED GYP. BD. CEILING TO A MINIMIMUM OF 6" ABOVE THE ADJACENT ACT CEILING UNLESS NOTED OTHERWISE. SEE FLOOR PLANS AND LIFE SAFETY PLANS.
12. WHERE GYP. BD. CEILINGS ARE INDICATED TO BE LOWER THAN ADJACENT GYP. BD. OR EXPOSED STRUCTURE CEILINGS THE CONTRACTOR IS TO PROVIDE A CONTINUOUS FINISHED VERTICAL GYP. BD. BULKHEAD RETURN TO THE ADJACENT FINISHED GYP. BD. CEILING.
13. EACH FIRE RATED BUILDING SHAFT IS TO HAVE A CLOSURE AT THE TOP AND BOTTOM OF THE SHAFT THAT MATCHES THE FIRE RATING OF THE SHAFT.



1 Reflected Ceiling Plan
1st Floor Reflected Ceiling Plan
A1.01B 1/8" = 1'-0"

Dreiser Add #5

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Construction Documents

Indiana State University - Dreiser Hall Renovation

Terre Haute, Indiana 47809

Project No.: 19A052
Drawn By: J. Young
Checked By: Checker
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REVISION SCHEDULE

Rev. #	Revision Description	Issue Date
3	Addendum #3	6/26/2020
5	Addendum #5	07/02/2020

1st Floor Reflected Ceiling Plan

A1.01B

CODED CEILING NOTES

NO.	NOTE
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GENERAL CEILING PLAN NOTES

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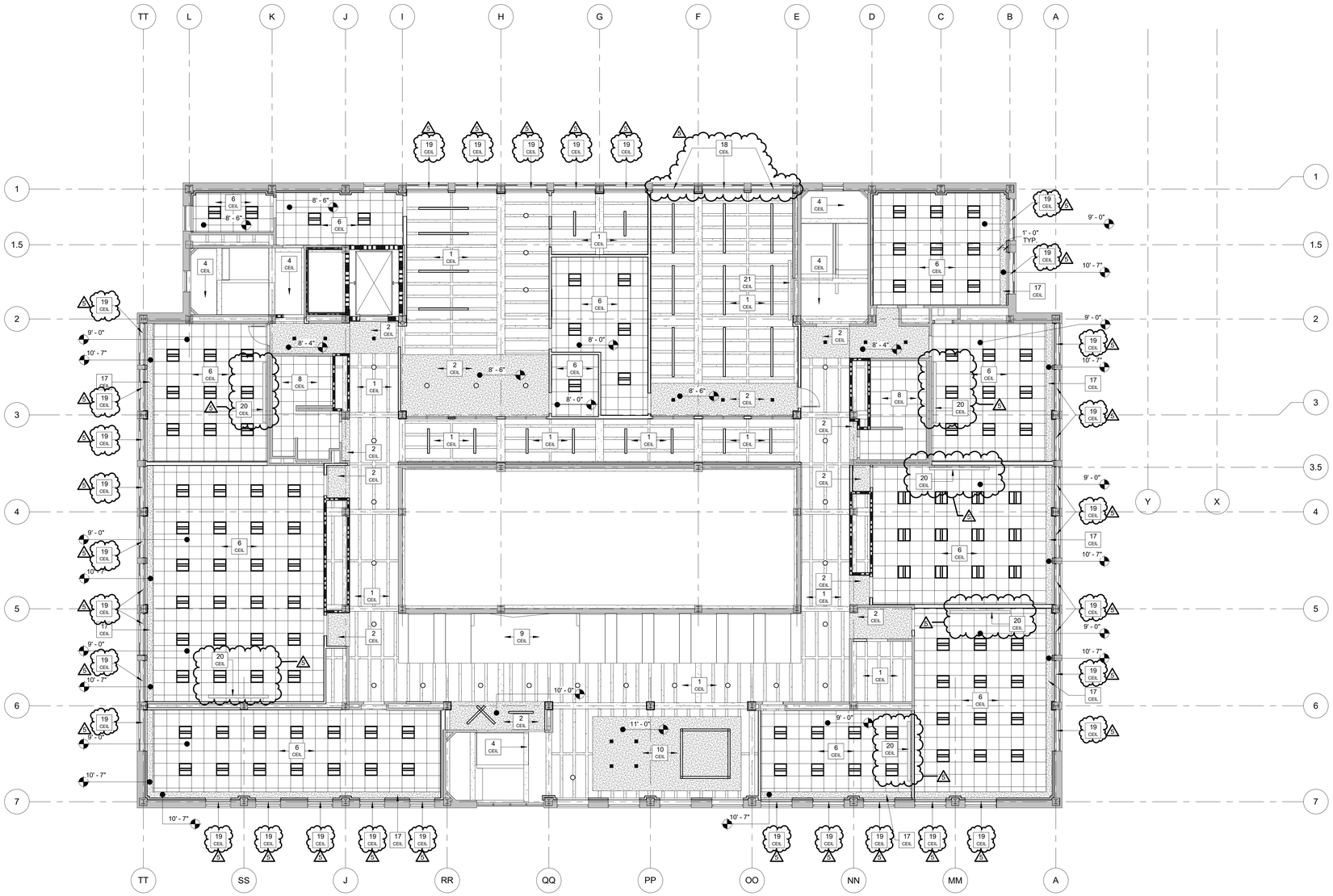
12. WHERE GYP. BD. CEILINGS ARE INDICATED TO BE LOWER THAN ADJACENT GYP. BD. OR EXPOSED STRUCTURE CEILINGS THE CONTRACTOR IS TO PROVIDE A CONTINUOUS FINISHED VERTICAL GYP. BD. BULKHEAD RETURN TO THE ADJACENT FINISHED GYP. BD. CEILING.
13. EACH FIRE RATED BUILDING SHAFT IS TO HAVE A CLOSURE AT THE TOP AND BOTTOM OF THE SHAFT THAT MATCHES THE FIRE RATING OF THE SHAFT.



1 A1.02B — Reflected Ceiling Plan
2nd Floor Reflected Ceiling Plan
1/8" = 1'-0"

Dreiser Add #5

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GREGORY E. JACOBY — REGISTERED — No. AR20902208 — STATE OF INDIANA — ARCHITECT

CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

Terre Haute, Indiana 47809

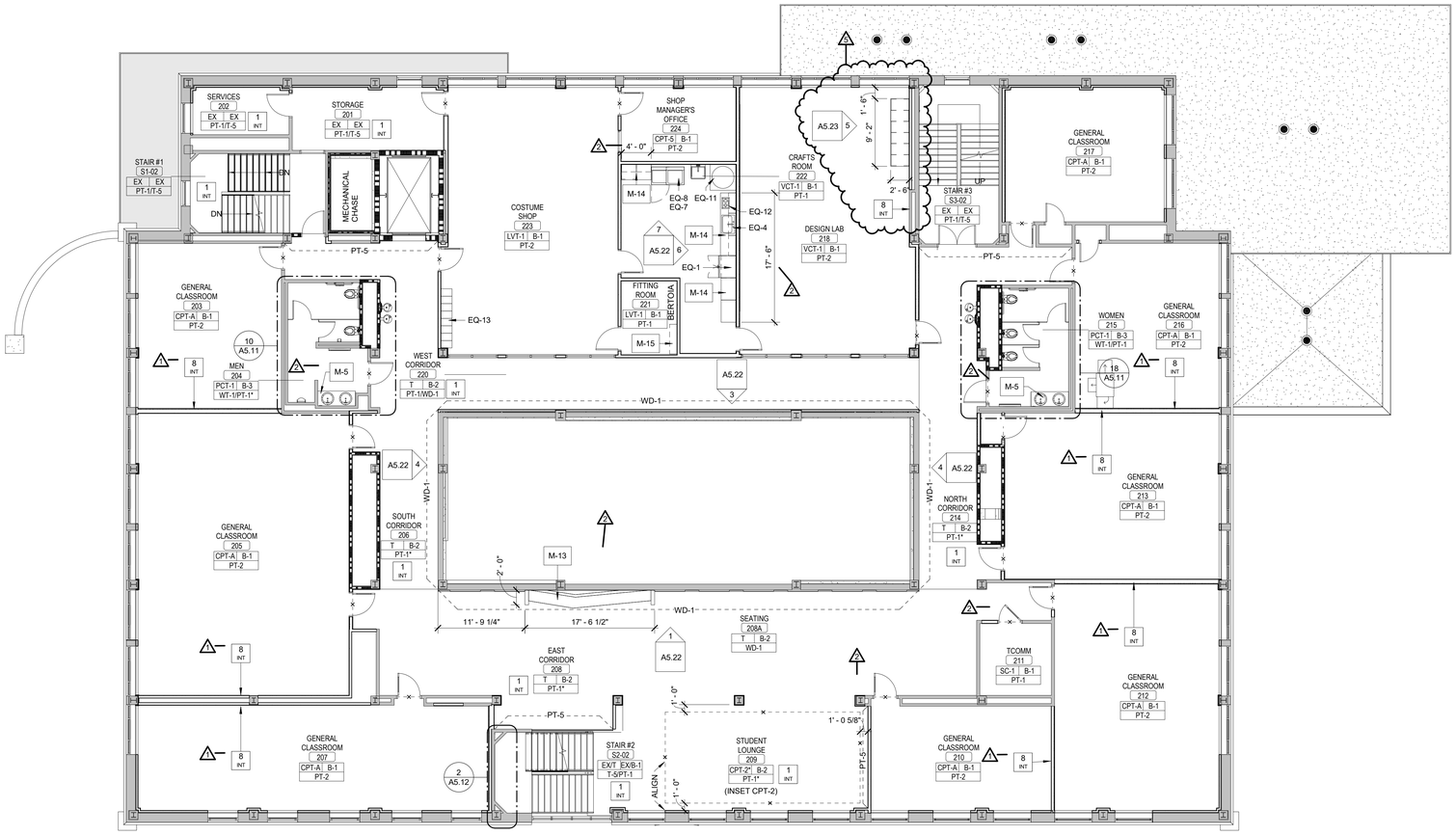
Project No.: 19A052
Drawn By: J. Young
Checked By: Checker
Scale: As Noted
Issue Date: June 5, 2020

REVISION SCHEDULE

Rev. #	Revision Description	Issue Date
3	Addendum #3	6/26/2020
5	Addendum #5	07/02/2020

2nd Floor Reflected Ceiling Plan

A1.02B



1 Finish Plans
2nd Floor - Finish Plan
A1.02C 1/8" = 1'-0"

GENERAL FINISH NOTES

1. REFER TO FINISH PLAN, ROOM FINISH SCHEDULE, INTERIOR ELEVATIONS, AND REFLECTED CEILING PLANS FOR FINISH INFORMATION.
2. MATERIAL INFORMATION IS GIVEN WHEREVER POSSIBLE ON THE INTERIOR SHEETS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BRING ANY DISCREPANCIES TO THE ATTENTION OF THE ARCHITECT SO THAT THE CORRECT MATERIAL IS INSTALLED.
3. REFER TO THE SPECIFICATIONS FOR EACH MATERIAL SELECTION.
4. ALL MATERIALS ARE TO BE INSTALLED USING THE MANUFACTURER'S RECOMMENDED ADHESIVES.
5. GYP. BD. WALLS AND SOFFITS TO RECEIVE A LEVEL FOUR (4) FINISH UNLESS NOTED OTHERWISE.
6. WALLS ARE TO BE PAINTED ***[PT-1]*** UNLESS NOTED OTHERWISE.
7. GYP. BD. BULKHEADS AND CEILINGS ARE TO BE PAINTED ***[PT-7]*** UNLESS NOTED OTHERWISE.
8. BULKHEADS, SOFFITS, AND FUR-DOWNS ARE TO BE FINISHED WITH THE SAME MATERIAL AND/OR COLOR ON ALL FACES AS SPECIFIED UNLESS NOTED OTHERWISE.
9. THERE SHALL NOT BE PAINT CONDITIONS THAT OCCUR CAUSING FINISH OR COLOR TO CHANGE ON AN OUTSIDE CORNER UNLESS NOTED OTHERWISE. IF THIS CONDITION OCCURS BRING THIS TO THE ARCHITECT'S ATTENTION IMMEDIATELY.
10. INTERIOR EXPOSED STEEL OR CONCRETE STRUCTURAL COLUMNS AND FRAMING ARE TO BE PAINTED UNLESS OTHERWISE NOTED. ARCHITECT TO SELECT COLOR FROM MANUFACTURER'S FULL RANGE.
11. FIRE RESISTANT RATED INTUMESCENT PAINT FINISH EXPOSED WITHIN A ROOM IS TO HAVE A SMOOTH FINISH AND RECEIVE A FINAL PAINT COLOR SELECTED BY THE ARCHITECT.
12. EXPOSED CMU, WHICH DOES NOT HAVE A SPECIAL FINISH, INTEGRAL COLOR OR DECORATIVE FACE, IS TO BE PAINTED ULESS NOTED OTHERWISE.
13. WALL GRILLES, CEILING DIFFUSERS, AND FIRE EXTINGUISHER CABINETS ARE TO BE FINISHED IN THE SAME MATERIAL AS THE ADJACENT WALL MATERIAL.
14. METAL TRIM PIECE TO OCCUR AT ALL TILED WALL OUTSIDE CORNERS.
15. PROVIDE FRP AT SINKS IN JANITOR CLOSETS FROM FLOOR TO 6" ABOVE FAUCETS AND ON ADJACENT WALLS.
16. TRANSITIONS, REDUCER STRIPS, AND THRESHOLDS TO BE LOCATED AT CENTERLINE OF DOOR WHEN IN CLOSED POSITION. SEE DETAILS ON TRANSITIONS ON PAGE A5.20.
17. ALIGN FLOORING TRANSITIONS WITH FINISH BASE EXCEPT AT DOORS UNLESS NOTED OTHERWISE.
18. FLOORING MATERIAL SHALL BE CENTERED UNDER THE DOOR IN THE CLOSED POSITION. TRANSITIONS, IF NEEDED, ARE ALSO TO BE CENTERED UNDER THE DOOR IN THE CLOSED POSITION.
19. CARPET SEAMS TO BE LOCATED AT CENTERLINE OF DOOR IN CLOSED POSITION.
20. CARPET TILE INSTALLATION NOTED IN FINISH LEGEND ON PAGE A5.02.
21. FLOORING TO BE INSTALLED PERPENDICULAR TO ROOM WALLS UNLESS NOTED OTHERWISE.
22. RUBBER TRANSITIONS AND METAL TRANSITIONS TO OCCUR BETWEEN DIFFERENT MATERIALS AND ARE TO BE SELECTED BY ARCHITECT FROM MANUFACTURER'S FULL RANGE OF PRODUCTS.
23. PROVIDE CRACK ISOLATION MEMBRANE AT ALL CERAMIC FLOORING. FLOORING CONTRACTOR TO COORDINATE WITH SPECIFICATIONS.
24. WALL AND FLOOR GROUT COLORS TO BE SELECTED BY ARCHITECT FROM MANUFACTURER'S FULL COLOR RANGE.
25. GROUT WIDTHS TO BE MANUFACTURER'S RECOMMENDED MINIMUM WIDTH UNLESS NOTED OTHERWISE.
26. REQUIRED FLOORING UNDERLAYMENTS ARE TO BE PROVIDED AND INSTALLED BY THE FLOORING CONTRACTOR.
27. TERRAZZO STRIPS SHOULD BE AT ALL BREAKS OR SAW CUTS IN SUPPORTING SLAB. ARCHITECTS APPROVAL NEEDED BEFORE FABRICATION.

CODED INTERIOR NOTES

NO.	NOTE
1	REFERENCE TERRAZZO PLANS
2	THEATER CURTAIN ON TRACK TO GO AROUND ENTIRE ROOM. SEE SPECIFICATIONS.
3	CASEWORK IS EXISTING TO REMAIN
4	ELECTRONIC EQUIPMENT WRACKS ARE EXISTING TO REMAIN
5	EQUIPMENT, STAGE LIFT. SEE SPECIFICATIONS.
6	RAMP
7	PAINTED MASONITE. USE MANUFACTURER'S RECOMMENDED FINISH FOR HIGH TRAFFIC AREAS.
8	WHITE BOARD: CLARUS - FLOAT - 8'-X 3'-0" PURE WHITE. T-TRAY AND MAGNETIC. INSTALL: 3'-0" AFF TO BOTTOM OF BOARD. BOARDS MUST BE CENTERED ON WALL.

SYMBOL LEGEND

- 1 / INT — CODED NOTE: SEE SCHEDULE ON THIS SHEET
- PT-1 — MATERIAL FINISH NOTE. SEE SHEET A5.02 OF DRAWINGS FOR DETAIL.
- M-1 — MILLWORK NOTE. SEE SHEET A5.02 OF DRAWINGS FOR DETAIL.
- EQ-1 — EQUIPMENT NOTE, SEE SHEET A5.02 OF DRAWINGS FOR DETAIL.
- TRANSITION LOCATION MARKER, SHOWS TRANSITION BETWEEN FLOOR MATERIAL. SEE DETAILS ON PAGE A5.20.
- ROOM NAME 101 / Floor Base Wall Finish — ROOM TAG WITH FINISHES. (*) INDICATES MORE THAN ONE FINISH IN THAT AREA. SEE PLAN/ NOTES FOR DETAILS. FLOORING (T) REFERENCE TERRAZZO PLANS.

Dreiser Add #5

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GREGORY F. JACOBY REGISTERED No. AR00602208 STATE OF INDIANA ARCHITECT

CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

Terre Haute, Indiana 47809

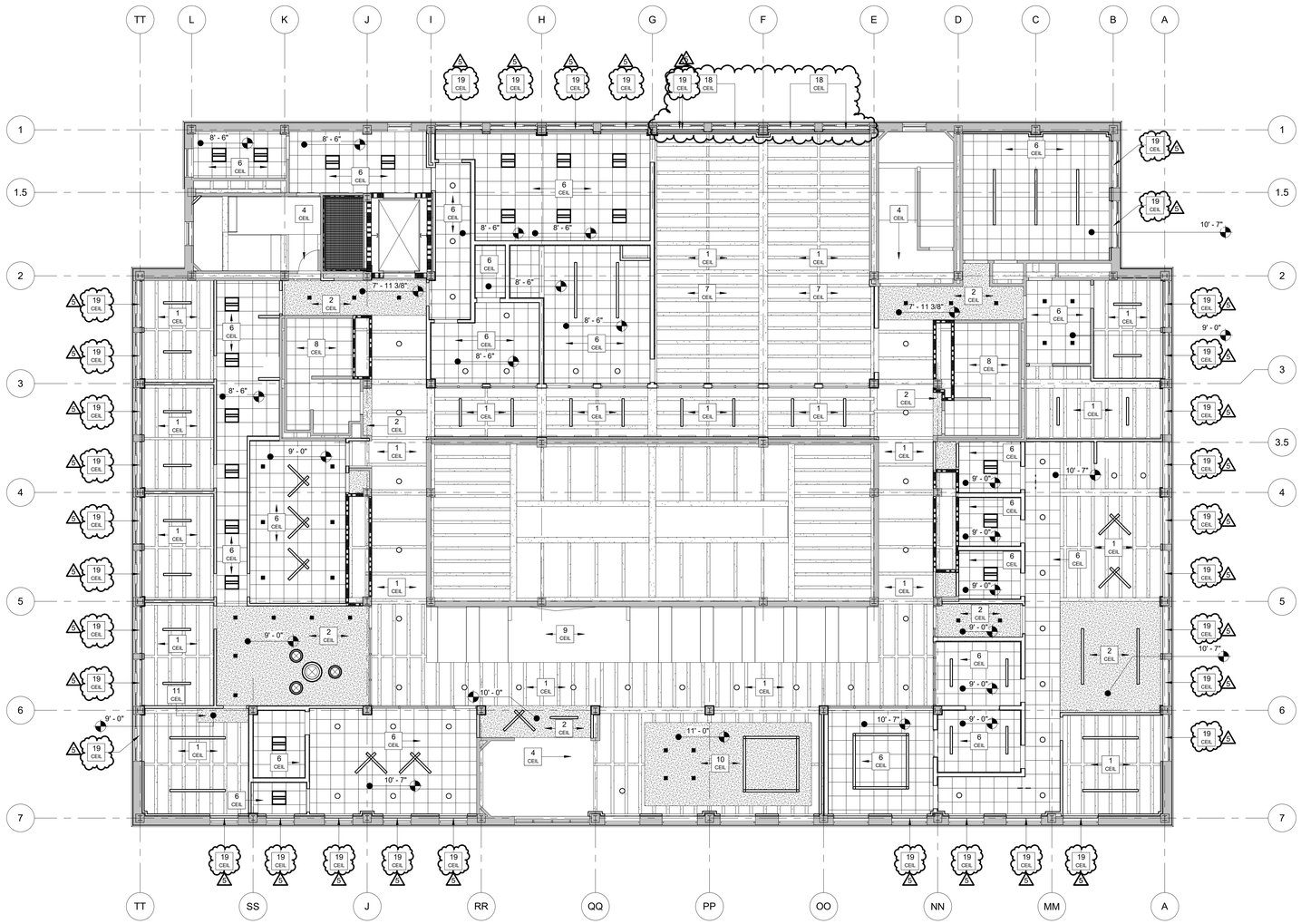
Project No.: 19A052
Drawn By: J. Starneri
Checked By: Checker
Scale: As Noted
Issue Date: June 5, 2020

REVISION SCHEDULE

Rev. #	Revision Description	Issue Date
1	Addendum #1	6/12/2020
2	Addendum #2	6/19/2020
5	Addendum #5	07/02/2020

2nd Floor Finish Plan

A1.02C



1 A1.03B — Reflected Ceiling Plan
3rd Floor Reflected Ceiling Plan
1/8" = 1'-0"

CODED CEILING NOTES

NO.	NOTE
1	EXPOSED CONCRETE STRUCTURE CEILING - PAINTED. ALL HANGER WIRE, ANCHORS, MISC. HARDWARE SHALL BE REMOVED FROM THE CONCRETE STRUCTURE DURING THE DEMOLITION. EMBEDDED REMNANTS ARE TO BE GROUND FLUSH WITH THE CONCRETE.
2	GYPSUM BOARD CEILING. PAINTED.
3	2-HOUR RATED HORIZONTALLY INSTALLED SHAFT WALL SYSTEM. GYPSUM BOARD CEILING ASSEMBLY TO ENCLOSE LOWER PORTION OF 2-HOUR RATED MECHANICAL SHAFT. REPORT NUMBER AER-09038 OR EQUAL. PAINTED.
4	PATCH AND PAINT EXISTING PLASTER CEILING.
5	ALTERNATE #4 - PROVIDE PIPE GRID CEILING AND THEATRICAL LIGHTING. SEE ELECTRICAL DRAWINGS FOR MORE DETAILS. BASE BID - NO PIPE GRID OR THEATRICAL LIGHTING. PROVIDE THEATRICAL CURTAIN.
6	2' X 2' ACOUSTICAL CEILING TILE SYSTEM.
7	PROVIDE PIPE GRID AND STUDIO LIGHT FIXTURES. SEE ELECTRICAL DRAWINGS FOR DETAILS.
8	EXISTING CEILING GRID, TILE, AND LIGHT FIXTURES TO REMAIN.
9	NEW VENEERED WOOD PANEL CEILING.
10	SUSPENDED GYPSUM BOARD CLOUD CEILING. PAINTED.
11	GYPSUM BOARD BULKHEAD.
12	WOOD PANEL CEILING SYSTEM. BASIS OF DESIGN - ARMSTRONG "WOODWORKS" LINEAR, SOLID PANEL
13	SUSPENDED WOOD PLANK CLOUD CEILING.
14	(2) LAYERS GYPSUM BOARD ON METAL FRAMING AND ISOLATION HANGERS (KINETICS ICC OR EQUIVALENT) WITH 3-1/2" FIBERGLASS INSULATION - SEE DETAIL 2/A1.01B
15	WOOD REFLECTOR PANELS ON METAL FRAMING / ISOLATION HANGERS (KINETICS ICC OR EQUIVALENT) BASIS OF DESIGN 'KINETICS REFLECT'
16	METAL PANEL CEILING SYSTEM TO MATCH METAL PANELS.
17	GYPSUM BOARD AND METAL FRAMING LIGHT WELL.
18	BLACKOUT ROLLER SHADE - MANUAL
19	LIGHT FILTERING ROLLER SHADE - MANUAL
20	72.5" x 116" RECESSED MOUNTED MOTORIZED PROJECTION SCREEN WITH TRIM KIT.
21	72.5" x 116" WALL MOUNTED MOTORIZED PROJECTION SCREEN.

GENERAL CEILING PLAN NOTES

1. DO NOT SCALE DRAWINGS.
2. SEE INTERIOR DRAWINGS FOR PAINT COLOR OF GYP. BD. AND EXPOSED CONCRETE STRUCTURE CEILINGS AND THEIR ASSOCIATED BULKHEADS.
3. UNLIKE FLOOR PLAN DIMENSIONS, THOSE SHOWN ON THE REFLECTED CEILING PLAN ARE FINISHED DIMINSIONS UNLESS NOTED OTHERWISE.

   CEILING ELEVATIONS ARE TO THE FINISHED FACE OF THE CEILING FINISH MATERIAL.

   BULKHEAD DIMENSIONS ARE TO THE FINISHED FACE OF GYP. BD.

   DIMENSIONS TO LIGHT FIXTURES ARE TO THE CENTERPOINT OF THE FIXTURE, THE FINISHED EDGE OF FIXTURE, OR TO THE CENTERLINE OF ASSOCIATED CEILING GRID SYSTEM.
4. LETTER DESIGNATIONS WITHIN A DIMENSION STRING (SUCH AS "A", "B", "C" AND SO ON) INDICATE THAT THE DIMENSION IS TO BE FIELD DETERMINED AND IT IS TO BE EQUAL TO OTHER DIMENSIONS OF THE SAME LETTER THROUGHOUT THAT SPECIFIC DRAWING SHEET, BUT NOT TO THE SAME DESIGNATION ON OTHER DRAWING SHEETS.
5. USE OF "EQUAL" OR "EQ" WITHIN A DIMENSION STRING INDICATES A DIMENSION THAT IS TO BE EQUAL ONLY RELATIVE TO OTHER EQUAL CALLOUTS ON THE SAME DIMENSION STRING IN WHICH IT APPEARS. DIMENSIONS CALLED OUT AS EQUAL ON TWO DIFFERENT DIMENSION STRINGS ARE NOT NECESSARILY EQUAL TO EACH OTHER.
6. ALL DESIGN TEAM DRAWINGS SHALL BE USED TO LOCATE BUILDING ELEMENTS. CONTACT THE ARCHITECT WITH CONFLICTS, DISCREPANCIES, AND OMISSIONS PRIOR TO COMMENCEMENT OF WORK. WRITTEN DOCUMENTATION SHALL BE PROVIDED BY THE CONTRACTOR REGARDING SUCH ITEMS.
7. STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING, LOW VOLTAGE AND FOOD SERVICE ELEMENTS ARE SHOWN FOR REFERENCE ONLY. VERIFY EACH ELEMENT WITH THE ASSOCIATED ENGINEER'S DRAWINGS. COORDINATE CONFLICTS WITH THE ARCHITECT.
8. REFER TO SPECIFICATIONS FOR EACH ITEM REPRESENTED WITHIN THE DRAWING SET.
9. GENERAL CONTRACTOR TO PROVIDE BACKER ROD AND SEALANT, OF A TYPE APPROPRIATE TO EACH CONDITION, BETWEEN MATERIALS BOTH SIMILAR AND DISSIMILAR THROUGHOUT THE INTERIOR AND EXTERIOR OF THE BUILDING. (COLORS TO BE SELECTED BY ARCHITECT)
10. NOT ALL LIGHT FIXTURES ARE REPRESENTED ON THE ARCHITECTURAL DRAWINGS. LIGHT FIXTURES ARE SHOWN FOR PLACEMENT LOCATION AND SIZE RELATIONSHIPS. ACTUAL FIXTURE TYPES ARE SHOWN ON ELECTRICAL DRAWINGS. SEE ELECTRICAL DRAWINGS FOR ADDITIONAL LIGHT FIXTURE TYPES AND LOCATIONS. CONFIRM ANY DESCREPANCIES BETWEEN DRAWINGS WITH THE ARCHITECT PRIOR TO COMMENCEMENT OF WORK.
11. WHERE GYP. BD. CEILINGS ARE INDICATED TO BE LOWER THAN ADJACENT ACT CEILINGS THE CONTRACTOR IS TO PROVIDE A FINISHED VERTICAL GYP. BD. BULKHEAD RETURN FROM THE LOWER FINISHED GYP. BD. CEILING TO A MINIMIMUM OF 6" ABOVE THE ADJACENT ACT CEILING UNLESS NOTED OTHERWISE. SEE FLOOR PLANS AND LIFE SAFETY PLANS.
12. WHERE GYP. BD. CEILINGS ARE INDICATED TO BE LOWER THAN ADJACENT GYP. BD. OR EXPOSED STRUCTURE CEILINGS THE CONTRACTOR IS TO PROVIDE A CONTINUOUS FINISHED VERTICAL GYP. BD. BULKHEAD RETURN TO THE ADJACENT FINISHED GYP. BD. CEILING.
13. EACH FIRE RATED BUILDING SHAFT IS TO HAVE A CLOSURE AT THE TOP AND BOTTOM OF THE SHAFT THAT MATCHES THE FIRE RATING OF THE SHAFT.

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GREGORY E. JACOBY — REGISTERED — No. AR00002008 — STATE OF INDIANA — ARCHITECT

CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

Terre Haute, Indiana 47809

Project No.: 19A052
Drawn By: J. Young
Checked By: Checker
Scale: As Noted
Issue Date: June 5, 2020

REVISION SCHEDULE

Rev. #	Revision Description	Issue Date
3	Addendum #3	6/26/2020
5	Addendum #5	07/02/2020

3rd Floor Reflected Ceiling Plan

A1.03B

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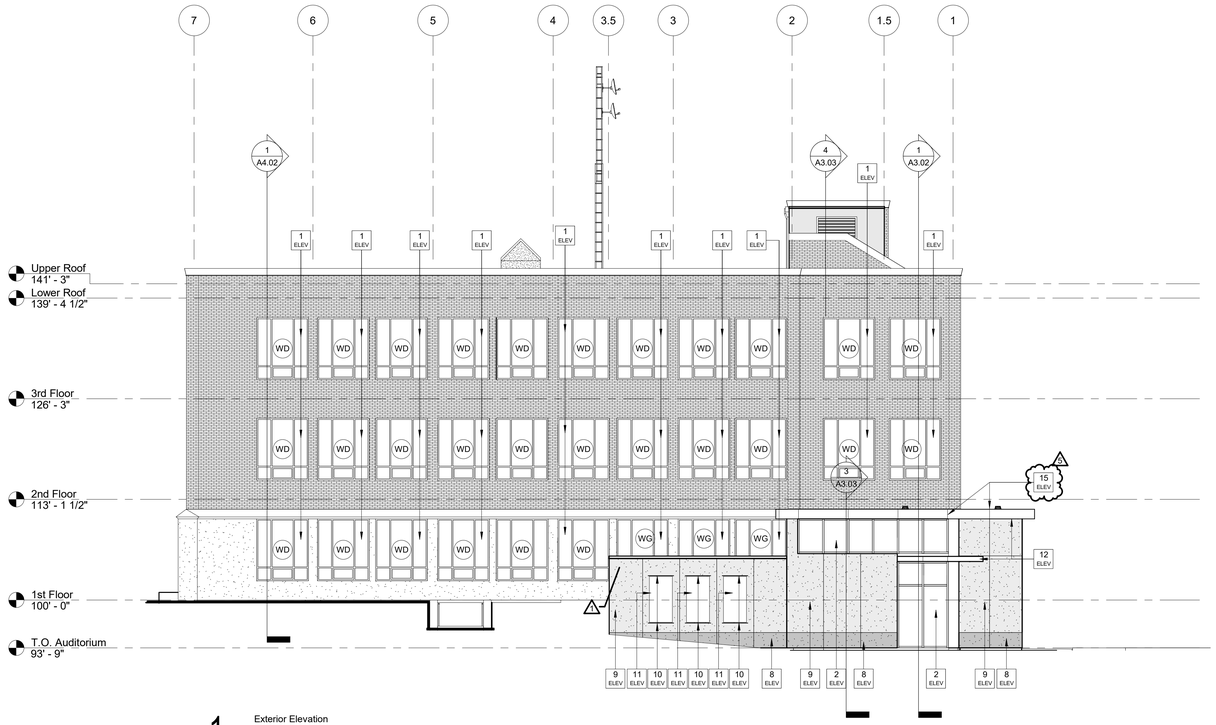
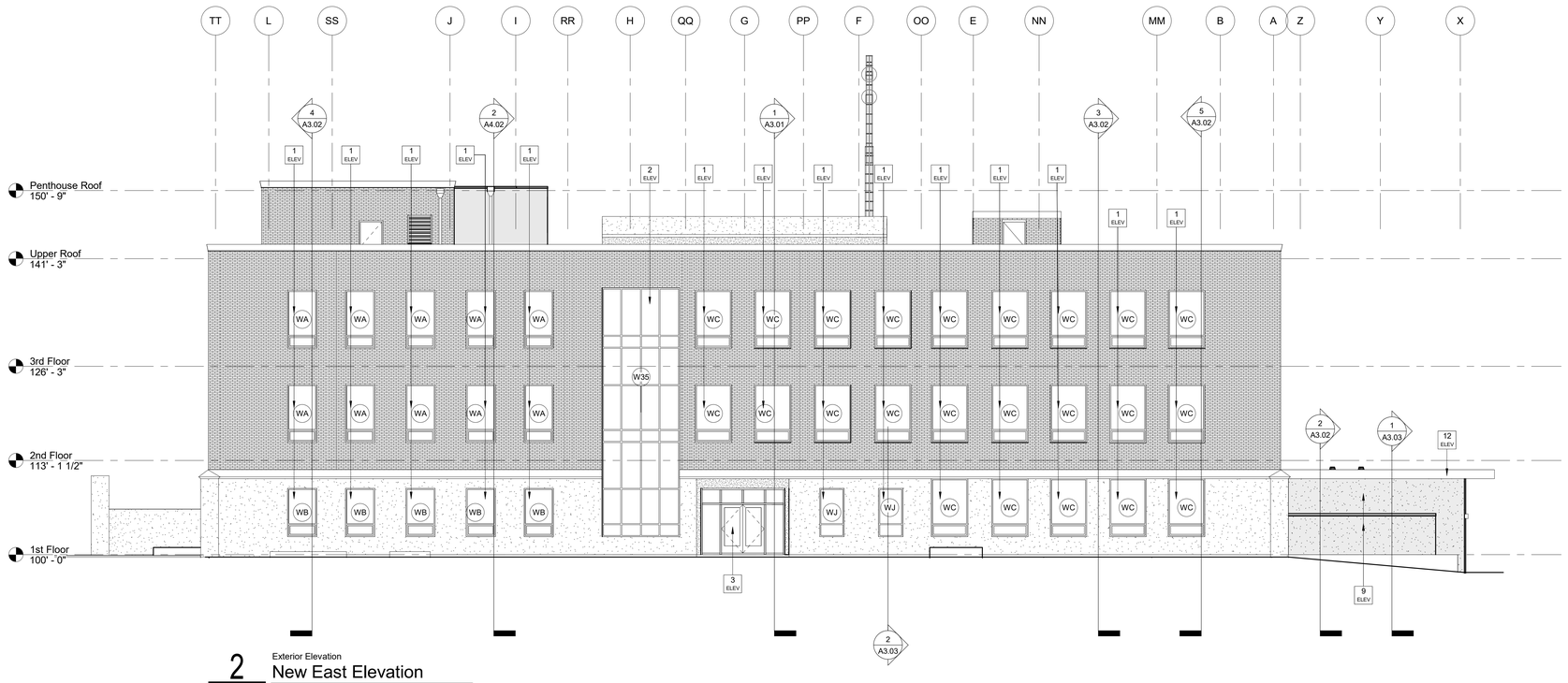


1 Exterior Elevation
New North Elevation
A2.01 1/8" = 1'-0"



2 Exterior Elevation
New East Elevation
A2.01 1/8" = 1'-0"

GENERAL ELEVATION NOTES

1. DO NOT SCALE DRAWINGS.
2. ALTERNATE #3 - 100% OF EXISTING LIMESTONE JOINTS AND 10% OF EXISTING BRICK JOINTS TO BE REPOINTED. MORTAR TO MATCH ADJACENT MORTAR IN COLOR, TEXTURE, AND HARDNESS. 100% OF LIMESTONE TO BE CLEANED. CONTRACTOR TO ASSUME 25 LIMESTONE PATCHES. BASE BID: NO MASONRY RESTORATION.

SYMBOL LEGEND

P-1 MATERIAL FINISH NOTE. SEE A5-SERIES OF DRAWINGS AND SPECIFICATIONS

W1 WINDOW TAG: SEE A8-SERIES DRAWINGS

CODED ELEVATION NOTES

NO.	NOTE
1	NEW ALUMINUM WINDOWS. BASE BID: WINDOWS TO FIXED IN PLACE. ALTERNATE #1: WINDOWS TO BE OPERABLE AS DEPICTED.
2	NEW ALUMINUM CURTAINWALL SYSTEM.
3	NEW ALUMINUM STOREFRONT ENTRANCE SYSTEM.
4	NEW ALUMINUM FASCIA ON EXISTING CANOPY STRUCTURE.
5	NEW ALUMINUM FASCIA ON NEW CANOPY STRUCTURE IN AREA INDICATED.
6	NEW HOLLOW METAL DOOR IN NEW OPENING.
7	ALUMINUM METAL PANEL COLUMN WRAP.
8	GRANITE WALL BASE.
9	LIMESTONE VENEER WALL CLADDING TO MATCH EXISTING
10	WALL MOUNTED BANNER BRACKETS.
11	BANNERS (NOT IN CONTRACT).
12	METAL PANEL FASCIA.
13	EXTRUDED ALUMINUM BUILDING SIGNAGE.
14	EXISTING PIPE COLUMN - CLEAN AND PAINT
15	METAL PANEL FASCIA JOINTS (VERT AND HORIZ) LOCATE JOINTS WHERE SHOWN.

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CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

Terre Haute, Indiana 47809

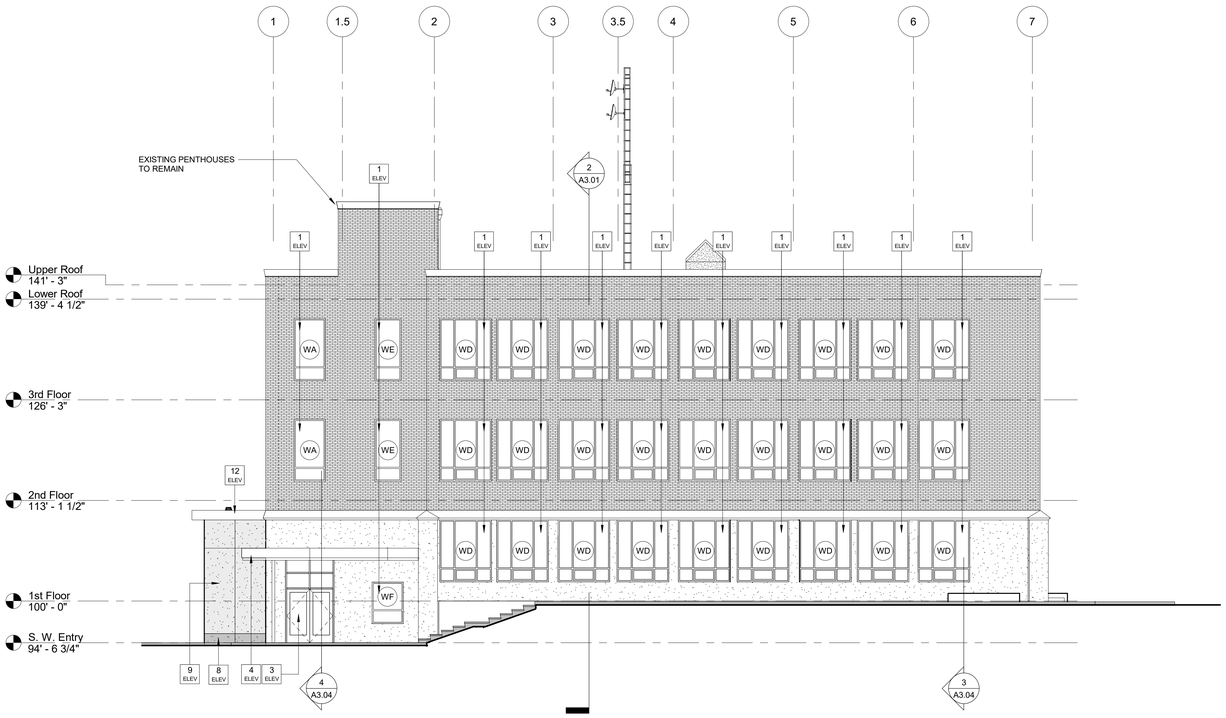
Project No.: 19A052
Drawn By: J. Young
Checked By:
Scale: As Noted
Issue Date: June 5, 2020

REVISION SCHEDULE

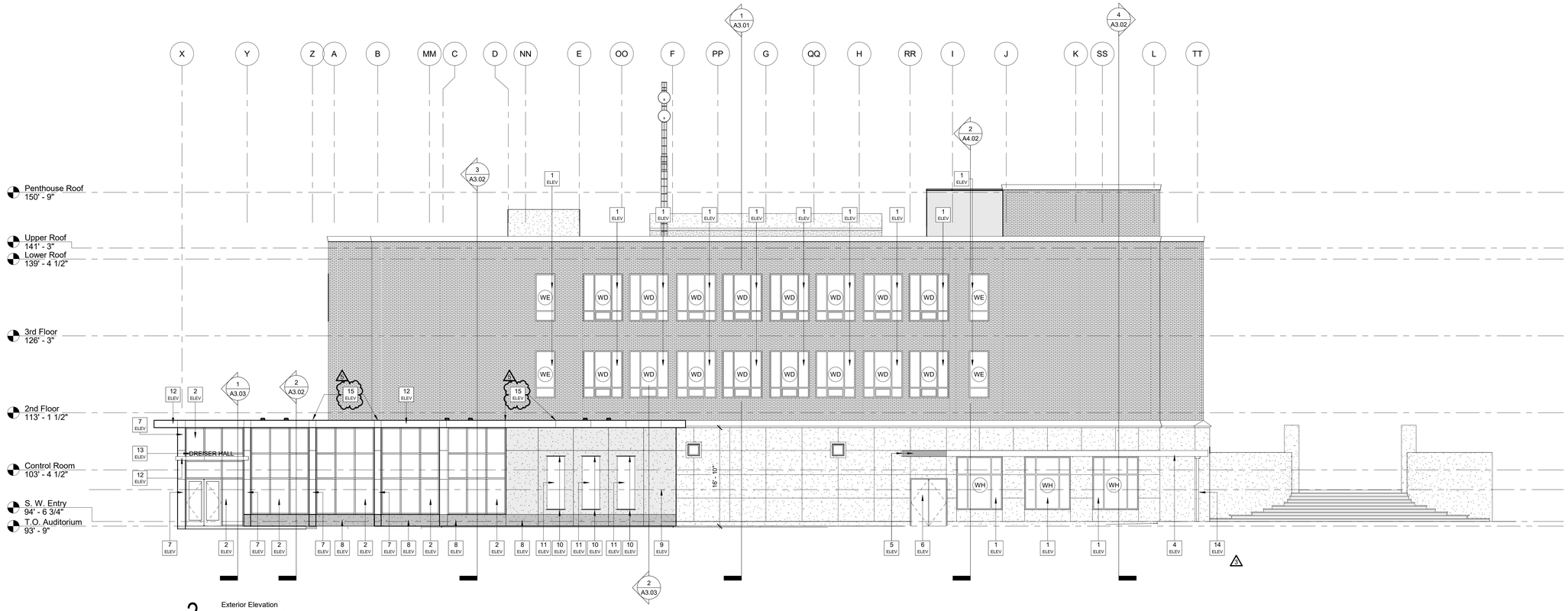
Rev. #	Revision Description	Issue Date
1	Addendum #1	6/12/2020
5	Addendum #5	07/02/2020

Exterior Elevations

A2.01



1 A2.02 — Exterior Elevation
New South Elevation
1/8" = 1'-0"



2 A2.02 — Exterior Elevation
New West Elevation
1/8" = 1'-0"

GENERAL ELEVATION NOTES

1. DO NOT SCALE DRAWINGS.
2. ALTERNATE #3 - 100% OF EXISTING LIMESTONE JOINTS AND 10% OF EXISTING BRICK JOINTS TO BE REPOINTED. MORTAR TO MATCH ADJACENT MORTAR IN COLOR, TEXTURE, AND HARDNESS. 100% OF LIMESTONE TO BE CLEANED. CONTRACTOR TO ASSUME 25 LIMESTONE PATCHES. BASE BID: NO MASONRY RESTORATION.

SYMBOL LEGEND

P-1 — MATERIAL FINISH NOTE. SEE A5-SERIES OF DRAWINGS AND SPECIFICATIONS

W1 — WINDOW TAG: SEE A8-SERIES DRAWINGS

CODED ELEVATION NOTES

NO.	NOTE
1	NEW ALUMINUM WINDOWS. BASE BID: WINDOWS TO FIXED IN PLACE. ALTERNATE #1: WINDOWS TO BE OPERABLE AS DEPICTED.
2	NEW ALUMINUM CURTAINWALL SYSTEM.
3	NEW ALUMINUM STOREFRONT ENTRANCE SYSTEM.
4	NEW ALUMINUM FASCIA ON EXISTING CANOPY STRUCTURE.
5	NEW ALUMINUM FASCIA ON NEW CANOPY STRUCTURE IN AREA INDICATED.
6	NEW HOLLOW METAL DOOR IN NEW OPENING.
7	ALUMINUM METAL PANEL COLUMN WRAP.
8	GRANITE WALL BASE.
9	LIMESTONE VENEER WALL CLADDING TO MATCH EXISTING
10	WALL MOUNTED BANNER BRACKETS.
11	BANNERS (NOT IN CONTRACT).
12	METAL PANEL FASCIA.
13	EXTRUDED ALUMINUM BUILDING SIGNAGE.
14	EXISTING PIPE COLUMN - CLEAN AND PAINT
15	METAL PANEL FASCIA JOINTS (VERT AND HORIZ) LOCATE JOINTS WHERE SHOWN.

Dreiser Add #5

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CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

Terre Haute, Indiana 47809

Project No.: 19A052
Drawn By: J. Young
Checked By: Checker
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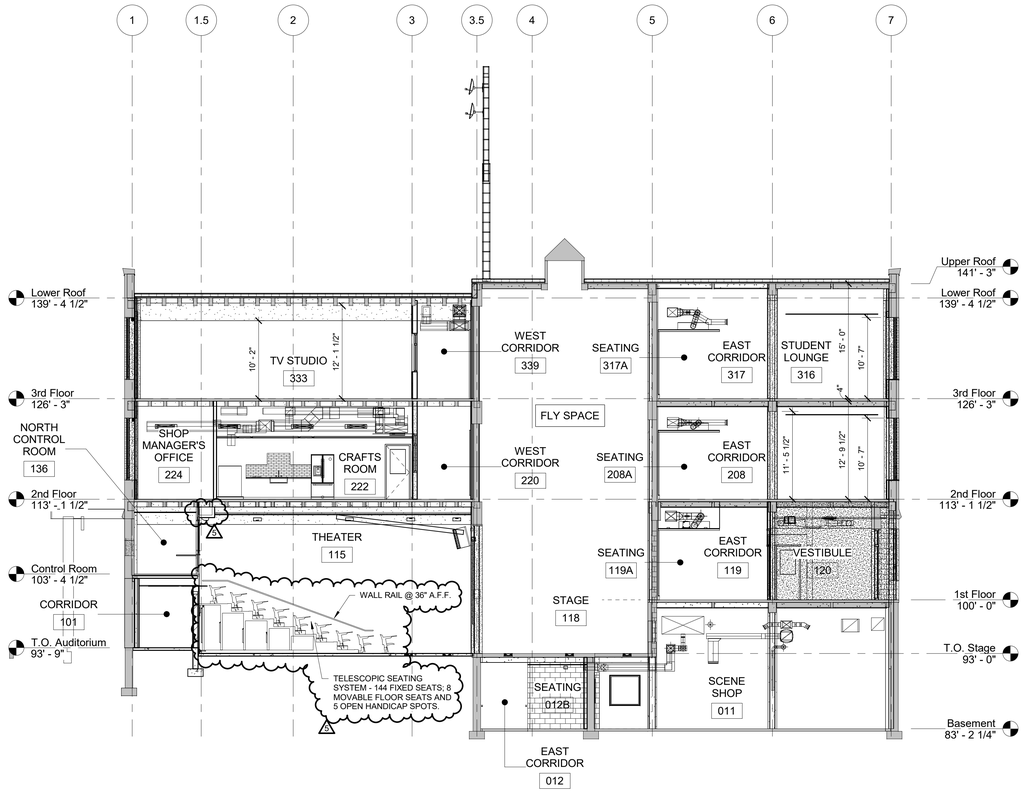
REVISION SCHEDULE

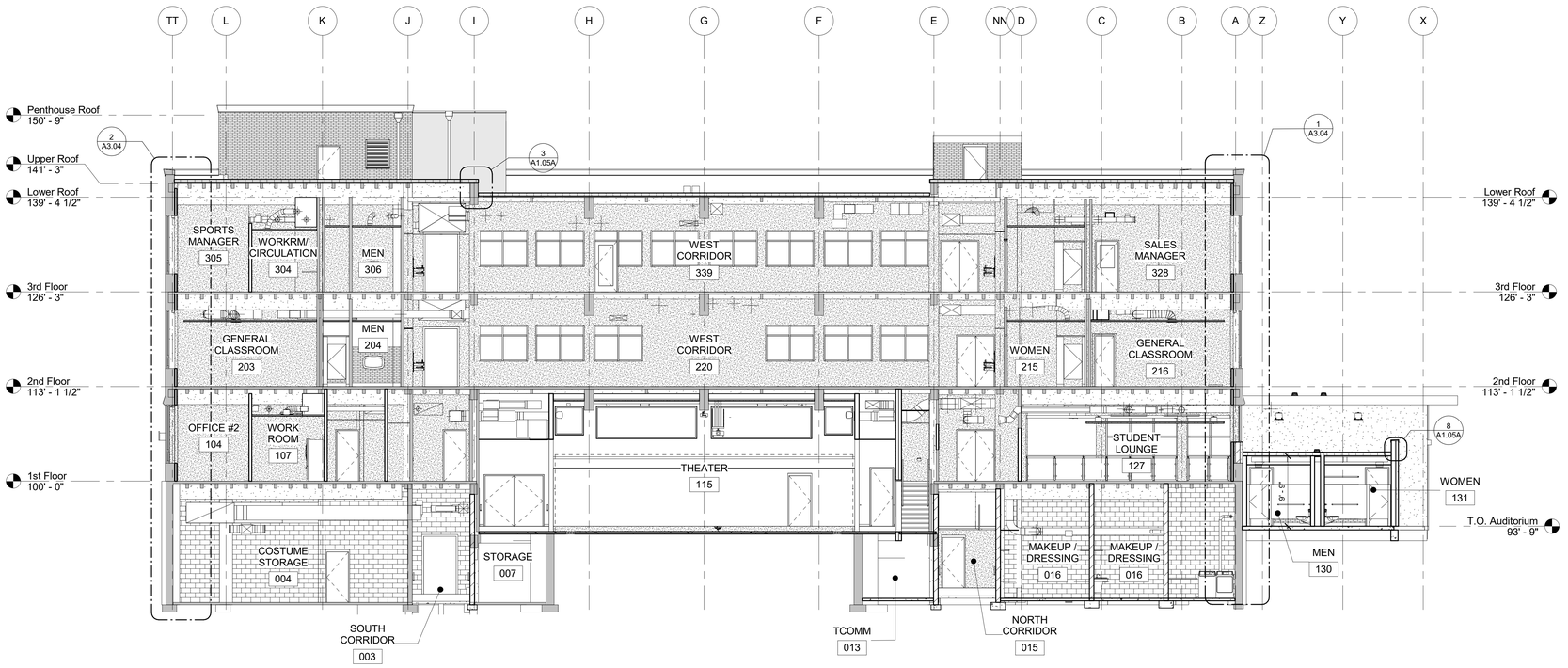
Rev. #	Revision Description	Issue Date
1	Addendum #1	6/12/2020
3	Addendum #3	6/26/2020
5	Addendum #5	07/02/2020

Exterior Elevations

A2.02



1 Wall Section
Transverse Section
A3.01 1/8" = 1'-0"



2 Wall Section
Longitudinal Section
A3.01 1/8" = 1'-0"

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CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

Terre Haute, Indiana 47809

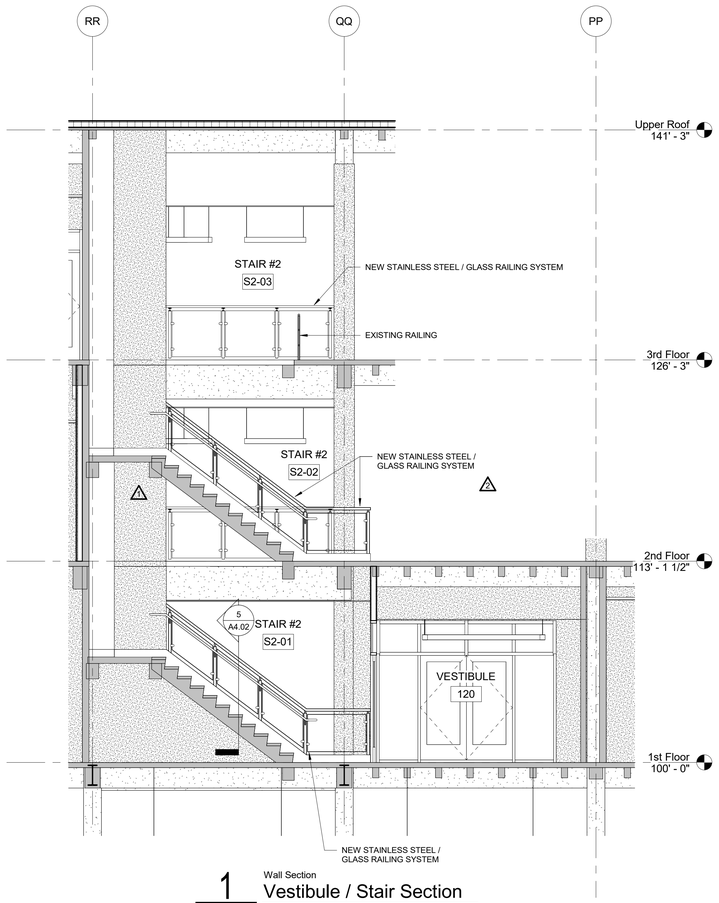
Project No.: 19A052
Drawn By: J. Starneri
Checked By: Checker
Scale: As Noted
Issue Date: June 5, 2020

REVISION SCHEDULE

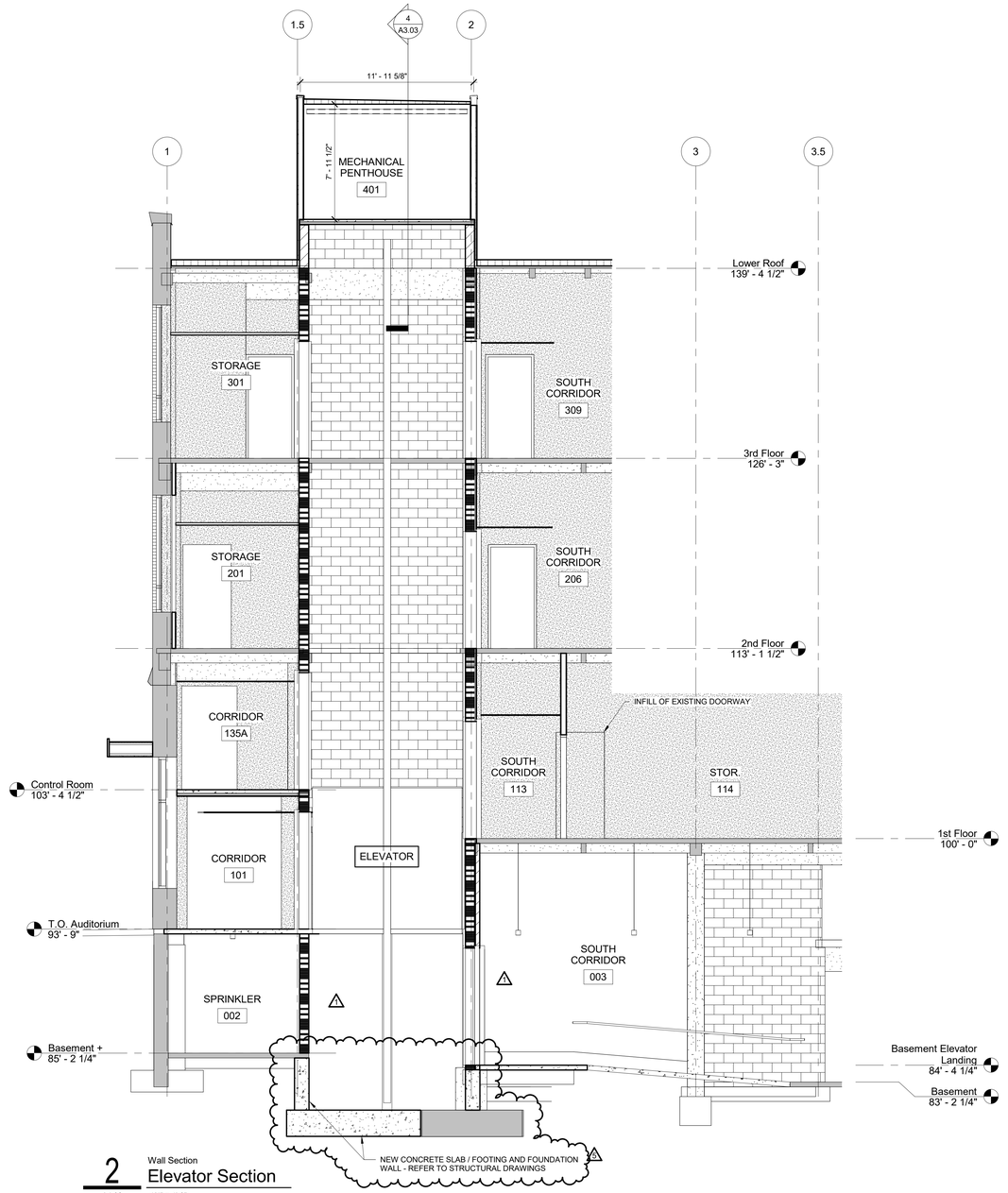
Rev. #	Revision Description	Issue Date
5	Addendum #5	07/02/2020

Building Sections

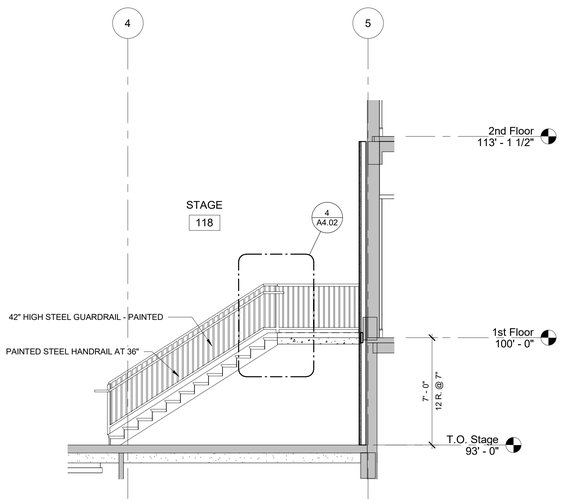
A3.01



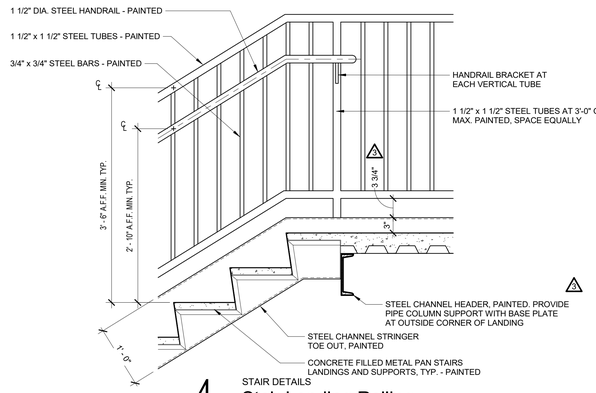
1 Wall Section
A4.02 Vestibule / Stair Section
1/4" = 1'-0"



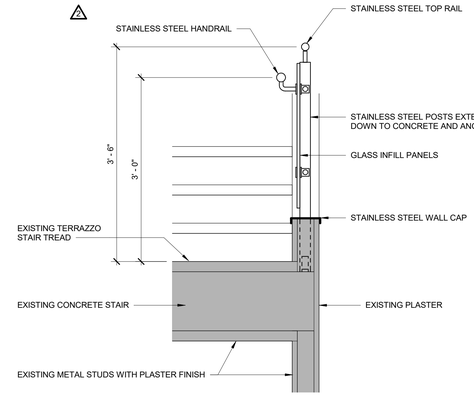
2 Wall Section
A4.02 Elevator Section
1/4" = 1'-0"



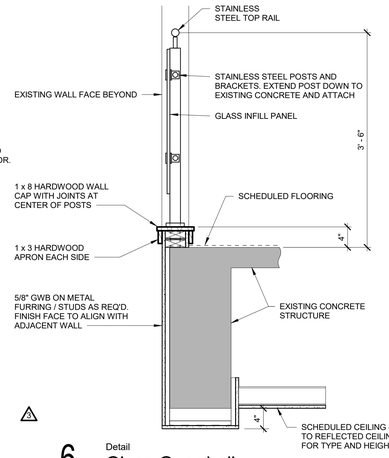
3 Wall Section
A4.02 Backstage Stair Section
1/4" = 1'-0"



4 STAIR DETAILS
A4.02 Stair Landing Railing
1" = 1'-0"



5 Wall Section (Sim)
A4.02 Stair Railing Detail
1" = 1'-0"



6 Detail
A4.02 Glass Guardrail
1" = 1'-0"

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CERTIFICATION

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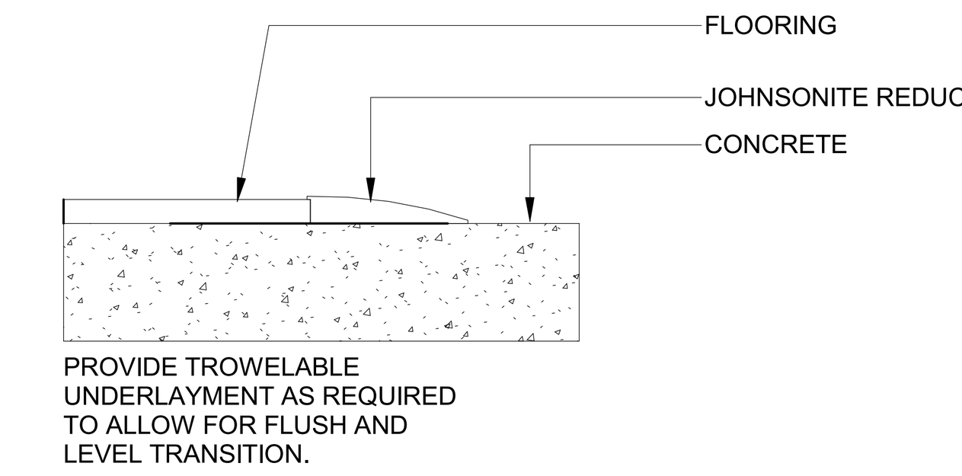
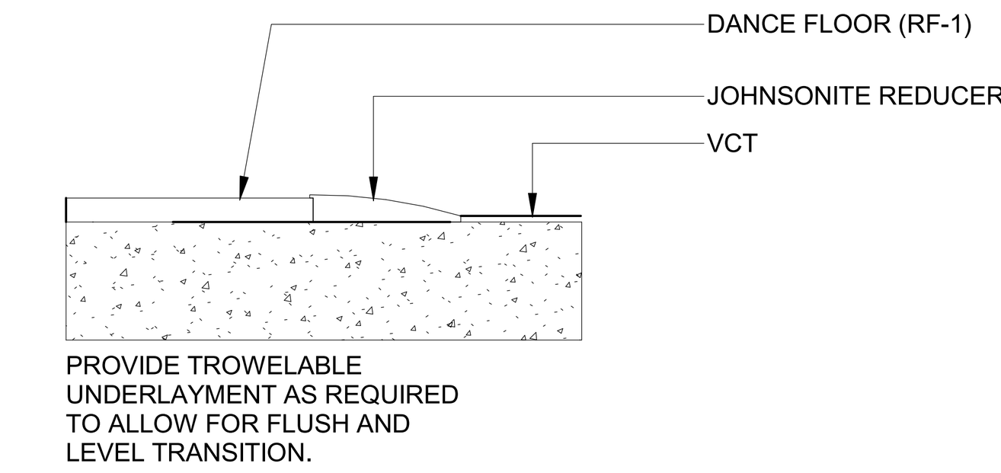
5	Addendum #5	07/02/2020

Vertical Circulation Sections
and Details

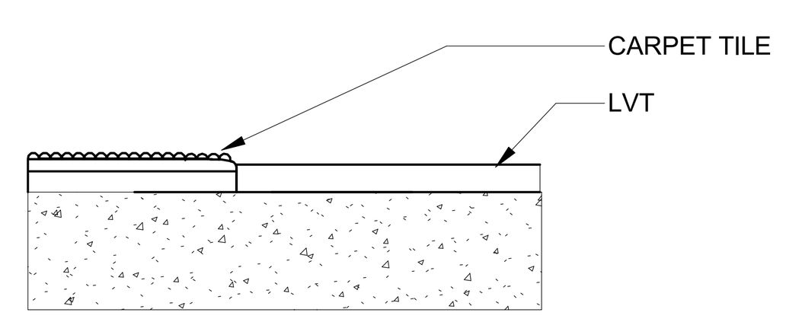
A4.02



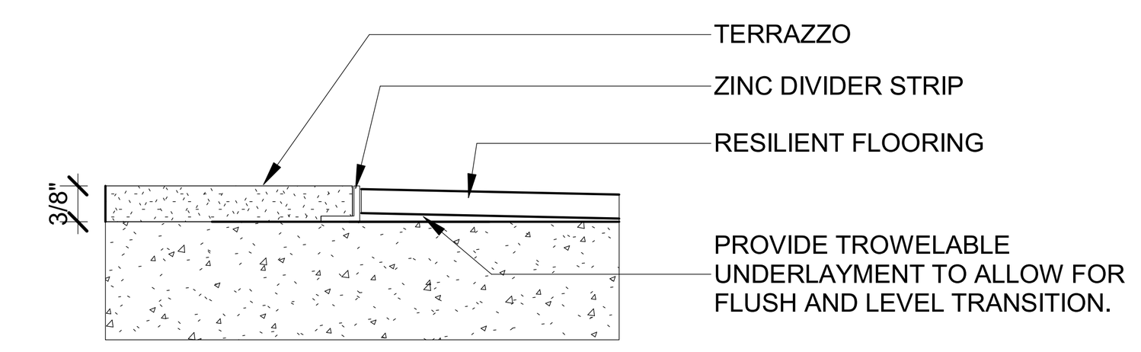
12 A5.20 Detail
TYP. Flooring to Concrete Reducer
6" = 1'-0"



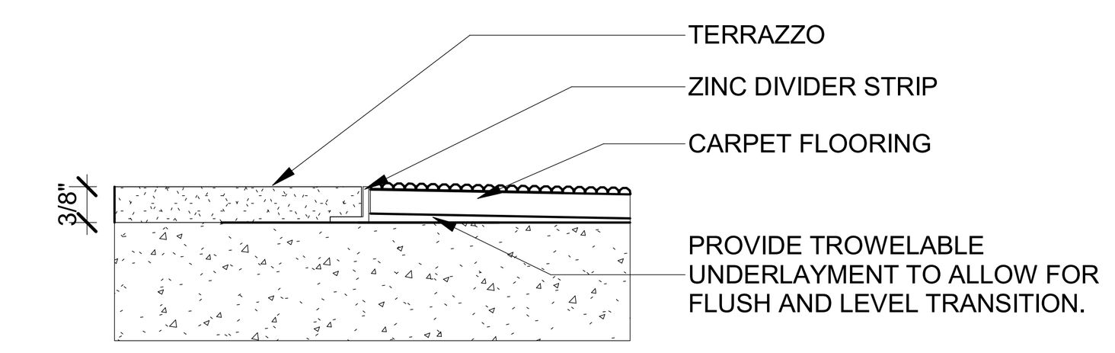
11 A5.20 Detail
TYP. RF-1 to VCT Reducer
6" = 1'-0"



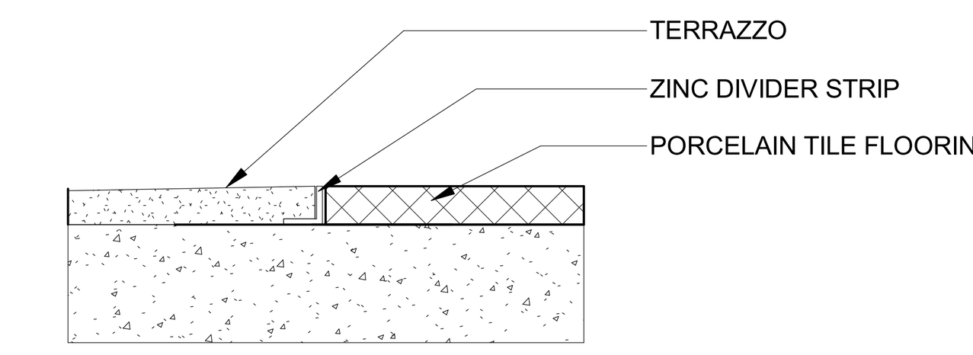
10 A5.20 Detail
Carpet Tile to LVT Transition
6" = 1'-0"



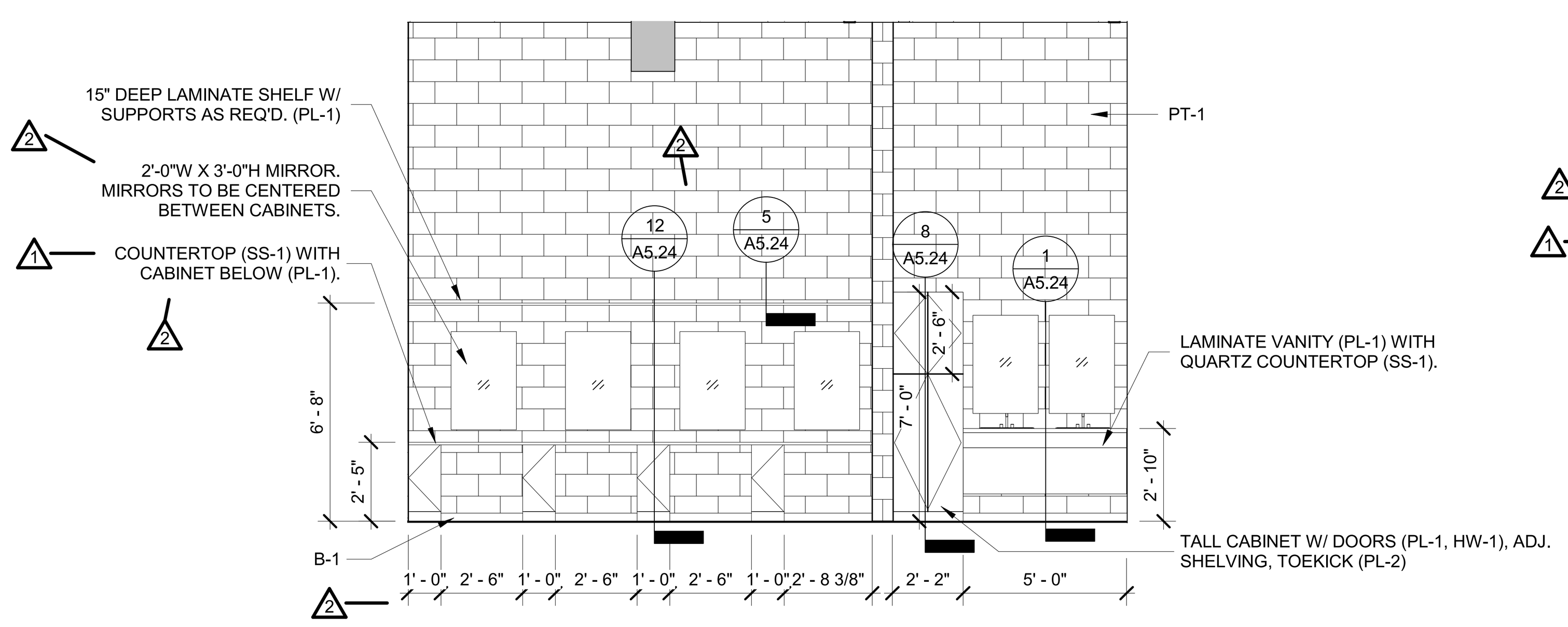
9 A5.20 Detail
Terrazzo to Resilient Flooring Transition
6" = 1'-0"



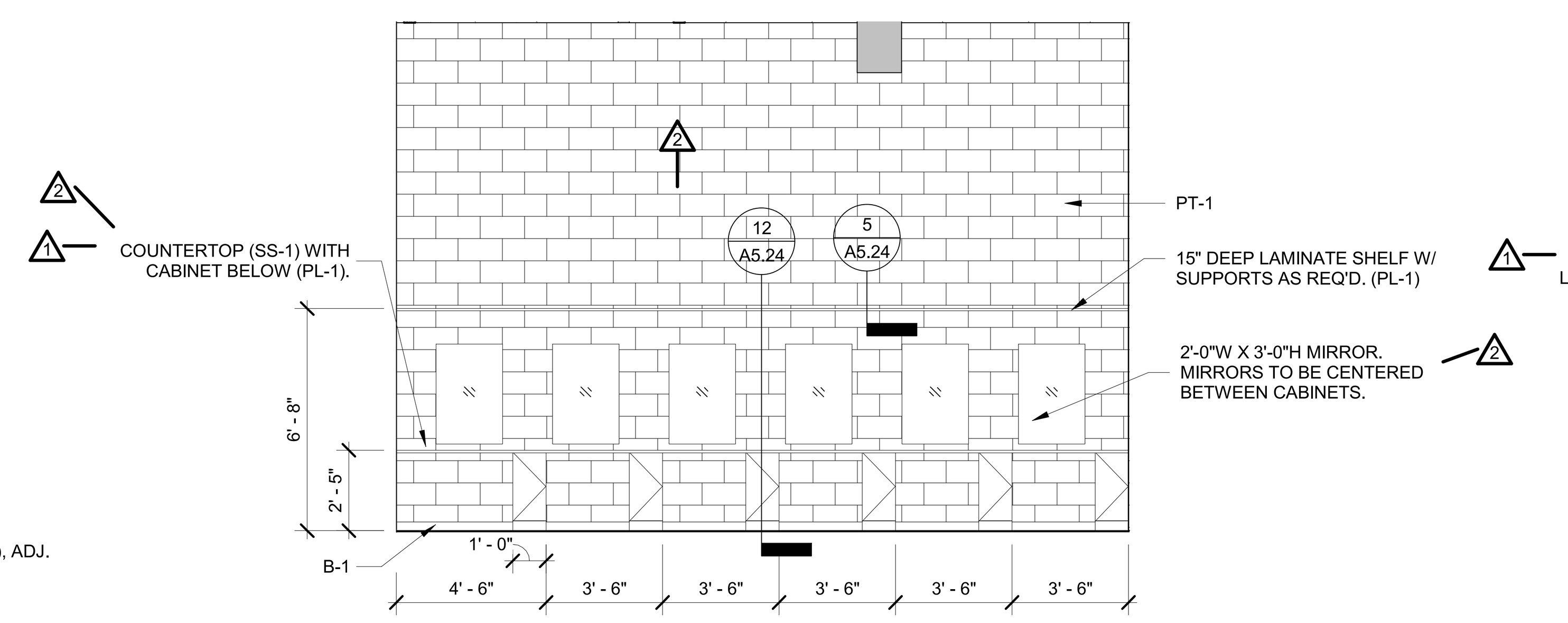
8 A5.20 Detail
Terrazzo to Carpet Transition
6" = 1'-0"



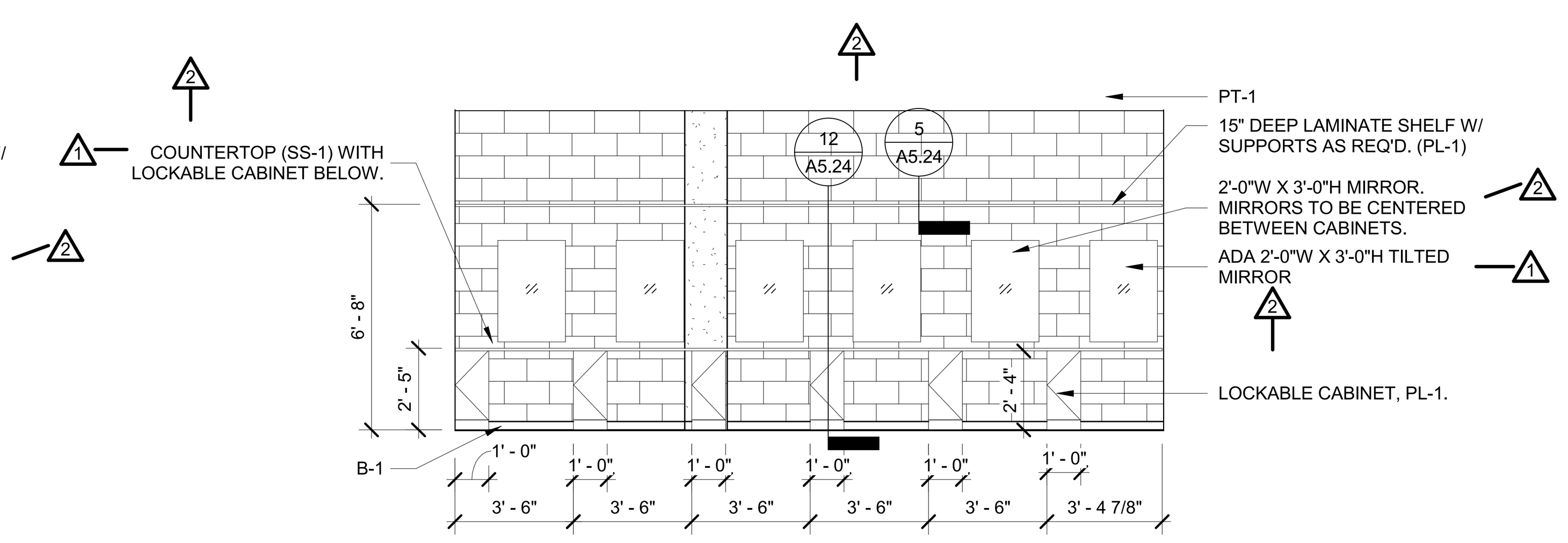
7 A5.20 Detail
Terrazzo to Porcelain Transition
6" = 1'-0"



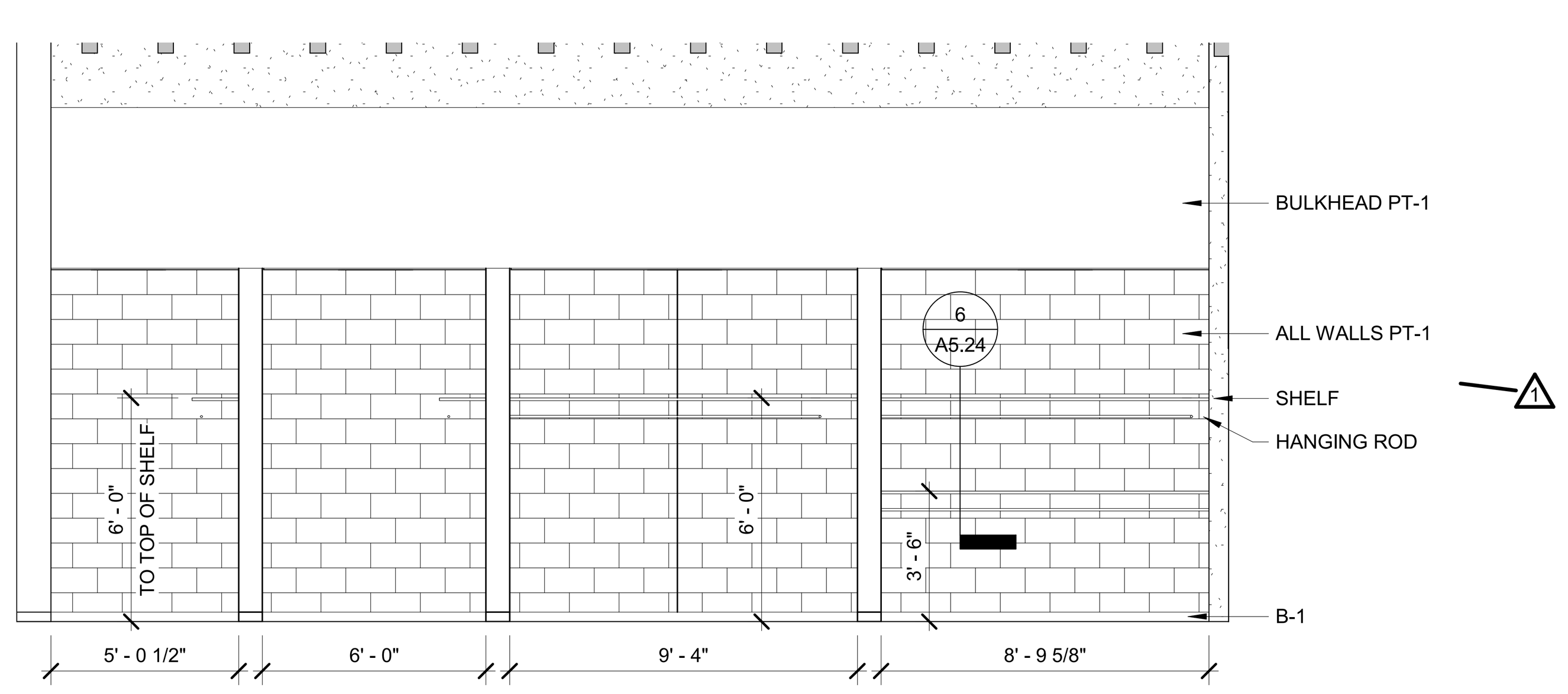
6 A5.20 Interior Elevation
M-4/M-5 - Makeup 3
1/4" = 1'-0"



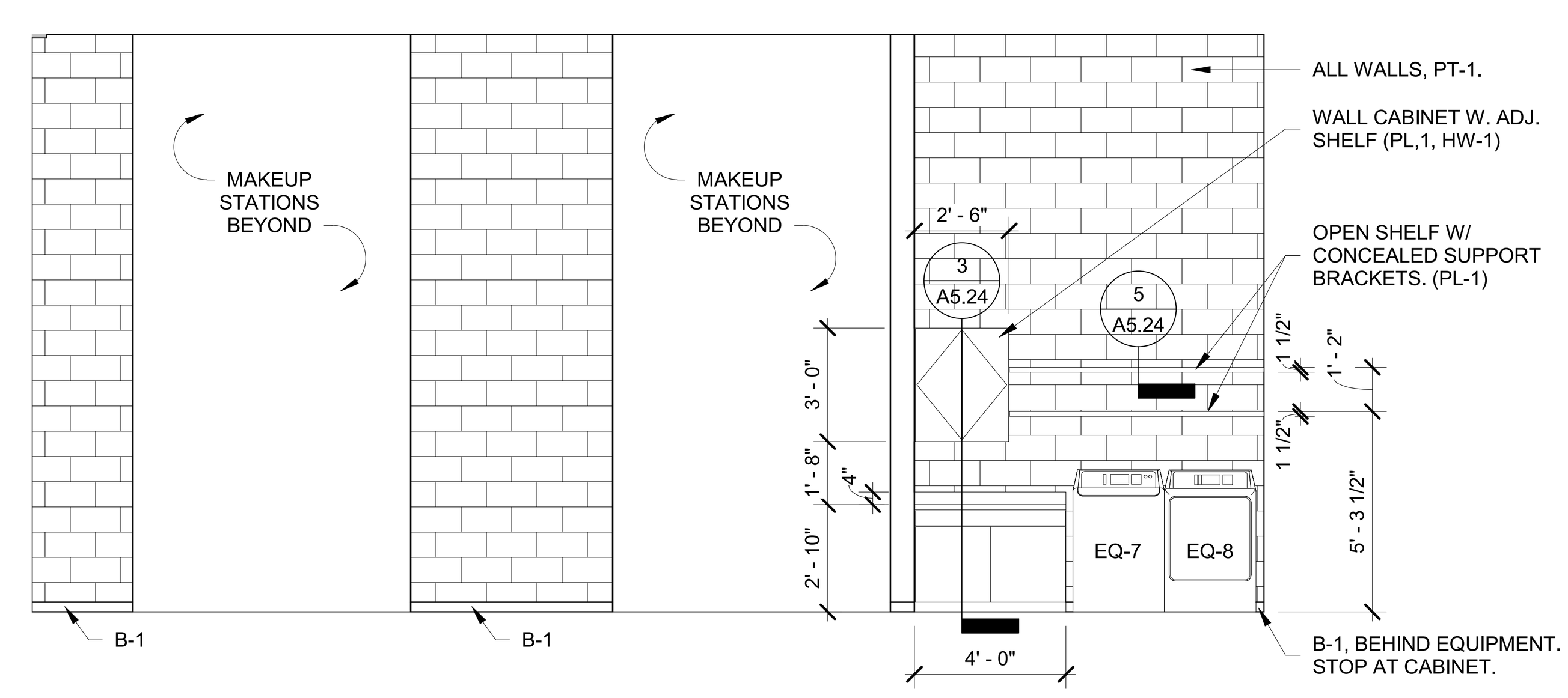
5 A5.20 Interior Elevation
M-4 - Makeup 2
1/4" = 1'-0"



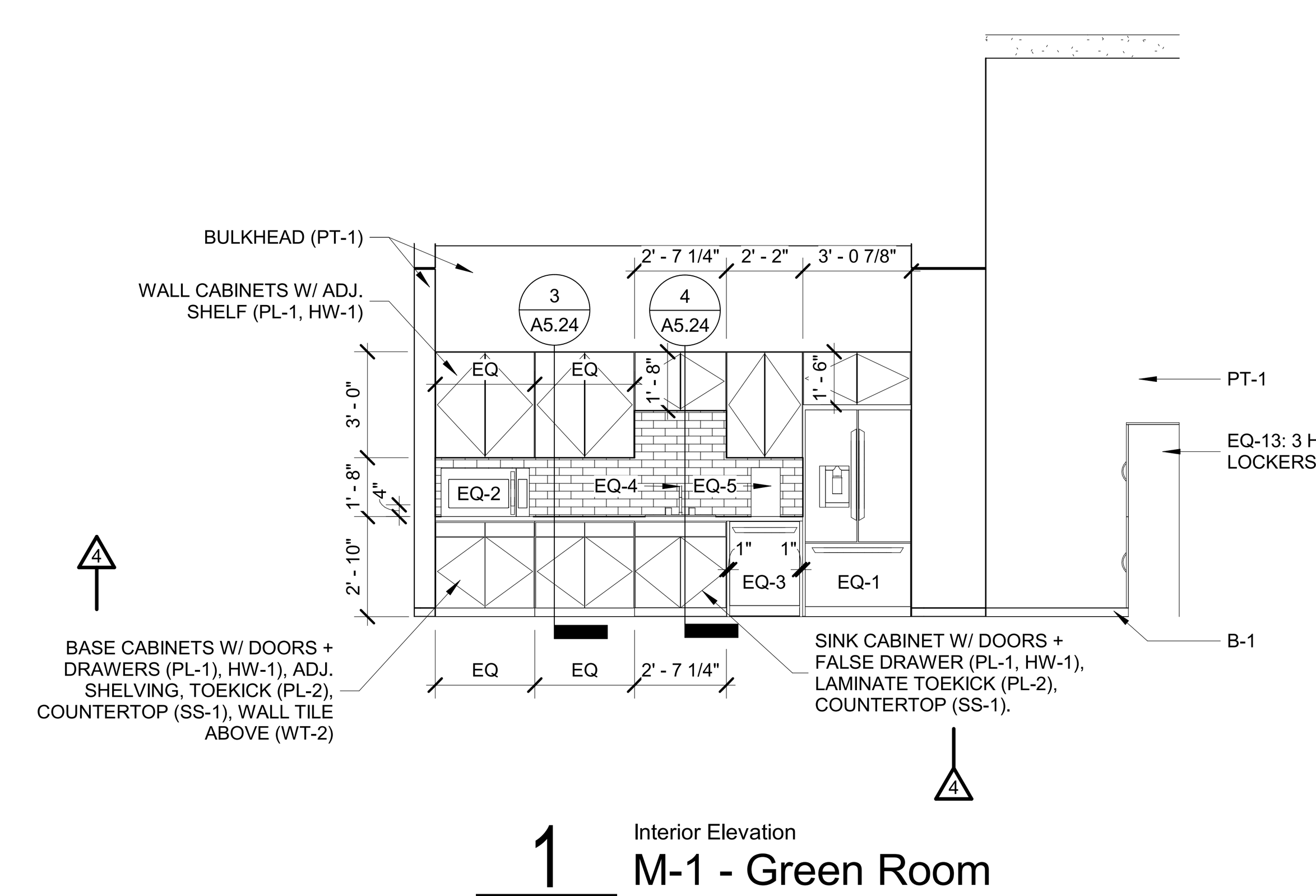
4 A5.20 Interior Elevation
M-4 - Makeup 1
1/4" = 1'-0"



3 A5.20 Interior Elevation
M-3 - DRESSING ROOM
1/4" = 1'-0"



2 A5.20 Interior Elevation
M-2 - Dressing Room
1/4" = 1'-0"



1 A5.20 Interior Elevation
M-1 - Green Room
1/4" = 1'-0"

Dreiser Add #5

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GREGORY E. JACOBY REGISTERED No. AR00860208 STATE OF INDIANA ARCHITECT

CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

Terre Haute, Indiana 47809

Project No.: 19A052
Drawn By: A. Mattingly
Checked By: Checker
Scale: As Noted
Issue Date: June 5, 2020

REVISION SCHEDULE

Rev. #	Revision Description	Issue Date
1	Addendum #1	6/12/2020
2	Addendum #2	6/19/2020
4	Addendum #4	07/01/2020

Millwork & Details

A5.20

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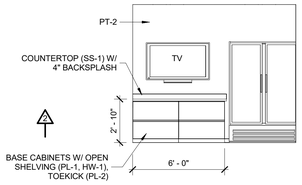
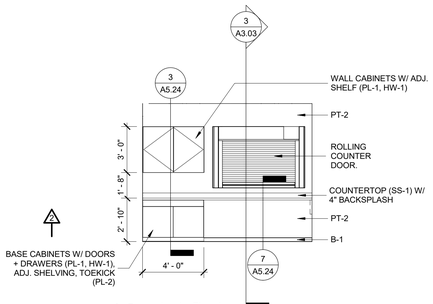
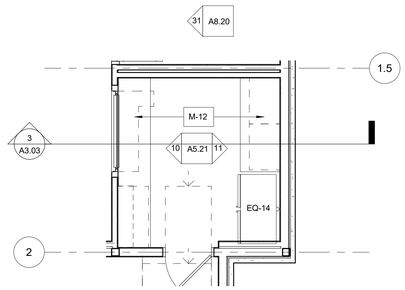
7/2/2020 1:32:40 PM



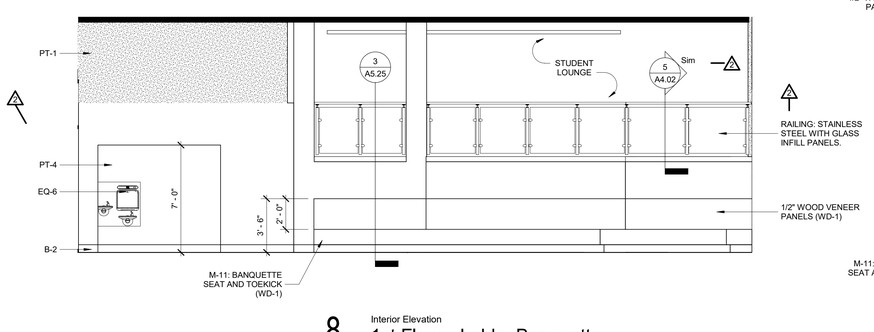
11 Interior Elevation
Conc. 133 - 2
A5.21 1/4" = 1'-0"



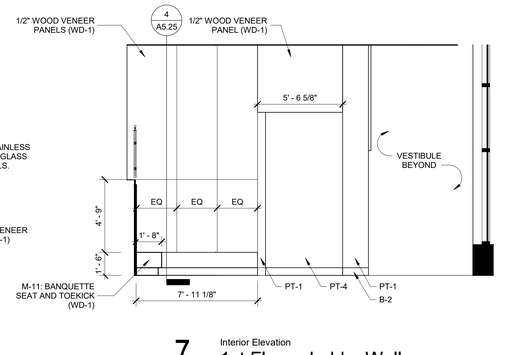
10 Interior Elevation
M-12 - Conc. 133 - 1
A5.21 1/4" = 1'-0"



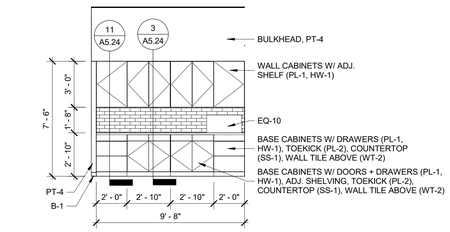
9 Floor Plan
1st Floor - Conc. 133
A5.21 1/4" = 1'-0"



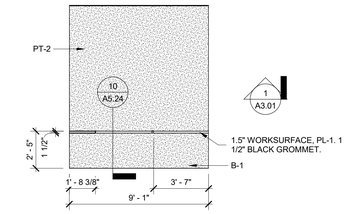
8 Interior Elevation
1st Floor - Lobby Banquette
A5.21 1/4" = 1'-0"



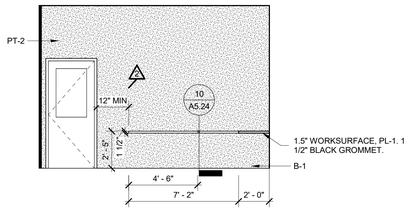
7 Interior Elevation
1st Floor - Lobby Wall
A5.21 1/4" = 1'-0"



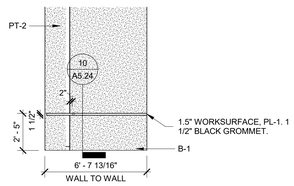
6 Interior Elevation
1st Floor - Unified Media Lab
A5.21 1/4" = 1'-0"



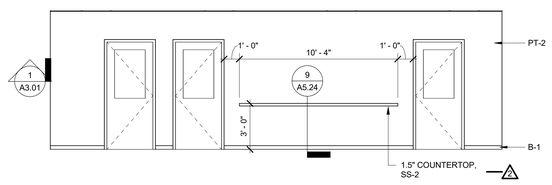
5 Interior Elevation
M-8 - Multi Media 2
A5.21 1/4" = 1'-0"



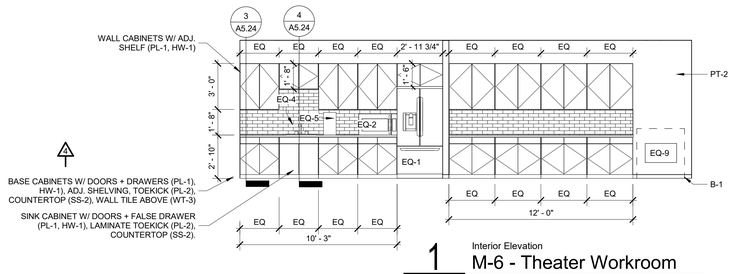
4 Interior Elevation
M-8 - Multi Media 1
A5.21 1/4" = 1'-0"



3 Interior Elevation
M-9 - Multi Media
A5.21 1/4" = 1'-0"



2 Interior Elevation
M-7 - Theater Workroom
A5.21 1/4" = 1'-0"



1 Interior Elevation
M-6 - Theater Workroom
A5.21 1/4" = 1'-0"

Dreiser Add #5

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GREGORY E. JACOBY REGISTERED No. AR20902208 STATE OF INDIANA ARCHITECT

CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

Terre Haute, Indiana 47809

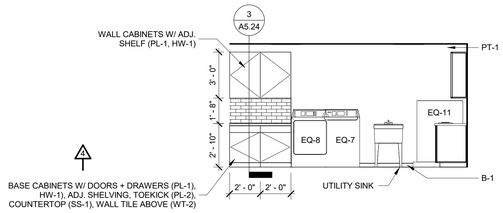
Project No.: 19A052
Drawn By: Author
Checked By: Checker
Scale: As Noted
Issue Date: June 5, 2020

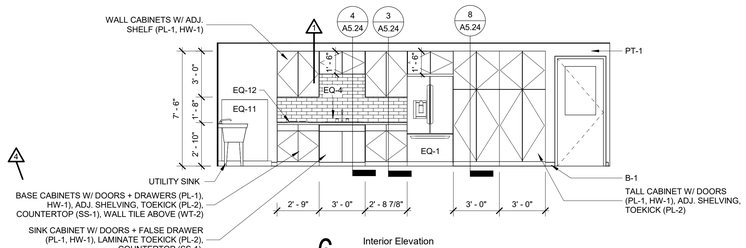
REVISION SCHEDULE

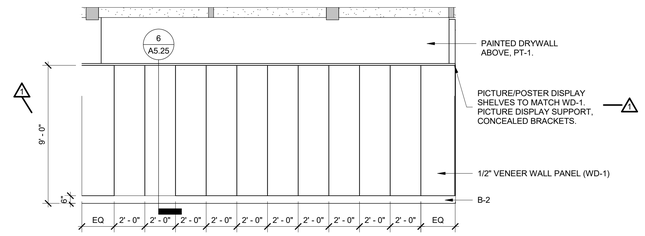
Rev. #	Revision Description	Issue Date
2	Addendum #2	6/19/2020
4	Addendum #4	07/01/2020

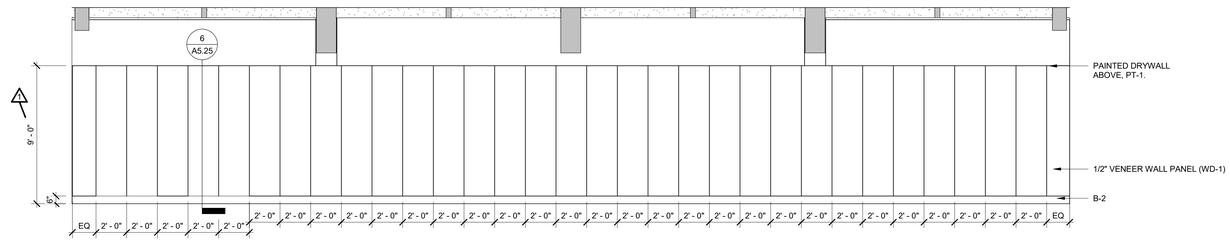
Millwork & Details

A5.21









7 Interior Elevation
2nd Floor - Craft Room 2
A5.22 1/4" = 1'-0"

6 Interior Elevation
2nd Floor - Craft Room 1
A5.22 1/4" = 1'-0"

4 Interior Elevation
2nd Floor - North Corridor Wall
A5.22 1/4" = 1'-0"

3 Interior Elevation
2nd Floor - West Corridor Wall
A5.22 1/4" = 1'-0"

2 Floor Plan
M-13 - Corridor Bench - Typ.
A5.22 1/4" = 1'-0"

1 Interior Elevation
2nd Floor - East Corridor Wall
A5.22 1/4" = 1'-0"

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GREGORY E. JACOBY
No. AR00860208

CERTIFICATION

Construction Documents

Indiana State University -
Dreiser Hall Renovation

Terre Haute, Indiana 47809

Project No.: 19A052
Drawn By: Author
Checked By: Checker
Scale: As Noted
Issue Date: June 5, 2020

REVISION SCHEDULE

Rev. #	Revision Description	Issue Date
1	Addendum #1	6/12/2020
4	Addendum #4	07/01/2020

Millwork & Details

A5.22

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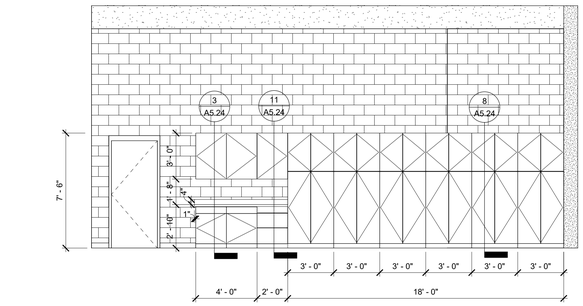
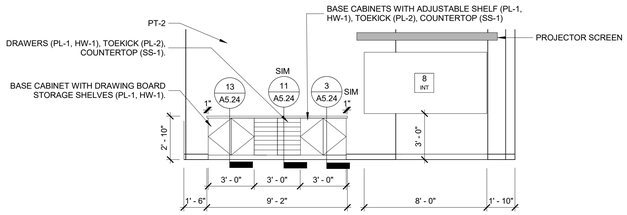
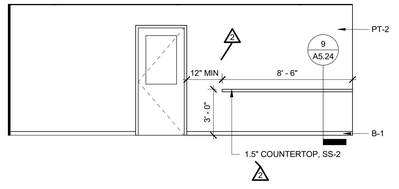


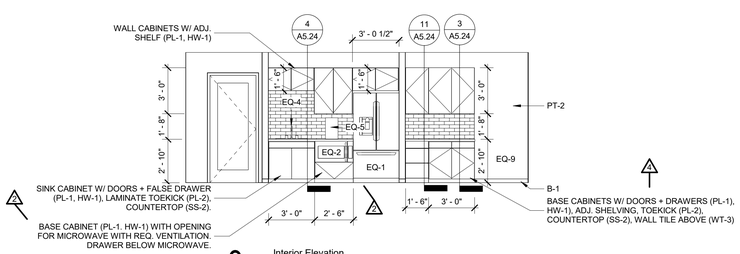
6 Interior Elevation
Performance and Tech Lab
A5.23 1/4" = 1'-0"



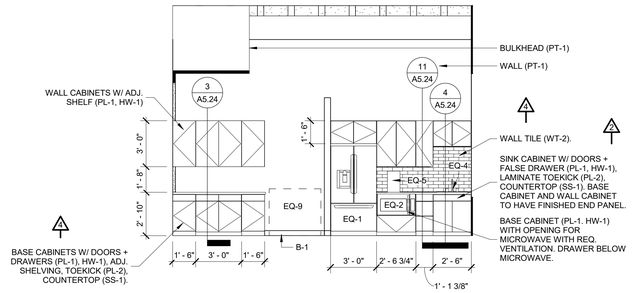
5 Interior Elevation
Design Lab Casework
A5.23 1/4" = 1'-0"



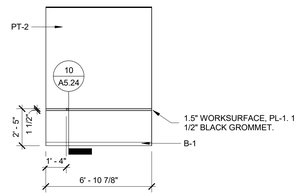
4 Interior Elevation
3rd Floor - Media Workroom 2
A5.23 1/4" = 1'-0"



3 Interior Elevation
3rd Floor - Media Workroom 1
A5.23 1/4" = 1'-0"



2 Interior Elevation
3rd Floor - Audio Commons 1
A5.23 1/4" = 1'-0"



1 Interior Elevation
Audio Studio - Worksurface
A5.23 1/4" = 1'-0"

Dreiser Add #5

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GREGORY E. JACOBY REGISTERED No. AR10600208 STATE OF INDIANA ARCHITECT

CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

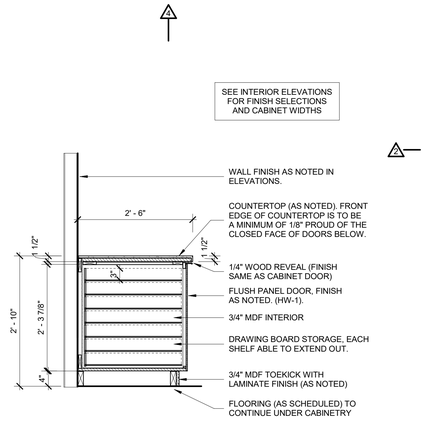
Terre Haute, Indiana 47809

Project No.: 19A052
Drawn By: Author
Checked By: Checker
Scale: As Noted
Issue Date: June 5, 2020

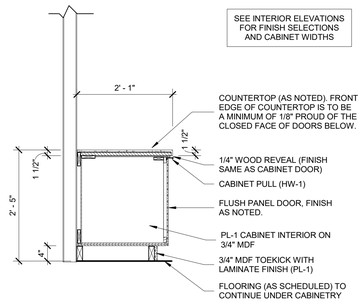
REVISION SCHEDULE		
Rev. #	Revision Description	Issue Date
1	Addendum #1	6/12/2020
2	Addendum #2	6/19/2020
4	Addendum #4	07/01/2020

Millwork & Details

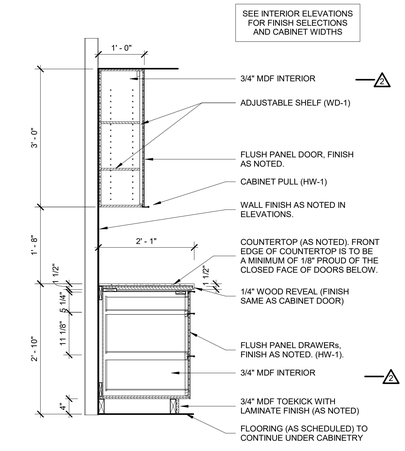
A5.23



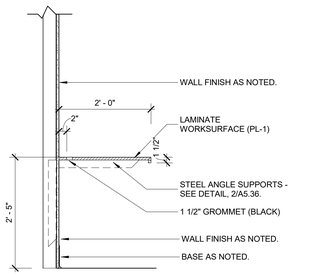
13 Detail
Drawing Board Storage
A5.24 3/4" = 1'-0"



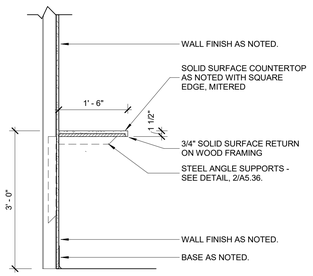
12 Detail
Makeup Room - Base Cabinet
A5.24 3/4" = 1'-0"



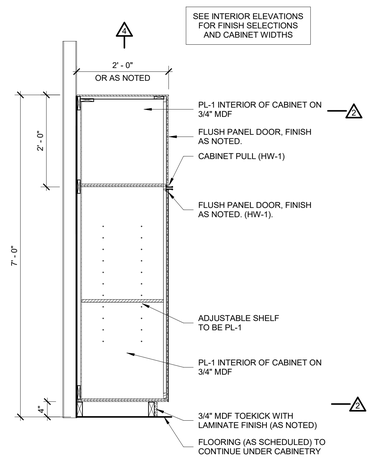
11 Detail
Typ. Base Cabinet w/ Drawers
A5.24 3/4" = 1'-0"



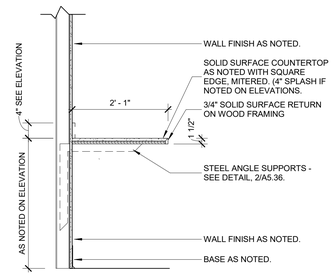
10 Detail
Floating Work Surface - 2
A5.24 3/4" = 1'-0"



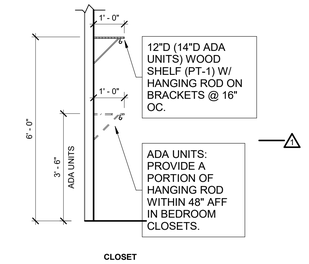
9 Detail
Floating Work Surface - 1
A5.24 3/4" = 1'-0"



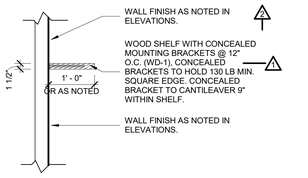
8 Detail
Tall Cabinet
A5.24 3/4" = 1'-0"



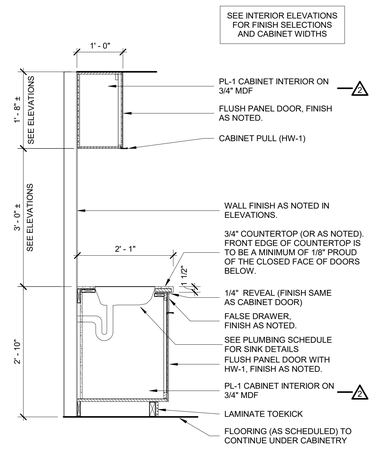
7 Detail
Typ. Floating Countertop
A5.24 3/4" = 1'-0"



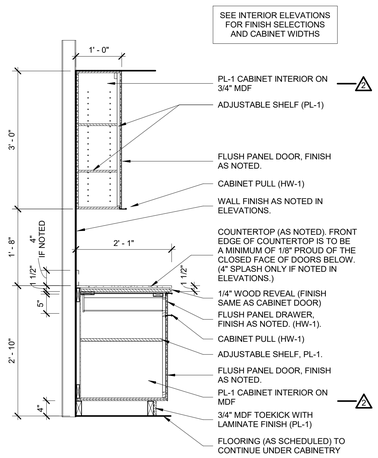
6 Mounting Detail
Shelves - Closet w/rod
A5.24 1/2" = 1'-0"



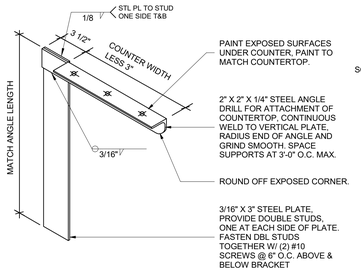
5 Detail
Floating Wall Shelf
A5.24 3/4" = 1'-0"



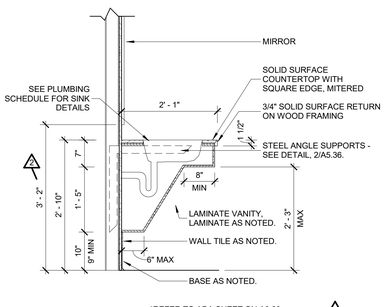
4 Detail
Base Cabinet - Sink
A5.24 3/4" = 1'-0"



3 Detail
Typ. Base + Wall Cabinet
A5.24 3/4" = 1'-0"



2 Detail
Counter Bracket
A5.24 3" = 1'-0"



1 Detail
Typ. Vanity Counter
A5.24 3/4" = 1'-0"

Dreiser Add #5

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GREGORY E. JACOBY REGISTERED No AR00860208 STATE OF INDIANA ARCHITECT

CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

Terre Haute, Indiana 47809

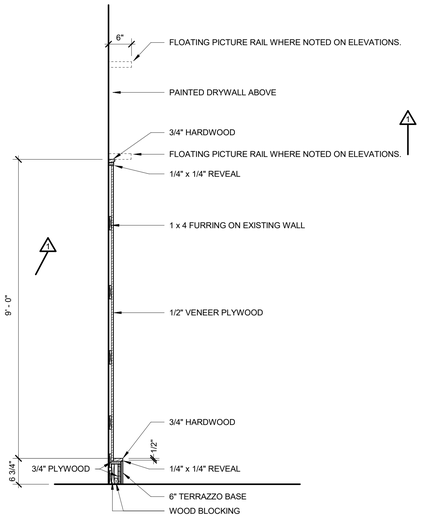
Project No.: 19A052
Drawn By: Author
Checked By: Checker
Scale: As Noted
Issue Date: June 5, 2020

REVISION SCHEDULE

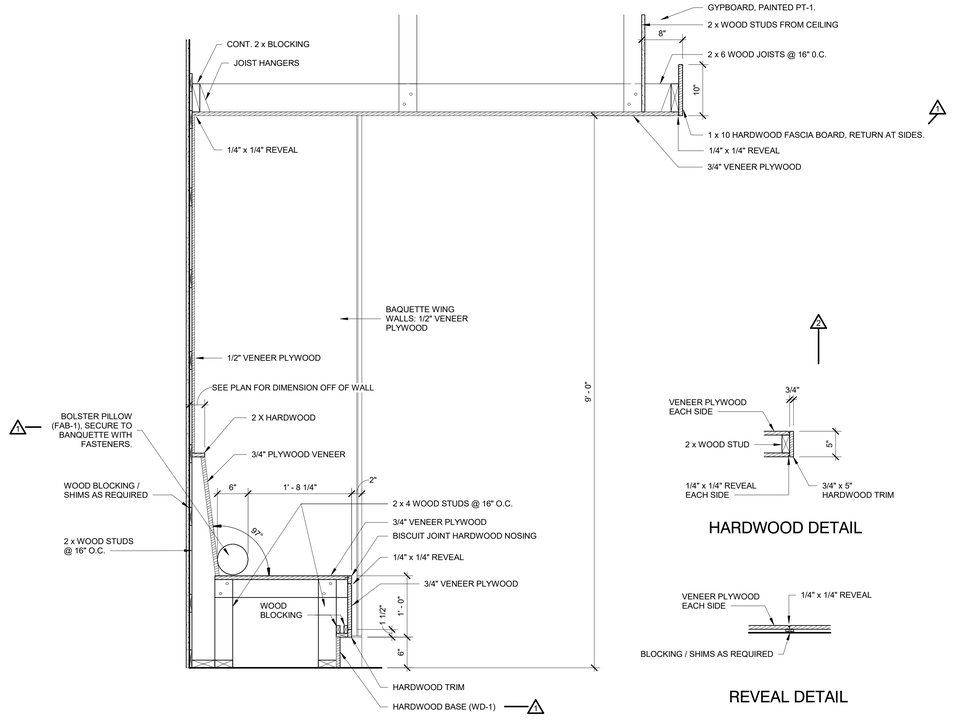
Rev. #	Revision Description	Issue Date
1	Addendum #1	6/12/2020
2	Addendum #2	6/19/2020
4	Addendum #4	07/01/2020

Interior Details

A5.24



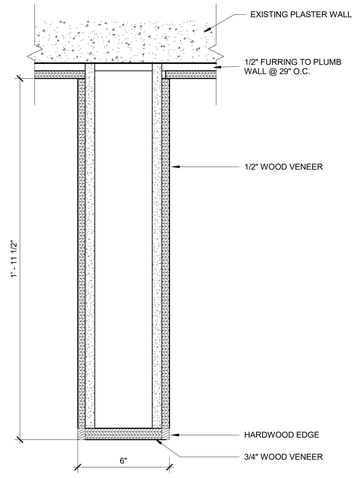
6 Detail
Wall Panel - Section 2
A5.25 3/4" = 1'-0"



5 Detail
Banquette Detail - Corridor
A5.25 1" = 1'-0"

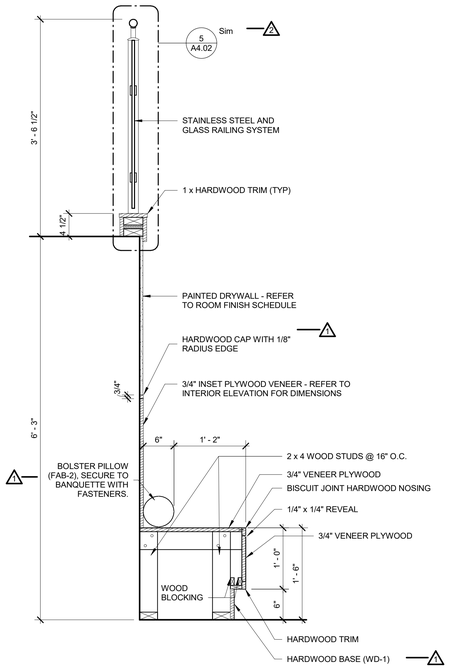
HARDWOOD DETAIL

REVEAL DETAIL

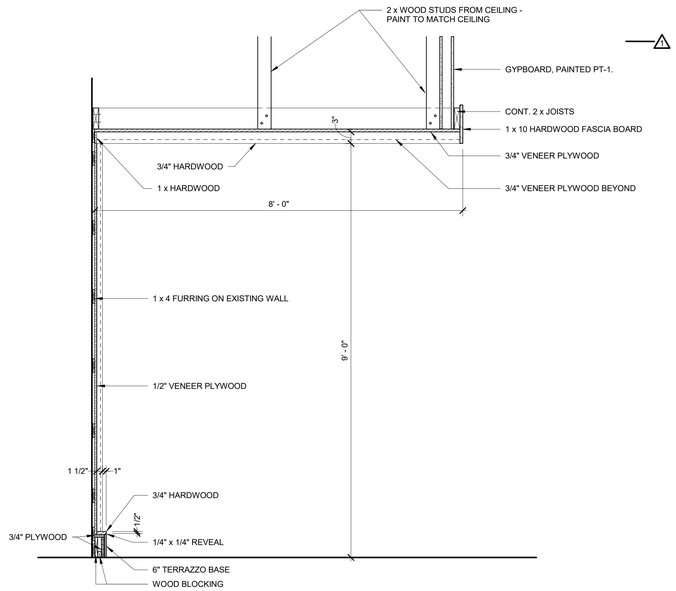


NOTE: ALL VENEER PLYWOOD AND SOLID WOOD TRIM IS QUARTER SAWN OAK WITH SAMPLE APPROVED BY ARCHITECT.

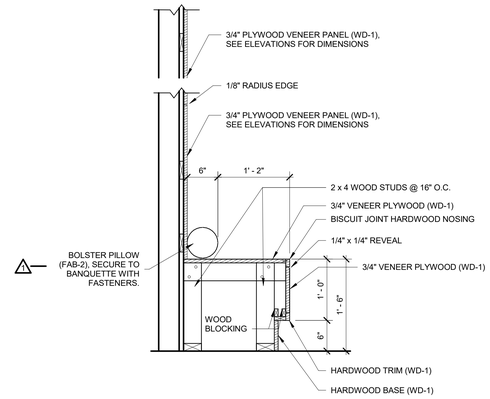
7 Detail
Banquette Wing Wall - Plan
A5.25 3" = 1'-0"



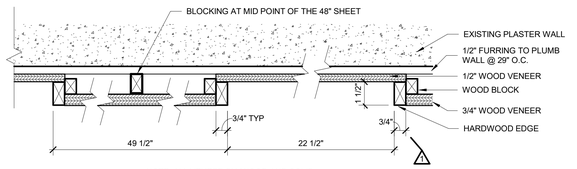
3 Detail
Banquette Detail - Lobby 1
A5.25 1" = 1'-0"



2 Detail
Wall Panel - Section 1
A5.25 3/4" = 1'-0"



4 Detail
Banquette Detail - Lobby 2
A5.25 1" = 1'-0"



NOTE: ALL VENEER PLYWOOD AND SOLID WOOD TRIM IS QUARTER SAWN OAK WITH SAMPLE APPROVED BY ARCHITECT.

1 Detail
Wall Panel Detail - Plan
A5.25 3" = 1'-0"

Dreiser Add #5

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GREGORY E. JACOBY REGISTERED No. AR10600208 STATE OF INDIANA ARCHITECT

CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

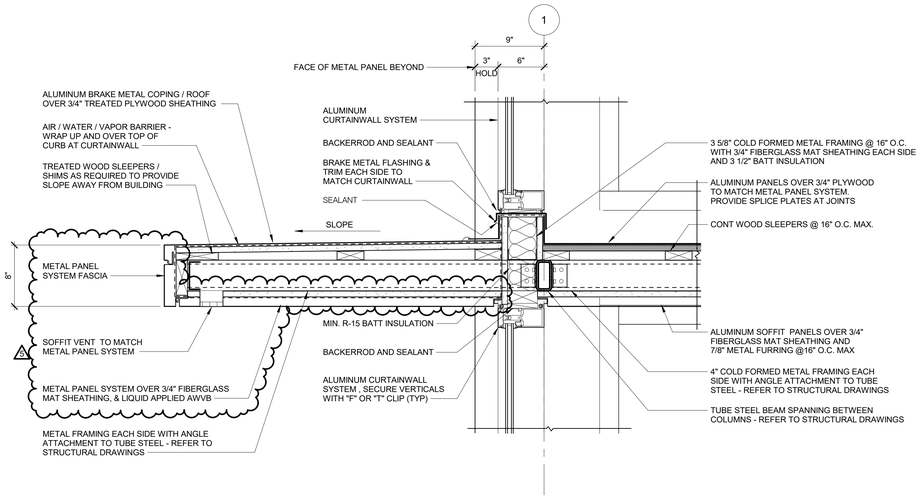
Terre Haute, Indiana 47809

Project No.: 19A052
Drawn By: Author
Checked By: Checker
Scale: As Noted
Issue Date: June 5, 2020

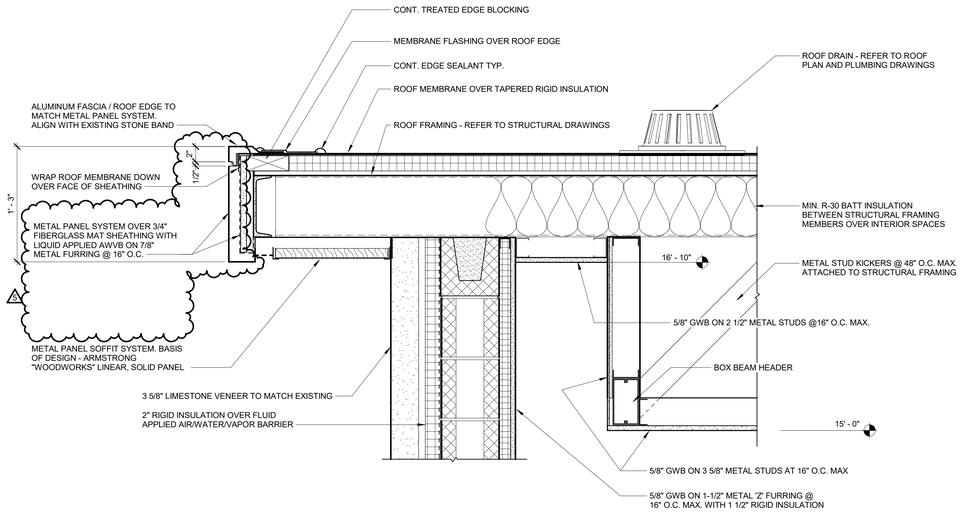
REVISION SCHEDULE		
Rev. #	Revision Description	Issue Date
1	Addendum #1	6/12/2020
2	Addendum #2	6/19/2020

Interior Details

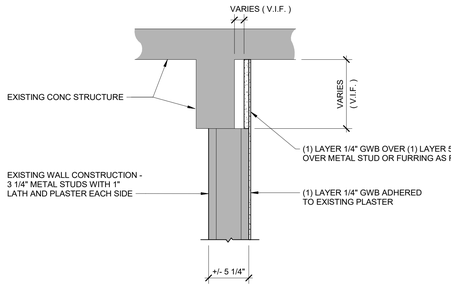
A5.25



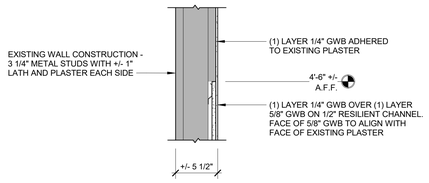
1 Wall Section
Lobby Canopy Detail
A6.02 1 1/2" = 1'-0"



2 Wall Section
Vestibule #129 Roof Detail
A6.02 1 1/2" = 1'-0"

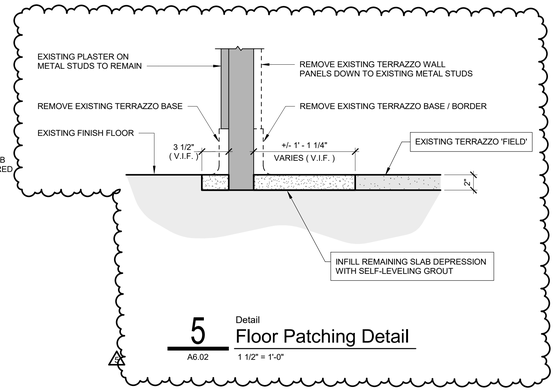


3 Detail
Top of Wall Detail
A6.02 1 1/2" = 1'-0"



NOTE:
CONDITION SHOWN IS AT LOCATIONS OF TERRAZZO WALL PANEL DEMOLITION. REFER TO DEMOLITION DRAWINGS FOR LOCATIONS. REMOVE ANY AND ALL REMAINING CONSTRUCTION DOWN TO FACE OF EXISTING STUD.

4 Detail
Wall Patch @ Terrazzo Demolition
A6.02 1 1/2" = 1'-0"



5 Detail
Floor Patching Detail
A6.02 1 1/2" = 1'-0"

Dreiser Add #5

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GREGORY E. JACOBY REGISTERED No. AR00860208 STATE OF INDIANA ARCHITECT

CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

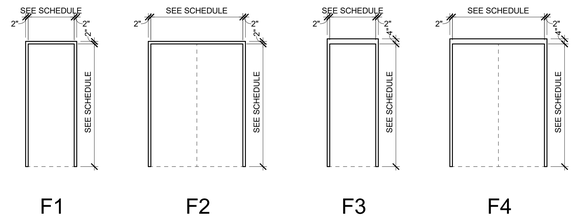
Terre Haute, Indiana 47809

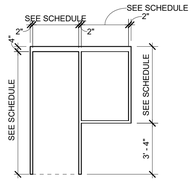
Project No.: 19A052
Drawn By: JPS
Checked By: J. Young
Scale: As Noted
Issue Date: June 5, 2020

REVISION SCHEDULE		
Rev. #	Revision Description	Issue Date
3	Addendum #3	6/26/2020
5	Addendum #5	07/02/2020

Details

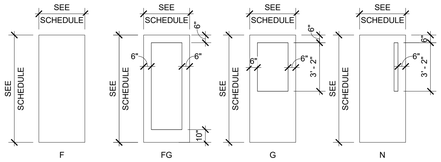
A6.02



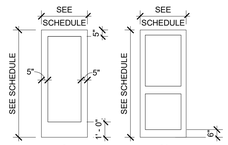


1 Door Frame Elevation

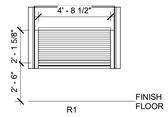
A8.01 1/4" = 1'-0"



STOREFRONT / CURTAINWALL PANELS



ROLLING DOOR



Door Panel Elevations

1/4" = 1'-0"

DOOR SCHEDULE

Mark	Room Name	OPENING Width	OPENING Height	PANEL Config	PANEL Material	PANEL Finish	PANEL Thick.	PANEL 1 Elev.	PANEL 1 Width	PANEL 2 Elev.	PANEL 2 Width	FRAME Elev.	FRAME Material	FRAME Finish	DETAILS Head	DETAILS Jamb	DETAILS Sill	Fire Rating	Hardware Set	Elec.	Comments
Basement																					
001-1	STORAGE	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F3	HM	PT	H2	J2			15.0		
002-1	SOUTH CORRIDOR	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F3	HM	PT	H1	J1			15.0		
005-1	SERVICES	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F3	HM	PT	H2	J2			20.0		
006-1	GREEN ROOM	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F3	HM	PT	H2	J2			20.0		
006-2	GREEN ROOM	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F3	HM	PT	H2	J2			21.0		
007-1	STORAGE	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F3	HM	PT	H1	J1			16.0		
009-1	COSTUME STORAGE	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F3	HM	PT	H2	J2			16.0		
010-2	MACHINE ROOM	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F3	HM	PT	H2	J2			15.0		
011-1	CORR	6' - 0"	7' - 0"	PAIR	HM	PT	1 3/4"	F	3' - 0"	F	3' - 0"	F4	HM	PT	H2	J2	S2		10.0		Frame to be grouted full. Perimieter seals/gasketing required.
011-2	NORTH CORRIDOR	6' - 0"	7' - 0"	PAIR	HM	PT	1 3/4"	F	3' - 0"	F	3' - 0"	F4	HM	PT	H2	J2	S2		10.0		Frame to be grouted full. Perimieter seals/gasketing required.
011A-1	SHOP OFFICE	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	G	3' - 0"			F3	HM	PT	H1	J2			19.0		
011B-1	TOOL ROOM	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F3	HM	PT	H2	J2			24.0		
011C-1	SHOP UTILITIES	6' - 0"	7' - 0"	PAIR	HM	PT	1 3/4"	F	3' - 0"	F	3' - 0"	F4	HM	PT	H1	J1			11.0		
012C-1	CLOSET	2' - 8"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	2' - 8"			F3	HM	PT	H2	J2			29.0		
013-1	TCOMM	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F3	HM	PT	H1	J1			16.0		
014-1	PERFORMANCE AND TECH LAB	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F3	HM	PT	H2	J2			23.0		
015-1	NORTH CORRIDOR	6' - 0"	7' - 0"	PAIR	HM	PT	1 3/4"	F	2' - 6"	F	2' - 6"	F4	HM	PT	H2	J2	S2		1.0		Electronic Access Control and Card Reader
016-1	MAKEUP / DRESSING	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F3	HM	PT	H1	J1			24.0		
016A-1	UNISEX ADA TOILET ROOM	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F3	HM	PT	H1	J1			26.0		
016B-1	UNISEX ADA TOILET ROOM	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F3	HM	PT	H1	J1			27.0		
016C-1	UNISEX ADA SHOWER ROOM	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F3	HM	PT	H1	J1			27.0		
017-1	MEN	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F1	HM	PT	H3	J3			33.0		
018-1	WOMEN	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F3	HM	PT	H1	J1		120 min.	33.0		
S100-1	STAIR #1	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F3	HM	PT	H2	J2		120 min.	8.0		
S300-1	STAIR #3	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F3	HM	PT	H2	J2		120 min.	8.0		
1st Floor																					
101-1		6' - 0"	7' - 0"	PAIR	ALUM	ALUM	1 3/4"	S	3' - 0"	S	3' - 0"		ALUM	ALUM	SEE A8.20	SEE A8.20	SEE A8.20		2.0		Electronic Access Control and Card Reader
101-2	STORAGE	5' - 0"	7' - 0"	PAIR	HM	PT	1 3/4"	F	2' - 6"	F	2' - 6"	F4	HM	PT	H2	J2		120 min.	5.0		
101-3	CORRIDOR	6' - 0"	8' - 0"	PAIR	HM	PT	1 3/4"	F	3' - 0"	F	3' - 0"	F4	HM	PT	H2	J2	S2		1.0		Electronic Access Control and Card Reader
101-4	CORRIDOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F3	HM	PT	H1	J1			16.0		STC 51
101A-1	CORRIDOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H3	J3			14.0		
102-1	RESTRM	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H3	J3			28.0		
103-1	OFFICE #1	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			19.0		
104-1	OFFICE #2	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			19.0		
105-1	OFFICE #3	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			19.0		
106-1	OFFICE #4	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			19.0		
108-1	THEATER OFFICE	3' - 0"	7' - 0"	SINGLE	WD	ALUM	1 3/4"	FG	3' - 0"				ALUM								
110-1	OFFICE #5	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			19.0		
111-1	OFFICE #6	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			19.0		
112-1	OFFICE #7	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			19.0		
114-1	STOR.	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H3	J3			15.0		
114-2	STOR.	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F3	HM	PT	H2	J2			14.0		
114-3	STOR.	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F3	HM	PT	H2	J2	S2		25.0		STC 51
115-1	THEATER	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H3	J3			17.0		STC 51
116-1	LIGHT LOCK	8' - 0"	7' - 0"	PAIR	WD	STAIN	1 3/4"	F	4' - 0"	F	4' - 0"	F2	HM	PT	H3	J3	S2 SIM		4.0		
116-2	LIGHT LOCK	8' - 0"	7' - 0"	PAIR	WD	STAIN	1 3/4"	F	4' - 0"	F	4' - 0"	F2	HM	PT	H3	J3			6.0		Frame to be grouted full. Perimeter seals/gasketing required. Acoustical core door required. STC 41
117-1	LIGHT LOCK	3' - 0"	8' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H3	J3	S2 SIM		7.0		
117-2	LIGHT LOCK	3' - 0"	8' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H3	J3	S2 SIM		10.0		STC 41
118-1	STAGE	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F3	HM	PT	H2	J2			23.0		
118-2	STAGE	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F3	HM	PT	H2	J2	S2		10.0		STC 51
120-1	VESTIBULE	6' - 0"	7' - 0"	PAIR	ALUM	ALUM	1 3/4"	S	3' - 0"	S	3' - 0"		ALUM	ALUM	SEE A8.20	SEE A8.20	SEE A8.20		2.0		Electronic Access Control and Card Reader
120-2	EAST CORRIDOR	6' - 0"	7' - 0"	PAIR	ALUM	ALUM	1 3/4"	S	3' - 0"	S	3' - 0"		ALUM	ALUM	SEE A8.20	SEE A8.20			2.0		Electronic Access Control and Card Reader
121-1	MULTI-MEDIA BOOTH	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3	S2 SIM		22.0		STC 45
122-1	MULTI-MEDIA BOOTH	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3	S2 SIM		22.0		STC 45
123-1	PUBLICATIONS DIRECTOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			19.0		
124-1	EAST CORRIDOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	FG	3' - 0"				ALUM	ALUM	SEE A8.20	SEE A8.20			24.0		
125-1	STOR.	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H3	J3			15.0		
126-1	STOR.	5' - 0"	7' - 0"	PAIR	WD	STAIN	1 3/4"	F	2' - 6"	F	2' - 6"	F4	HM	PT	H3	J3			12.0		
126A-1	STOR.	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F3	HM	PT	H3	J3			9.0		
130-1	MEN	3' - 0"	8' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H3	J3			33.0		
131-1	WOMEN	3' - 0"	8' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H3	J3			33.0		
133-1	CONC.	3' - 0"	8' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H3	J3			20.0		
133-2	CONC.	6' - 0"	4' - 0"		STL	MFGR						R1	HM	MFGR	H5	J5	S5		34.0		Rolling concessions door. Sill provided by manufacturer.
134-1	VESTIBULE	6' - 0"	8' - 0"	PAIR	ALUM	ALUM	1 3/4"	S	3' - 0"	S	3' - 0"		ALUM	ALUM	SEE A8.20	SEE A8.20			2.0		Electronic Access Control and Card Reader
134-2	VESTIBULE	6' - 0"	8' - 0"	PAIR	ALUM	ALUM	1 3/4"	S	3' - 0"	S	3' - 0"		ALUM	ALUM	SEE A8.20	SEE A8.20			2.0		
134-5	STOR.	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H3	J3			15.0		
135-1	SOUTH CONTROL ROOM	3' - 6"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 6"			F1	HM	PT	H2	J2			14.0		
135-2	NORTH CONTROL ROOM	3' - 0"	6' - 3"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H2	J2			15.0		
135-3	CORRIDOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H2	J2			15.0		
S101-1	STAIR #1	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F1	HM	PT	H3	J3		120 min.	8.0		
S201-1	STAIR #2	6' - 0"	7' - 0"	PAIR	ALUM	ALUM	1 3/4"	S	3' - 0"	S	3' - 0"		ALUM	ALUM	SEE A8.20	SEE A8.20	SEE A8.20		3.0		
2nd Floor																					
201-1	STORAGE	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F1	HM	PT	H3	J3					
202-1	SERVICES	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H2	J2			13.0		
203-1	GENERAL CLASSROOM	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H2	J2	S2		25.0		
204-1	SOUTH CORRIDOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H2	J2			33.0		
205-1	SOUTH CORRIDOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3	S2 SIM		10.0		
205-2	EAST CORRIDOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3	S2 SIM		10.0		
207-1	EAST CORRIDOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H2	J2			24.0		
210-1	GENERAL CLASSROOM	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H2	J2			24.0		
211-1	TCOMM	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			16.0		
212-1	EAST CORRIDOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			23.0		
213-1	NORTH CORRIDOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			23.0		
213-2	GENERAL CLASSROOM	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H3	J3			29.0		
215-1	NORTH CORRIDOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H2	J2			33.0		
216-1	NORTH CORRIDOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H2	J2	S2		25.0		
216-2	GENERAL CLASSROOM	2' - 6"	7' - 0"	SINGLE	WD		1 3/4"	F	2' - 6"			F1	HM	PT	H3	J3			29.0		
217-1	NORTH CORRIDOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H2	J2			23.0		
217-2	STO	2' - 6"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	2' - 6"			F1	HM	PT	H2	J2			30.0		
218-1	NORTH CORRIDOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			24.0		
221-1	COSTUME SHOP	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H3	J3			26.0		
222-1	CRAFTS ROOM	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			23.0		
222-2	DESIGN LAB	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			23.0		
223-1	COSTUME SHOP	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			24.0		
224-1	SHOP MANAGER'S OFFICE	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			19.0		
S102-1	STAIR #1	3' - 0"	7' - 0"	SINGLE	HM	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H2	J2		120 min.	8.0		
S102-2	STAIR #1	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H2	J2			8.0		Door to be fixed in place.
S302-1	NORTH CORRIDOR	5' - 0"	7' - 0"	PAIR	HM	PT	1 3/4"	F	2' - 6"	F	2' - 6"	F2	HM	PT	H2	J2		120 min.	5.0		
3rd Floor																					
301-1	HALL	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H3	J3			16.0		
302-1	STORAGE	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H2	J2			13.0		
303-1	TV MANAGER	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			19.0		
304-1	SOUTH CORRIDOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	FG	3' - 0"			F1	HM	PT	H3	J3			20.0		
305-1	SPORTS MANAGER	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			19.0		
306-1	SOUTH CORRIDOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H2	J2			33.0		
307-1	SYCAMORE CREATIONS MANAGER	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			19.0		
308-1	SOUTH CORRIDOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	FG	3' - 0"			F1	HM	PT	H3	J3			31.0		
308-2	WORKRM/ CIRCULATION	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			31.0		
308A-1	CONF. RM.	2' - 6"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	2' - 6"			F1	HM	PT	H3	J3			30.0		
310-1	ADMIN. ASSISTANT	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			19.0		
311-1	EAST CORRIDOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	FG	3' - 0"				ALUM	ALUM	SEE A8.20	SEE A8.20			21.0		
312-1	STUDENT MEDIA EXECUTIVE DIRECTOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			19.0		
313-1	VIDEO EDITING	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3	S2 SIM		22.0		STC 45
314-1	STORAGE	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H3	J3			29.0		
315-1	EAST CORRIDOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	FG	3' - 0"				ALUM	ALUM	SEE A8.20	SEE A8.20			20.0		
318-1	RADIO STUDIO #1	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3	S2 SIM		22.0		Laboratory rated to meet STC rating in acoustical report. Perimeter seals/gasketing required. STC 45
319-1	RADIO STUDIO #2	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3	S2 SIM		22.0		STC 45
321-1	FM RADIO STATION MANAGER	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			19.0		
322-1	RADIO STUDIO #3	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3	S2 SIM		22.0		STC 45
325-1	AUDIO STUDIO #1	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3	S2 SIM		22.0		STC 45
326-1	AUDIO STUDIO #2	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3	S2 SIM		22.0		STC 45
327-1	AUDIO STUDIO #3	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3	S2 SIM		22.0		STC 45
328-1	SALES MANAGER	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			19.0		
329-1	NORTH CORRIDOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H2	J2			33.0		
330-1	PUBS. ASSIST.	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			19.0		
331-1	NORTH CORRIDOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	FG	3' - 0"			F1	HM	PT	H2	J2			20.0		
331-2	PUBS. OFFICE	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H2	J2			29.0		
332-1	NORTH CORRIDOR	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	FG	3' - 0"			F1	HM	PT	H2	J2			20.0		
332-2	MULTIMEDIA SALES	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H2	J2			30.0		
333-1	NORTH CORRIDOR	6' - 0"	7' - 0"	PAIR	WD	STAIN	1 3/4"	G	3' - 0"	G	3' - 0"	F2	HM	PT	H2	J2	S2		18.0		STC 45
333-2	ESPN3	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3	S2		22.0		STC 45
333-3	CONTROL ROOM	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			22.0		STC 45
334-1	CONTROL ROOM	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3			20.0		
335-1	ESPN3	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	FG	3' - 0"				ALUM	ALUM	SEE A8.20	SEE A8.20			20.0		
336-1	VIDEO EDIT.	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	G	3' - 0"			F1	HM	PT	H3	J3	S2 SIM		22.0		
336-2	VIDEO EDIT.	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H3	J3	S2 SIM		32.0		STC 45
337-1	HALL	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H3	J3			20.0		
S103-1	STAIR #1	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F1	HM	PT	H2	J2		120 min.	8.0		
S103-2	STAIR #1	3' - 0"	7' - 0"	SINGLE	WD	STAIN	1 3/4"	F	3' - 0"			F1	HM	PT	H2	J2			34.0		Door to be fixed in place.
S303-1	STAIR #3	5' - 0"	7' - 0"	PAIR	HM	PT	1 3/4"	F	2' - 6"	F	2' - 6"	F4	HM	PT	H2	J2		120 min.	5.0		
S303-2	STAIR #3	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F3	HM	PT	H2	J2			15.0		
Lower Roof																					
S104-2	AIR LOCK	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F1	HM	PT	H3	J3			15.0		
S104-3	AIR LOCK	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F3	HM	PT	H2	J2	S2		2.1		
S304-1	STAIR #3	3' - 0"	7' - 0"	SINGLE	HM	PT	1 3/4"	F	3' - 0"			F3	HM	PT	H2	J2	S2		2.1		

Dreiser Add #5

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GREGORY E. JACOBY REGISTERED No. AR10900208 STATE OF INDIANA ARCHITECT

CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

Terre Haute, Indiana 47809

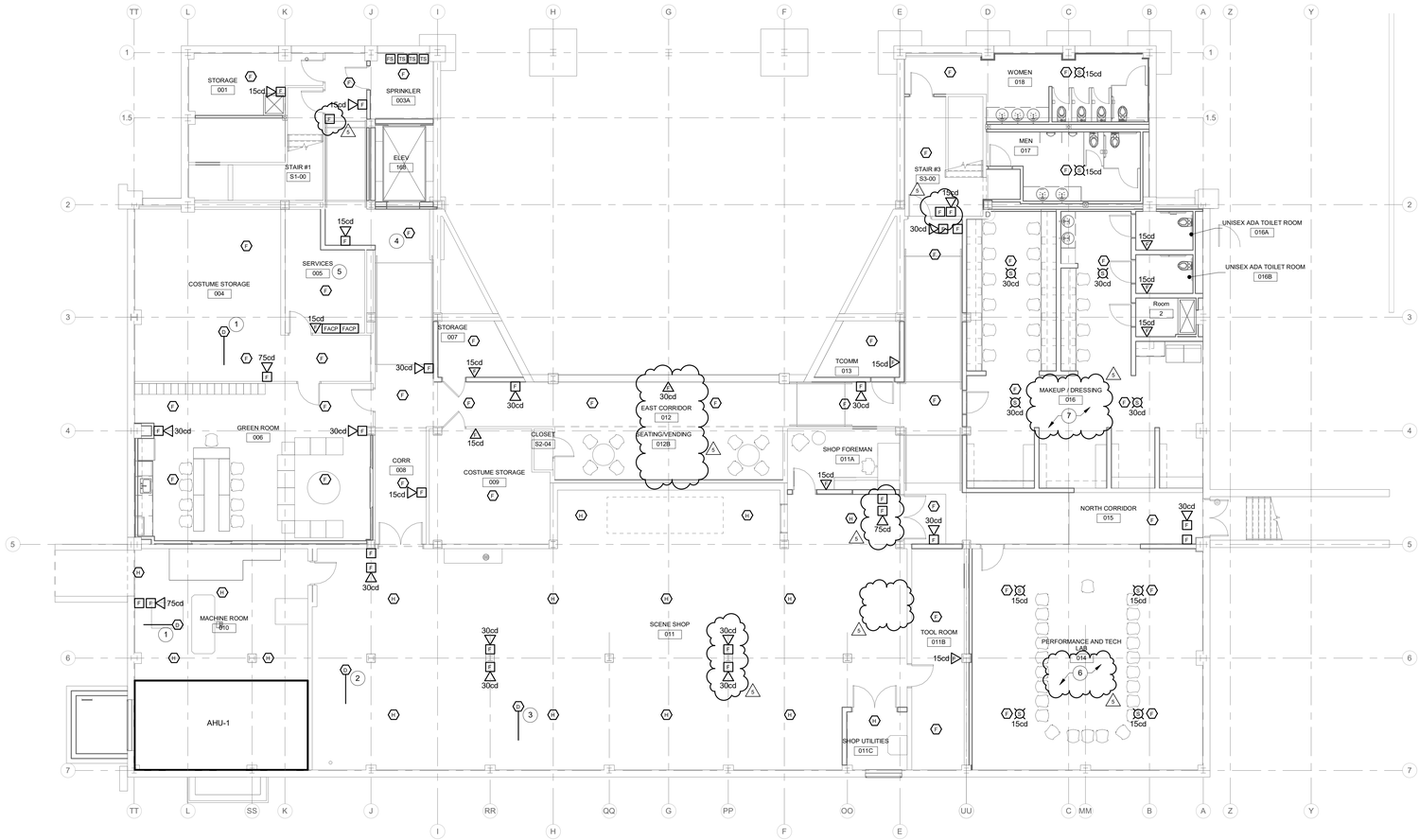
Project No.: 19A052
Drawn By: J. Young
Checked By: Checker
Scale: As Noted
Issue Date: June 5, 2020

REVISION SCHEDULE

Rev. #	Revision Description	Issue Date
1	Addendum #1	6/12/2020
2	Addendum #2	6/19/2020
5	Addendum #5	07/02/2020

Door Schedule and Frame Elevations

A8.01



BASEMENT PLAN - FIRE ALARM

SCALE: 1/8" = 1'-0"

NORTH

RENOVATION LEGEND:

WORK TO BE INSTALLED

WORK TO REMAIN

GENERAL NOTES:

1. REFER TO SHEET E0.1 FOR ADDITIONAL GENERAL NOTES.
2. FOR CEILING MOUNTED FIRE ALARM DEVICES, MOUNT SO DEVICE IS VISIBLE AND PROVIDE PENDANT WHERE REQUIRED SO DEVICE IS LEVEL WITH LOWEST NEARBY PIPING, DUCTWORK, LIGHT FIXTURE, ETC.

PLAN NOTES:

1. INSTALL DUCT SMOKE DETECTOR IN RETURN AIR DUCT. WIRE TO SHUT DOWN AHU-1 DURING ALARM.
2. INSTALL DUCT SMOKE DETECTOR IN SUPPLY AIR DUCT. WIRE TO SHUT DOWN AHU-1 DURING ALARM.
3. INSTALL DUCT SMOKE DETECTOR IN RETURN AIR DUCT. WIRE TO SHUT DOWN AHU-2 DURING ALARM.
4. INTERLOCK SMOKE DETECTOR FOR ELEVATOR RECALL.
5. PROVIDE FIRE ALARM CONTROL PANEL(S). INTERLOCK WITH THEATER LIGHTING CONTROLS IN THIS ROOM TO RUN THEATER LIGHTS ON TO 100% DURING ANY ALARM IN THE THEATER AREA.
6. CEILING MOUNTED SPEAKER/STROBES TO BE LEVEL WITH PIPE GRID IN THIS AREA IF PIPE GRID ALTERNATE IS TAKEN. CONFIRM IN FIELD.
7. PROVIDE PENDANT STEM FOR CEILING SPEAKER STROBES IN THIS AREA SO DEVICES ARE LEVEL WITH BOTTOM OF LIGHT FIXTURES.

Dreiser Add #5

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REGISTERED
No. PE60910351
STATE OF INDIANA
PROFESSIONAL ENGINEER

CERTIFICATION 06/05/2020

100% CONSTRUCTION DOCUMENTS

Indiana State University - Dreiser Hall Renovation

221 North 6th Street
Terre Haute, IN 47809

Project No.: 19A052
Drawn By: JPS
Checked By: TEH
Scale: See Drawing
Issue Date: 06/05/2020

REVISION SCHEDULE		
Rev. #	Revision Description	Issue Date
5	ADDENDUM #5	2020-07-02

BASEMENT PLAN - FIRE ALARM

E2.30

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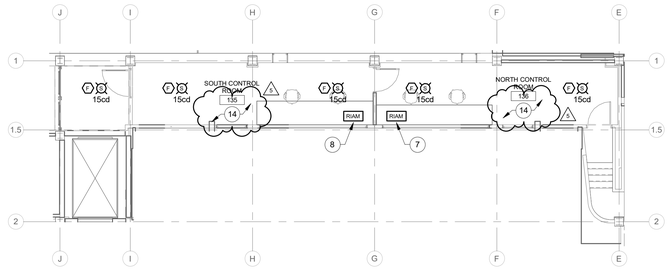
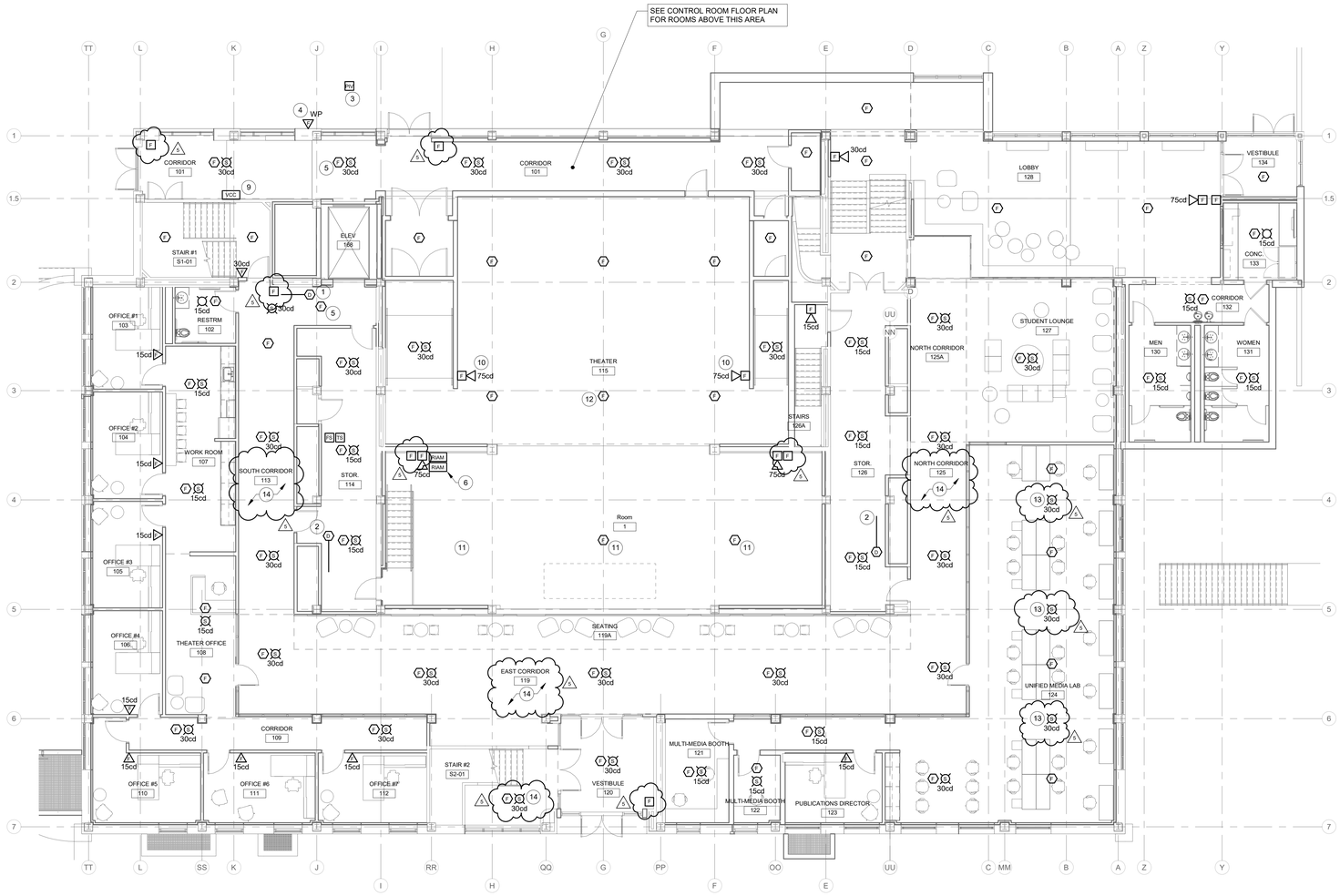


CONTROL ROOM FLOOR PLAN - FIRE ALARM

SCALE: 1/8" = 1'-0"

NORTH



FIRST FLOOR PLAN - FIRE ALARM

SCALE: 1/8" = 1'-0"

NORTH

RENOVATION LEGEND:

WORK TO BE INSTALLED

WORK TO REMAIN

GENERAL NOTES:

1. REFER TO SHEET E0.1 FOR ADDITIONAL GENERAL NOTES.
2. FOR CEILING MOUNTED FIRE ALARM DEVICES, MOUNT SO DEVICE IS VISIBLE AND PROVIDE PENDANT WHERE REQUIRED SO DEVICE IS LEVEL WITH LOWEST NEARBY PIPING, DUCTWORK, LIGHT FIXTURE, ETC. △

PLAN NOTES:

1. INSTALL DUCT SMOKE DETECTOR IN RETURN DUCT AND WIRE TO SHUT DOWN AHU-1 IN BASEMENT DURING ALARM.
2. INSTALL DUCT SMOKE DETECTOR IN SUPPLY DUCT AND WIRE TO SHUT DOWN AHU-1 IN BASEMENT DURING ALARM.
3. PROVIDE CONNECTION TO TAMPER SWITCHES AT VALVE PIT AND PIV. PROVIDE CIRCUIT PROTECTOR.
4. PROVIDE WEATHERPROOF STROBE AT FIRE DEPARTMENT CONNECTION AREA. COORDINATE IN FIELD.
5. INTERLOCK SMOKE DETECTOR FOR ELEVATOR RECALL.
6. PROVIDE CONTROL RELAY IAM AND WIRE TO EXISTING RELOCATED SMOKE EVAC FANS AND PROGRAM TO TURN ON FANS DURING ANY SMOKE ALARM CONDITION IN THE THEATER AREAS.
7. PROVIDE CONTROL RELAY IAM TO TURN THEATER AREA LIGHTING ON TO 100 PERCENT DURING ANY FIRE ALARM CONDITION. INTERLOCK WITH LIGHTING CONTROLS IN BASEMENT SERVICES 005.
8. PROVIDE CONTROL RELAY IAM TO SHUNT THEATER SOUND SYSTEM DURING ANY FIRE ALARM CONDITION. ALSO INTERLOCK WITH SOUND SYSTEM CONTROLS IN STORAGE 114.
9. PROVIDE VOICE COMMAND CENTER AND INTERLOCK WITH FIRE ALARM CONTROL PANEL IN BASEMENT SERVICES 005.
10. VERIFY SPEAKER/STROBE LOCATION WITH ARCHITECT.
11. INSTALL SMOKE DETECTORS ABOVE CATWALK.
12. COORDINATE EXACT LOCATIONS OF SMOKE DETECTORS IN THEATER WITH ALL OTHER COMPONENTS AND ACOUSTICAL TREATMENTS. MOUNT DETECTORS ON BOTTOM OF BEAMS.
13. CEILING MOUNTED SPEAKER STROBE TO BE MOUNTED TO BOTTOM OF STRUCTURE.
14. PROVIDE PENDANT STEM FOR FIRE ALARM DEVICES SO DEVICES ARE LEVEL WITH BOTTOM OF LIGHT FIXTURES IN THIS AREA. △

Dreiser Add #5

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DANIEL E. DIMOND REGISTERED No. PE60910351 STATE OF INDIANA PROFESSIONAL ENGINEER

CERTIFICATION 06/05/2020

100% CONSTRUCTION DOCUMENTS

Indiana State University - Dreiser Hall Renovation

221 North 6th Street
Terre Haute, IN 47809

Project No.: 19A052
Drawn By: JPS
Checked By: TEH
Scale: See Drawing
Issue Date: 06/05/2020

REVISION SCHEDULE		
Rev. #	Revision Description	Issue Date
5	ADDENDUM #5	2020-07-02

FIRST FLOOR PLAN - FIRE ALARM

E2.31

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Dreiser Add #5

RENOVATION LEGEND:

- WORK TO BE INSTALLED
- WORK TO REMAIN

GENERAL NOTES:

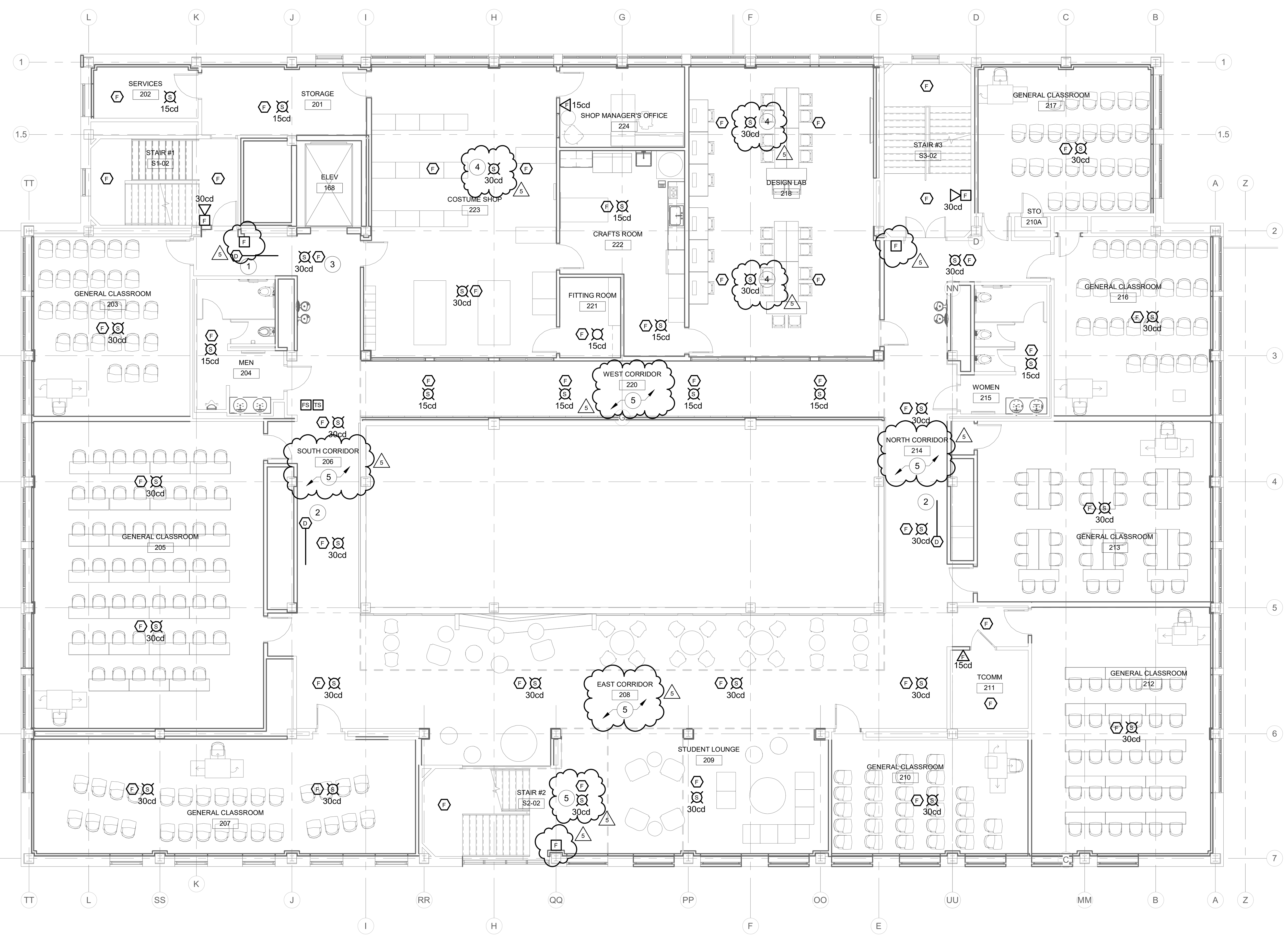
1. ~~REFER TO SHEET E0.1 FOR ADDITIONAL GENERAL NOTES.~~
2. FOR CEILING MOUNTED FIRE ALARM DEVICES, MOUNT SO DEVICE IS VISIBLE AND PROVIDE PENDANT WHERE REQUIRED SO DEVICE IS LEVEL WITH LOWEST NEARBY PIPING, DUCTWORK, LIGHT FIXTURE, ETC.

5

PLAN NOTES:

1. INSTALL DUCT SMOKE DETECTOR IN RETURN DUCT AND WIRE TO SHUT DOWN AHU-1 IN BASEMENT DURING ALARM.
2. INSTALL DUCT SMOKE DETECTOR IN SUPPLY DUCT AND WIRE TO SHUT DOWN AHU-1 IN BASEMENT DURING ALARM.
3. ~~INTERLOCK SMOKE DETECTOR FOR ELEVATOR RECALL.~~
4. CEILING MOUNTED SPEAKER STROBE TO BE MOUNTED TO BOTTOM OF STRUCTURE.
5. PROVIDE PENDANT STEM FOR FIRE ALARM DEVICES SO DEVICES ARE LEVEL WITH BOTTOM OF LIGHT FIXTURES IN THIS AREA.

5



SECOND FLOOR PLAN - FIRE ALARM

SCALE: 1/8" = 1'-0"

NORTH

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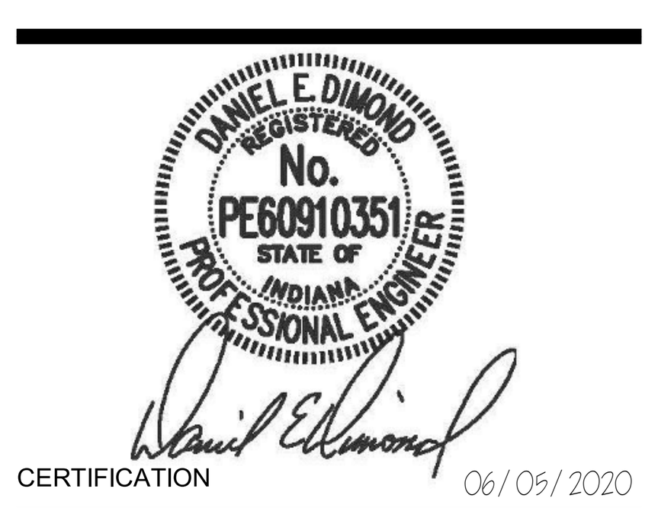

CERTIFICATION 06/05/2020

100% CONSTRUCTION DOCUMENTS

Indiana State University - Dreiser Hall Renovation

221 North 6th Street
Terre Haute, IN 47809

Project No.: 19A052
Drawn By: JPS
Checked By: TEH
Scale: See Drawing
Issue Date: 06/05/2020

REVISION SCHEDULE

Rev. #	Revision Description	Issue Date
5	ADDENDUM #5	2020-07-02

SECOND FLOOR PLAN - FIRE ALARM

E2.32

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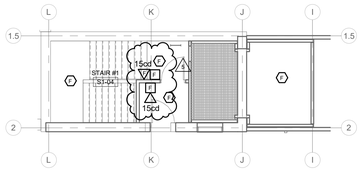
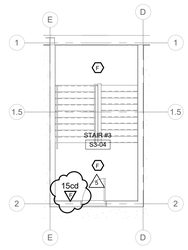


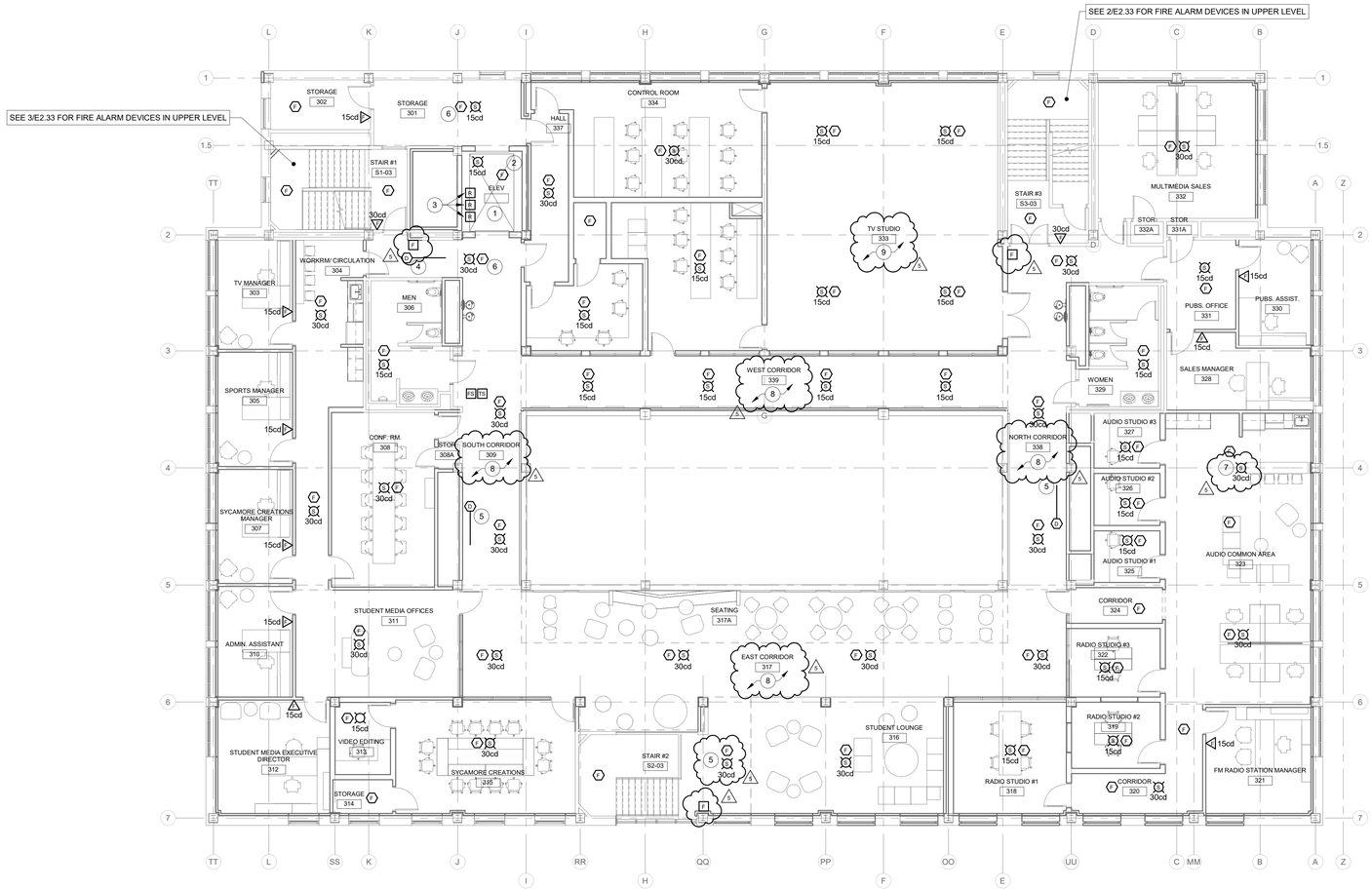
3 UPPER STAIR #1 - FIRE ALARM

SCALE: 1/8" = 1'-0"



2 UPPER STAIR #3 - FIRE ALARM

SCALE: 1/8" = 1'-0"



NORTH

THIRD FLOOR PLAN - FIRE ALARM

SCALE: 1/8" = 1'-0"

RENOVATION LEGEND:

- WORK TO BE INSTALLED
- WORK TO REMAIN

GENERAL NOTES:

1. REFER TO SHEET E0.1 FOR ADDITIONAL GENERAL NOTES.
2. FOR CEILING MOUNTED FIRE ALARM DEVICES, MOUNT SO DEVICE IS VISIBLE AND PROVIDE PENDANT WHERE REQUIRED SO DEVICE IS LEVEL WITH LOWEST NEARBY PIPING, DUCTWORK, LIGHT FIXTURE, ETC. (5)

(#) PLAN NOTES:

1. COORDINATE LOCATION OF ALL DEVICES IN ELEVATOR SHAFT WITH ELEVATOR INSTALLER PRIOR TO ROUGH-IN.
2. PLACE SMOKE DETECTOR IN ELEVATOR EQUIPMENT ROOM SPACE. PROGRAM FOR 'FIREMAN'S HAT' FUNCTION.
3. PROVIDE ADDRESSABLE CONTROL RELAYS FOR ELEVATOR SHUTDOWN FUNCTION AND 'FIREMAN'S HAT' WARNING INDICATOR. FIELD COORDINATE EXACT LOCATIONS.
4. INSTALL DUCT SMOKE DETECTOR IN RETURN DUCT AND WIRE TO SHUT DOWN AHU-1 IN BASEMENT DURING ALARM.
5. INSTALL DUCT SMOKE DETECTOR IN SUPPLY DUCT AND WIRE TO SHUT DOWN AHU-1 IN BASEMENT DURING ALARM.
6. INTERLOCK SMOKE DETECTOR FOR ELEVATOR RECALL.
7. CEILING MOUNTED SPEAKER STROBE TO BE MOUNTED TO BOTTOM OF STRUCTURE. (5)
8. PROVIDE PENDANT STEM FOR FIRE ALARM DEVICES SO DEVICES ARE LEVEL WITH BOTTOM OF LIGHT FIXTURES IN THIS AREA.
9. CEILING MOUNTED SPEAKER STROBES TO BE MOUNTED LEVEL WITH PIPE GRID IN THIS AREA. COORDINATE IN FIELD.

Dreiser Add #5

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REVISION SCHEDULE		
Rev. #	Revision Description	Issue Date
5	ADDENDUM #5	2020-07-02

THIRD FLOOR PLAN - FIRE ALARM

E2.33

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Dreiser Add #5

				Electrical Contractor			System Integrator		
Box	**TYP**	**Location**	**Description**	**Supply**	**Install**	**Line Voltage Termination**	**Supply**	**Install**	**Low Voltage Termination**
ADD ALTERNATE #4									
1	A	Grid	Pipe Mount Box		X	X	X		X
2	B	Grid	Pipe Mount Box		X	X	X		X
3	A	Grid	Pipe Mount Box		X	X	X		X
4	A	Grid	Pipe Mount Box		X	X	X		X
5	B	Grid	Pipe Mount Box		X	X	X		X
6	A	Grid	Pipe Mount Box		X	X	X		X
7	C	Grid	Pipe Mount Box		X	X	X		X
8	B	Grid	Pipe Mount Box		X	X	X		X
9	C	Grid	Pipe Mount Box		X	X	X		X
10	A	East Wall	Wall Mount Box		X	X	X		X
11	A	South Wall	Wall Mount Box		X	X	X		X
12	A	North Wall	Wall Mount Box		X	X	X		X
13	D	West Wall	Wall Mount Box		X	X	X		X
14		Sensor 24 Relay Panel	Surface Mount		X	X	X		X
15		Auxiliary Control Rack	Surface Mount		X	X	X		X
16		EDBK	Surface Mount		X	X	X		
17		DEBC	Surface Mount		X	X	X		X
18		SC1008	Surface Mount		X	X	X		
19		Theatre Connections	Surface Mount	X	X				X

Notes
All Conduit Supplied and Installed By Electrical Contractor
All Line Voltage Conductors Supplied and Installed By Electrical Contractor
All Line Voltage Conductors Terminated By Electrical Contractor
All Low Voltage Cables Supplied and Installed By Electrical Contractor
All Low Voltage Cables Terminated by System Integrator

Dreiser Add #5

	LIGHTING BASE BID		Electrical Contractor			System Integrator		
BOX	Location	Description	Supply	Install	Line Voltage Termination	Supply	Install	Low Voltage Termination
1A	FOH 1	Pipe Mount Box		X	X	X		X
1B	FOH 1	Pipe Mount Box		X	X	X		X
2A	FOH 2	Pipe Mount Box		X	X	X		X
2B	FOH 2	Pipe Mount Box		X	X	X		X
3A	FOH 3	Pipe Mount Box		X	X	X		X
3B	FOH 3	Pipe Mount Box		X	X	X		X
4A	FOH 4	Pipe Mount Box		X	X	X		X
4B	FOH 4	Pipe Mount Box		X	X	X		X
5	1ST LX	Connector Strip						
	Connector Strip			X	X	X		
	Grid Iron Junction Box			X	X	X		
	Kellums Cord Grips			X		X		
	Multi-Conductor Cable			X	X	X		
	DMX Cable		X	X				X
	Network Cable		X	X				X
6	2ND LX	Connector Strip						
	Connector Strip			X	X	X		
	Grid Iron Junction Box			X	X	X		
	Kellums Cord Grips			X		X		
	Multi-Conductor Cable			X	X	X		
	DMX Cable		X	X				X
	Network Cable		X	X				X
7	DropBox Multicable 1	Drop Box						
	C-Clamp Drop Box					X	X	
	Grid Iron Junction Box			X	X	X		
	Kellums Cord Grips			X		X		
	Multi-Conductor Cable			X	X	X		
	DMX Cable		X	X				X
8	DropBox Multicable 2	Drop Box						
	C-Clamp Drop Box					X	X	
	Grid Iron Junction Box			X	X	X		
	Kellums Cord Grips			X		X		
	Multi-Conductor Cable			X	X	X		
	DMX Cable		X	X				X
9	DropBox Multicable 3	Drop Box						
	C-Clamp Drop Box					X	X	
	Grid Iron Junction Box			X	X	X		
	Kellums Cord Grips			X		X		
	Multi-Conductor Cable			X	X	X		
	DMX Cable		X	X				X
10	DropBox Multicable 4	Drop Box						
	C-Clamp Drop Box					X	X	
	Grid Iron Junction Box			X	X	X		
	Kellums Cord Grips			X		X		
	Multi-Conductor Cable			X	X	X		
	DMX Cable		X	X				X
11	DropBox Multicable 5	Drop Box						
	C-Clamp Drop Box					X	X	
	Grid Iron Junction Box			X	X	X		
	Kellums Cord Grips			X		X		
	Multi-Conductor Cable			X	X	X		
	DMX Cable		X	X				X
12	DropBox Multicable 6	Drop Box						
	C-Clamp Drop Box					X	X	
	Grid Iron Junction Box			X	X	X		
	Kellums Cord Grips			X		X		
	Multi-Conductor Cable			X	X	X		
	DMX Cable		X	X				X
13	SR Floor Pocket 1	Recessed Floor Pocket		X	X	X		X
14	SR Floor Pocket 2	Recessed Floor Pocket		X	X	X		X
15	SR Floor Pocket 3	Recessed Floor Pocket		X	X	X		X
16	SR Floor Pocket 4	Recessed Floor Pocket		X	X	X		X
17	SL Floor Pocket 1	Recessed Floor Pocket		X	X	X		X
18	SL Floor Pocket 2	Recessed Floor Pocket		X	X	X		X
19	SL Floor Pocket 3	Recessed Floor Pocket		X	X	X		X
20	SL Floor Pocket 4	Recessed Floor Pocket		X	X	X		X
21	SR Box Boom	Surface Mount Connector Strip		X	X	X		X
22	SL Box Boom	Surface Mount Connector Strip		X	X	X		X
23	Tech Table Floor Pocket SR	Recessed Floor Pocket / Lighting		X	X	X		X
	Tech Table Floor Pocket SR	Recessed Floor Pocket / AV		X		X		
24	Tech Table Floor Pocket CS	Recessed Floor Pocket / Lighting		X		X		X
	Tech Table Floor Pocket CS	Recessed Floor Pocket / AV		X		X		
25	Tech Table Floor Pocket SL	Recessed Floor Pocket / Lighting		X		X		X
	Tech Table Floor Pocket SL	Recessed Floor Pocket / AV		X		X		
26	Stage Managers Panel SR	Surface Mount Panel		X	X	X		X
27	Control Booth	Control Receptacles		X	X	X		X
28	Auxiliary Control Rack	Surface Mount		X	X	X		X
29	Sensor Dimmer Rack	Floor Standing		X	X	X		X
30	Sensor Relay Panel	Surface Mount		X	X	X		X
31	Emergency By-Pass Detection Kit (EBDK)	Surface Mount		X	X	X		
32	DMX Emergency Bypass Controller	Surface Mount		X	X	X		X
33	SC1008 - UL 1008 LISTED	Surface Mount		X	X	X		
34	SC1008 - UL 1008 LISTED	Surface Mount		X	X	X		
35	Lighting Branch Breaker Panel by others. Located in Dimmer Room		X	X	X			
36	Lighting Console	Lighting Console				X	X	
37	Touch Screen Monitor	Touch Screen 22" Monitor				X	X	
38	Touch Screen Monitor	Touch Screen 22" Monitor				X	X	
39	Access Point	Cisco WAP				X	X	
44	Entry Station - SR	Paradigm				X	X	
45	Entry Station - SL	Paradigm				X	X	
46	Entry Station - HL	Paradigm				X	X	
47	Entry Station - HR	Paradigm				X	X	
48	Running Lights Box - DSR	Surface Mount 120VAC & DMX		X	X	X		X
49	Running Lights Box - DSL	Surface Mount 120VAC & DMX		X	X	X		X
50	Running Lights Box - USL	Surface Mount 120VAC & DMX		X	X	X		X
51	Running Lights Box - USR	Surface Mount 120VAC & DMX		X	X	X		X
52	Index Light Dim Box (2x Lutron Nova LED Dimmers)	By SSRC		X	X	X		

Notes

All Conduit Supplied and Installed By Electrical Contractor
All Line Voltage Conductors Supplied and Installed By Electrical Contractor
All Line Voltage Conductors Terminated By Electrical Contractor
All Low Voltage Cables Supplied and Installed By Electrical Contractor
All Low Voltage Cables Terminated by System Integrator

	SYMBOL	DEFINITION
1	ACC	Administrative Control Console
2	ADA	Americans with Disabilities Act
3	AFF	Above Finished Floor
4	AFG	Above Finished Grade
5	AFSF	Above Finished Stage Floor
6	AM	Amplitude Modulation
7	ANSI	American National Standards Institute
8	ASME	American Society of Mechanical Engineers
9	ASTM	American Society of Testing Materials
10	ATM	Asynchronous Transfer Mode
11	AVR	Audio Visual Rack
12	AWG	American Wire Gauge
13	BFC	Below Finished Ceiling
14	BGP	Border (Boundary) Gateway Protocol
15	BICSI	Building Industry Consulting Services
16	BIT	Binary digit
17	BOM	Bill of Material
18	BPS	Bits per second
19	BRI	Basic Rate Interface (ISDN)
20	CAD	Computer Aided Design
21	CAN	Campus Area Network
22	CATV	Community Antenna Television
23	CCITT	Consultative Committee for International
24	CCTV	Closed Circuit Television
25	CDDI	Copper Distributed Data Interface
26	CH	Counter Height
27	CLEC	Competitive Local Exchange Carrier
28	CPE	Customer Premises Equipment
29	CPU	Central Processing Unit
30	CSA	Canadian Standards Associations
31	CSMA/CA	Carrier—Sense Multiple Access with Collision
32	CSMA/CD	Carrier—Sense Multiple Access/Collision
33	CSU	Channel Service Unit
34	CT	Communications Technology
35	CTC	Communications Technology Contractor
36	db	Decibel
37	DSL	Digital Subscriber Line
38	DSU	Data Service Unit/Digital Service Unit
39	DTE	Data Terminal Equipment
40	DTR	Data/Telecommunications Rack
41	DVR	Digital Video Recorder
42	EC	Electrical Contractor
43	EF	Entrance Facility
44	EGP	Exterior Gateway Protocol
45	EIA	Electronics Industries Association
46	EMI	Electromagnetic Interface
47	ER	Equipment Room
48	ETSI	European Telecommunications Standards
49	FB	Floor Box
50	FCC	Federal Communications Comission
51	FDDI	Fiber Data Distributed Interface
52	GAN	Global Area Network
53	GB	Giga Byte
54	Gb/s	(Gbps) — Gigabits per second
55	GHz	Gigahertz
56	HC	Horizontal Cross—connect
57	IC	Intermediate Cross—connect
58	IDF	Intermediate Distribution Frame (Replaced by
59	IEEE	Institute of Electrical and Electronics
60	IP	Internet Protocol
61	IPX	Internet Packet Exchange
62	ISDN	Integrated Services Digital Network
63	ISO	International Organization for Standardization
64	ISP	Internet Service Provider
65	LAN	Local Area Network
66	LANE	LAN Emulation
67	LASER	Light Amplification by Stimulated Emission of
68	LAT	Local Area Transport
69	LATA	Local Access and Transport Area
70	LEC	Local Exchange Carrier
71	LED	Light Emitting Diode
72	LI	Local (AV) Input
73	LO	Local (AV) Output
74	MAC	Media Access Control
75	MAN	Metropolitan Area Network
76	MB	Mega Bytes
77	Mb/s	Megabits per second
78	MC	Main Cross—connect
79	MDF	Main Distribution Frame (Also see ER)
80	MHz	Megahertz
81	MODEM	Modulator/Demodulator
82	ms	millisecond
83	MTBF	Mean Time Between Failures
84	MPLS	Multi Protocol Label Switching
85	OC	Optical Carrier
86	OFE	Owner Furnished Equipment
87	OFOI	Owner Furnished, Owner Installed
88	OSI	Open Systems Interconnection
89	PAN	Personal Area Network
90	PAR	Public Address Rack
91	PAY	Pay Telephone Location
92	pps	Packets Per Second
93	PRI	Primary Rate Interface
94	PSTN	Public Switched Telephone Network
95	QoS	Quality of Service
96	RAID	Random Array of Inexpensive Disks
97	RAM	Random Access Memory
98	RBOC	Regional Bell Operating Company
99	RF	Radio Frequency
100	RFC	Request For Comment
101	RFI	Request For Information/ Radio Frequency
102	RFP	Request For Proposal
103	RFQ	Request For Quotation
104	RFR	RF Equipment Rack
105	RIP	Routing Information Protocol
106	RMON	Remote Monitor
107	ROM	Read Only Memory
108	SBB	Security system BackBoard
109	SC	Sound Cabinet; screw cover
110	SCR	Security Equipment Rack
111	SJB	Speaker Junction Box
112	SCJB	Security Camera Junction Box
113	SMTP	Simple Main Transfer Protocol
114	SNA	Systems Network Architecture
115	SNMP	Simple Network Management Protocol
116	SONET	Synchronous Optical Network
117	SP	Service Provider (Also Local Service Provider)
118	SR	Strike Release — Door
119	SSR	Sound System Rack
120	TAAC	To Above Accessible Ceiling
121	RFI	Request For Information/ Radio Frequency
122	RFP	Request For Proposal
123	RFQ	Request For Quotation
124	RFR	RF Equipment Rack
125	RIP	Routing Information Protocol
126	RMON	Remote Monitor
127	ROM	Read Only Memory
128	SBB	Security system BackBoard
129	SC	Sound Cabinet; screw cover
130	SCR	Security Equipment Rack
131	SJB	Speaker Junction Box
132	SCJB	Security Camera Junction Box
133	SMTP	Simple Main Transfer Protocol
134	SNA	Systems Network Architecture
135	SNMP	Simple Network Management Protocol
136	SONET	Synchronous Optical Network
137	SP	Service Provider (Also Local Service Provider)
138	SR	Strike Release — Door
139	SSR	Sound System Rack
140	TAAC	To Above Accessible Ceiling
141	TAHC	To Above accessible Hallway Ceiling
142	TB	Tera Byte
143	TBB	Telecommunications BackBoard
144	TCP	Transmission Control Protocol
145	TCP/IP	Transmission Control Protocol/Internet
146	TIA	Telecommunications Industries Association
147	TO	Telecommunications Outlet
148	TR	Telecommunications Room
149	UON	Unless Otherwise Noted
150	VCR	Video Cassette Recorder
151	VoIP	Voice over Internet Protocol
152	W	Wall Mounted Device
153	WAN	Wide Area Network
154	WAP	Wireless Access Point
155	WG	Wire Guard

COMMUNICATION TECHNOLOGY LEGEND

SYMBOL	DESCRIPTION	ROUGH—IN — SEE NOTE (2)			NOTES
		BOX	HEIGHT	WIRE WAY	
	TELECOMMUNICATIONS (VOICE, DATA, AND VIDEO)				
◀ W	VOICE OUTLET, WALL MOUNTED TELEPHONE W = DENOTES WALL TELEPHONE USE. UON ONE 4 PR UTP. EC = EMERGENCY CALL STATION (PHONE)	1—GANG BOX	* 48" AFF	1" CONDUIT	* MOUNTING HEIGHT SUBJECT TO ADA REQUIREMENTS
◁ X	EQUIPMENT OUTLET X = DENOTES INTENDED USE: ELEV/ELEVATOR, FACP/FIRE ALARM CONTROL PANEL, BAS/BUILDING AUTOMATION SYSTEM (HVAC) UON TWO 4 PR UTP.	2—GANG BACK BOX, DEEP	COUNTER HEIGHT	1" CONDUIT	EQUIPMENT CONNECTION; COORDINATE LOCATION WITH ACCESS TO ELECTRICAL POWER OUTLET
◁ X	DATA OUTLET X = DENOTES QUANTITY OF CABLES. MINIMUM 1 CABLE.	2—GANG BACK BOX, DEEP LI OPTION : 3—GANG BACK BOX, 3—1/2" DEEP	18" AFF	(2) 1" CONDUIT OR (1) 1 ¼" CONDUIT	WHEN "LI" SUBSCRIPT IS USED WITH THIS SYMBOL PROVIDE ALL ADDITIONAL CABLING AND CONNECTIVITY AS INDICATED ON DETAILS.
◁ WAP	WIRELESS ACCESS POINT WAP = DENOTES SPECIAL USE. MINIMUM 2 CABLES	1—GANG BACK BOX WHEN WALL MOUNTED CEILING MOUNTED LOCATIONS SHALL INCLUDE A CABLE SUPPORT ; DISCREET CABLES TO ATTACH DIRECTLY TO DEVICE WHEN INSTALLED	SEE NOTES	3/4" CONDUIT	WALL MOUNTED VERSIONS OF THIS DEVICE SHALL BE INSTALLED 84" AFF OR 6" BELOW FINISHED CEILING, WHICHEVER IS HIGHER. PROVIDE 1 WAP PER EACH 25 USERS.
◁ X	SPECIAL SUBSCRIPT DEFINITIONS IN ADDITION TO BASIC SYMBOL REQUIREMENTS: B = BLANK COVER PLATE. NO CONNECTORS OR CABLES LI = LOCAL AV INPUT OPTION (SEE SPECS AND DETAILS) LO = LOCAL OUTPUT; SPECIFIC LOCATION FOR TERMINATION OF LI CABLES (SEE SPECS AND DETAILS) FO = ADD ONE PAIR OF 50/125 MM FIBER OPTIC CABLE (SEE SPECS AND DETAILS)	2—GANG BACK BOX, DEEP LI OPTION : 3—GANG BACK BOX, 3—1/2" DEEP	18" AFF	(2) 1" CONDUIT OR (1) 1 ¼" CONDUIT LI OPTION : (3) 1" CONDUITS	WHEN "LI" SUBSCRIPT IS USED WITH THIS SYMBOL PROVIDE ALL ADDITIONAL CABLING AND CONNECTIVITY AS INDICATED ON DETAILS.
TV	TELEVISION OUTLET — WALL MOUNTED PROVIDE (2) DATA CABLES. LO = SPECIAL LOCAL AV OUTPUT OPTION. SEE SPECS AND DETAILS.	2—GANG BACK BOX, DEEP LO OPTION : 3—GANG DEVICE BOX, 3—1/2" DEEP	84" AFF	(2) 1" CONDUIT OR (1) 1 ¼" CONDUIT LI OPTION : (3) 1" CONDUITS	COORDINATE LOCATION OF THIS DEVICE WITH AC POWER. PROVIDE AC POWER RECEPTACLE ADJACENT TO EACH OF THESE DEVICES. PROVIDE ADDITIONAL CONDUITS TO CONCEAL AUDIO/VIDEO CABLING AS REQUIRED.
TV	TELEVISION OUTLET CEILING HUNG PROVIDE (2) DATA CABLES. LO = SPECIAL LOCAL AV OUTPUT OPTION. SEE SPECS AND DETAILS.	ABOVE CEILING CABLE SUPPORT; DISCREET CABLES TO PASS THROUGH MOUNTING STEM TO ATTACH DIRECTLY TO DEVICE WHEN INSTALLED	84" AFF		COORDINATE LOCATION OF THIS DEVICE WITH AC POWER. PROVIDE AC POWER RECEPTACLE ADJACENT TO EACH OF THESE DEVICES. PROVIDE ADDITIONAL CONDUITS TO CONCEAL AUDIO/VIDEO CABLING AS REQUIRED.
VP◁	VIDEO PROJECTOR LOCATION — CEILING MOUNTED PROVIDE (2) DATA CABLES MINIMUM UON. LO = SPECIAL LOCAL AV OUTPUT OPTION. SEE SPECS AND DETAILS.	ABOVE CEILING CABLE SUPPORT; DISCREET CABLES TO PASS THROUGH MOUNTING STEM TO ATTACH DIRECTLY TO DEVICE WHEN INSTALLED	84" AFF		COORDINATE LOCATION OF THIS DEVICE WITH AC POWER. PROVIDE AC POWER RECEPTACLE ADJACENT TO EACH OF THESE DEVICES. PROVIDE ADDITIONAL CONDUITS TO CONCEAL AUDIO/VIDEO CABLING AS REQUIRED.
VP◁	VIDEO PROJECTOR LOCATION — OUTLET (PORTABLE USE) PROVIDE (2) DATA CABLES MINIMUM UON. LO = SPECIAL LOCAL AV OUTPUT OPTION. SEE SPECS AND DETAILS.	2—GANG BACK BOX, DEEP LO OPTION : 3—GANG DEVICE BOX, 3—1/2" DEEP	84" AFF	(2) 1" CONDUIT OR (1) 1 ¼" CONDUIT LI OPTION : (3) 1" CONDUITS	COORDINATE LOCATION OF THIS DEVICE WITH AC POWER. PROVIDE AC POWER RECEPTACLE ADJACENT TO EACH OF THESE DEVICES. PROVIDE ADDITIONAL CONDUITS TO CONCEAL AUDIO/VIDEO CABLING AS REQUIRED.
CEILING MTG ZONE ENCLOSURE ▽	TELECOMMUNICATIONS ACTIVE CEILING ENCLOSURE PROVIDE (2) DATA CABLES MINIMUM UON. LO = SPECIAL LOCAL AV OUTPUT OPTION. SEE SPECS AND DETAILS.	SEE SPECIFICATIONS; MOUNTS IN 2' X 2' ACCESSIBLE CEILING TILE GRID	84" AFF		COORDINATE LOCATION OF THIS DEVICE WITH AC POWER. PROVIDE AC POWER RECEPTACLE ADJACENT TO EACH OF THESE DEVICES.
CEILING MTG ZONE ENCLOSURE XX ▽XXX	SPECIAL USE (VP, WAP, ETC.) ACTIVE CEILING ENCLOSURE PROVIDE (2) DATA CABLES MINIMUM UON. LO = SPECIAL LOCAL AV OUTPUT OPTION. SEE SPECS AND DETAILS.	SEE SPECIFICATIONS; MOUNTS IN 2' X 2' ACCESSIBLE CEILING TILE GRID	84" AFF		COORDINATE LOCATION OF THIS DEVICE WITH AC POWER. PROVIDE AC POWER RECEPTACLE ADJACENT TO EACH OF THESE DEVICES.
◁ X	TELE—POWER POLE X = DENOTES QUANTITY OF CABLE.	SEE NOTES	COORDINATE FOR POWER CONNECTION WITH E.C.	SEE NOTES	
●	CONNECTION TO SYSTEM FURNITURE — WALL	MULTI—GANG BACK BOX, MINIMUM 2—1/2" DEEP WITH FURNITURE WHIP ASSEMBLY	18" AFF COORDINATE WITH FURNITURE / CASEWORK	PROPERLY SIZED FOR QUANTITY OF CABLES DESIRED (40% FILL)	PROVIDE FURNITURE WHIP ASSEMBLY TO THE SYSTEM FURNITURE. COORDINATE WITH FURNITURE SYSTEM.
⊙	CONNECTION TO SYSTEM FURNITURE — FLOOR	SEE SPECIFICATIONS AND DETAILS FOR FLOOR BOX TYPE WITH FURNITURE WHIP ASSEMBLY		PROPERLY SIZED FOR QUANTITY OF CABLES DESIRED (40% FILL)	PROVIDE FURNITURE WHIP ASSEMBLY TO THE SYSTEM FURNITURE. COORDINATE WITH FURNITURE SYSTEM.
▭	FLOOR BOX, MULTI—FUNCTION COMMUNICATIONS BOX X = BOX TYPE	SEE DETAILS FOR ADDITIONAL REQUIREMENTS	FLUSH IN FINISHED FLOOR	(3) 1—1/4" CONDUIT AND (2) 3/4" CONDUIT TAAC	
⊙◁ X	FLOOR OUTLET — POKE THROUGH X = DENOTES QUANTITY OF CABLES.	SEE SPECS AND DETAILS			
	SECURITY				
DS	DOOR STATUS CONTACT(S) CONCEALED MAGNETIC TYPE ALL DOOR CONTACT SWITCHES SHALL BE DPDT UNLESS OTHERWISE NOTED	N/A	TOP OF DOOR FRAME	3/4" CONDUIT	PROVIDE TWO INDEPENDENT CONTACTS ON DOUBLE DOORS. ADJACENT DOORS MAY SHARE THE SAME ROUGH—IN IF CONSTRUCTION ALLOWS.
CR	CARD READER	1—GANG BOX, 3 ½" DEEP	48" AFF	1" CONDUIT	PROVIDE ONE HORIZONTAL UTP CABLE TO TELECOM ROOM. SEE DOOR SECURITY DETAILS FOR ADDITIONAL WORK.
DR	ACCESS CONTROL SYSTEM, DOOR RELEASE SWITCH	1—GANG BOX	48" AFF	3/4" CONDUIT	
KP	ACCESS CONTROL SYSTEM, DOOR ENTRY KEYPAD	1—GANG BOX, 3 ½" DEEP	48" AFF	1" CONDUIT	
PS	PANIC (DURESS) SWITCH/STATION	1—GANG DEVICE BOX	48" AFF	3/4" CONDUIT	
◪	DOOR LOCK, ELECTRIC SHEAR TYPE	AS REQUIRED BY LOCK	TOP OF DOOR FRAME	3/4" CONDUIT	
◩	ACCESS CONTROL SYSTEM, ELECTRIC DOOR LOCK/STRIKE	N/A	SIDE OF DOOR FRAME	3/4" CONDUIT	
C◁	SURVEILLANCE CAMERA SEE NOTE	2—GANG BOX, 3 ½" DEEP	10' EXTERIOR AFF	1" CONDUIT	COORDINATE ROUGH—IN WITH CAMERA SUPPLIER. PROVIDE CAMERA MOUNT COMPLETE FOR EXTERIOR CAMERAS. CAMERA BY OTHERS.
C◁ CV	CAMERA, COVERT SEE NOTE	1—GANG DEVICE BOX	CEILING MOUNT	3/4" CONDUIT	COORDINATE ROUGH—IN WITH CAMERA SUPPLIER
CM	MICROPHONE, COVERT SEE NOTE	1—GANG DEVICE BOX	48" AFF	3/4" CONDUIT	COORDINATE ROUGH—IN WITH MICROPHONE SUPPLIER
S	CONTROL STATION	1—GANG BOX, 3 ½" DEEP	48" AFF	3/4" CONDUIT	
◁M	MOTION SENSOR	1—GANG BOX	96" AFF UON	3/4" CONDUIT	

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* ALL 1-Gang and 2-Gang Boxes reference in this legend shall be assembled from 4 11/16th" square boxes with separate trim rings. Depth of composite assembly shall be as indicated.
** Where a mounting height measurement is applied to a rough-in, the measurement shall be referenced to the center of the rough-in device, UON.
*** A Triangle symbol without a subscript designation shall have at least the minimum quantities of cable(s); Soild – one voice, Hollow – one data, and Combination – one voice and one data cable.

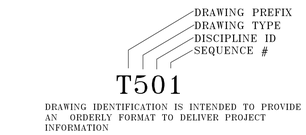
Where a telecommunications outlet location is adjacent to an electrical outlet, the mounting height will be the same for each. Where multiple Telecommunications are adjacent (such as Telecommunications and Sound Devices, faceplates shall be coordinated to the same type and color and mounted at the same height.

CONDUIT RUNS SHALL HAVE NO MORE THAN 180 DEGREES OF BENDS WITHOUT AN ADEQUATE PULL BOX.

GENERAL NOTES — DEMOLITION:

1. THE CONTRACT DOCUMENTS DO NOT PROPOSE TO SHOW ALL SYSTEMS, MATERIALS, OR EQUIPMENT EXISTING ON THE PROJECT THAT WILL REQUIRE DEMOLITION. DEMOLITION DRAWINGS ARE BASED ON PARTIAL FIELD OBSERVATION. REPORT DISCREPANCIES TO THE CONSULTANT BEFORE DISTURBING EXISTING INSTALLATION.
2. REMOVE ALL ABANDONED CABLING AS DEFINED BY THE NEC.
3. PROVIDE DEMOLITION REQUIRED FOR REMOVAL OF SYSTEMS AND EQUIPMENT MADE OBSOLETE BY THIS PROJECT AND PAST PROJECTS.
4. IDENTIFY ITEMS TO BE SALVAGED WITH THE OWNER. PROVIDE NON-DESTRUCTIVE REMOVAL OF SYSTEMS, MATERIALS, AND EQUIPMENT FOR REUSE OR SALVAGE AS REQUIRED.
5. REMOVAL ALL COMMUNICATIONS DEBRIS FROM SITE AND LEGALLY DISPOSE OF IT.
6. RELOCATE EXISTING EQUIPMENT TO ACCOMMODATE CONSTRUCTION.
7. CONTRACTOR UNDERSTANDS THAT ADJACENT AREAS NEED TO REMAIN IN OPERATION AND THAT SERVICES TO THESE AREAS NEED TO BE MAINTAINED.
8. PROTECT EXISTING EQUIPMENT AND INSTALLATIONS INDICATED TO REMAIN. IF DAMAGED OR DISTURBED IN THE COURSE OF THE WORK, REMOVE DAMAGED PORTIONS AND INSTALL NEW PRODUCTS OF EQUAL CAPACITY, QUALITY, AND FUNCTIONALITY.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING TELEPHONE, DATA, CENTRAL SOUND, SECURITY CCTV, AND ALARM SYSTEM SERVICES IN ALL EXISTING AREAS FOR DURATION OF PROJECT FOR MULTI-PHASED PROJECTS. CONTRACTOR SHALL COLLABORATE WITH OWNER'S TECHNOLOGY PERSONNEL AS NECESSARY AND PROVIDE TEMPORARY WIRING, CROSS-CONNECTS, TERMINATION DEVICES, AND LABOR TO MAINTAIN OPERATION ACCEPTABLE TO THE OWNER. CONTRACTOR SHALL REFER TO THE SPECIFICATIONS FOR ADDITIONAL INFORMATION RELATED TO PHASING.
10. PROVIDE AND MAINTAIN TEMPORARY PARTITIONS OR DUST BARRIERS ADEQUATE TO KEEP DIRT, DUST, NOISE, AND OTHER PARTICLES FROM BEING TRANSFERRED TO ADJACENT AREAS.
11. CONTRACTOR SHALL PROVIDE ALL CUTTING AND PATCHING REQUIRED FOR REMOVAL OR RELOCATION OF EXISTING INSTALLATIONS.
12. SCHEDULE TO REMOVE EXISTING CABLING AFTER OWNER'S SYSTEMS ARE CUT OVER TO THE NEW CABLING SYSTEM.
13. REMOVE, STORE, PROTECT, CLEAN, REINSTALL, RECONNECT, AND MAKE OPERATION COMPONENTS INDICATED FOR RELOCATION/REINSTALLATION.
14. REMOVE DIRT, DUST, DEBRIS, UNSALVAGEABLE AND NON-REUSABLE ITEMS, AND THE LIKE FROM THE PROJECT SITE DAILY. REFUSE SHALL NOT BE ALLOWED TO BLOCK, OR OTHERWISE IMPAIR, CIRCULATION IN CORRIDORS, STAIRS, SIDEWALKS, OR OTHER TRAFFIC AREAS.
15. WHERE A DEVICE IS REMOVED FROM A WALL OR CEILING THAT IS TO REMAIN, PROVIDE A NEW BLANK COVERPLATE ON EXISTING DEVICE BOX. REMOVE ALL SURFACE RACEWAYS AND BOXES.
16. REMOVE ALL EXISTING COMMUNICATIONS PATHWAYS, INCLUDING EXISTING CABLE TRAYS, CONDUITS, RACEWAYS, ETC. UON.

DRAWING LABELING		
DRAWING PREFIX		
	T	TELECOMMUNICATIONS
DRAWING TYPE		
	0	LEGEND—INDEX
	1	FLOORPLANS
	2	ELEVATIONS
	3	SECTIONALS
	4	ENLARGED FLOORPLANS
	5	DETAILS
	6	DIAGRAMS
DISCIPLINE ID		
	0	COMMUNICATIONS
	1	STRUCTURED CABLING
	2	DATA SYSTEMS
	3	TELEPHONE SYSTEM
	4	AV SYSTEMS
	5	DISTRIBUTED COMMUNICATIONS
SEQUENCE #		
	0	RESERVED
	1—9	FIRST—NINTH
	A—Z	10—36



DRAWING IDENTIFICATION IS INTENDED TO PROVIDE AN ORDERLY FORMAT TO DELIVER PROJECT INFORMATION

A MAJORITY OF DRAWINGS CONTAIN INFORMATION THAT IS REQUIRED OR WILL BE BENEFICIAL TO MULTIPLE DISCIPLINES AND/OR CONTRACTORS. LIKEWISE, EACH SPECIFICATION SECTION MAY REQUIRE INFORMATION ON MULTIPLE DRAWINGS TO COMPLETE THE SYSTEM(S).

A DRAWING IDENTIFICATION

Scale = NONE

MISCELLANEOUS

SYMBOL	DESCRIPTION
J	JUNCTION BOX — WALL MOUNTED FLUSH MOUNTED IN FINISHED AREAS.
Ⓙ	JUNCTION BOX — CEILING MOUNTED LOCATED ABOVE ACCESSIBLE CEILING, OR HIGH TO STRUCTURE IN UNFINISHED AREAS
P	PULL BOX — WALL MOUNTED FLUSH MOUNTED IN FINISHED AREAS. NO SPLICES/CABLE CONNECTIONS PERMITTED IN THIS BOX.
Ⓟ	PULL BOX — CEILING MOUNTED LOCATED ABOVE ACCESSIBLE CEILING, OR HIGH TO STRUCTURE IN UNFINISHED AREAS. NO SPLICES/CABLE CONNECTIONS PERMITTED IN THIS BOX.
	DEVICE LOCATION MODIFIER PROVIDES CLARIFICATION AS TO THE INTENDED LOCATION OF A DEVICE. GENERALLY USED WHEN DEVICES ARE TO LOCATED IN CLOSE PROXIMITY HORIZONTALLY, OR ARRAYED VERTICALLY, BUT DRAWING SCALE DOES NOT ALLOW THIS TO BE SHOWN WITH VISUAL CLARITY.
XXXX	LOCATION LABEL AN ABBREVIATION USED TO UNIQUELY A LOCATION ON A DRAWING. SPECIFICATIONS, SYSTEM DRAWING AND DETAILS REFER TO THIS LOCATION. ID TEXT VARIES.
XXXX	DEVICE ID LABEL USED TO UNIQUELY IDENTIFY A DEVICE ON A DRAWING. OFTEN USED TO ASSOCIATE THE INSTALLED LOCATION OF A DEVICE (AS DEPICTED ON A PLAN DRAWING) WITH ADDITIONAL INFORMATION ABOUT THE DEVICE AS INDICATED ON THE COMMUNICATION TECHNOLOGY SYSTEM, DETAIL AND ELEVATION DRAWING. ID TEXT VARIES.
XXXX XXXX	ROUTING DESTINATION IDENTIFIERS IDENTIFIES THE DEVICE/LOCATION TO THE WIRE WAY AND CABLING SHALL BE ROUTED. PROVIDE CONDUIT AND CABLING AS LISTED AND AS SPECIFIED.
	CONDUIT SLEEVE 2" DIAMETER UNLESS OTHERWISE NOTED; PROVIDE FIRE STOPPING; ROUTE FROM ACCESSIBLE CEILING TO ACCESSIBLE CEILING
	CONDUIT STUB UP INTO ACCESSIBLE CEILING QUANTITY AND SIZE OF CONDUIT PER LEGEND; AS SPECIFIED; AS NOTED.
	CONDUIT(S) BENEATH FINISHED FLOOR QUANTITY AND SIZE OF CONDUIT AS NOTED AND AS LISTED AND AS SPECIFIED

GENERAL NOTES:

1) NOTHING SET FORTH IN THESE DRAWINGS SHALL RELEASE ANY CONTRACTOR FROM HIS RESPONSIBILITY TO PROVIDE APPROPRIATE QUANTITIES, FIELD MEASUREMENTS, DIMENSIONAL STABILITY, INSTALLATION, ANCHORAGE, AND COORDINATION WITH OTHER TRADES; OR RELEASE HIM FROM HIS RESPONSIBILITY TO IDENTIFY AND RESOLVE DEVIATIONS FROM THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, OR FREE HIM OF HIS RESPONSIBILITY TO ALERT DESIGNER TO ERRORS OR OMISSIONS.
2) CONTRACTOR SHALL USE THESE DRAWINGS IN CONJUNCTION WITH THE SPECIFICATIONS TO DETERMINE THE FULL SCOPE, INTENT AND REQUIREMENTS OF THE PROJECT. SPECIFICATIONS AND DRAWINGS ARE INTENDED TO BE COMPLEMENTARY, NOT MUTUALLY EXCLUSIVE. WORK SHOWN ON THE DRAWINGS BUT NOT LISTED IN THE SPECIFICATIONS, AND WORK DESCRIBED IN THE SPECIFICATIONS BUT NOT SHOWN ON THE DRAWINGS SHALL BE INTERPRETED AS THOUGH WORK WERE FULLY DESCRIBED IN BOTH PLACES. THE HIGHER QUANTITY, HIGHER QUALITY, MORE LABOR INTENSIVE AND OVERALL MORE STRINGENT AND MORE COSTLY REQUIREMENT SHALL APPLY UNLESS OTHERWISE CLARIFIED IN WRITING PRIOR TO BID.
3) EACH CONTRACTOR SHALL VERIFY IN THE FIELD ALL EXISTING APPLICABLE CONDITIONS AND DIMENSIONS SHOWN ON THE DRAWINGS AND AS PERTINENT TO THE INTENT OF THESE DRAWINGS. ANY DISCREPANCY DISCOVERED SHALL BE BROUGHT TO THE ATTENTION OF THE DESIGNER PRIOR TO THE COMMENCEMENT OF ANY WORK AFFECTED BY, OR RELATED TO, SUCH DISCREPANCY. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH, OR CAUSED BY HIS FAILURE TO COMPLY WITH THIS REQUIREMENT.
4) EACH CONTRACTOR SHALL REVIEW ALL PORTIONS OF HIS WORK, BEFORE STARTING THE WORK, TO VERIFY THAT THE WORK WILL NOT PROHIBIT COMPLETION OF THE PROJECT AS INTENDED IN THESE CONSTRUCTION DOCUMENTS. ALL QUESTIONS SHALL BE REFERRED TO THE DESIGNER FOR RESOLUTION.
5) EACH CONTRACTOR SHALL BE RESPONSIBLE FOR JOB CLEANLINESS. PROJECT AREAS SHALL BE THOROUGHLY CLEANED AND TRASH DISPOSED OF AT THE END OF EACH WORK DAY. OWNER'S FACILITIES SHALL NOT BE USED FOR WASTE DISPOSAL.
6) PROVIDE DUST PROTECTION WHEN WORKING IN EXISTING FACILITIES. SEAL OFF ALL WORK AREAS FROM REMAINDER OF THE EXISTING FACILITY TO RETAIN ALL CONSTRUCTION DIRT AND DUST. SEAL EXISTING DOORS WITH TAPE AND PROVIDE DUST—PROOF BARRIERS AS REQUIRED.
7) ALL WORK SHALL BE SEQUENCED TO PROVIDE FOR THE OWNER'S CONTINUED USE OF THE EXISTING FACILITY WHEN REQUIRED. OWNER'S ACCESS, EGRESS AND SAFETY SHALL BE MAINTAINED BY EACH CONTRACTOR. THE SEQUENCE OF WORK SHALL BE AS DETERMINED BY THE CONSTRUCTION MANAGER. REFER TO THE PROJECT MANUAL FOR FURTHER REQUIREMENTS.
8) EACH CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF ALL SURFACES AND FINISHES IN THE INTERIOR OR EXTERIOR OF THE FACILITY. DAMAGED SURFACES OR FINISHES RESULTING FROM THE PERFORMANCE OF THE WORK OR NEGLIGENCE SHALL BE REPAIRED AT NO COST TO THE OWNER BY THE RESPONSIBLE CONTRACTOR. FINISHES AND SURFACES SHALL BE MADE TO MATCH THE EXISTING FINISHES OR SURFACES TO THE SATISFACTION OF THE OWNER AND ARCHITECT/CONSTRUCTION MANAGER.
9) EACH CONTRACTOR SHALL COORDINATE HIS RESPECTIVE CUTTING AND PATCHING WORK WITH THE CONSTRUCTION MANAGER.
10) COLORS OF CABLING USED FOR ALL COMMUNICATIONS TECHNOLOGY WORK SHALL BE REVIEWED AND APPROVED PRIOR TO PROCUREMENT AND INSTALLATION.
11) ALL LADDER RACK AND OTHER COMMUNICATION TECHNOLOGY CABLING PATHWAYS DEPICTED ON THE ENLARGED FLOOR PLANS AND OTHERWISE NECESSARY FOR PROFESSIONAL WIRE MANAGEMENT WITHIN THE MAIN EQUIPMENT ROOM (ER) AND ALL TELECOMMUNICATION ROOMS (TR) SHALL BE PROVIDED BY THE COMMUNICATIONS TECHNOLOGY CONTRACTOR. SEE DIVISION 27 SPECIFICATIONS AND DRAWINGS FOR REQUIREMENTS.
12) THE DIVISION 27 CONTRACTOR SHALL THOROUGHLY REVIEW THE SPECIFIED ROUGH —IN TO ENSURE THAT SUPPLIED ROUGH—IN WILL SUPPORT THE CABLING AND DEVICES BEING SUPPLIED. DIVISION 27 CONTRACTOR SHALL THOROUGHLY COORDINATE WITH THE DIVISION 26 ROUGH—IN PROVIDER PRIOR TO ROUGH—IN MATERIAL ACQUISITION AND INSTALLATION.
13) CABLE TRAY SHOWN ON THE 1/8" SCALE FLOORPLAN DRAWINGS SHALL BE FURNISHED BY THE DIVISION 26 CONTRACTOR.
14) CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING TELEPHONE, DATA, CENTRAL SOUND, SECURITY CCTV AND ALARM SYSTEM SERVICES IN ALL EXISTING AREAS FOR DURATION OF PROJECT FOR MULTI—PHASED PROJECTS. CONTRACTOR SHALL COLLABORATE WITH OWNER'S TECHNOLOGY PERSONNEL AS NECESSARY AND PROVIDE TEMPORARY WIRING, CROSS—CONNECTS, TERMINATION DEVICES, AND LABOR TO MAINTAIN OPERATION ACCEPTABLE TO THE OWNER. CONTRACTOR SHALL REFER TO THE FRONT END DOCUMENTS OF THE SPECIFICATIONS FOR ADDITIONAL INFORMATION RELATED TO PHASING. ALL PHASING QUESTIONS SHALL BE ADDRESSED PRIOR TO THE CONTRACTOR'S BID SUBMISSION.
15) EACH CONTRACTOR SHALL FIELD VERIFY ALL EXISTING APPLICABLE CONDITIONS AND DIMENSIONS SHOWN ON THE DRAWINGS. AS PERTAINS TO THE INTENT OF THESE DRAWINGS, CONTRACTOR SHALL BRING TO THE ATTENTION OF THE ARCHITECT AND DESIGNER ANY DISCREPANCIES DISCOVERED PRIOR TO THE COMMENCEMENT OF ANY WORK AFFECTED BY OR RELATED TO SUCH DISCREPANCY. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH OR CAUSED BY THAT CONTRACTOR'S FAILURE TO COMPLY WITH THIS REQUIREMENT.
16) EVERY SPACE INCLUDING HALLWAYS, RESTROOMS, CLOSETS, STAIRWELLS, ETC SHALL HAVE A UNIQUE ROOM IDENTIFIER. FINAL ROOM NUMBERS SHALL BE CONFIRMED WITH OWNER BEFORE CONSTRUCTION DOCUMENTS ARE ISSUED. ONCE CONSTRUCTION BEGINS ROOM NUMBERS SHALL NOT CHANGE.
17) THE MAJORITY OF THIS BUILDING WILL HAVE NO CONCEALED ACCESSIBLE CEILING SPACES. PROVIDE COMMUNICATIONS PATHWAYS AS SPECIFIED SECURED TO THE BUILDING STRUCTURE. BUILDING STRUCTURE AND COMMUNICATIONS PATHWAYS WILL BE PAINTED. PROVIDE COMMUNICATIONS PATHWAYS TO CONCEAL ALL COMMUNICATIONS CABLING FROM VIEW AND FROM PAINT.
18) WHERE COMMUNICATIONS CABLING IS LOCATED IN CONCEALED ACCESSIBLE CEILING SPACES, OPEN TOP CABLING SUPPORTS AS SPECIFIED MAY BE USED TO SUPPORT CABLING. PROVIDE SLEEVED PENETRATIONS AS REQUIRED FOR CABLING TO CORRIDOR PRIMARY PATHWAY.

GENERAL CABLING NOTES:

1. PLENUM CABLE REQUIRED. ALL PROVIDED CABLE THAT WILL NOT BE INSTALLED IN A FULLY ENCLOSED CONDUIT SYSTEM SHALL BE RATED FOR INSTALLATION WITHIN A RETURN AIR PLENUM.
2. ALL INSTALLED CABLING SHALL BE CONTINUOUS AND WITHOUT SPLICES, EXCEPT WHERE OTHERWISE NOTED.

○ PLAN NOTES: APPLIES TO ALL FLOOR PLANS

1. EXISTING CABLE TRAY TO REMAIN.
2. EXISTING TELECOM ROOM. REMOVE ALL EXISTING CABLING EQUIPMENT AND HARDWARE. TURN OVER ALL EQUIPMENT AND HARDWARE TO OWNER.
3. REMOVE EXISTING PATHWAYS AND CABLING COMPLETE.
4. EXISTING 150 PAIR CAMPUS COPPER BACKBONE TERMINATES HERE. REMOVE COMPLETE BACK TO SPLICE CASE LOCATED IN UTILITY TUNNEL.
5. EXISTING CAMPUS FIBER TERMINATES HERE. REMOVE FROM THIS SPACE AND RE—ROUTE TO NEW TELECOM ROOM 013, SHEET T2.00.
6. PROVIDE 12" WIDE CABLE TRAY AS SPECIFIED TO SUPPORT COMMUNICATIONS CABLING. PROVIDE SOLID BOTTOM WHERE EXPOSED TO PUBLIC VIEW.
7. ALIGN WITH EXISTING CABLE TRAY.
8. VERIFY LOCATION WITH OWNER.
9. PROVIDE 4 HORIZONTAL UTP DATA CABLES FROM MASTER CONTROL RACK LOCATED IN RADIO STUDIO #2 TO EACH OF RADIO STUDIO #1 AND #3 FOR AUDIO SERVICES. TERMINATE COMPLETE. COORDINATE WITH OWNER PRIOR TO INSTALLATION.
10. PROVIDE VIKING E—1600—60A ROYAL BLUE EMERGENCY WALL—MOUNT TELEPHONE AND ANALOG CONNECTION, TYPICAL OF EACH 911 OUTLET.
11. PROVIDE A/V EQUIPMENT AS INDICATED ON SHEET 4.04. SEE DETAILS. CONFIRM REQUIREMENTS PRIOR TO ROUGH—IN.
12. FIVE SATELLITE DISHES EXIST ON THE ROOF. TWO HAVE NON—PENETRATING BALLASTED MOUNTS. TWO HAVE PENETRATING MOUNTS. ONE IS WALL—MOUNTED TO THE NORTH STAIRWELL. REMOVE COMPLETE INCLUDING ALL HARDWARE AND CABLING.
13. PROVIDE MONO SYSTEMS RACETRAY OR EQUIVALENT AS SPECIFIED FOR PRIMARY PATHWAYS THROUGH CORRIDORS. COORDINATE INSTALLATION WITH ELECTRICAL, MECHANICAL, PLUMBING, AND OTHER SYSTEMS TO AVOID CONFLICTS. PROVIDE OVERHEAD SUPPORT FROM STRUCTURE ABOVE. LOCATION SHOWN IS APPROXIMATE. PROVIDE COMPLETE SYSTEM AS REQUIRED.
14. PROVIDE 18" x 18" x 6" PULL BOX. ALL COMMUNICATIONS PATHWAYS ON SOUTH SIDE OF BASEMENT TERMINATE HERE. ROUTE HORIZONTAL CABLING TO SECOND FLOOR CORRIDOR PRIMARY PATHWAY VIA THIS CONDUIT.
15. TERMINATE CONDUIT ABOVE PRIMARY PATHWAY IN CORRIDOR.
16. TERMINATE CAMPUS FIBER IN THIS LOCATION. SEE SHEET T3.01. IN ADDITION, PROVIDE J—TRAY AS SPECIFIED BETWEEN THIS RACK LOCATION AND THE RACK LOCATION IN THE NORTHEAST CORNER OF CONTROL ROOM 334. COORDINATE ROUTE WITH OWNER PRIOR TO INSTALLATION. PROVIDE SYSTEM COMPLETE.
17. SEE DRAWING E6.01 FOR FLOOR BOX SCHEDULE.
18. LOCATE POWER SUPPLY AND CONTROL PANEL IN CEILING SPACE OF CONCESSION 133.
19. LOCATE POWER SUPPLY AND CONTROL PANEL ON INSIDE WALL ABOVE DOOR.
20. LOCATE POWER SUPPLY AND CONTROL PANEL IN CEILING SPACE OF MULTIMEDIA BOOTH 121.
21. LOCATE POWER SUPPLY AND CONTROL PANEL IN RECESSED JUNCTION BOX IN WEST WALL OF CORRIDOR 101.

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Dreiser Add #5

INDIANA STATE UNIVERSITY
TERRE HAUTE, INDIANA

COMMUNICATIONS STANDARDS

Dreiser Hall Renovation

221 North 6th Street
Terre Haute, IN 47809

Browning Day
Project No. 19A052

R.E. Dimond
Project No. 19082

James A Darnell
BICSI ID #101926
EXPIRES 12-31-21
RCDD
06/05/2020

06/05/2020 — 100% CONSTRUCTION DOCUMENTS

MARK	DESCRIPTION	DATE
5	ADDENDUM #5	2020—07—02

PROJECT NO.:
PROJECT DATE: June 05, 2020
DRAWN BY:
CHECKED BY:
DWG FILE:

Keyplan

LEGEND

T0.01

RENOVATION LEGEND:

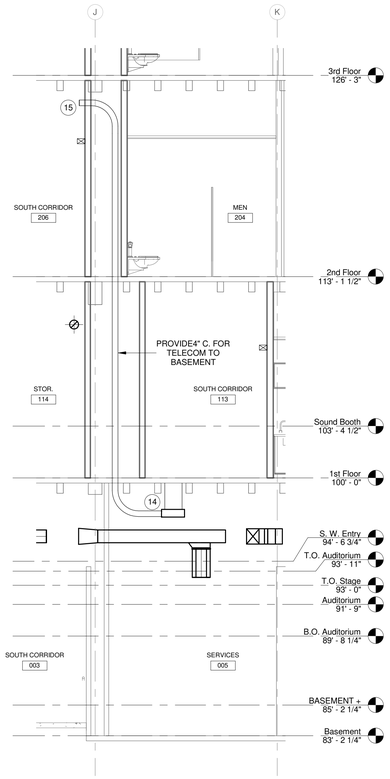
- WORK TO BE INSTALLED
- WORK TO REMAIN

GENERAL NOTES:

1. REFER TO SHEET T0.01 FOR ADDITIONAL GENERAL NOTES.

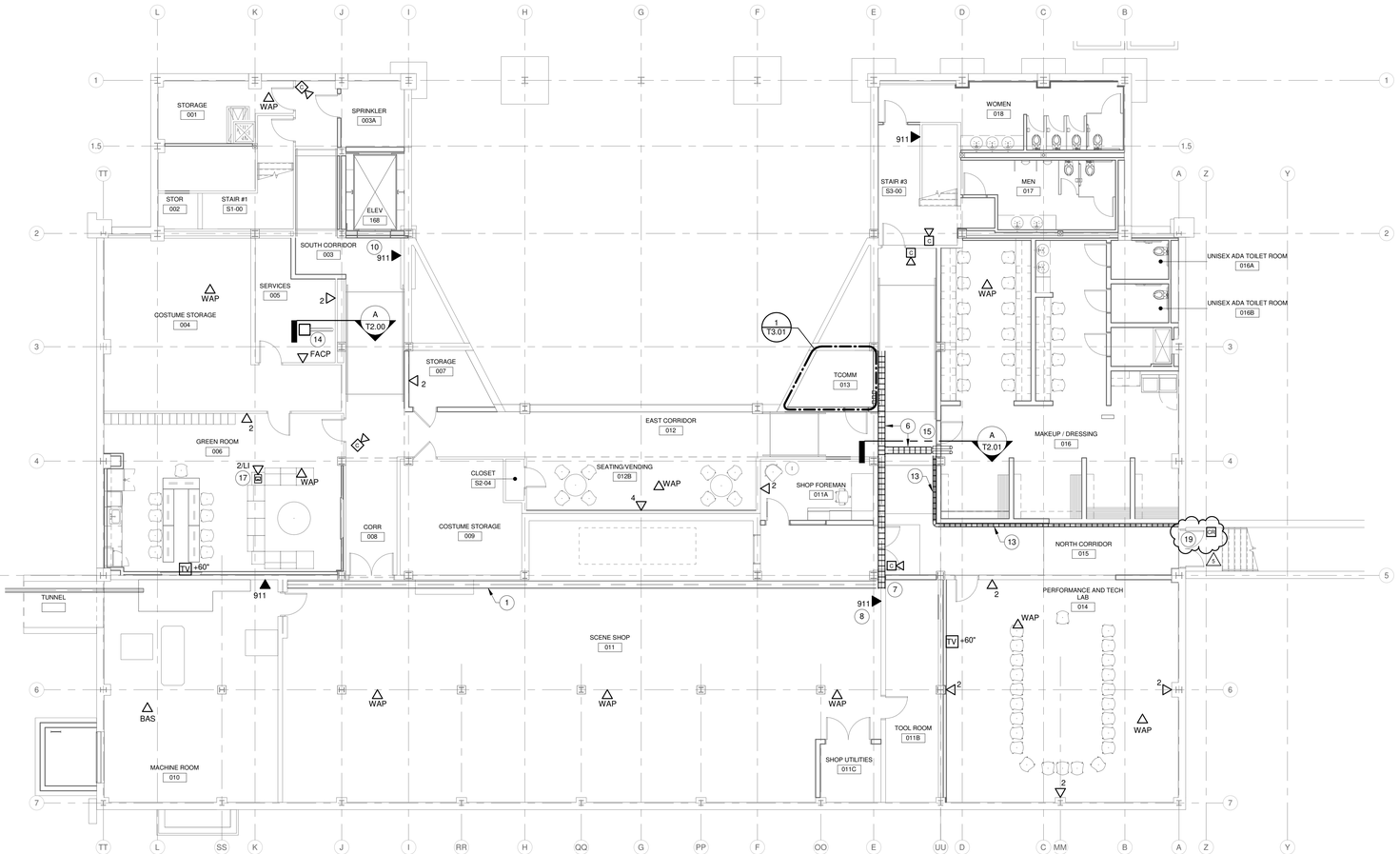
(#) PLAN NOTES:

1. SEE T0.01.



A BASEMENT TO 1ST FLOOR CONDUIT ROUTING - TELECOMMUNICATIONS

SCALE: 1/4" = 1'-0"



BASEMENT PLAN - TELECOMMUNICATIONS

SCALE: 1/8" = 1'-0"

NORTH

Dreiser Add #5

browning day

626 North Illinois Street
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Phone: (317) 635-5030
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BICSI ID # 101925
EXPIRES 12-31-21
RCDD

CERTIFICATION 06/06/2020

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Indiana State University -
Dreiser Hall Renovation

221 North 6th Street
Terre Haute, IN 47809

Project No.: 19A052
Drawn By: DK
Checked By: JD
Scale: See Drawing
Issue Date: 06/05/2020

REVISION SCHEDULE		
Rev. #	Revision Description	Issue Date
5	ADDENDUM #5	2020-07-02

BASEMENT PLAN - TELECOMMUNICATIONS

T2.00

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RENOVATION LEGEND:

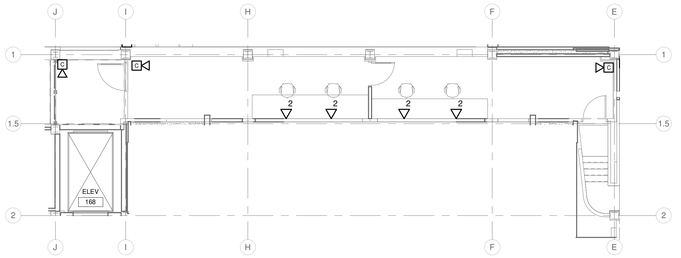
- WORK TO BE INSTALLED
- WORK TO REMAIN

GENERAL NOTES:

1. REFER TO SHEET T0.01 FOR ADDITIONAL GENERAL NOTES.

(#) PLAN NOTES:

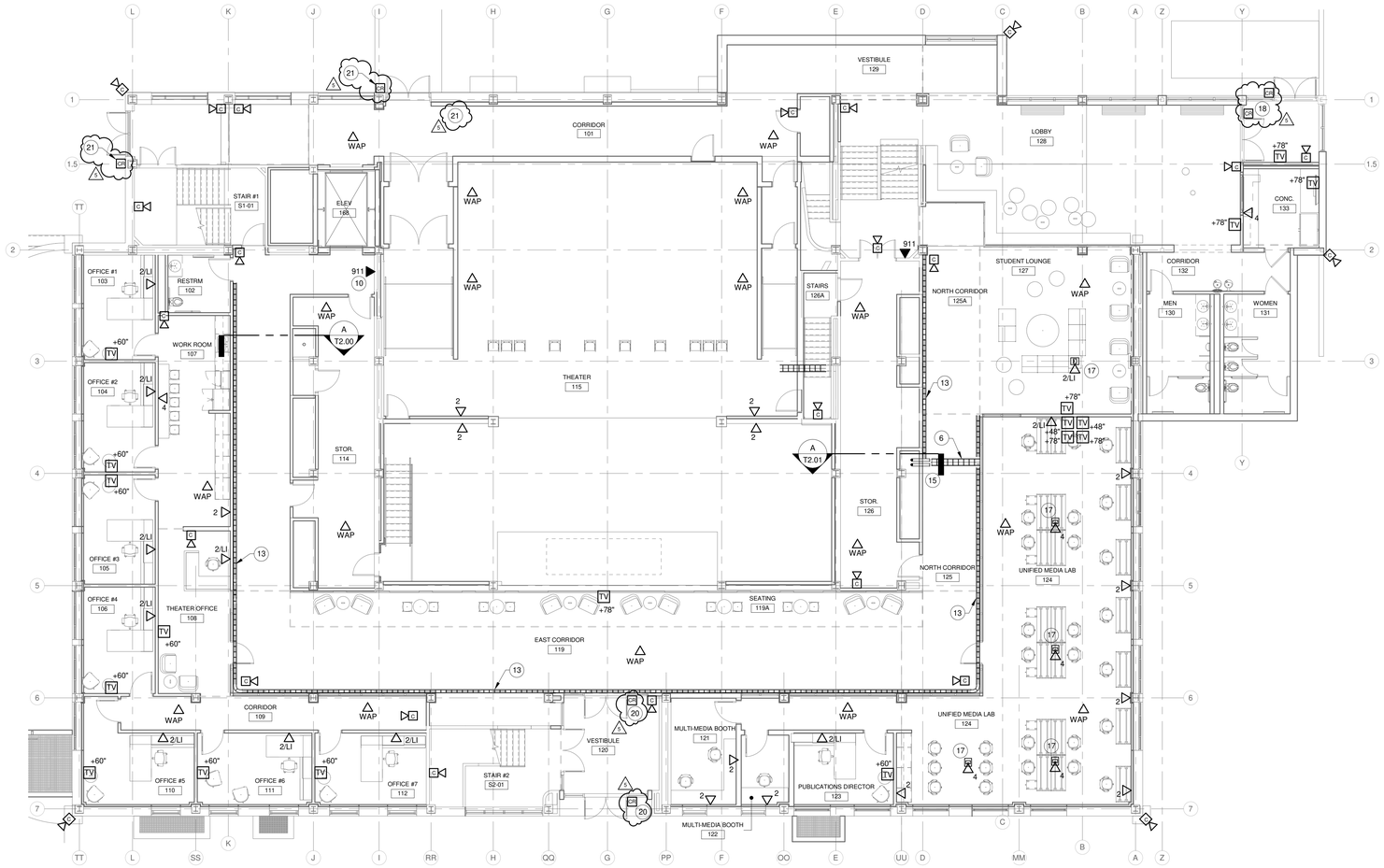
1. SEE T0.01.

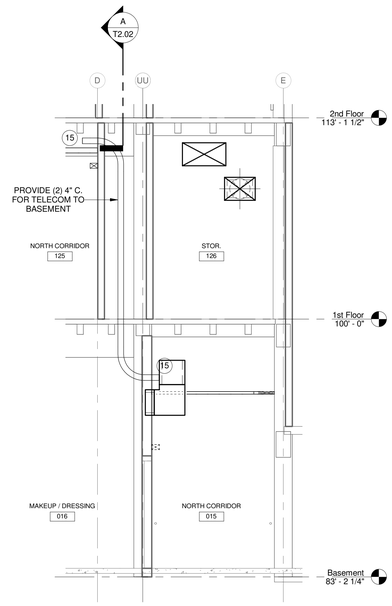


CONTROL ROOM FLOOR PLAN - TELECOMMUNICATIONS

SCALE: 1/8" = 1'-0"

NORTH





A BASEMENT TO 1ST FLOOR CONDUIT ROUTING - TELECOMMUNICATIONS

SCALE: 1/4" = 1'-0"

FIRST FLOOR PLAN - TELECOMMUNICATIONS

SCALE: 1/8" = 1'-0"

NORTH

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Bicsi
James A Durnell
BICSI ID # 101925
EXPIRES 12-31-21
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CERTIFICATION

06/06/2020

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Indiana State University - Dreiser Hall Renovation

221 North 6th Street
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REVISION SCHEDULE		
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5	ADDENDUM #5	2020-07-02

FIRST FLOOR PLAN - TELECOMMUNICATIONS

T2.01

RENOVATION LEGEND:

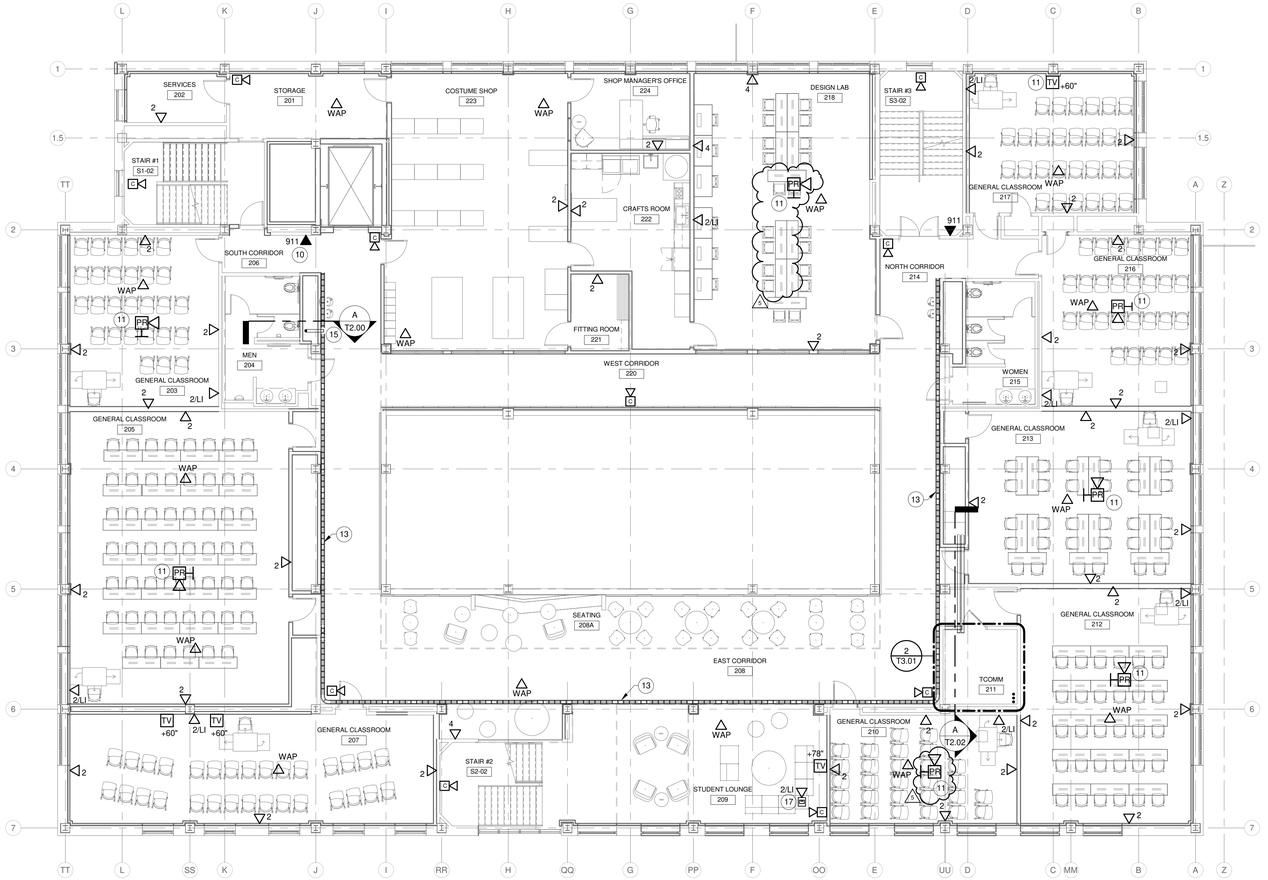
- WORK TO BE INSTALLED
- WORK TO REMAIN

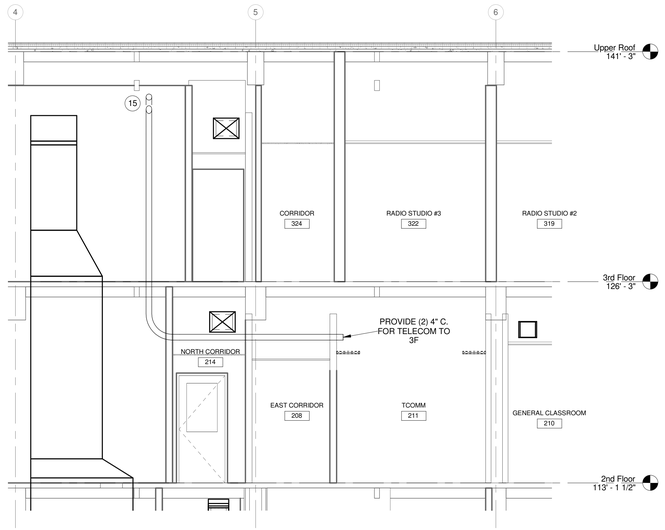
GENERAL NOTES:

1. REFER TO SHEET T0.01 FOR ADDITIONAL GENERAL NOTES.

(#) PLAN NOTES:

1. SEE T0.01.





A 2ND TO 3RD FLOOR CONDUIT ROUTING - TELECOMMUNICATIONS

SCALE: 1/4" = 1'-0"

SECOND FLOOR PLAN - TELECOMMUNICATIONS

SCALE: 1/8" = 1'-0"

NORTH

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BICSI ID # 103126
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CERTIFICATION 06/06/2020

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Indiana State University - Dreiser Hall Renovation

221 North 6th Street
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Project No.: 19A052
Drawn By: DK
Checked By: JD
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Issue Date: 06/05/2020

REVISION SCHEDULE		
Rev. #	Revision Description	Issue Date
5	ADDENDUM #5	2020-07-02

SECOND FLOOR PLAN - TELECOMMUNICATIONS

T2.02

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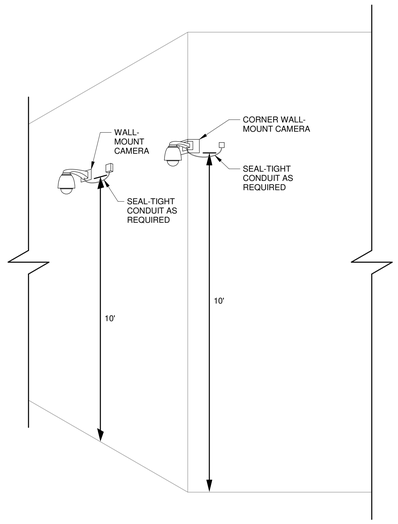
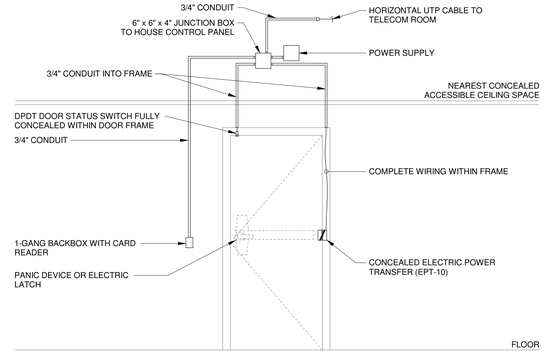


D TYPICAL EXTERIOR CAMERA MOUNTING DETAIL

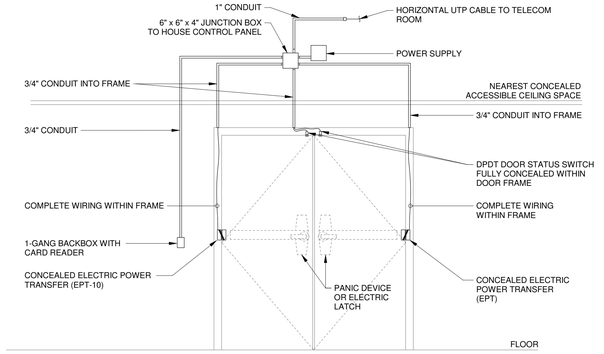
SCALE: NONE



NOTE:
DOOR POWER SUPPLY, POWER TRANSFER DEVICES AND ELECTRIFIED HARDWARE PROVIDED UNDER DIVISION 8. INSTALL EQUIPMENT ON SECURED SIDE OF DOOR UNLESS SPECIFICALLY NOTED. PROVIDE ALL WIRING FROM CONTROL PANEL TO ELECTRIFIED DOOR HARDWARE AND CARD READER.

A TYPICAL DOOR DETAIL 'A'

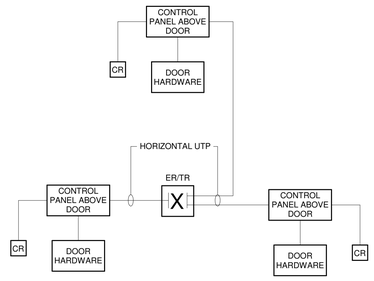
SCALE: 1/2" = 1'-0"



NOTE:
DOOR POWER SUPPLY, POWER TRANSFER DEVICES, AND ELECTRIFIED HARDWARE PROVIDED UNDER DIVISION 8. INSTALL EQUIPMENT ON SECURED SIDE OF DOOR UNLESS SPECIFICALLY NOTED. PROVIDE ALL WIRING FROM CONTROL PANEL TO ELECTRIFIED DOOR HARDWARE AND CARD READER.

B TYPICAL DOOR DETAIL 'B'

SCALE: 1/2" = 1'-0"



C TYPICAL OF EAC SYSTEM HORIZONTAL CONNECTIONS

SCALE: NONE

Dreiser Add #5

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BICSI ID # 101926
EXPIRES 12-31-21
RCDD

CERTIFICATION 06/06/2020

100% CONSTRUCTION DOCUMENTS

Indiana State University - Dreiser Hall Renovation

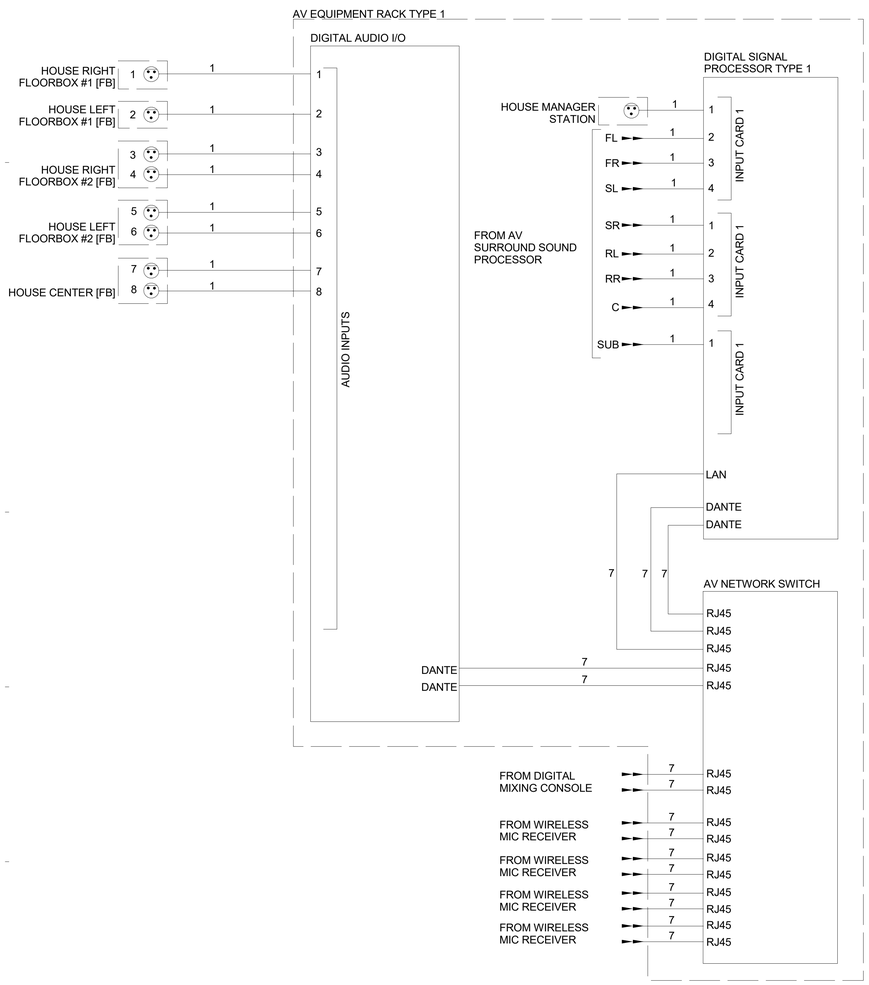
221 North 6th Street
Terre Haute, IN 47809

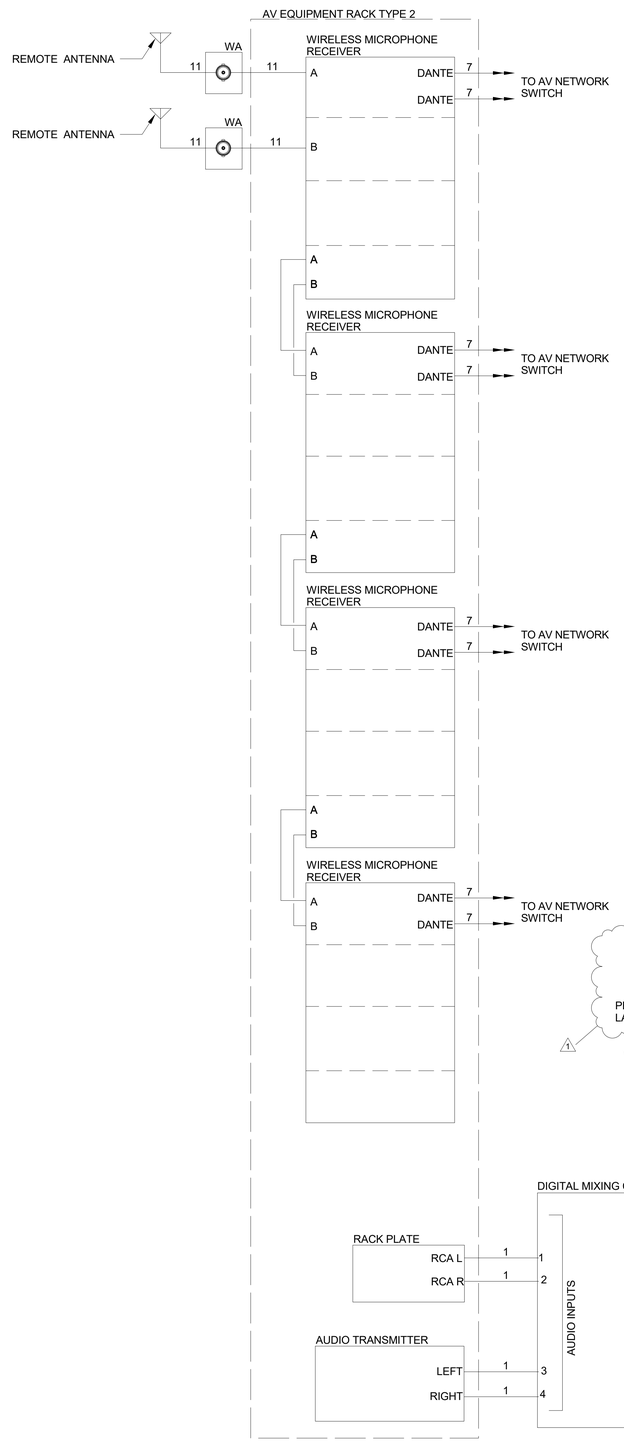
Project No.: 19A052
Drawn By: DK
Checked By: JD
Scale: See Drawing
Issue Date: 06/05/2020

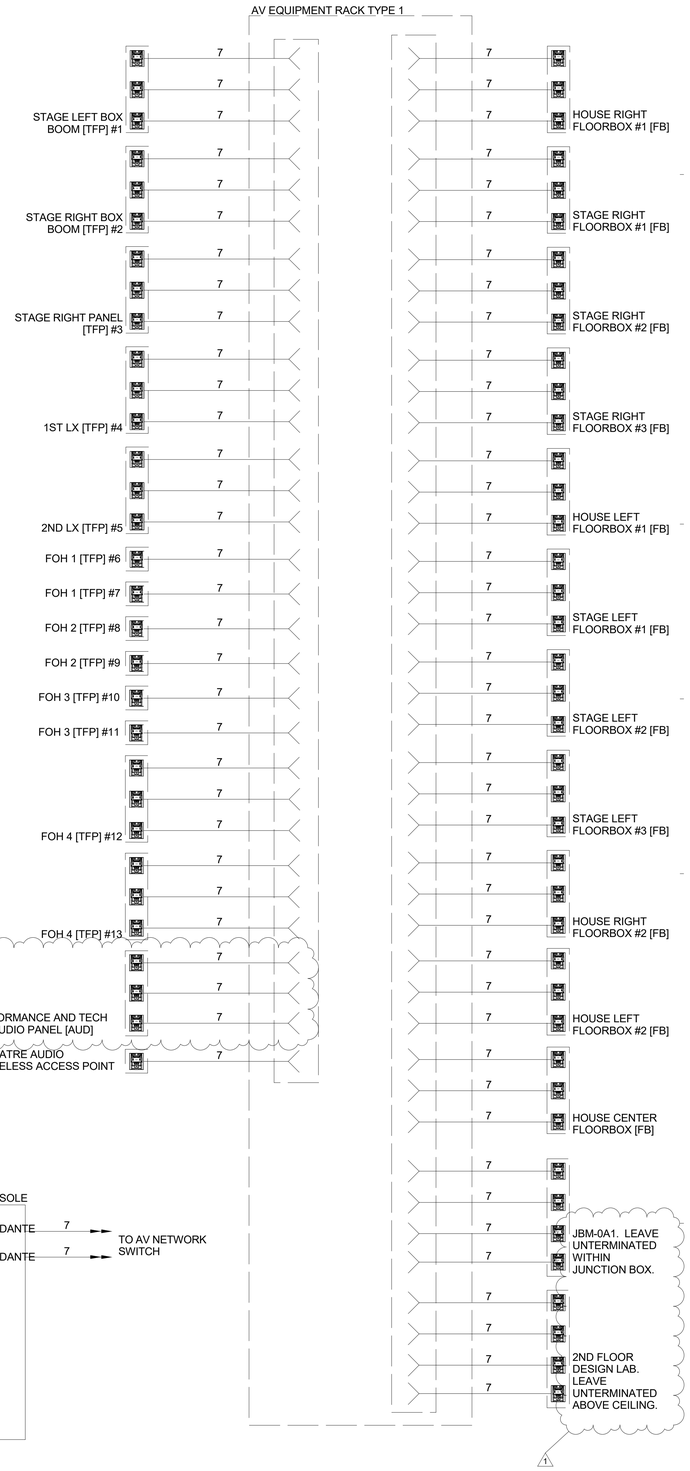
REVISION SCHEDULE		
Rev. #	Revision Description	Issue Date
5	ADDENDUM #5	2020-07-02

DETAILS - DOOR SECURITY

T4.05







CABLING LEGEND

1. BALANCED MICROPHONE / LINE LEVEL CABLING
2. UNBALANCED MICROPHONE / LINE LEVEL CABLING
3. 12AWG LOUDSPEAKER CABLING
4. 16AWG LOUDSPEAKER CABLING
5. HDMI CABLING
6. STP CABLING
7. UTP CABLING
8. MANUFACTURER RECOMMENDED CABLING
9. RS-232 CABLING
10. RELAY CABLING
11. RF CABLING

1 AUDIO HEADEND DIAGRAM
N.T.S.

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CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

Terre Haute, Indiana 47809

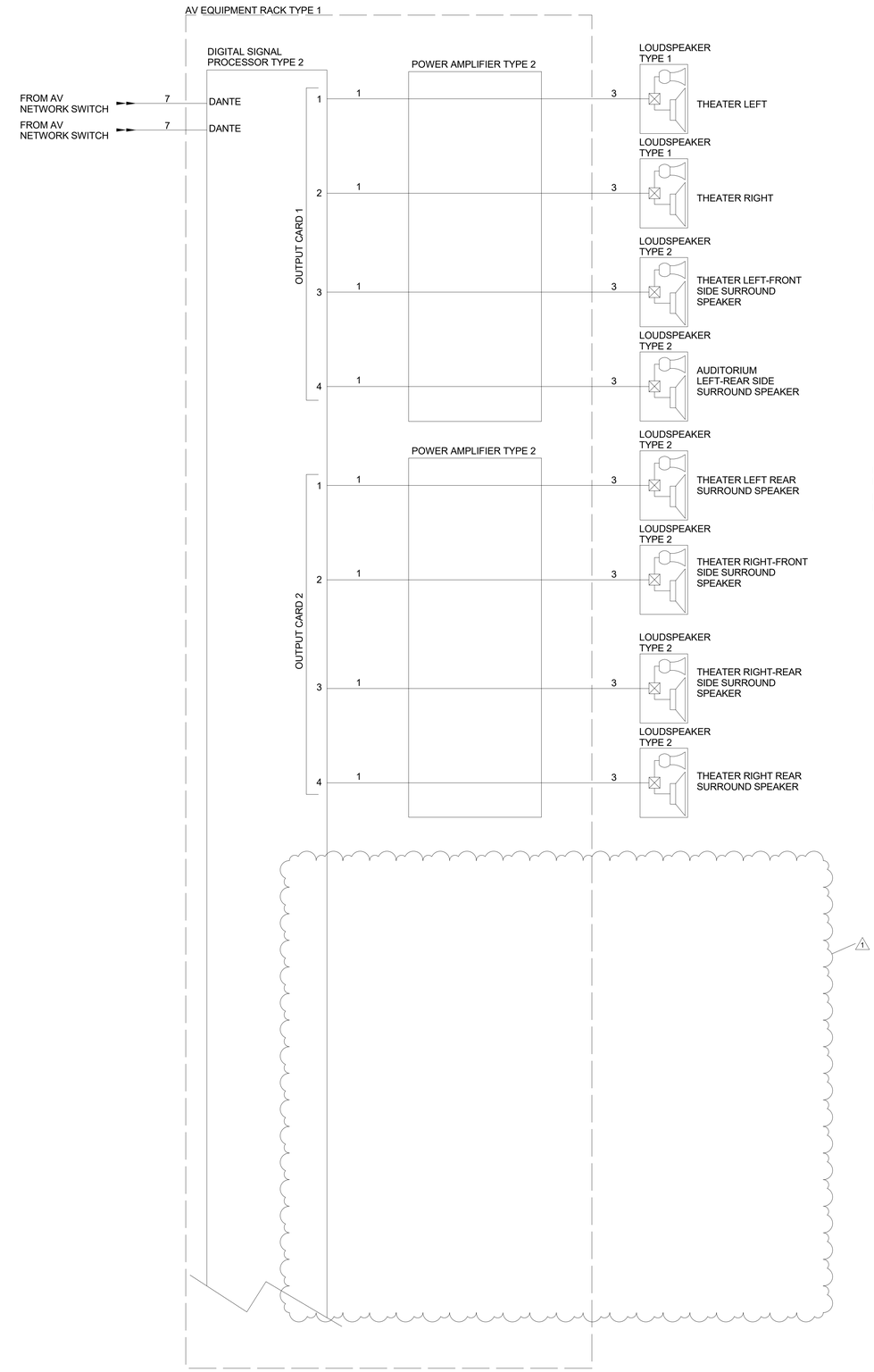
Project No.: 19A052
Drawn By: LAC
Checked By: JJK
Scale: See Drawing
Issue Date: June 5, 2020

REVISION SCHEDULE

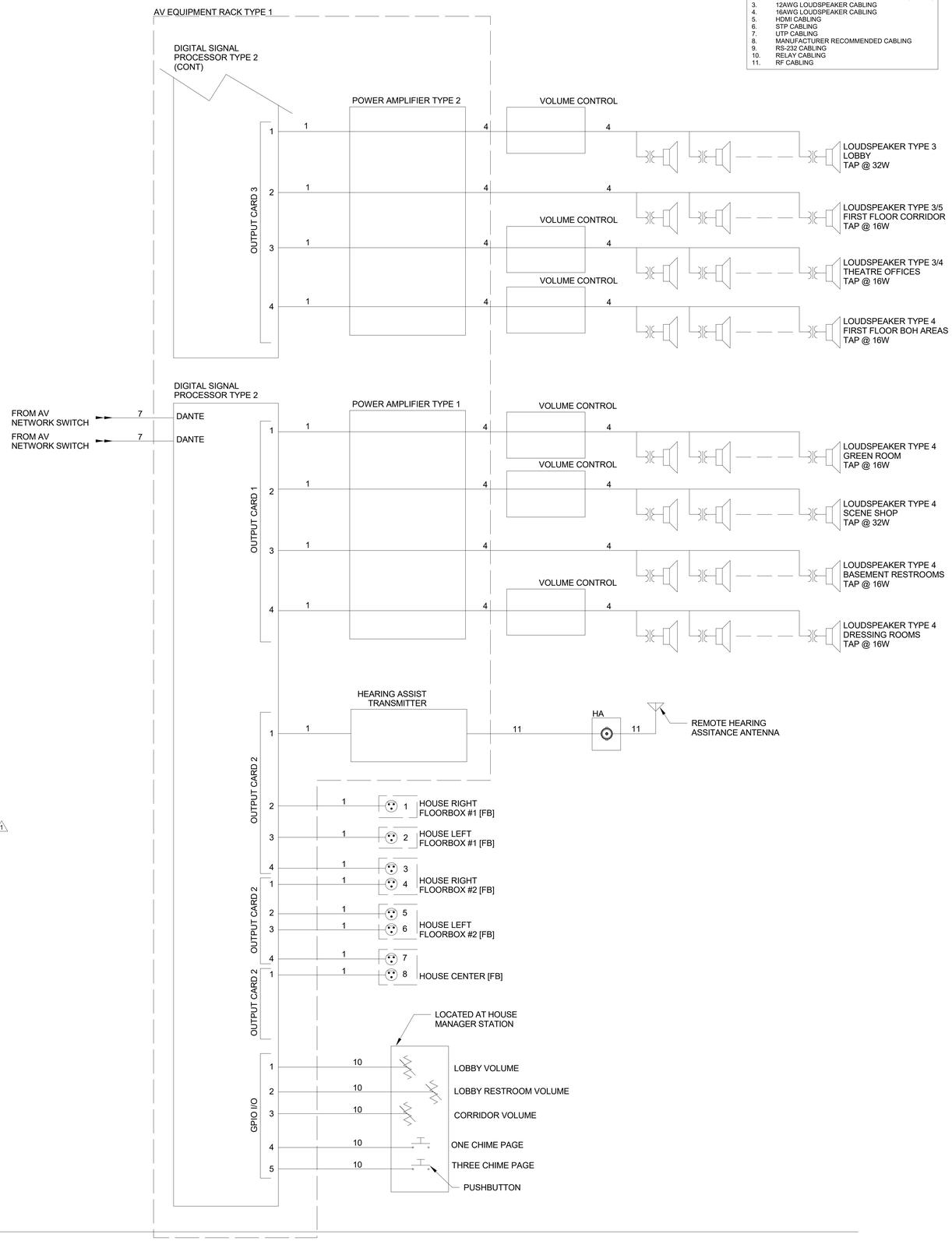
Rev. #	Revision Description	Issue Date
1	Addendum #5	07/02/2020

THEATER FUNCTIONAL DIAGRAMS

AV3.00



1 LOUDSPEAKER DIAGRAM
N.T.S.



CABLING LEGEND

1.	BALANCED MICROPHONE / LINE LEVEL CABLING
2.	UNBALANCED MICROPHONE / LINE LEVEL CABLING
3.	12AWG LOUDSPEAKER CABLING
4.	16AWG LOUDSPEAKER CABLING
5.	HDMI CABLING
6.	STP CABLING
7.	UTP CABLING
8.	MANUFACTURER RECOMMENDED CABLING
9.	RS-232 CABLING
10.	RELAY CABLING
11.	RF CABLING

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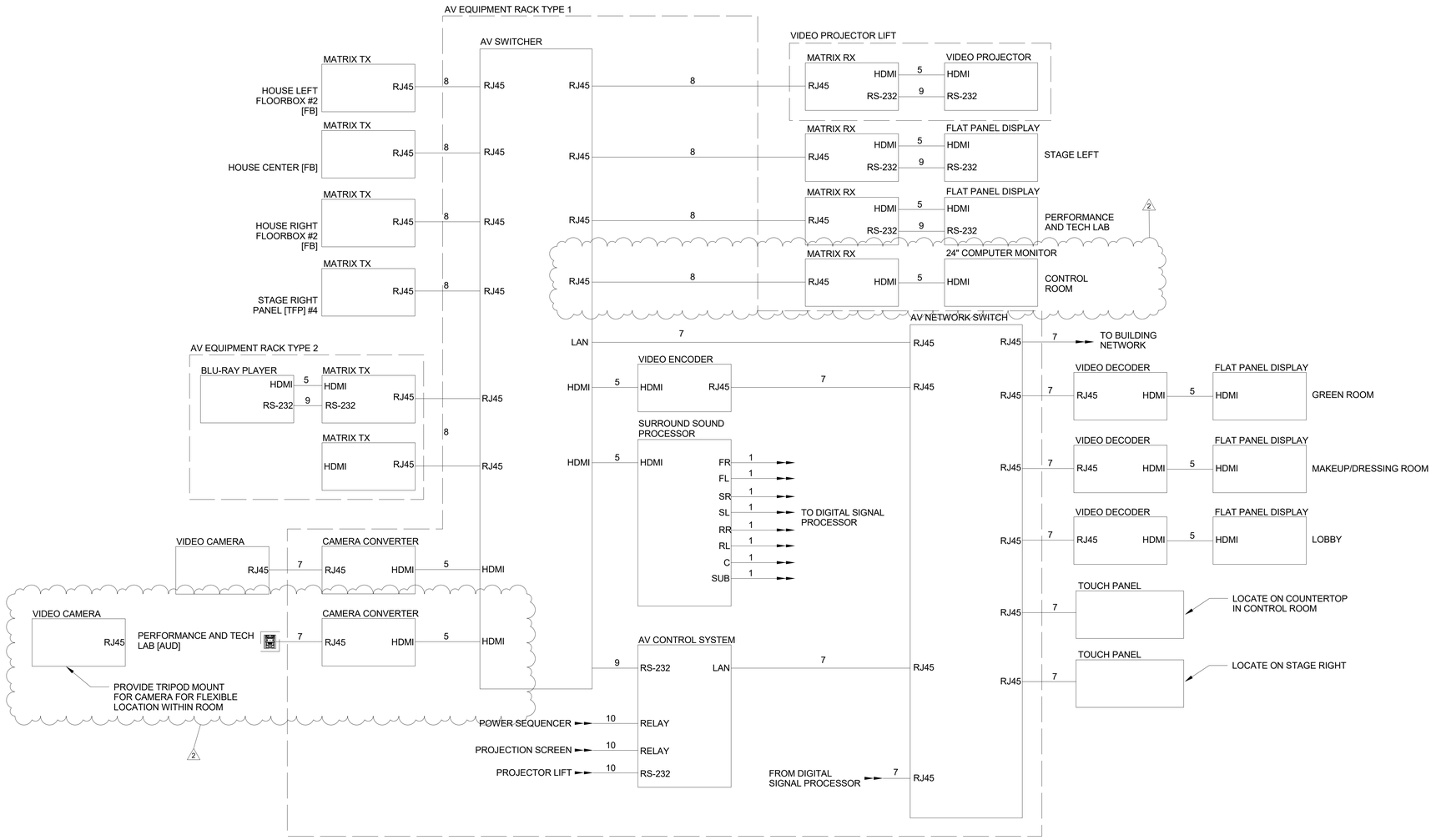
REVISION SCHEDULE

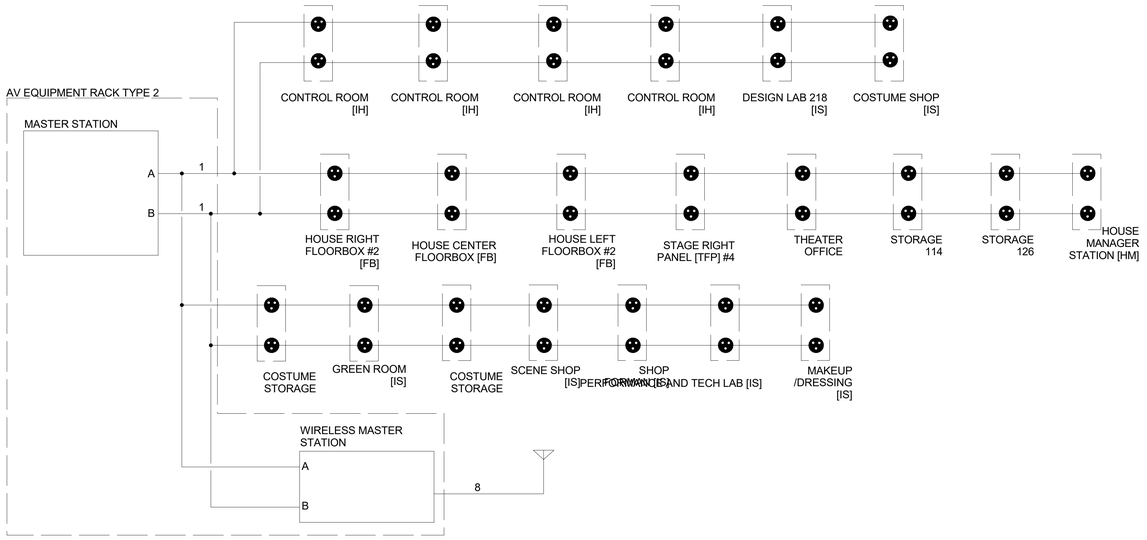
Rev. #	Revision Description	Issue Date
1	Addendum #5	07/02/2020

THEATER FUNCTIONAL DIAGRAMS

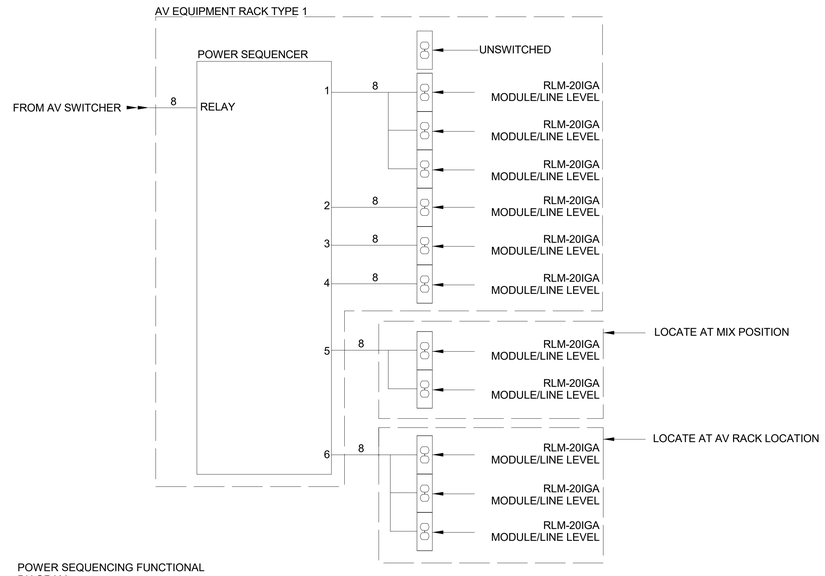
AV3.01



1 AUDIO-VISUAL SYSTEM DIAGRAM
N.T.S.



2 INTERCOM FUNCTIONAL DIAGRAM
N.T.S.



3 POWER SEQUENCING FUNCTIONAL DIAGRAM
N.T.S.

CABLING LEGEND

1. BALANCED MICROPHONE / LINE LEVEL CABLING
2. UNBALANCED MICROPHONE / LINE LEVEL CABLING
3. 12AWG LOUDSPEAKER CABLING
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CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

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Drawn By: LAC
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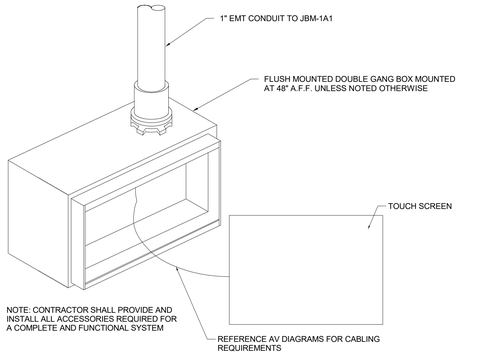
REVISION SCHEDULE

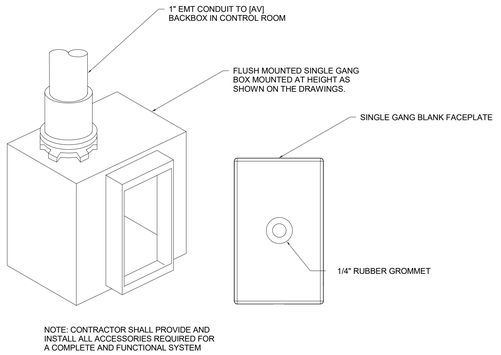
Rev. #	Revision Description	Issue Date
1	Addendum #2	06/19/2020
2	Addendum #5	07/02/2020

THEATER FUNCTIONAL DIAGRAMS

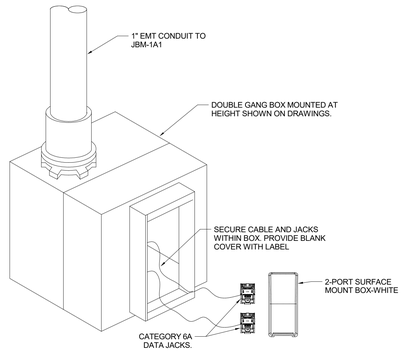
AV3.02



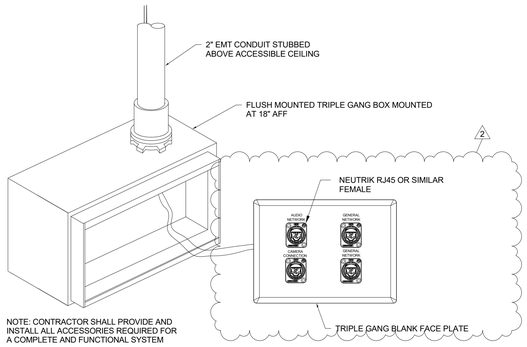
1 TOUCH SCREEN LOCATION
N.T.S.



2 VIDEO CAMERA LOCATION
N.T.S.



3 WIRELESS ACCESS POINT - WALL MOUNTED
N.T.S.



4 AUDIO INPUT LOCATION
N.T.S.

RACK BLANK
WIRELESS MASTER STATION
MASTER STATION
RACK PLATE
BLU-RAY PLAYER
RACK PLATE
RACK PLATE
RACK BLANK
SLIDING SHELF
RACK BLANK

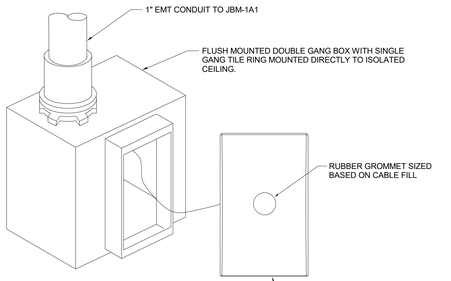
5 NORTH CONTROL ROOM 136 AV EQUIPMENT RACK ELEVATION
N.T.S.

RACK BLANK
WIRELESS MICROPHONE RECEIVER
WIRELESS MICROPHONE RECEIVER
WIRELESS MICROPHONE RECEIVER
WIRELESS MICROPHONE RECEIVER
RACK BLANK
AUDIO TRANSMITTER
RACK BLANK
RACK PLATE
RACK BLANK
SLIDING SHELF
RACK BLANK

6 SOUTH CONTROL ROOM 135 AUDIO RACK ELEVATION
N.T.S.

RACK BLANK
POWER SEQUENCER
RACK BLANK
HEARING ASSIST TRANSMITTER
RACK BLANK
DIGITAL SIGNAL PROCESSOR
DIGITAL SIGNAL PROCESSOR
DIGITAL SIGNAL PROCESSOR
RACK BLANK
SURROUND SOUND PROCESSOR
VIDEO ENCODER
AV NETWORK SWITCH
OFOI NETWORK SWITCH
OFOI NETWORK SWITCH
PATCH PANEL
PATCH PANEL
PATCH PANEL
AV SWITCHER
RACK BLANK
DIGITAL AUDIO I/O
RACK VENT
POWER AMPLIFIER
RACK VENT
POWER AMPLIFIER
POWER AMPLIFIER
RACK VENT
POWER AMPLIFIER
POWER AMPLIFIER
RACK VENT

7 THEATER AMPLIFIER RACK ELEVATION
N.T.S.



8 VIDEO PROJECTOR LOCATION
N.T.S.

Dreiser Add #5

browning day

626 North Illinois Street
Indianapolis, Indiana 46204
Phone: (317) 635-5030
Website: www.browningday.com

Indiana State University
Owner

200 North 7th Street
Terre Haute, IN 47809
Phone: (812) 237-3773
Website: www.indstate.edu

VS Engineering
Structural Engineer

4275 North High School Road
Indianapolis, IN 46254
Phone: (317) 293-3542
Website: www.vsengineering.com

RE Dimond
MEP Engineer

732 North Capitol Avenue
Indianapolis, IN 46204
Phone: (317) 634-4672
Website: www.redimond.com

Design 27
Acoustical Engineer

1650 East 49th Street
Indianapolis, IN 46205
Phone: (317) 536-8000
Website: www.design27.com

Myers Engineering, Inc.
Civil Engineer

525 West Honey Creek Drive
Terre Haute, IN 47802
Phone: (812) 238-9731
Website: www.myersengineering.com

CERTIFICATION

Construction Documents

Indiana State University - Dreiser Hall Renovation

Terre Haute, Indiana 47809

Project No.: 19A052
Drawn By: LAC
Checked By: JJK
Scale: See Drawing
Issue Date: June 5, 2020

REVISION SCHEDULE		
Rev. #	Revision Description	Issue Date
1	Addendum #2	06/19/2020
2	Addendum #5	07/02/2020

AUDIO VISUAL DETAILS

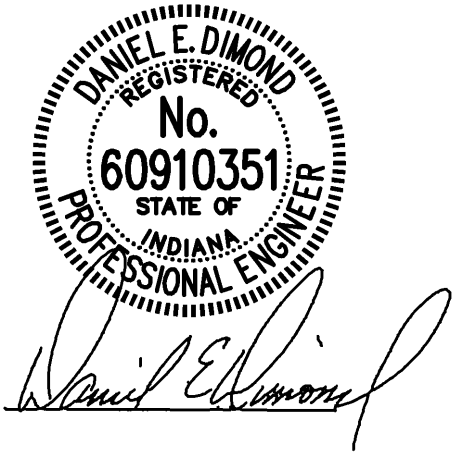
AV4.02

R.E. Dimond
Consulting Engineers

ADDENDUM NO. 05

Indiana State University
Dreiser Hall Renovation

July 2, 2020



Daniel. E. Dimond, PE CEM

This Addendum issued prior to bidding, alters, amends, corrects or clarifies the Proposal Documents to the extent stated herein and does hereby become a part of the Proposal Documents, and will become a part of the Contract Documents of the successful bidder.

MECHANICAL

A. SPECIFICATIONS

1. Section No. 20 00 10 – COMMON WORK RESULTS FOR FIRE SUPPRESSION, PLUMBING & HVAC
   a. Paragraph 1.013, Z. – Change to read “Ceiling and wall access panels shall be located and provided by the mechanical contractor and installed by the mechanical contractor.

2. Section No. 20 00 50 – COMMON MATERIALS AND METHODS FOR FIRE SUPPRESSION, PLUMBING & HVAC
   a. Paragraph 2.016, CEILING AND WALL ACCESS PANELS – change to read as follows:
      a) Ceiling and wall access panels for mechanical equipment shall be furnished and installed by the mechanical contractor.
         i. Wherever any item of equipment is concealed or enclosed above or behind walls, ceilings, floors, bulkheads, etc., an access panel or door shall be provided.

ii. When access through acoustic tile ceiling is required, this shall be accomplished wherever possible by use of removable ceiling tiles.
iii. All access panels, doors and removable ceiling tiles required for mechanical equipment shall be provided and installed by contractor as required and as approved by Architect/Engineer.
iv. Minimize quantity of access panels as much as possible and coordinate each location with other trades to share use.
v. Access panels or doors shall be of design suitable to type of construction at each location. Locks shall be flush, screwdriver-operated, cam action type. Doors and frames shall be furnished in prime coat of gray, rust-inhibitive paint unless otherwise specified. These units shall be manufactured by Milcor Style 'M' or approved equal. 24"x24", or as required in specific instances for suitable access. Coordinate with all trades to match access panels (make/model/size) being used throughout the project.

3. Section No. 23 36 00 – AIR TERMINAL UNITS
   a. Add "Carrier" as an approved manufacturer of air terminal units within this section.

4. Section No. 23 82 19 – FAN COIL UNITS
   a. Add "Carrier" as an approved manufacturer of fan coil units within this section.

5. Section No. 23 84 13 – HUMIDIFIERS
   a. Add "Neptronic" as an approved manufacturer of duct mounted humidifier units within this section.

B. DRAWINGS

1. Drawing M2.03 – THIRD FLOOR PLAN – AIR DISTRIBUTION
   a. Revise Plan Note 3 to read as follows: "3. 48"x10"x38" L-shaped fiberglass room cross talk silencer like Price XT-L or equal. Provide zero deflection return grille on TV-Studio 333 side of wall."
   b. Replace L-shaped transfer duct elbow "HH" at south end of Control Room 334 with two "48"x10" U-shaped fiberglass room cross talk silencers like Price XT-U or equal.
   c. Revise Plan Note 5 to read as follows: "5. 30"x24" transfer air opening in wall above ceiling."

ELECTRICAL

A. SPECIFICATIONS

1. Section No. 26 05 00 – COMMON WORK RESULTS FOR ELECTRICAL
   a. Add 2.07 ACCESS PANELS
      A) Ceiling and wall access panels for electrical equipment shall be furnished and installed by the electrical contractor.
         i. Wherever any electrical outlet, junction box, or item of equipment is concealed or enclosed above or behind walls, ceilings, floors, bulkheads, etc., an access panel or door shall be provided.
         ii. When access through acoustic tile ceiling is required, this shall be accomplished wherever possible by use of removable ceiling tiles.

iii. All access panels, doors and removable ceiling tiles required for electrical equipment shall be provided and installed by contractor as required and as approved by Architect/Engineer.
iv. Minimize quantity of access panels as much as possible and coordinate each location with other trades to share use.
v. Access panels or doors shall be of design suitable to type of construction at each location. Locks shall be flush, screwdriver-operated, cam action type. Doors and frames shall be furnished in prime coat of gray, rust-inhibitive paint unless otherwise specified. These units shall be manufactured by Milcor or approved equal, 24"x24" Style 'M', or as required. Coordinate with all trades to match access panels (make/model/size) being used throughout the project.

2. Section No. 26 55 61 – THEATRICAL LIGHTING AND CONTROLS
   a. Add "Theater Dimming Control Matrix 07-01-20" and "Performance Lab Matrix 07-01-20" as issued in this addendum.

B. DRAWINGS

1. Drawing E2.02 – SECOND FLOOR PLAN – LIGHTING
   a. Revise lighting control in the following rooms so that dimmer 'a' controls the row of lights at the projection screen and dimmer 'b' controls the remainder of room lights – 203 (north wall), 210 (west wall) & 218 (north wall). Coordinate with final layout.

2. Drawing E2.10 – BASEMENT PLAN – POWER
   a. Provide a dedicated 20-amp 120-volt emergency circuit from Panel 'BXD' to access controls at door 015-1.

3. Drawing E2.11 – FIRST FLOOR PLAN – POWER
   a. Provide emergency power connection to access controls at doors 120-1, 120-2, 134-1 & 134-2. Connect to door operator emergency circuit for power source. Provide all required work.
   b. Provide emergency power connection to access controls at doors 101-1 & 101-3. Connect to door operator emergency circuit at door 101-1 for power source. (power supply and controller to be recessed in west wall near door 101-3 – verify). Provide all required work.

4. Drawing E2.12 – SECOND FLOOR PLAN – POWER
   a. Revise projection screen location and power connection in the following rooms - 210 (west wall) & 218 (north wall). Coordinate with final layout.

5. Re-issue Drawing E2.30 – BASEMENT PLAN – FIRE ALARM
   a. See clouds on re-issued drawing.

6. Re-issue Drawing E2.31 – FIRST FLOOR PLAN – FIRE ALARM
   a. See clouds on re-issued drawing.

7. Re-issue Drawing E2.32 – SECOND FLOOR PLAN – FIRE ALARM
   a. See clouds on re-issued drawing.

8. Re-issue Drawing E2.33 – THIRD FLOOR PLAN – FIRE ALARM
   a. See clouds on re-issued drawing.

9. Drawing E4.02 – DETAILS – THEATRICAL LIGHTING
   a. Delete this drawing information. It is not specific to this project.

10. Drawing E5.01 – NEW ONE-LINE DIAGRAM - ELECTRICAL
    a. Transformer T-1IG – change name to T-IG. Primary to be 208V-3ph delta and secondary to be 208Y/120V-3ph-4wire, shielded, isolated ground, K13, 75KVA.

TELECOMMUNICATIONS

C. SPECIFICATIONS

1. Section 28 13 00 – ELECTRONIC ACCESS CONTROL (EAC) SYSTEM
   a. Add this section in its entirety.

D. DRAWINGS

1. Re-issue Drawing T0.01 – LEGEND
   a. See clouds on re-issued drawing.

2. Re-issue Drawing T2.00 – BASEMENT FLOOR PLAN – TELECOM
   a. See clouds on re-issued drawing.

3. Re-issue Drawing T2.01 – FIRST FLOOR PLAN – TELECOM
   a. See clouds on re-issued drawing.

4. Re-issue Drawing T2.02 – SECOND FLOOR PLAN – TELECOM
   a. See clouds on re-issued drawing.

5. Add Sheet 4.05 – DETAILS – DOOR SECURITY

END OF ADDENDUM