DATE: July 14, 2023

DEPARTMENT OF GENERAL SERVICES
BUREAU OF CAPITAL PROJECT DESIGN MANAGEMENT
1800 HERR STREETS
HARRISBURG, PENNSYLVANIA

ADDENDUM NO. 32

on

PROJECT NO. DGS C-0211-0005 PHASE 005
PROJECT TITLE - PA State Police Academy - Core Bldgs, BESO & Sitework
PROFESSIONAL:
SOM
7 World Trade Center
New York, NY, 10007

If you submitted a bid prior to this Addendum being issued, your bid has been discarded and you must re-submit your bid(s) prior to the bid opening date and time.

GENERAL CHANGES – ALL CONTRACTS

Item 1 - Please note the following:

Final questions must be submitted via e-Builder no later than 5:00 PM ET on Tuesday, July 18.

Final Addendum will be issued via e-Builder no later than Tuesday, July 25th.

Bids are due by Tuesday, August 1, no later than 2:00 PM. This is a very tight bidding schedule so please manage your time effectively.

Item 2 - Addendums for this bid begin with Addendum 24. Please note that Addendums 1-23 were issued in the course of the previous bid process and can be disregarded for the purposes of this bid. Items issued in addendums from the previous bid process have been incorporated into the current, re-issued bid documents.

Item 3 - Additional individuals from any bidder wishing to gain access to the bid documents must register through eMarketplace and create an account to access e-Builder. Access cannot be granted in any other fashion.

Item 4 - In response to questions submitted, please note the following:

.1 CONTRACT

- Question 120: Door Schedule : Please provide door schedule for OTV Pump House
- Response: Refer to revised GEN-A-580 issued in Addendum #32.
- Question 121: OTV Window : OTV-PH -A-101 calls for (2) W10 windows. Please provide spec and schedule for W10 window.
- Response: Refer to revised GEN-A-580 as issued in Addendum 32 and specification section 088856, including specification information on W10 windows.

- Question 131: Underslab Insulation : The drawings are not clear on where underslab insulation is to go and the thickness. It seams to show at the following locations: Lobby of FTUE, Food storage room in BSO, Pumphouse, and East and West ramps outside Auditorium. Please confirm these locations and thickness and advise on any other locations.
- Response: Underslab insulation is confirmed to be required at all locations listed (Lobby of FTUE, Food Storage Room in BSO, Pump House in OTV, East and West Ramps outside Auditorium). Thickness is 2" at all of these locations.
- Question 133: Perimeter Insulation : Please confirm locations for perimeter insulation on the interior face of foundation walls. The drawings are unclear.
- Response: Perimeter insulation at interior face of foundation wall is required as listed above in question 131 (Lobby of FTUE, Food Storage Room in BSO, Pump House in OTV, East and West Ramps outside Auditorium), plus the fully conditioned portions of the BSO building (excluding the Kennel). Insulation is to extend from top of footing to underside of slab on grade, and extending 2' minimum under building.
- Question 137: Overhead Doors : Drawing ITV-A-603 shows (1) OHD-08 and drawing ITV-A-606 shows (2) OCD-01. These items are not on the door schedule. Please advise.
- Response: Refer to MAQ drawings for Door schedule for OCD-01 door information. See revised ITV-A-702 as issued in Addendum 32 for OHD-08.
- Question 142: Metal Fabrication Testing: Spec 055000 2.16B calls for a " full time inspection agency to perform testing and inspection services for metal fabrication work". Please provide more specifics for this requirement. Which metal fabrication work needs inspected? Does this need to be full time while any metal fabrication work is being done?
- Response: Inspections are required for welded and bolted connections as per 055000, 2.16C. Refer to revised spec section 055000 as issued in Addendum 32 clarifying inspection requirement.
- Question 145: STC Testing : Please confirm where the testing in 092116 3.19C applies on the project.
- Response: Refer to revised spec section 092116 clarifying where testing applies.
- Question 154: Casework : In response to question/response 67 on Addendum 28; the question was referring to the ADA vanity panel below the countertop, not the countertop. Please indicate if the vanity panel material is to be solid surface, plastic laminate or other. Please provide an updated detail with labels for 1/GEN-A-771.
- Response: Vanity panels below countertops in restrooms to be PLAM-01, typically. See 1/GEN-A-771 as shown in addendum #32.
- Question 158: CMU : Detail 3/OTV-PH A-250 indicates CMU-03 for the facade and refers to GEN-A-580 for additional details. Detail 1/GEN-A-580 indicates CMU-01 for the facade. Which is correct?
- Response: Both are correct. Refer to elevations for what CMU type is specified. GEN-A-580 and OTV-PH-A-250 have been updated in Addendum 32 to clarify that both types are possible.
- Question 159: Metals : Detail 1/GEN-A-580 shows a metal angle MFAB-04 however MFAB-04 is not listed in the Keynotes or the specifications. Similar occurs on detail 2/MAQ-A-558 with MFAB-07 and MFAB-08. Sizes of these items are not defined. Additionally, shelf angels sizes are not defined anywhere. Please indicate the sizes of all L-angle steel shown throughout the drawings. Reference GEN series drawings; A-520, A-521, A-540.
- Response: Refer to revised drawings MAQ-A-551. MAQ-A-552, MAQ-A-558 and revised specification section 055000 as issued in Addendum 32. Thicknesses are delegated to miscellaneous metals fabricator.

- Question 160: Structure : Please provide details for the suspended structure above the range baffles shown on 2/FTU-A-660. What is the assembly?
- Response: Range baffle suspension structure is delegated to miscellaneous metals contractor. Refer to revised spec section 010100 clarifying inclusion of scope.
- Question 161: Roof Hatches : How are people to access the catwalk door in the FTU building? Roof hatches are shown on drawing FTUE-A-103 however, there are no ladders shown. Please advise.
- Response: Refer to revised FTUE-A-103 and FTU-A-111 as issued in Addendum 32, showing revised roof hatch and ladder location.
- Question 162: Range : Please provide details for the suspension system for the range baffles in the FTU building. Reference 2/FTU-A-660, 5/FTU-A-720, and 8/FTU-A-720. What is the material?
- Response: Range baffle suspension structure is delegated to miscellaneous metals contractor. Refer to revised spec section 010100 clarifying inclusion of scope.
- Question 169: Zip Sheathing : What is the thickness of the zip sheathing shown on detail 3/FTUE-A-521?
- Response: Refer to CLT spec 061719 and refer to revised FTUE-A-521 and GEN-A-510 as issued in Addendum 32. Zip sheathing is an acceptable form of moisture control but moisture control is to be proposed by CLT supplier and submitted and reviewed as per 061719 1.4 G.
- Question 170: MEP Work at Admin Wing : Please confirm that sheet notes 2-5 on drawing ACD-MX-101 are the responsibility of the .2 and .4 contractor.
- Response: Confirmed, sheet notes 2-5 on drawing ACD-MX-101 are responsibility of the .2 and .4 contractors.
- Question 171: 80350 : Spec 080350 call for a corrosion report from and engineer who is an expert in corrosion. Our exterior envelope consultant is not aware of anyone who does this. Please provide direction on who to reach out to
- Response: We recommend contacting Scott Lieberman of Socotec, contact as follows: scott.lieberman@socotec.us; or David Artigas of SGH, contact as follows: DJArtigas@sgh.com Note: Corrosion report is only required for areas of high humidity and chlorinated humidity, in the Training Tank, shower area and adjacent/associated spaces.
- Question 172: 80350 : Spec 080350 is still not clear on what needs to be designed by the contract. The drawings have a completed exterior design. The curtain wall contractor will provide engineered drawings. Other than that, it is not clear what the contractor needs to design and engineer. Please advise.
- Response: The engineered shop drawings are the only delegated portion of enclosure design.
- Question 173: casework : Please indicate casework material on detail 9/GEN-A-770.
- Response: Casework in mother's room to be PLAM-05. See 9/GEN-A-770 as shown in addendum #32.
- Question 174: suspension : What is the suspension system that the WCP-XX panels attach to in the Auditorium M-0220? Details on MAQ-A-746 do not have labels for the structure. Please clarify.
- Response: Suspension system used is per wood panel manufacturer recommendation.
- Question 175: casework : There is graphical indication of casework and countertops in the BESO EQP Drying Area B-136 shown on drawing BSO-A-111 however, enlarged plans or elevations are not provided. Please advise.
- Response: Refer to Elevations on BSO-A-656 and revised BSO-A-111 as issued in Addendum 32 for reference to elevations.

- Question 176: CLT : Drawing MAQ-S-141 shows a section cut 2/MAQ-S-542 along column line R9, however, drawing MAQ-S-542 does not exist. Is there an expansion joint detail for the CLT deck condition? Please advise.
- Response: The section cut is a model error. It has been removed from MAQ-S-141 for clarification. Refer to revised MAQ-S-141 as issued in Addendum 32.
- Question 177: Specialties : MEQ-07 is listed as "not used" in spec section 117710, but it is shown on (3) drawings, MAQ-A-658, 662, and 663. Please advise.
- Response: References to MEQ-07 are not found on MAQ-A-662 or 663, and MAQ-A-658 is not a sheet issued in this bid package. Verify location of MEQ-07 and re-submit question as required.
- Question 178: Expansion Joints : Please confirm the exterior expansion joint covers receive a 3-coat kynar finish.
- Response: Confirmed, exterior expansion joint covers receive 3-coat PVDF finish as described in 079513, 2.9 D. Refer to revised spec section 075913 as issued in Addendum 32.
- Question 179: Waterproofing : In the Marquee building along column line M25, exterior wall section detail 2/MAQ-A-512 indicates WPS-02 and WPS-01 waterproofing however, the enlarged detail 1/MAQ-A-558 indicates WPS-03. Please confirm WPS-01 and WPS-02 are correct.
- Response: Please see waterproofing as noted in revised 1/MAQ-A-558 as issued in Addendum #32.
- Question 180: Traffic Coating : Traffic coating keynote TM-04 is not defined in the spec. Please advise.
- Response: Updated specification will be included in an upcoming addendum.
- Question 181: Masonry : Pump house masonry fence detail 4/OTV-PH A-250 indicates CMU-01B however, the unit size is not defined. Please clarify.
- Response: Refer to revised OTV-PH A -101 and OTV-PH-A-250 and spec section 042000 as issued in Addendum 32, for updated keynote CMU-12A for CMU type.
- Question 182: Expansion Joints : Please confirm interior expansion joint covers receive a 2-coat kynar finish.
- Response: Confirmed, exterior expansion joint covers receive 2-coat PVDF finish as described in 079513, 2.9 C. Refer to revised spec section 075913 as issued in Addendum 32.
- Question 183: FTU : Drawing 2/FTUE-S-111 indicates CS2 to span. Where is CS2 defined?
- Response: CS2 indicates as 5-ply CLT panel. Refer to revised FTUE-S-111 as issued in Addendum 32 with clarifying note.
- Question 184: Lockers : The "Full Height Staff Lockers" and "Full Height Transient Lockers" are both labeled "LKR-02" in spec section 105100 - 2.2. Please advise.
- Response: "Full Height Transient Lockers" are LKR-03, as indicated in 105100.1.C. Revised spec section 105100 will be included in an upcoming addendum.
- Question 185: Damproofing : Please confirm where DMPF-01 is located on the project?
- Response: DMPF-01 is not used, disregard.
- Question 186: Unit Price Schedule & Unit Price Specification Clarification : The issued "1 Unit Price Schedule - Package 1" word document does not align with the unit prices identified in Specification Section 010250 - Unit Prices in Lump Sum Contracts, Section 1.4. Please provide direction.
- Response: See revised Specification section 010250 as issued in Addendum 32, and revised Unit Price Schedule word documents.

- Question 187: Training Simulator Installation : Reference Drawing ITV-A-331. TRN-02 is shown in both Level 1 Simulation Suites, but it is not listed in the 11 90 30 TRAINING EQUIPMENT Specification. Is the .1 Contractor responsible to furnish and install the two (2) training simulators? If so, please provide specification.
- Response: Contractor is not responsible for TRN -02 - Simulators. The keynote referenced has been removed in the revised drawing ITV-A-331 as issued in Addendum 32.
- Question 188: Aquatic Data: The "Aquatic Data" listed on Sheet GYM-SP-001 is incorrect. With a pool volume of 347,800 gallons - a design turnover of 5.2 hours would result in a design flow rate of 1,115 gpm - not 825 gpm.

  Current Commercial/Institutional regulations require a minimum 6 hour turnover (not 8 hour as listed) and a flow rate at that turnover (6 hours) would be 967 gpm.

  I have checked the pool volume as designed and the 347,800 is correct; however, the other items listed above are not. This type error if carried through design, could also result in improper selection of the filtration and recirculation equipment (pumps) sizing, pipe sizes, etc.
- Response:

  1. As you have pointed out, the turnover rate given by the designer as 5.2 hours is incorrect for a pool volume of 347,800 gallons and flow rate of 825 gpm.

  2. A more accurate calculation of the pool volume is 345,516 gallons, not 347,800 gallons as originally shown.

  3. At a pool volume of 345,516 gallons and a flow rate of 825 gpm, the turnover rate is 7.0 hours.

  4. I reviewed health code for Derry Township and Dauphin County and did not see any references to a maximum turnover rate for a public pool. Under the Pennsylvania State Code, Title 28, Chapter 18, Public Swimming and Bathing Places, Section 18.24, the maximum turnover rate is listed as 8 hours. Please show what applicable code requires a 6 hour turnover for this public pool.

  5. The maximum flow rate to meet VGB requirements through each specified main drain (18” x 18” Lawson Super Sump) is 816 gpm. With two main drains, each drain has to be sized to meet 100% of the design flow, i.e., 825 gpm. 825 gpm exceeds the maximum of 816 gpm for the Lawson Main Drains. For this reason, the design flow should be set at 815 gpm.

  6. At 815 gpm, the turnover rate is 7.1 hours, which is still below 8 hours.

  7. Also, checking the flow rates through the sand filters, at 815 gpm, the flow through each sand filters would be 12.5 gpm/sf, which should work well.
- Question 189: Volume 2 - Missing Drawings : The following drawings are missing from Volume 2: MAQ-E-508, MAQ-E-611, MAQ-E-612, MAQ-E-613. Please provide.
- Response: Drawings were not issued. Refer to revised Drawing Index GEN-G-003.1 as issued in Addendum 32.
- Question 190: Paver Setting Bed : The materials schedule on Drawing L-110 calls for a 1" sand setting bed for items PAV-01 through PAV-04; however, Detail 3/L-900 calls for the pavers to be set on a 1" mortar setting bed. Which paver setting bed is correct?
- Response: Pavers to be set on mortar setting bed except for PAV-03 which varies. See updated STE-L-110 included in Addendum 29.

- Question 191: River Rock / Setting Bed : Drawing STE-L-104_F shows LST-01 Pattern A river rock being stacked on edge. Please confirm that this is a requirement as this will be very expensive. If required, what is the setting bed?
- Response: Intent is for the top layer of river rock to be stacked on edge per the precedent photo for Pattern A. The setting bed should be river rock laid randomly (same as Pattern B).
- Question 192: Interior Training Maze Panel Weight : Regarding the Interior Training Maze as per Specification 11 90 30 TRAINING EQUIPMENT, the new specification states that the panels must be under 60 lbs. per panel. Neither Action Target or Simtek Modular (the specified manufacturers) offer panels that are under 60 lbs. Is a heavier panel weight acceptable? Please advise.
- Response: A heavier panel will be accepted. Revised specification section 11 90 30 TRAINING EQUIPMENT will be issued in Addendum 33.
- Question 193: Modified Bituminous Membrane Roofing Manufacturer : Is GAF an acceptable manufacturer for 075200- Modified Bituminous Membrane Roofing?
- Response: Yes, GAF is an acceptable manufacturer.
- Question 194: Riding Ring Surface & Concrete Sidewalk : Addendum 27, Response 37 confirms riding ring fencing is not be in this contract. Please also confirm riding ring surface and the concrete sidewalk to the riding ring are also to be excluded.
- Response: Confirmed.
- Question 195: K-9 Grill Gate Material : The details on Drawings BSO-A-201, BSO-A-652 and BSO-A-721 as it pertains to the K-9 Grill Gate (KEQ-07) do not appear to be drawn to match the specifications. Specification 13 19 00, Section 2.7 calls for 1-1/4" tube steel and 8ga 2"x 4" wire mesh. Please advise.
- Response: Sheet BSO-A-721 has been revised in Addendum 32 to match the specification.
- Question 196: KEQ-07 Door Type : Reference Specification 13 19 00, Section 2.7 for KEQ-07. Confirm there are no sliding gates required; only swinging doors are shown on all drawings.
- Response: There are no sliding gates required, only swinging doors as per the drawings.
- Question 197: Specification Section 01 03 00 - Base Bid Descriptions : The Table of Contents lists Specification Section 01 03 00 - Base Bid Descriptions; however, this specification was not issued. Please confirm that this specification is not applicable.
- Response: Spec section 01 03 00 was included in the Specifications Volume 1 file, it is one page long. Please resubmit question if it is not visible.
- Question 198: Auditorium : Please provide a labeled roof plan for the Marquee Auditorium. See drawing MAQ-A-126.
- Response: See revised MAQ-A-126 as issued in Addendum #32.
- Question 199: Benches : Please provide a detail for the cast stone benches LBCH-02.
- Response: Please reference STE-L-104_F included in Addendum #32 for bench size and spacing. Intent is for benches to sit on top of roof pavers.
- Question 200: Benches : Drawing STE-L-104_F calls for six (6) LBCH-02 cast stone benches however, both 2/STE-L-801 and MAQ-A-126 indicate two (2) benches. Please clarify.
- Response: Intent is for 6 benches to be provided per plan. See sheet STE-L-801 included in Addendum #32.
- Question 201: Fiberglass : Detail 2/MAQ-A-745 mentions a 3LB fiberglass backer. Please provide additional information regarding this material.

- Response: Note refers to acoustical fiberglass backing located behind perforated wood panels. 8200T10 by Armstrong is an acceptable product, but exact product will vary per selected wood panel manufacturer.
- Question 202: Laundry: Laundry elevation drawings 6 and 9 on MAQ-A-685 indicate WV-01 white oak wood veneer for the linen closet shelves however, section detail drawing 1/MAQ-A-770 indicates PLAM-01 plastic laminate. Which is correct?
- Response: Shelves to be PLAM-01. See revised MAQ-A-685 as issued in Addendum #32
- Question 203: Insulation : Please confirm spray foam insulation that is shown on details 9 and 10 of drawing GEN-A-531 is only applicable to the BESO building. Also reference 2/BSO-A-521.
- Response: Confirmed.
- Question 204: Insulation : Please confirm spray foam insulation that is shown on details 2 and 3 of drawing GEN-A-725 is only applicable to the BESO building.
- Response: Confirmed.
- Question 205: Retaining Wall : Please confirm the retaining wall for the stables, mentioned on STE-C-454, is not part of the phase 5 work.
- Response: Confirmed, retaining wall for stables is not in contract scope.
- Question 206: CLT : Detail 1/GEN-A-510 refers to CLT panel with waterproofing and directs to structural drawings. Where is the CLT waterproofing scope defined?
- Response: Refer to CLT spec 061719 and refer to revised FTUE-A-521 and GEN-A-510 as issued in Addendum 32. Moisture control is to be proposed by CLT supplier and submitted and reviewed as per 061719 1.4 G.
- Question 207: Roof : All the provided roof plans of the Marquee building are labeled RS-01. Is this correct?
- Response: Confirmed, for main roof level and classroom roofs. Auditorium roof is RS-02; see revised MAQ-A-126 as issued in Addendum #32.
- Question 208: Roof : Spec section 075200-2.1-B-2-a calls for a minimum R-value of 30 while drawing 1/GEN-A-510 calls for and average R-value of 33. Which is correct?
- Response: Drawing note is correct, average R-value of 33. 075200-2.1-B-2 notes that R-value of 30 is required unless otherwise indicated on drawings. Drawings superside in this case.
- Question 209: Metal Panels : Which metal panels clad the vestibule walls/ceiling shown on GEN-A-560/561/562?
- Response: Refer to notes on detail 2 / GEN-A-560 for metal panel material notes. Refer to detail 5 / GEN-A-562 for ceiling metal panel notes.
- Question 210: Lockers : The drawings shows type LKR-01 as 3'x2'x6' Patriot locker. The spec sheet calls out 2'x2'x6'. Please advise.
- Response: LKR-01 is 3'x2'x6'. Spec section 105100 will be revised in an upcoming addendum.
- Question 211: Lockers : The drawings shows type LKR-03 as 15"x15"x72". The spec sheet calls out 12"x18"x72" and the drawings show a double tier unit. Please advise.
- Response: LKR-03 is 15"x15"x72". Spec section 105100 will be revised in an upcoming addendum.
- Question 212: Lockers : The drawings show the cubbies as 15"x19"x72". The spec sheet calls out 12"x18"x72". Please advise.
- Response: Response will be included in an upcoming addendum.

- Question 213: Roofing : Please provide a labeled roof plan for the BESO Kennel. See drawing BSO-A-103/121
- Response: Refer to updated sheet BSO-A-121 as issued in Addendum 32.
- Question 214: Site Visit : How do we go about setting up a site visit to see the existing buildings?
- Response: Refer to spec section 010400, issued in Addendum 32.
- Question 215: Blasting : Please confirm blasting is allowed.
- Response: Blasting is not permitted. Refer to DGS General Conditions GC10.11 Explosives.
- Question 216: Marquee Over Excavation : Marquee Over Excavation - Page 12 of the geotech report recommends assuming about 10 feet of over-excavation below the footings in the middle and south column lines, and recommend holding a contingency in the over-excavation budget of at least 20% to account for variability in the bedrock. Should this assumption and contingency be included in our bid?
- Response: Contractors should include the required over excavation in their bids. The bids should indicate the assumed quantity based on the contractors proposed excavation means and methods, and should include an add/deduct for more or less overexcavation needed depending on the actual soil and rock conditions encountered during construction. Refer to revised spec section 010250 as issued in Addendum 32, and revised unit price word document including over-excavation unit price.
- Question 217: Window Treatments : BSO-A-521 shows details for WTR-03 by window WA-04. WTR-03 and WA-04 are not shown on any other documents. Please advise.
- Response: Refer to specification sections 12 21 00 for WTR-03 - Window shade. Refer to specification section 08 51 13 for WA-04 -Window component information.
- Question 218: Glass : There are details for GLRL-01 on MAQ-A-343, but it is not clear where these details apply or the quantity of GLRL-01. Please provide the necessary information.
- Response: Refer to MAQ-A-654B and detail 2 / MAQ-A-727 for extents and detailing of GLRL-01 scope.
- Question 219: Addendum 30 Question 83 : Addendum 30 Response 83 notes to provide bids for "estimation" of temporary heat needs during construction. What are the means to provide clarification on our "estimation" assumption and how will we be compensated if the requirements are over our "estimation"?
- Response: Estimation for temporary heat needs is at the discretion of the bidder to complete work within scope with temporary heat requirements. Refer to revised unit prices and spec section 010250 including temporary heat days.
- Question 220: Addendum 30 Response 92 : Addendum 30 Response 92 seems to be contradictive. The response says that the ".1 General Contractor is responsible for installation for incoming service duct bank and all utility work 5' outside the building footprints." However, the question was asking about the excavation and backfill for the utility work within 5' of the building including under the building pad. The excavation and backfill within 5' of the building and in the building pad has to be done by the .2, .3, and .4 as they are the ones deciding where the rough-ins go. Please confirm.
- Response: .1 General Contractor is responsible for all excavation and backfill for utility work beyond 5' outside of building. Confirmed that excavation and backfill within 5' of building pad line is scope of the .2, .3 and .4 contractors. This response supersedes response to Addendum 31 Response 92.
- Question 221: Addendum 30 Response 93 : Addendum 30 Response 93 notes that the .1 contractor is to provide bids for "estimation" of excavation needed for the geothermal. What means are there for the .1

contractors to clarify the "estimation" for this work and how will additional work over an above this "estimation" be documented and paid for?

- Response: Excavation for geothermal is responsibility of the .2 contractor and is delegated as part of geothermal well site design. This response supersedes response to Addendum 31 Response 93.
- Question 222: Addendum 30 response 94 : Addendum 30 response 94 notes there is a revised STE-C-701 drawings issued but it isn't in the addendum. Please provide.
- Response: Revised STE-C-701 was posted as part of Addendum 31, posted 7.6.23 to e-Builder. Please verify receipt.
- Question 223: Stacked Wall on STE-L-104 : Please provide more top and bottom of wall elevations for stacked wall on STE-L-104 and STE-C-501.
- Response: Please reference detail 5/STE-L-901. Intent is for top of wall to meet grades as shown on high side of wall on STE-C-501. Bottom of wall to be 6" below contours shown on low side of wall on STE-C-501.
- Question 224: Addendum 30 Response 10 for .2 Contract : Please reconsider Addendum 30 Response 10 for .2 Contract. If the .2 contractor is responsible for temporary heat after building enclosure, the same contractor should be responsible for the ventilation, dehumidification, and cooling. The logically go together. If the .2 contractor is using the permanent systems for temp heat, the same can go for cooling, dehumidification, etc. Please reconsider response.
- Response: .2 contractor is responsible for temporary ventilation, dehumidification and cooling. This response supersides response to Addendum 31 question 10 for .2 contract.
- Question 225: Temp Heat: If the temp heat after enclosure is responsibility of the HVAC contractor, why does each contractor need to provide 135 days of temp heat in bid per 015000 1.4J?
- Response: Each contractor is responsible for temporary heating and cooling for temperature-sensitive work for each of their scope.
- Question 226: Addendum 31 Response 108 .1 Contract : Addendum 31 Response 108 .1 Contract noted that any ACM outside of the quantities provided that is uncovered during construction will be addressed with unit prices. The unit prices requested in the .1 contract are only for ACM at waterproofing. How will any other ACM materials be addressed?
- Response: Response will be included in an upcoming addendum.
- Question 227: Addendum 31 Response 111 .1 Contract. : Addendum 31 Response 111 .1 Contract provided updated drawings only showing the geothermal wellfield north of the Phys Ed building. Are the wellfields to the south and west of OTV removed? If they are still in the project, the .1 contractor needs to know before the bid submission whether or not those wellfields need to be installed for the Marquee building. This will drastically change the sequencing on the project. This can't wait to be coordinated after award.
- Response: No well fields are removed from the scope of the project. Refer to the STE-C-401, 403, 404, 701, 703, and 704 sheets for the areas designated for geothermal well fields. Delegated Design of well field systems will determine final extents and phasing of geothermal well fields.

.2 CONTRACT

- Question 34: Drawing GYM-M-800 Missing : Drawing GYM-M-800 is referenced, but missing from the documents. Please provide.

- Response: GYM-M-800 is included in Addendum 32.

.3 CONTRACT

- Question 1: Fire protection piping schedule : To help get the project in budget we are suggesting using the industry standard fire protection piping which is 2" pipe and larger to be schedule 10 pipe with grooved fittings. This will save money on materials, labor and fabrication.
- Response: It has been evaluated, discussed and finalized during design phase to not use schedule 10 pipes for fire sprinklers at this facilty. Follow the contract drawings.
- Question 2: Plumbing unit prices and allowances : Please review the plumbing unit prices and allowances, to save money and help get the project in budget please delete the mineral wool insulation(since it isn't used on the project) and reduce the quantity allowance of hub & spigot cast iron soil pipe and hangers since all the aboveground piping is hubless cast iron and none of the drainage piping is larger than 8".
- Response: Please clarify the comment. Both fiberglass wool and mineral wool insulations are allowed per contract specifications 220719. Also please clarify how unit price and allowance schedule is affecting the overall project cost.

.4 CONTRACT

- Question 11: Audiovisual : Good Afternoon! Will the audiovisual package be coming out separately to bid or will this portion of the project be going direct? My firm is interested in the a.v. design/installation/service portion of this project. Thank you for your response.
- Response: IT Network backbone is in C-0211-0005 Phase 5 project scope. Audiovisual package will be part of a separate FFE procurement package.

Note: Responses to additional questions received will be included in an upcoming addendum.

SPECIFICATION CHANGES – ALL CONTRACTS

Item 1 - Please refer to the attached documents for updated specifications as described in responses to questions and listed below.

NUMBER / NAME / ACTION

010250 / Unit Prices in Lump Sum Contracts / Revised
010400 / Coordination and Control / Issued
042000 / Unit Masonry / Revised
055000 / Metal Fabrications / Revised
079513 / Expansion Joint Cover Assemblies / Revised
092116 / Gypsum Board Assemblies / Revised

DRAWING CHANGES – ALL CONTRACTS

Item 1 - Please refer to the attached documents for updated drawings as described in responses to questions and listed below.

NUMBER / NAME / ACTION

GEN-G-003.1 / DRAWING INDEX VOLUME 2 / Revised (removed sheets not issued)
STE-L-104_F / ENLARGED SITE MATERIALS PLAN - TILE D / Revised (clarified paver pattern)
STE-L-801 / SECTION - AUDITORIUM ROOF / Revised (clarified bench scope)
GEN-A-510 / EXTERIOR ROOFING AND WATERPROOFING SYSTEMS / Revised (CLT notes revised)
GEN-A-770 / RESTROOM DETAILS / Revised (materials clarified)
GEN-A-771 / RESTROOM DETAILS / Revised (materials clarified)
GEN-A-580 / TRAINING VILLAGES ENCLOSURE DETAILS / Revised (Added door and window schedules)
MAQ-A-126 / FLOOR PART PLAN G - LEVEL 1 / Revised (roof types clarified)
MAQ-A-551 / ENCLOSURE SECTION DETAILS CW-01 / Revised (angle sizing clarified)
MAQ-A-552 / ENCLOSURE SECTION DETAILS / Revised (angle sizing clarified)
MAQ-A-558 / ENCLOSURE ENLARGED SECTION DETAILS - CW-02 / Revised (angle sizing clarified)
MAQ-A-685 / ENLARGED PLANS, RCPS, AND ELEVATIONS - LAUNDRY AT LEVEL 2-3 TYP / Revised (materials clarified)
ITV-A-331 / OVERALL TRAINING FURNITURE PLAN - LEVEL 1 / Revised
FTU-A-110 / FLOOR PART PLAN A- LEVEL 1 / Revised (ladder location clarified)
FTU-A-111 / FLOOR PART PLAN B - LEVEL 1 / Revised (ladder location clarified)
FTUE-A-103 / ROOF PLAN / Revised (hatch location revised)
FTUE-A-521 / EXTERIOR DETAILS - SKYLIGHT /
BSO-A-111 / FLOOR PART PLAN B - LEVEL 1 / Revised
BSO-A-121 / FLOOR PART PLAN B - LEVEL 2 / Revised
BSO-A-656 / INTERIOR ELEVATION - BESO EQP DRYING AREA / Revised
BSO-A-721 / DOOR AND GATE DETAILS / Revised
OTV-PH A-101 / FLOOR & ROOF PLANS - BUILDING ELEVATIONS / Revised
OTV-PH A-250 / BUILDING SECTIONS - EXTERIOR WALL SECTION - REFLECTED CEILING PLAN - POWER-COMMUNICATION PLAN / Revised
MAQ-S-141 / FRAMING PART PLAN B - LEVEL 3 & 4 / Revised (callout removed)
FTUE-S-111 / FRAMING PART PLAN E - LEVEL 2 / Revised (clarified note)
MAQ-M-111 / FLOOR PART PLAN B - LEVEL 0 – MECHANICAL / Revised (clarified louver size reference)
GYM-M-800 / CONTROLS – MECHANICAL / Revised (clarified units)
MAQ-P-145 / MARQUEE -FLOOR PART PLAN A -DOMESTIC WATER SUPPLY -LEVEL 4 -PLUMBING / Revised (Revised plans to match schedule)
MAQ-P-146 / MARQUEE -FLOOR PART PLAN B -DOMESTIC WATER SUPPLY -LEVEL 4 -PLUMBING / Revised (Revised plans to match schedule)
MAQ-P-147 / MARQUEE -FLOOR PART PLAN C -DOMESTIC WATER SUPPLY -LEVEL 4 -PLUMBING / Revised (Revised plans to match schedule)
MAQ-P-148 / MARQUEE -FLOOR PART PLAN D -DOMESTIC WATER SUPPLY -LEVEL 4 -PLUMBING / Revised (Revised plans to match schedule)
MAQ-P-320 / MARQUEE -GAS RISER -PLUMBING / Revised (Revised selective pipe sizing as indicated)
MAQ-E-101 / OVERALL FLOOR PLAN - LEVEL 0 - ELECTRICAL SYSTEMS / Revised (showed previously hidden conduit layout)
MAQ-E-102 / OVERALL FLOOR PLAN - LEVEL 1 - ELECTRICAL SYSTEMS / Revised (showed previously hidden conduit layout)
MAQ-E-103 / OVERALL FLOOR PLAN - LEVEL 2 - ELECTRICAL SYSTEMS / Revised (showed previously hidden conduit layout)
MAQ-E-104 / OVERALL FLOOR PLAN - LEVEL 3 - ELECTRICAL SYSTEMS / Revised (showed previously hidden conduit layout)
MAQ-E-105 / OVERALL FLOOR PLAN - LEVEL 4 - ELECTRICAL SYSTEMS / Revised (showed previously hidden conduit layout)

SECTION 010100

SUMMARY OF WORK

PART 1 – GENERAL

1.1 STIPULATIONS

A. The specifications sections "General Conditions of the Construction Contract", "Special Conditions", and "Division 1 - General Requirements" form a part of this Section by this reference thereto, and shall have the same force and effect as if printed herewith in full.

1.2 LOCATION

A. 175 Hershey Park Drive, Hershey PA 17033

1.3 PROJECT DESCRIPTION

A.

1.4 CONTRACT DURATION

A. The Construction Contract duration shall be **1642** calendar days commencing on the date of the Initial Job Conference.

B. The Project will consist of Work on an existing, operating and occupied Pennsylvania State Police Academy & Headquarters Facility located on an approximately 160 acre campus

C. 1. The site includes multiple support functions operating from multiple facilities

D. 2. The Work of this Project should be executed in such a manor so as to minimize all interference with the ongoing operations and activities of the Pennsylvania State Police Academy. Proposed phasing and sequencing drawings are included in the Contract Drawings to illustrate the Agency's Continuity of Operations priorities. All means and methods, and final sequencing and schedule are the sole responsibility of the Contractor.

1.5 WORK INCLUDED

A. The Work of this Project consists of, but is not necessarily limited to, the following. Detailed requirements of the Work are described in the pertinent specification Sections and/or shown on the Drawings.

B. General Construction (.1) Contract:

1. All responsibilities for the lead contractor as established by the Department's General Conditions, Division 1 and technical specifications
2. All work pertaining to the 0.1 contractor shown in the contract drawings and specifications
3. Salvage, cleaning and storage of 2,500 bricks from the existing academy building.
4. Partial demolition of the Administrative wing of the main academy building to the extents indicated on the drawings.
5. Total demolition of existing buildings and structures as shown to be demolished on the drawings:
    a. Academy "shoot house"
    b. Water tower
    c. Stables
    d. Maintenance building
    e. BESO Headquarters and covered parking/ garage and miscellaneous structures
    f. BESO Stables
    g. The Main Academy building

6. Demolition of existing Site utilities, and the temporary relocation and maintenance of existing utilities as required to maintain operations including:
    a. storm water management system and drainage networks
    b. Domestic and Fire Projection water
    c. Sanitary Sewer
    d. Natural gas service
    e. Electrical service
7. Site work including but not limited to:
    a. Site utilities from 5’-0” outside of the building line:
        i. Storm water system
        ii. Domestic and Fire Projection water
        iii. Sanitary Sewer
        iv. Natural gas service from the connection to the main to the meter
        v. Incoming Electrical service
        vi. Site utility tunnels and ducts
    b. Site improvements including but not limited to:
        i. Relocation, and regrading of eastern run of Police Academy Drive
        ii. New service road from Keiffer road connecting to Police Academy Drive
        iii. Relocation, regrading and repaving of Police Academy Drive West
        iv. Amphitheater
        v. Parking areas, including all paving, curbs and islands.
        vi. New walks, curbs, pavers
        vii. Fences, excluding generator or transformer enclosures
        viii. Site access control gates
        ix. Site security and anti-ram bollards
        x. Tree removal as shown on the drawings
        xi. Seeding and plantings
        xii. Site stairs and ramps
        xiii. Site Signage
        xiv. Site Furniture
        xv. All other misc. site accessories.
8. Major site infrastructure including but not limited to:
    a. Foundations for Diesel generators
    b. Structure and envelope of the main campus pump house, including all utilities outside of 5’-0” of the building line
    c. Fuel tanks for vehicle refueling
9. Relocation of existing BESO storage containers as shown on the drawings
10. Construction of all buildings, outbuildings and secondary structures
    a. All buildings on the campus are described in the drawings, and include, but are not limited to:
        i. The “Marquee” or main academy buildings
        ii. Physical Education building, including pool and all pool systems and equipment
        iii. Fire Arms Building
        iv. BESO Headquarters
        v. Museum Garage
    b. All concrete work including but not limited to
        i. Foundations, grade beams, and slab on grade
        ii. Building walls and slabs
        iii. Topping slabs
        iv. Curbs at walls, doors, or openings
    c. All subgrade waterproofing
    d. Installation of foundation sleeves furnished by other prime contractors.
    e. All primary structural work including but not limited to:
        i. Structural steel
        ii. Metal decking and pour stops
        iii. CLT Timber floor slabs

iv. Glulam Timber beams

f. All structural masonry work including, but not limited to:
   i. Load bearing CMU, walls and lintels
   ii. CMU pilasters

g. Exterior enclosure:
   i. Exterior CMU Masonry cavity wall inclusive of air/ water barrier, and all accessories
   ii. Roofing and all roofing accessories as shown in the drawings and specifications
      1. SBS modified bitumen roofing
      2. Protected membrane roofs with paver over burden
      3. Standing seam metal panel roofs
   iii. Installation of roof drains furnished by the .3 Plumbing contractor
   iv. Exterior at grade waterproofing systems
      1. Protected membrane with lawn and soil overburden
   v. Exterior aluminum and glass curtain wall
   vi. Exterior custom fabricated vestibules as shown in the drawings and specifications
   vii. Exterior aluminum entrances and storefronts
   viii. Aluminum Windows
   ix. Skylights
      1. Aluminum and glass skylights
      2. Aluminum and plexiglass skylights
   x. Powered coiling doors
   xi. Bi-fold garage doors
   xii. Glazing
   xiii. Pre-engineered metal building structure and enclosure
   xiv. Louvers and similar items that affect the building appearance. (Some items may be furnished to the GC by other Prime contractors).

h. Miscellaneous metal framing as shown on the drawings or required by the specifications including but not limited to:
   i. Misc. metal supports for vanities and countertops
   ii. Mechanical platforms and grating
   iii. Catwalks
   iv. Exterior platforms and grating
   v. Mechanical room access stairs and landings
   vi. Angle Lintels, sills and brick shelfs
   vii. Loose lintels
   viii. Indoor Range Baffling Supports

i. Cold formed metal framing as shown on the drawings or required by the specifications
   i. Exterior back-up wall assemblies
   ii. Interior partitions where required by the drawings and specifications

j. Stone work,
   i. Natural stone as shown on the drawings and in the specifications
   ii. Solid surface countertops as shown in the drawings and specifications

k. Interior partitions
   i. Metal stud and GWB partitions
   ii. Interior CMU Masonry partitions consisting of
      1. Standard concrete masonry units
      2. Ground faced concrete masonry units
   iii. Blocking either interior to the partition, or applied to the partition to support the work of this and other prime contractors.

l. Ceilings
   i. Suspended Gypsum Ceiling Board Ceilings
   ii. Suspended Acoustic tile ceilings
   iii. Suspended Washable Acoustic tile ceilings

iv. Suspended wood baffling systems

m. Interior and exterior doors
   i. Hollow metal doors and frames
   ii. Wood doors

n. Interior vision panels and storefronts
   i. Aluminum and glass demountable partitions
   ii. Hollow metal and glass acoustical rated assemblies
   iii. Aluminum and glass interior store front

o. Interior finishes including but not limited to:
   i. Ceramic tile
   ii. Floor tile
   iii. Quarry tile
   iv. Carpet tile
   v. Resilient flooring
   vi. Athletic flooring
   vii. Cork bulletin board
   viii. Felt acoustic panels

p. Exterior and interior painting and finishing

q. Specialties including:
   i. Metal lockers
   ii. Toilet, bath and shower accessories
   iii. Toilet and shower partitions
   iv. Fire extinguisher cabinets and Fire extinguishers
   v. Magnetic glass whiteboards

r. Millwork and casework including but not limited to:
   i. Main Reception desk
   ii. Mock-courtroom
   iii. Bathroom vanities
   iv. Base cabinets
   v. PLAM storage shelving on standards
   vi. Closet rods and hat shelves
   vii. Wood veneer wall panels
   viii. Perforated wood veneer wall panels
   ix. Solid wood baseboard

s. Specialty wall and partition construction for interior tactical mazing walls and facades

t. Laundry equipment

u. Kitchen and cafeteria equipment, excluding hood systems and associated fans, ducts and hood by the .2 HVAC contractor

v. Vertical transportation systems
   i. Machine room-less traction passenger elevators
   ii. Machine room-less traction hydraulic elevators
   iii. Hole-less, machine room-less hydraulic elevators

w. Stairs, guardrails and handrails
   i. Egress stairs: Steel pan stairs with concrete fill, and painted steel guardrails and handrails
   ii. Monumental stair: composed of steel pan stair with precast concrete treads and risers with decorative wood guardrail and powder coated steel handrail
   iii. Ornamental metal steel pan stairs with concrete infill, decorative painted steel guardrail and wood handrail

x. Hazardous Materials abatement including asbestos, lead, PCB, Radon and other materials as applicable

y. Foundations and/ or supports for all heavy equipment

z. Firing range equipment

aa. Firing range baffling

11. Temporary construction as required to maintain existing operations and facilities and protect occupants and visitors to the site.

C. HVAC Construction (.2) Contract:

1. The usual heating, ventilation and air-conditioning work, including controls, piping, ductwork AHU's, fan coil, exhaust fans, heat exchangers and pumps
2. All work included in the contract drawings, plans and specifications
3. Site distribution of, hot water and chilled water (buried underground between Marquee and FTU
4. Light weight equipment supports and housekeeping pads
5. Central plant and HVAC equipment controls
6. All associated water treatment systems for hydronic systems under the 0.2 contract
7. Furnishing of Intake and exhaust louvers to be installed by the .1 General Contractor
8. All fuel tanks and fuel lines excluding vehicle refueling tanks and other isolated specialty tanks under a .1 contract
9. Cathodic protection for steel tanks
10. HVAC connections for kitchen equipment, laundry equipment and any equipment provided by others that requires HVAC connections
11. Kitchen hood systems including hood, ductwork, exhaust fans and controls
12. Electric resistance heating
13. In slab heating
14. Below slab duct work
15. Hazmat work associated with the HVAC contractor's work
16. System start-up
17. Commissioning and balancing and training
18. BMS and controls systems
19. Geothermal well field

D. Plumbing Construction (.3) Contract:

1. The usual plumbing work for buildings including water, sanitary and rain water conductors for building system, within 5'-0" of the exterior building line
2. All work pertaining to the 0.3 contractor shown in the contract drawings and specifications
3. All gas piping and connections for building systems and from the gas meter to the service point.
4. Insulation of all piping and equipment as shown in the drawings and specifications
5. Water treatment equipment
6. Plumbing connections to pool equipment, pumps and associated piping and pumping
7. Plumbing connections to chlorinated water treatment systems associated with the pool equipment.
8. Domestic water and fire water pumps
9. Central pump house equipment
10. Painting of sprinkler pipe and gas pipe as shown on the contract drawings and specifications
11. Air-conditioning drainage systems
12. Grease, oil and lint trap systems within buildings and grease/oil traps and piping exterior to buildings.
13. Furnishing of roof drains to be installed by the .1 General Contractor
14. Rain water conductors from roof drains
15. Fire suppression system
16. equipment supports and housekeeping pads
17. Hazardous materials work associated with the plumbing contractors work
18. Testing, disinfection of water system, adjusting and placing in operation all systems installed

E. Electrical Construction (.4) Contract:

1. The usual electrical work for buildings including power, lighting, communications, security and fire alarm
2. Electrical service points of entry
3. Transformer stations, complete, including fences
4. Load side Electrical distribution cabling and conduit between buildings and site elements, not inclusive of line side incoming electrical services
5. Site lighting
6. Electrical power generators and transfer switches, including sub-base tanks, mufflers, exhaust piping and outdoor enclosures. Day tank and muffler to be furnished to .2 HVAC Contractor
7. Electrical power, starters, overload protection and disconnecting means for all HVAC and Plumbing equipment where not furnished integral to the equipment.
8. Telecommunications structured cabling pathways, provide cabling, outlets and terminal unless otherwise directed
9. Fire alarm systems including connections for elevators, air handling equipment and door hardware
10. Security including access control, video surveillance systems and intrusion/ various alarms
11. Public address systems
12. Central clock system
13. Electrical connections for kitchen equipment, laundry equipment and other equipment furnished by others that requires electrical connections
14. equipment supports and housekeeping pads
15. Hazardous materials work associated with the electrical equipment removal or installation
16. Lighting protection
17. Installation of all site network pathways, including conduits and service vaults
18. Installation, testing and completion of all Information Technology Audio-Visual and Physical Security equipment cabling, devices and systems

1.6 SPECIFICATION FORMAT

A. The Specifications for the work of the separate prime Contracts are bound in one volume. Technical provisions which apply to each prime Contract are included in the Divisions listed below:

B. General Construction (.1) Contract: Divisions 01 through 14 and Divisions 31, 32 and applicable Sections of Division 33

C. HVAC Construction (.2) Contract: Divisions 01, 23 and applicable Sections of Divisions 02, 03, 05, 07, 09, 25, 31, 32 and 33.

D. Plumbing Construction (.3) Contract: Divisions 01, 21, 22 and applicable Sections of Divisions 02, 03, 05, 07, 09, 25, 31, 32 and 33.

E. Electrical Construction (.4) Contract: Divisions 01, 25, 26 and applicable Sections of 02, 03, 07, 08, 31, 32, and 33.

Note: The term Professional refers to the Architectural or Engineering firm retained by the Department to design and document the work of the Project, or the Professional's authorized representative. The term Professional may also refer to the Client Agency if the Project design was delegated to the Client Agency. Throughout the Specifications and Drawings wherever the terms 'A/E', 'Architect' or 'Engineer' are used it shall mean Professional.

1.7 WORK BY OTHERS

A.

1.8 E-BUILDER CONSTRUCTION MANAGEMENT SOFTWARE

A. The electronic document repository to improve productivity and efficiency, and to streamline the process of construction management during all phases of design, procurement, award and contract administration. The Department and all Prime Contractors will utilize the e-Builder Enterprise Software Program (e-Builder) for all Work and administrative duties provided under this Contract. Any and all notifications, request, submittals, approvals, etc. between the Department, The Prime Contractors, the Professional, and/or the Construction Manager (if a CM is assigned to the Project) shall be through the e-Builder system.

1.9 QUESTIONS DURING BIDDING PERIOD

A. Direct all questions pertaining to the Project to the Project Professional utilizing the e-Builder Enterprise Software Program (e-Builder) as described in the Instructions To Bidders.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 010250

UNIT PRICES IN LUMP SUM CONTRACTS

PART 1 – GENERAL

1.1 STIPULATIONS

A. The specifications sections "General Conditions of the Construction Contract", "Special Conditions", and "Division 1 - General Requirements" form a part of this Section by this reference thereto, and shall have the same force and effect as if printed herewith in full.

1.2 DEFINITIONS

A. Unit Price: An amount bid by the Contractor for a unit quantity of a work item listed in the Schedule of Unit Prices.

B. Schedule of Unit Prices: The schedule of work items in the Contract for which the Contractor is to provide a price for adjusting the Contract amount for changes in quantity of work required.

1.3 PROCEDURES

A. Unit Prices will be used as the basis for computing "additions to" or "deductions from" the Lump Sum Contract amount for extra work and for reductions in quantities of work called for by the Contract Documents. The unit price applied for “Adds” to the bid quantity will be equal to the unit price applied for “Deducts” to the bid quantity for each item listed. Unit Prices shall remain binding and irrevocable for the entire period of the Contract.

B. Unit Prices shall include all costs by the Contractor, his suppliers and subcontractors for the work, including labor, material, tools, equipment, insurance, taxes, field overhead, general overhead and profit and bond. The work shall include all incidental items required to complete the work.

C. The Department will not be bound by the Unit Prices unless it accepts the same by indication on the Construction Contract. The Department may award the contract without accepting the bidder's Unit Prices. If the Department and the Contractor are unable to agree upon a new Unit Price, the Department may at its discretion, direct the Contractor to perform such work on a force account basis.

D. Work added to the Contract will be of the same general character as that required by the Contract Documents. Contractors are to assume that changes will be made in a timely manner, not requiring the Contractor to incur additional mobilization or other disproportional expenses in connection with the adjustment in contract quantities.

E. Each bidder shall carefully check the drawings and specifications for the Bid Package quantities required to be included under the Contract.

F. Contractors are to comply with requirements of the Instructions to Bidders and instructions for completion of the Bid Form.

1.4 SCHEDULE OF UNIT PRICES

A. The following Schedules of Unit Prices apply to the Contracts indicated on the Schedules. The Contractor is to provide Unit Prices for all items.

GENERAL CONSTRUCTION (.1) CONTRACT – SCHEDULE OF UNIT PRICES			
ITEM NO.	DESCRIPTION	UNIT OF MEASUREMENT	QUANTITY
	MARQUEE Building		
1	Foundation concrete	Cu. Yds	100
2	Foundation reinforcement	Tons	2
3	Anchor rods – 1 1/2” x 30” ASTM F1554 Grade 55	Each	4
4	Rock anchors – Type 1	Each	2
5	Foundation wall penetrations – 12” dia.	Each	4
6	Foundation wall penetrations – 6” dia.	Each	6
7	Grade beam penetrations – 6” dia.	Each	5
8	Floor slab concrete	Cu. Yds	50
9	Slab reinforcement	Tons	0.5
10	Steel deck – 3” 18 GA	SF	250
11	CLT – 5 ply 6 7/8”	SF	250
12	Metal Deck Closure	LF	500
13	Structural steel framing (identified prior to fabrication)	Tons	30
14	Structural steel framing (identified after erection complete)	Tons	2
15	Shop installed circular beam penetrations -6” dia.	Each	75
16	Shop installed rectangular beam penetrations - 10”x20” reinforced	Each	10
17	Field installed circular beam penetrations – 6” dia.	Each	10
18	Headed shear studs – ¾” x 6” long	Each	500
	PEMB Foundation		
19	Concrete	Cu.Yds	100
20	Reinforcement	Tons	2
	Other buildings (not including PEMB)		
21	Foundation concrete	Cu. Yds	50
22	Foundation reinforcement	Tons	1
23	Structural steel framing	Tons	2
24	8” Structural CMU wall	SF	250
25	Glulam 6 ¾” x 18”	LF	50

	ACM Waterproofing Material Work referenced in Section 02 08 00	UNIT	QUANTITY
	Main Building (Buildings A, B, C, D, E and H)		
26	Building Foundations	SF	10000

27	Structural and masonry components behind face brick	SF	20000
Pool Area in Main Building			
28	Waterproofing associated with the Pool and its surroundings	SF	2000
Maintenance Building			
29	Buildings Foundations	SF	2000
30	Structural and masonry components behind face brick	SF	2000
Miscellaneous Concealed Spaces			
31	Allowance for ACM waterproofing discovered during demolition/site activities	SF	2000

	Excavation Work		
32	**Over-Excavated Materials**	**Cu. Yd**	**1**
	Temporary Heat Days		
33	**Temporary Heat Days**	**Day**	**1**

Structural unit price quantities are in addition to structural material quantities directly indicated and/or implied on the structural drawings, including related notes and specifications. They relate specifically to primary structural system components and do not include miscellaneous elements required by other trades for such items as support of secondary bracing steel for the exterior façade, MEP support elements, connection materials, secondary support for building maintenance equipment, stairs, interior partitions, housekeeping pads, concrete fills and curbs, or any other elements included on the architectural equipment drawings.

HVAC CONSTRUCTION (.2) CONTRACT – SCHEDULE OF UNIT PRICES			
ITEM NO.	DESCRIPTION	UNIT OF MEASUREMENT	QUANTITY
1	Insulated Chilled Water Pipe ½”	Per foot	100
2	Insulated Chilled Water Pipe ¾”	Per foot	100
3	Insulated Chilled Water Pipe 1”	Per foot	100
4	Insulated Chilled Water Pipe 1 ¼”	Per foot	100
5	Insulated Chilled Water Pipe 1 ½”	Per foot	100
6	Insulated Chilled Water Pipe 2”	Per foot	100
7	Insulated Chilled Water Pipe 2 ½”	Per foot	100
8	Insulated Chilled Water Pipe 3”	Per foot	100
9	Insulated Chilled Water Pipe 4”	Per foot	100
10	Insulated Chilled Water Pipe 5”	Per foot	100
11	Insulated Chilled Water Pipe 6”	Per foot	100
12	Insulated Chilled Water Pipe 8”	Per foot	100
13	Insulated Chilled Water Pipe 10”	Per foot	100
14	Insulated Hot Water Pipe ½”	Per foot	100
15	Insulated Hot Water Pipe ¾”	Per foot	100
16	Insulated Hot Water Pipe 1”	Per foot	100

17	Insulated Hot Water Pipe 1 ¼”	Per foot	100
18	Insulated Hot Water Pipe 1 ½”	Per foot	100
19	Insulated Hot Water Pipe 2”	Per foot	100
20	Insulated Hot Water Pipe 2 ½”	Per foot	100
21	Insulated Hot Water Pipe 3”	Per foot	100
22	Insulated Hot Water Pipe 4”	Per foot	100
23	Insulated Hot Water Pipe 5”	Per foot	100
24	Insulated Hot Water Pipe 6”	Per foot	100
25	Insulated Hot Water Pipe 8”	Per foot	100
26	Insulated Hot Water Pipe 10”	Per foot	100
27	Condenser Water Pipe 2”	Per foot	100
28	Condenser Water Pipe 2 ½”	Per foot	100
29	Condenser Water Pipe 3”	Per foot	100
30	Condenser Water Pipe 4”	Per foot	100
31	Condenser Water Pipe 5”	Per foot	100
32	Condenser Water Pipe 6”	Per foot	100
33	Condenser Water Pipe 8”	Per foot	100
34	Condenser Water Pipe 10”	Per foot	100
35	Condenser Water Pipe 12”	Per foot	100
36	Galvanized sheet metal all gauges	Per Lb	250
37	Specified Duct Insulation	Per Square	50
38	Chilled Water Fan Coil Units	Per Unit	5
39	Fan Powered VAV Boxes	Per Unit	5
40	Shut Off VAV boxes	Per Unit	5
41	DOAS Terminal Boxes	Per Item	5
42	Lay-in 24”x24” Ceiling Diffuser	Per Item	5
43	Lay-in 12”x12” Ceiling Diffuser	Per Item	5
44	Sidewall Grille – 0-10 Square Inches	Per Item	5
45	Sidewall Grille – 10-50 Square Inches	Per Item	5
46	Sidewall Grille – 50-100 Square Inches	Per Item	5
47	Sidewall Grille – 100-200 Square Inches	Per Item	5
48	Sidewall Grille – 200-500 Square Inches	Per Item	5
49	Sidewall Grille – 500-1000 Square Inches	Per Item	5
50	Linear Slot Diffuser – 4’	Per Item	5
51	Analog Control Points	Per Item	10
52	Digital Control Points	Per Item	10
53	Fire Damper – 0-50 Square Inches	Per Item	1
54	Fire Damper – 50-200 Square Inches	Per Item	1
55	Fire Damper – 200-500 Square Inches	Per Item	1
56	Fire Damper – 500-1000 Square Inches	Per Item	1
57	Fire Damper – 1000-1500 Square Inches	Per Item	1
58	Fire Damper – 1500-2000 Square Inches	Per Item	1
59	Smoke Damper – 0-50 Square Inches	Per Item	1
60	Smoke Damper – 50-200 Square Inches	Per Item	1
61	Smoke Damper – 200-500 Square Inches	Per Item	1
62	Smoke Damper – 500-1000 Square Inches	Per Item	1
63	Smoke Damper – 1000-1500 Square Inches	Per Item	1
64	Smoke Damper – 1500-2000 Square Inches	Per Item	1

65	Volume Control Damper – 0-50 Square Inches	Per Item	5
66	Volume Control Damper – 50-200 Square Inches	Per Item	5
67	Volume Control Damper – 200-500 Square Inches	Per Item	5
68	Volume Control Damper – 500-1000 Square Inches	Per Item	5
69	Volume Control Damper – 1000-1500 Square Inches	Per Item	5
70	Volume Control Damper – 1500-2000 Square Inches	Per Item	5
71	Specified Valves – ½"	Per Item	5
72	Specified Valves – ¾"	Per Item	5
73	Specified Valves – 1"	Per Item	5
74	Specified Valves – 1 ¼"	Per Item	5
75	Specified Valves – 1 ½"	Per Item	5
76	Specified Valves – 2"	Per Item	5
77	Specified Valves – 2 ½"	Per Item	5
78	Specified Valves – 3"	Per Item	5
79	Specified Valves – 4"	Per Item	5
80	Specified Valves – 5"	Per Item	5
81	Specified Valves – 6"	Per Item	5
82	Specified Valves – 8"	Per Item	5
83	Specified Valves – 10"	Per Item	5
84	Specified Valves – 12"	Per Item	5
Temporary Heat Days			
85	**Temporary Heat Days**	**Day**	**1**

HVAC unit price quantities are in addition to material quantities directly indicated and/or implied on the mechanical drawings, including related notes and specifications. They relate specifically to system components and do not include miscellaneous elements required by this or other trades to accomplish the work shown or implied in the contract document

PLUMBING (.3) CONTRACT – SCHEDULE OF UNIT PRICES			
Item No.	Description	Unit	QUANTITY
22 05 23	**GENERAL DUTY VALVES FOR PLUMBING**		
1	Ball Valves, Soldered or Threaded		
	1/2" Ball Valve	EA	1
	3/4" Ball Valve	EA	1
	1" Ball Valve	EA	1
	1-1/2" Ball Valve	EA	1
	2" Ball Valve	EA	1
2	Gate Valve, Soldered or Threaded		
	1" Gate Valve	EA	1
	1-1/2" Gate Valve	EA	1
	2" Gate Valve	EA	1
	2-1/2" Gate Valve	EA	1
	3" Gate Valve	EA	1

3	Check Valve, Soldered or Threaded		
	1/2" Check Valve	EA	1
	1" Check Valve	EA	1
	1-1/2" Check Valve	EA	1
	2" Check Valve	EA	1
4	Butterfly Valve, Soldered or Threaded		1
	1" Butterfly Valve	EA	1
	2" Butterfly Valve	EA	1
5	Globe Valve, Soldered or Threaded		
	1/2" Globe Valve	EA	1
	1" Globe Valve	EA	1
	2" Globe Valve	EA	1
	3" Globe Valve	EA	1
22 07 19	**PLUMBING PIPING INSULATION**		
1	1" Mineral Wool insulation		
	1/2" diameter pipe	LF	100
	3/4" diameter pipe	LF	100
	1-1/2" diameter pipe	LF	100
	4" diameter pipe	LF	100
	6" diameter pipe	LF	100
2	2" Mineral Wool insulation		
	1/2" diameter pipe	LF	100
	3/4" diameter pipe	LF	100
	1-1/2" diameter pipe	LF	100
	2" diameter pipe	LF	100
	4" diameter pipe	LF	100
	6" diameter pipe	LF	100
3	1" Fiber Glass with service jacket		
	1/2" diameter pipe	LF	100
	3/4" diameter pipe	LF	100
	1-1/2" diameter pipe	LF	100
	2" diameter pipe	LF	100
	4" diameter pipe	LF	100
	6" diameter pipe	LF	100
4	2" Fiber Glass with service jacket		
	1/2" diameter pipe	LF	100
	3/4" diameter pipe	LF	100
	1-1/2" diameter pipe	LF	100
	2" diameter pipe	LF	100
	4" diameter pipe	LF	100
	6" diameter pipe	LF	100

5	30 mil thick PVC jacket		
	1-1/2" diameter insulation	LF	100
	2" diameter insulation	LF	100
	5" diameter insulation	LF	100
	6" diameter insulation	LF	100
22 11 13	**FACILITY WATER DISTRIBUTION PIPING**		
1	Type 'K' including fittings, couplings and hanger assemblies		
	1/2" Pipe	LF	100
	3/4" Pipe	LF	100
	1-1/2" Pipe	LF	100
	2" Pipe	LF	100
	4" Pipe	LF	100
	6" Pipe	LF	100
2	Type 'L' including fittings, couplings and hanger assemblies		
	1/2" Pipe	LF	100
	3/4" Pipe	LF	100
	1-1/2" Pipe	LF	100
	2" Pipe	LF	100
	4" Pipe	LF	100
	6" Pipe	LF	100
3	Ductile Iron Pipe including Couplings and Hangers		
	3" Pipe	LF	100
	4" Pipe	LF	100
	6" Pipe	LF	100
	8" Pipe	LF	100
22 13 16	**SANITARY WASTE AND VENT PIPING**		
1	Hubless Cast-Iron Soil Pipe including Coupling and hangers		
	2" Hubless Cast Iron	LF	100
	3" Hubless Cast Iron	LF	100
	4" Hubless Cast Iron	LF	100
	6" Hubless Cast Iron	LF	100
2	Hub and Spigot Cast-Iron Soil Pipe including Coupling and hangers		
	2" Hub and spigot Cast Iron	LF	100
	3" Hub and spigot Cast Iron	LF	100
	4" Hub and spigot Cast Iron	LF	100

	6" Hub and spigot Cast Iron	LF	100
	8" Hub and spigot Cast Iron	**LF**	**100**
	10" Hub and spigot Cast Iron	**LF**	**100**
	12" Hub and spigot Cast Iron	**LF**	**100**
	15" Hub and spigot Cast Iron	**LF**	**100**
	Plumbing Fixtures		
	Dorm Water Closet + Seat	EA	1
	Dorm Lavatory	EA	1
	Commercial Water Closet + Seat	EA	1
	Commercial Lavatory	EA	1
	Commercial Urinal	EA	1
	Commercial Showers	EA	1
	Water Closet Flushometers	EA	1
	Urinal Flushometer	EA	1
	Lavatory Accessories	EA	1
	Shower Accessories	EA	1
Temporary Heat Days			
1	**Temporary Heat Days**	**Day**	**1**

FIRE PROTECTION (.3) CONTRACT – SCHEDULE OF UNIT PRICES			
Specification No.	Item	Unit	QUANTITY
21 13 13	**WET SPRINKLER PIPE**		
1	SCH 40 Ductile Iron Pipe, Grooved joint, Couplings and Hangers		
	3" Pipe	LF	100
	4" Pipe	LF	100
	6" Pipe	LF	100
	8" Pipe	LF	100
	5.6 K Factor sprinklers	EA	10
	25.2 K Factor sprinklers	EA	10
	5" Storz type FDC	EA	1
	4" FCVA	EA	1
	6" FCVA	EA	1

Plumbing unit price quantities are in addition to material quantities directly indicated and/or implied on the mechanical drawings, including related notes and specifications. They relate specifically to system components and do not include miscellaneous elements required by this or other trades to accomplish the work shown or implied in the contract document

ELECTRICAL (.4) CONTRACT – SCHEDULE OF UNIT PRICES			
ITEM NO.	DESCRIPTION	UNIT OF MEASUREMENT	QUANTITY
1	Junction boxes for mechanical equipment for control wiring	Per Unit	1
2	¾" Conduit for control wiring per mechanical equipment.	LF	50
3	20A duplex receptacle for mechanical controls	Each	1
4	Brach circuit wiring for control equipment (2#10+1#10G in ¾" conduit)	LF	100
5	Junction boxes and supports for each control equipment	Per Unit	1
6	208 volts, 2 pole NEMA-4X, 30 amp Disconnect switch-	Each	1
7	208 volts, 2 pole NEMA-4X, 30 amp Disconnect switch-	Each	1
8	Weather proof 20A duplex receptacle for outdoor area	Each	1
9	20A Duplex receptacle, GFCI	Each	1
10	20A Duplex receptacle	Each	1
11	20A Quadruplex receptacle	Each	1
12	NEMA L6-20R Receptacle	Each	1
13	NEMA L6-30R Receptacle	Each	1
14	NEMA L5-20R Receptacle	Each	1
15	Floor Boxes	Each	1
16	Poke thrus	Each	1
17	¾" EMT conduit	LF	100
18	1" EMT conduit	LF	100
19	¾" RGC conduit	LF	100
20	Type THHN/THWN-2, 12 AWG	LF	100
21	Type THHN/THWN-2, 10 AWG	LF	100
22	Type THHN/THWN-2, 8 AWG	LF	100
23	**Temporary Heat Days**	**Day**	**1**

Electrical unit price quantities are in addition to material quantities directly indicated and/or implied on the mechanical drawings, including related notes and specifications. They relate specifically to system components and do not include miscellaneous elements required by this or other trades to accomplish the work shown or implied in the contract document

1.5 CHANGES

A. All changes in the quantity of work for which there is a Unit Price will be authorized using change order procedures provided in the General Conditions. Change Orders shall be written prior to performing the work where possible but may be written after the work is authorized, completed and measured when quantities are not able to be determined in advance.

1.6 MEASUREMENT

A. Measurement of the work quantities where the work is performed prior to issuance of a Change Order shall be net quantities and not include cutting waste, or other adjustments to the unit of measure of the Unit Price. The Department and Contractor shall arrive at a rational procedure for measurement prior to performing the work. The Contractor shall be responsible for measurement and will submit the calculations and worksheets to the Department for approval.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 010400

COORDINATION AND CONTROL

PART 1 – GENERAL

1.1 STIPULATIONS

A. The specifications sections " General Conditions of the Construction Contract ", "Special Conditions", and "Division 1 - General Requirements" form a part of this Section by this reference thereto, and shall have the same force and effect as if printed herewith in full.

1.2 SECTION INCLUDES

A. This section includes the on-site provisions that govern the performance of the work to complete this Project.

1.3 CONTRACTS - FOR THIS PROJECT CONSTRUCTION

A. DGS C-0211-0005 Phase 5 General Construction (Lead Contractor)

B. DGS C-0211-0005 Phase 5 HVAC Construction

C. DGS C-0211-0005 Phase 5 Plumbing Construction

D. DGS C-0211-0005 Phase 5 Electrical Construction

1.4 VISIT TO SITE

A. For access to the site during the bidding period contact the Client Agency site personnel with phone number listed below:

1. Client Agency Site Representative: Lte. Dustin Shireman and Lt Jason Troutman_
2. Telephone Number: (717) 533-9111 Ext. 308, (717) 533-9111 ext 315_____

1.5 UNIDENTIFIED HAZARDOUS MATERIALS (ASBESTOS, CHEMICALS, ETC.)

A. There is a possibility that hazardous materials not identified in the contract documents may be discovered on this project. Should it be determined that some or all of the hazardous materials must be removed, the Contractor shall obtain an estimate for said removal from a Subcontractor who is experienced in the field, has insurance and is knowledgeable of the regulations as they apply. The Contractor may provide the estimate itself if it is qualified in the applicable hazardous materials field. The Department shall consider authorizing a Change Order for the removal of the hazardous material to the extent necessary.

B. The Contractor or Subcontractor must comply with all requirements of the General Conditions, including the maintenance of insurance up to the limit required under the General Conditions.

C. Should a hazardous material be encountered on the job, the Contractor shall comply with all statutes and regulations of the Commonwealth of Pennsylvania and all rules and regulations of the United States Environmental Protection Agency as they apply during construction and demolition work and the disposal of hazardous material. Particular attention is drawn to Code of Federal Regulations, Title 40, Part 61, Section 112 of Clean Air Act and PA Department of Labor and Industry, Act 194 for asbestos.

D. The Contractor shall comply fully with the regulations of OSHA as they pertain to the protection of workers exposed to the emission of asbestos fibers, chemicals, etc. and shall take all steps necessary to protect its employees, as well as all other people occupying the building.

E. Whenever a hazardous material is to be removed or disposed of, the Contractor is required to make proper notification to the Bureau of Air Quality in the PA Department of Environmental Protections' Regional Office, PA Department of Labor and Industry and EPA as applicable, and is required to obtain and pay for any permits required. Disposal shall conform to all applicable regulations and documentation shall be required when, applicable.

1.7 MOLD

A. In the event mold is encountered, the Contactor shall implement corrective actions to protect workers, other building occupants, and to prevent the disturbance of mold in affected areas. Although not presently regulated by EPA and/or OSHA, the EPA does provide industry standards regarding worker safety and abatement procedures, which are the minimum procedures to be followed if mold is encountered.

B. Any mold that appears as a result of construction shall be abated immediately by the Contractor responsible for this condition. The affected surface shall be cleaned, removed, and replaced. Inspection and testing shall be done by a qualified testing agency to confirm the mold has been removed in its entirety.

1.8 TESTING OF EQUIPMENT

A. After any equipment furnished under the contract and any permanent heating, ventilating, plumbing, drainage or electrical systems and equipment have been installed or modified, it shall be the responsibility of the Contractor to operate its equipment for a satisfactory period of time, as required by the Department for proper testing and instructing the operating personnel. Fuel, electricity and water required for proper testing of permanent equipment and for the period of instructing personnel, shall be paid for by the Contractor testing its equipment.

1.9 PROJECT PHOTOGRAPHS[AJ1]

A. Photographer: Engage a qualified competent commercial photographer, with not less than three years of experience, take construction photographs.

B. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.

C. Maintain key plan with each set of construction digital images that identifies each photographic location.

D. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

1. Date and Time: Include date and time in filename for each image.

2. Field Office Images: Maintain one set of images in the field office at Project site, available at all times for reference. Identify images same as for those submitted to Architect.

E. Quantity and Timing of Construction Photographs

1. Preconstruction Photographs: Before starting construction, take digital photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points.

2. Periodic Construction Photographs: Take color, digital photographs (30 minimum), weekly, with timing each month adjusted to coincide with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.

3. Final Completion Construction Photographs: Take color digital photographs (30 minimum) after date of Substantial Completion for submission as Project Record Documents.

4. Digital Images: Provide images in uncompressed PDF, TIFF or JPEG format, produced by a digital camera with minimum sensor size of 8.0 megapixels.

1.10 INSTRUCTIONS AND TRAINING

A. Refer to the General Conditions of the Construction Contract, as specified in the applicable technical portion of each specification for "Operations and Maintenance Instruction Manuals" and "Record Drawings" requirements.

B. Unless approved by the Department, training shall not be scheduled/conducted until Record Drawings, Operation and Maintenance Instruction Manuals, valve tag lists, equipment and piping system identification, and all software programming is complete.

C. Provide full on-site training and instruction to designated Commonwealth personnel given by competent manufacturer's authorized personnel thoroughly familiar with all technical and operational aspects of the installed items. Instructions are to cover operation and maintenance of all systems, equipment components and other items as specified and furnished under this contract. Instructional digital video recordings may be used to augment required instructions and training but may not be substituted for the in person on-site training. All on-site training shall be digitally recorded by the Contractor. The digital video files are to be turned over to the Client Agency.

D. Contractor shall provide an outline of the training and course content, which shall be submitted and accepted by the Professional and the Department prior to conducting training.

E. Conduct instruction and training during regular working hours. For training on complicated systems, allow at least one-half of the training time to be at and/or with the system equipment.

F. Provide additional training and instructions for all significant modifications and/or changes made under the terms and/or conditions of the manufacturer's and/or Contractor's warranty.

G. The Contractor shall maintain and submit a sign-in list that clearly documents all personnel attending the training.

1.11 PROJECT SIGN

A. Provide a Project Sign. Refer to the General Conditions of the Construction Contract.

1.12 REUSE OF MATERIALS

A. No removed materials or equipment shall be reinstalled in the work, unless so noted on the Drawing or in these Specifications.

1.13 GENERAL

A. All construction trailers, offices, equipment and materials required to be on-site shall be located as shown on the Drawings, or at the direction of the Department.

1.14 WORKING HOURS

A. The Contractor's available working hours shall be from _6:00_ A.M. to _9:00_ P.M., Monday through Sunday, unless expanded hours are prearranged and preapproved by the Department.

B. Work during different hours, State and National Holidays or overtime work, must have the Regional Director's or his designee's prior written approval. Work on these days if approved shall be at no additional cost or time to the Contract.

C. This shall not apply in those unforeseen isolated and/or emergency instances when a particular operation must be performed in a continuous sequence that extends the working day beyond the approved working hours. Coordinate with the Department in these instances.

D. The Department's failure to approve different working hours, weekend or holiday working hours, or overtime hours is not cause for a claim against the Department for delay or any added costs or time to the Contract.

E. Utility shut-downs required for tie-ins to existing systems shall be done in off-hours, weekends, and/or holidays to minimize the impact on the operations of the Client Agencies (and/ or surrounding buildings). These costs shall be anticipated and included in the Contractor's bid.

1.15 DELIVERY, STORAGE AND HANDLING

A. Prefinished materials shall arrive at job site in their original unopened cartons or other protective packaging necessary to protect finishes. Materials shall be stored in such packages until time of application. Flat materials such as panels shall arrive and remain on adequate support to ensure flatness and prevent damage.

B. Store all materials, equipment and bulk items prior to installation in clean, dry, well ventilated locations away from uncured concrete, masonry or damage of any kind. Waterproof tarpaulin or polyethylene sheeting must allow for air circulation under covering.

C. Coordinate storage location with the Department.

D. Refer to each section for specific delivery, handling and storage instructions of items specified.

1.16 PARKING

A. Parking shall be limited to areas indicated on the Site Plans. All parking is subject to prior approval of the Department and Client Agency.

1.17 TRAFFIC

A. The Lead Contractor shall submit via eBuilder prior to the Initial Job Conference a construction staging and traffic plan for the project which minimizes the construction interference with the Client Agency's operations. This plan is subject to the Department's and the Client Agency's

review and acceptance. This acceptance does not relieve the Contractors of their responsibilities regarding safety coordination, and adherence to all traffic laws and ordinances.

1.18 SUBSURFACE INFORMATION

A. Any available data concerning subsurface materials or conditions based on soundings, test pits or test borings, has been obtained by the Department for its own use in designing this Project. The Test Boring logs are incorporated into the construction contract as a Contract Document. However, the Geotechnical Report with all other exhibits is provided for information purposes only; it is not to be relied upon or included in the construction contract as a Contract Document. The Report is available to Bidders but the Bidders must agree and acknowledge that the information and recommendations in the Report are not warranted for accuracy, correctness or completeness, and is not incorporated as a Contract Document.

B. Test Boring logs reflect the conditions at the specific locations of each test boring only. The Contractor accepts full responsibility for any conclusion drawn with respect to conditions between test borings. Bidders shall therefore undertake to perform their own investigation of existing subsurface conditions. The Department will not be responsible in any way for the consequences of the Contractor's failure to conduct such an investigation. Excavation for the Project is "Unclassified" as fully described in the Earthwork Section.

1.19 SITE FENCE

Provision for and Maintenance of a Temporary Fence: Provide and maintain a temporary fence to enclose the area at the job site and to effectively guard and close in the construction area. Provide gates of substantial construction as described below, cross-braced, hung on heavy strap hinges, with suitable hasps and padlocks. Submit shop drawings of fence and gates for review of Professional and the Department.

B. Before construction operations begin, the Lead Contractor shall furnish and install a temporary site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.

1. Extent of Fence: As required to enclose entire Project Site or portion determined sufficient to accommodate construction operations.
2. Fencing: Chain - Link: Minimum 2 inch (50 mm) 0.148 inch (3.8 mm) thick, galvanized steel, chain - link fabric fencing; minimum 6 feet (1.8 m) high with galvanized steel pipe posts; minimum 2 3/8 inch (60 mm) O.D. line posts and 2 7/8 inch (73 mm) O.D. corner and pull posts, with 1 5/8 inch (42 mm) O.D. top and bottom rails. Provide galvanized steel base for supporting posts, and sled type bases for intermediate posts; secure sections together.
3. Gates: Provide swing gates, 1 pair each location; galvanized steel, with fabric matching fencing. Secure with locks and chains.

C. Removal of Temporary Fence: Remove the fence upon completion of the Work or at such time before final completion as directed by the Department.

1.20 ENVIRONMENTAL QUALITY CONTROL

A. The Prime Contractor and its Subcontractors shall perform their work in a manner which shall minimize the possibility of air, water, land and noise pollution, in accordance with the General Conditions of the Construction Contract.

B. The name, address and telephone number of the Department of Environmental Protection Regional Office is furnished below. This office shall be contacted for waste disposal permits and for information concerning sites already approved for conducting waste disposal.

Southcentral Regional Office 909 Elmerton Avenue Harrisburg, Pa. 17110-8200 (717) 705-4700	Counties: Adams, Bedford, Berks, Blair, Cumberland, Dauphin, Franklin, Fulton, Huntingdon, Juniata, Lancaster, Lebanon, Mifflin, Perry, and York

1.21 OFFICE FOR CONTRACTOR

A. Each Prime Contractor shall provide and maintain, at its cost, a suitable office on the premises, at a location shown on the Lead Contractor's accepted staging plan. The Contractor shall provide and maintain heating facilities and supply fuel for same in cold weather, and shall remove the office from the premises at completion of all work. Provide electrical, telephone and internet service.

1.22 DGS CONSTRUCTION COORDINATOR OFFICE

A. The Lead Contractor shall prepare a drawing of the DGS Construction Coordinator Office along with proposed arrangement of the Contractor's Office and construction staging area for the Department's approval. An electronic copy in .pdf format of the sketch plan is to be submitted through e-Builder to the Department within 7 calendar days of Effective Date of Contract or issuance of Letter of Intent whichever occurs first.

B. The Lead Contractor shall furnish, within five (5) days of the Department's approval of the Lead Contractor's construction staging drawing, a suitably finished mobile office of at least 1,000 square feet, as agreed to by the Construction Regional Director or Construction Project Coordinator, including the necessary extension or provisioning of utilities and service lines required for its proper operation. The Lead Contractor shall both clean DGS Construction Coordinator office and dispose of trash from the office at least bi-weekly, maintain and pay all utility bills, for the duration of the Project, through the completion of all punch list items (unless directed otherwise by the Department). The Lead Contractor shall remove the office from the premises when directed by the Department. The office shall be suitably partitioned as directed by the Department and shall include:

1. Heating and Air-Conditioning
2. Screened and locking high security windows with bars, on at least two (2) sides, provided with adequate window blinds
3. Locking high strength steel, high security doors with high quality deadbolt door locks, complete with entrance steps and up to four (4) sets of keys
4. Lighting and electrical receptacles of suitable number and capacity
5. One (1) Restroom with water closet, and lavatory with hot and cold water and sanitary service.
6. A first quality mercury thermometer on the outside of the DGS Construction Coordinator Office which records the high and low temperature for the day
7. The Lead contractor shall arrange for all electrical power hook-up/service (as well as water and sanitary, if required), and shall be responsible for all costs necessary to provide these services to the DGS Construction Coordinator Office (including monthly utility costs). A temporary electric service shall be ordered from the utility provider. If the temporary electrical service is not readily available from the utility provider, a temporary generator shall be provided and maintained (including fuel) until such time power can be established.)
8. The[AJ2] Lead Contractor to install (6) 9'x20' parking spaces directly adjacent to the DGS Construction Coordinator Office location for the exclusive use of the DGS Staff

Members. Specific location of parking spaces to be coordinated with Construction Project Coordinator.

9. Sanitary[AJ3] holding tank (to accommodate item 5 above) with capacity of eight persons per week, plus one weekly meeting with 25 persons. Tank shall be protected from freezing. Tank shall be emptied on weekly basis, more often if needed. Contractor shall arrange and be responsible for all costs necessary to provide this service to the field office (including all pickup and dump charges).
10. Domestic water holding tank with the same capacity as item 9 above (sized accordingly), to accommodate item 5 above.

C. **Equipment:** Within 14 calendar days of the Initial Job Conference, the Lead Contractor shall furnish for use in the DGS Construction Coordinator Office, the following items in the quantity indicated and remove same from the premises when directed by the Department. The Lead Contractor shall maintain all items in good condition and furnish all supplies (i.e., toner, paper, bottled water, drinking cups) for the duration of the Contract. If any equipment fails, it shall be repaired or replaced by the Lead Contractor within twenty-four (24) hours of being notified by the Department.

1. 4 Desk[AJ4](s) with swivel chair(s)
2. 1 Plan rack, plan rack shall include required quantity of plan sticks to fully utilize the plan rack
3. 1 Plan table
4. 4 Six (6) foot tables
5. 4 Office chairs
6. 1 Provide an all in one print/copy/scan/fax machine capable of producing 35 pages per minute double sided on 8-1/2"x11" and 11"x17". Machine shall be wireless capable and network capable and print/copy/scan/fax both in color and black and white
7. 40 500 count reams of 8-1/2"x11"20LB paper suitable for the copy machine provided.
8. 10 500 count reams of 11"x17" 20LB paper suitable for the copy machine provided.
9. 1 First-Aid Kit
10. 1 Fire Extinguisher
11. 1 Water cooler, with hot and cold taps
12. 3 Filled 5 gallon water bottles per month for the duration of the project.
13. 4 Office Trash cans w/ appropriately sized plastic trash bags[AJ5]
14. 40 Folding Chairs

IT Hardware/Peripherals: The specified IT hardware/peripherals shall be compatible with the HP ProBook or EliteBook laptop computers and include all required battery chargers, data cables (including HDMI), software, ect. to provide a fully integrated and functioning system.

14. 8 Computer monitor(s) - basis of design - Hewlett Packard P24 G4 24 FHD Monitor (#1a7e5aa)
15. 4 Monitor Speaker Bar - basis of design - Hewlett Packard S101 Speaker Bar (Only compatible w/P24 andE243i Monitor) (#5UU40AA)
16. 4 Keyboard & Mouse - basis of design - Hewlett Packard Wired 320MK Combo USB Mouse & Keyboard (#9SR36AA-1)
17. 4 Docking station with all associated cables for connection of all peripheral devices to support the Hewlett Packard ProBook or EliteBook laptop computers - Basis of design - HP USB-C Dock G5 (ProBook, EliteBook) (#5TW10UT).
18. 1 55” High Definition LED flat panel monitor with wall mount bracket and remote. Monitor shall be network/wireless capable, 120Hz, 1080P.
19. 1 All-In-One 4K Conference Cam with 120° FOV Lens - Basis of design – Logitech #960-001101

20. 4 DisplayPort to HDMI Adapter Cable, 15'
21. 1 4'x3' white marker board with (2) sets of markers of standard color.
22. 4 12 Month Wall Calendars, one for each year of the project duration included within construction schedule - 20"x30" - Basis of design AT-A-GLANCE, Model #PM4-28-17

Other Items:

23. 6 Plain white ANSI approved hardhats
24. 6 Safety Glasses

C. The DGS Construction Coordinator Office shall be equipped by the Lead Contractor with a Broadband Internet service and pay all connections/disconnection and monthly fees.

1. The Lead Contractor shall further provide Wi-Fi access utilizing WPA2 security. Options include cable modem, DSL, Satellite, or similar service (dial up is not acceptable). The wireless access point should be positioned to provide sufficient coverage in the DGS Construction Coordinators Office space. The Lead contractor shall provide usernames/passwords for authorized wireless users as determined by the DGS Construction Project Coordinator.

2. It shall be the Lead Contractor's responsibility to ascertain the means in which the Broadband Internet source will be provided. Internet download and upload speeds of 100Mbs shall be provided at all times. The Internet source must be coordinated with the DGS Construction Project Coordinator to assure compatibility with the Department's hardware/software requirements. Wireless access point shall be made fully operational and maintained by the Contractor.

1.23 SANITARY FACILITIES

A. **T**he Lead Contractor shall, at its cost, provide and maintain in a clean and sanitary condition, adequate and approved sanitary facilities in accordance with O.S.H.A. requirements. All facilities shall be screened against insects. When directed by the Department, the Contractor shall dismantle and remove these facilities and disinfect as required. Portable chemical toilets approved by the Pennsylvania Department of Health are acceptable. Under temporary field conditions, provisions shall be made to assure not less than one toilet facility is available.

1.24 SMOKING POLICY

A. Smoking and use of smokeless-tobacco, chewing tobacco, snuff, Vape machines and similar paraphernalia are strictly prohibited in all buildings.

1.25 CONCRETE AND EARTHWORK

A. All Contractors shall perform concrete work and earthwork required for their work, and shall comply with applicable Division 2, 3, 31, 32, and 33 sections. If any specification section contains language conflicting with requirements of applicable Division 2, 3, 31, 32, and 33 sections, the most stringent requirements shall prevail.

1.26 QUALITY CONTROL TESTING

A. Structural-related testing and inspections required to be performed by the Contractor(s) are listed in Section 014000 – Quality Control Testing Services. If Quality Control testing or inspections required appear in Section 014000 and in a technical section, the most stringent requirements shall prevail. If Quality Control testing or inspections required appear in a technical section and not in Section 014000, they shall be required as if specified in Section

014000. Conditions pertaining to Quality Control testing and inspections may appear in the technical sections. All testing herein is to be by the Contractor. Testing by the Department, Quality Assurance Testing, is for the purpose of checking the results of the Contractor's Quality Control Testing. Testing is to be by the Contractor, unless specifically stated to be "by the Department" or required by Section 014010 – Quality Assurance Testing and Inspection Services.

B. Non-structural testing is in the technical specifications.

1.27 CADD FILE WAIVER

A. The Professional will make graphic portions of the bid drawings available for use by the Contractor by uploading files to e-Builder.

B. Electronic files shall be uploaded only after all construction contracts have been executed.

C. The files are provided as a convenience to the Contractor, for use in preparing shop drawings and/or coordination drawings related to the construction of this Project only. These files and the information contained within are the property of the Department, and may not be reproduced or used in any format except in conjunction with this Project.

D. The Contractor acknowledges that the information provided in these files is not a substitution or replacement for the Contract Documents and does not become a Contract Document. The Contractor acknowledges that neither the Professional nor the Department warrant or make any representation that the information contained in these files reflect the Contract Documents in their entirety. The Contractor assumes full responsibility in the use of these files and acknowledges that all addenda, clarifications and changes to the drawings executed as a part of the Contract Documents may or may not be incorporated in these electronic files.

E. The Contractor acknowledges that the furnishing of these files in no way relieves the Contractor from the responsibility for the preparation of shop drawings or other schedules as set forth in the Contract between the Contractor and the Department.

F. The electronic documents shall be stripped of the Professional's name and address, and any professional licenses and signatures indicated on the contract documents. Use of these electronic documents is solely at the Contractor's risk, and shall in no way alter the Contractor's Contract for Construction.

G. Disclaimer: The Professional and Department make no representation regarding fitness for any particular purpose, or suitability for use with any software or hardware, and shall not be responsible or liable for errors, defects, inexactitudes, or anomalies in the data, information, or documents (including drawings and specifications) caused by the Professional's or its Consultant's computer software or hardware defects or errors; the Professional's or its Consultant's electronic or disk transmittal of data, information or documents; or the Professional's or its Consultant's reformatting or automated conversion of data, information or documents electronically or disk transmitted from the Professional's Consultants to the Professional.

H. By the Contractor's or their subcontractor's use of the electronic files (e.g., AutoCAD files), the Contractor and their subcontractor waive all claims against the Department the Professional, its employees, officers and Consultants for any and all damages, losses, or expenses the Contractor incurs from any defects or errors in the electronic documents. Furthermore, the Contractor shall indemnify, defend, and hold harmless the Department, the Professional, and its Consultants together with their respective employees and officers, from and against any claims, suits, demands, causes of action, losses, damages or expenses (including all attorney's

fees and litigation expenses) attributed to errors or defects in data, information or documents, including drawings and specifications.

1.28 DELEGATED DESIGN SERVICES

A. Performance and Design Criteria: Where design services or certifications by a design professional are specifically delegated to the Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated in the technical specification sections.

1. If criteria indicated in the technical sections are not sufficient to perform services or certification required, submit a written request for additional information to the Professional.

B. Delegated Design Services Submittals: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement signed and sealed by the responsible design professional registered in the Commonwealth of Pennsylvania, for each product and system specifically assigned to the Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.29 COORDINATION DRAWINGS

A. General:

1. Refer to the General Conditions of the Construction Contract regarding the preparation of Coordination Drawings and the responsibilities of all Prime Contractors. Any conflicts between or questions regarding the requirements in this Section and the requirements in the General Conditions should be brought to the attention of the Professional.
2. Refer to Technical Specification sections for specific Coordination Drawing requirements for mechanical and electrical installations. Other Technical Specifications sections may also identify requirements for Coordination Drawings.
3. The Prime Contractors shall indicate the value of this effort as a line item on the Schedule of Values.
4. Submission of Coordination Drawings shall be included as a milestone on the Construction Schedule. The General Contractor shall initiate this action and acquire the necessary dates from the other Prime Contractors as part of their overall scheduling responsibilities.
5. Coordination drawings shall be completed within (60) calendar days of the Effective Date of the Contract.
6. The Department's receipt of Coordination Drawings does not in any way constitute approval, or relieve the Prime Contractors of the responsibility to accurately coordinate and install their work.

B. Coordination Procedures:

1. The HVAC Contractor shall have the lead role in this process and shall initiate Coordination Drawings by producing background drawings in electronic format. Electronic drawing files will be available in e-Builder to all Prime Contractors. These background drawings shall include walls, partitions, structural elements, finished floor elevations, dimensions, ductwork, piping, conduit, system devices, associated equipment, etc.
2. Electronic drawings shall then be forwarded to the other Prime Contractors, one at a time, including the General Contractor, for inclusion, layout and interface of all relative equipment, material and penetrations associated with the Work.

3. Each Prime Contractor is responsible for the accuracy and completeness of all Coordination Drawings and shall review all other Prime Contractor's drawings so that there will be no interference and/or conflict with its portion of the work.
4. Upon completion of the preliminary Coordination Drawings, the HVAC Contractor shall schedule a coordination meeting with all Prime Contractors in order to resolve all interference issues. Altering structural elements, bearing elevations, established dimensions, partition locations and ceiling/bulkhead heights or any other aesthetic effect is prohibited without the consent of the Professional.
5. Upon resolution of all interference issues, the Coordination Drawings shall be revised as required, and upon acceptance by all Prime Contractors, the HVAC Contractor will upload the final Coordination Drawings to e-Builder.

    a. Coordination Drawings shall contain a signature block for each Prime Contractor to provide signatures and dates indicating concurrence.

6. Coordination Drawings may be formulated and submitted in partial submittals to facilitate the construction schedule and sequence of work within the Project. This must be agreed to by all Prime Contractors and a priority of sequence must be established that has the concurrence of all parties, including the Department. Approval of partial sets of Coordination Drawings shall not relieve the Contractors of their responsibility for properly coordinating work appearing in subsequent submissions. Any revisions to subsequent work necessitated by such partial approvals shall be performed at no additional cost to the Department.

C. Coordination of Work:

1. Each Prime Contractor shall clearly show, and coordinate with the other Prime Contractors, the following:

    a. Arrange for pipe spaces, chases, slots, sleeves, and openings with general construction work, and arrange in building structure during progress of the Work, to allow for and facilitate distribution line and equipment installation.
    b. Coordinate installation of required supporting devices for ductwork, piping, and conduit, as well as sleeves, and other structural components, as they are constructed.
    c. Coordinate requirements for access panels and doors for HVAC, Plumbing and Electrical items requiring access where concealed behind finished surfaces.
    d. Coordinate electrical connections to equipment provided by all Contractors.
    e. Sequence, coordinate, and integrate installing materials and equipment for efficient flow of the Work. Coordinate installing large items of equipment requiring positioning before closing in the building.

2. Each Prime Contractor shall coordinate its construction operations with those of other Prime Contractors and entities to ensure efficient and orderly installation for each part of the Work. Each Prime Contractor shall coordinate its operations with other operations, included in different Sections that depend on each other for proper installations, connection, and operation. All Prime Contractors shall:

    a. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
    b. Coordinate installation of all components with other Prime Contractors to ensure adequate accessibility/clearance for required maintenance and service.
    c. Make provisions to accommodate items scheduled for later installation.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 042000

UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Stipulations:

1. The specifications sections “General Conditions to the Construction Contract”, “Special Conditions” and “Division 01 - General Requirements” form a part of this Section by this reference thereto, and shall have the same force and effect as if printed herewith in full.

B. General: Provide unit masonry in accordance with requirements of the Contract Documents.

C. Section Includes, but not limited to, the following:

1. **CMU-01 and 1A**: Concrete Masonry Unit, Split Face.
2. **CMU-02**: Concrete Masonry Unit, Ground Face
3. **CMU-03**: Concrete Masonry Unit, Ground Face.
4. **CMU-04**: Concrete Masonry Unit.
5. **CMU-04A**: Concrete Masonry Unit, Split Face.
6. **CMU-06**: Concrete Masonry Unit.
7. **CMU-06A**: Concrete Masonry Unit, Ground Face.
8. **CMU-06C**: Glazed Concrete Masonry Unit.
9. **CMU-08**: Concrete Masonry Unit.
10. **CMU-08A**: Concrete Masonry Unit, Ground Face.
11. **CMU-08B**: Concrete Masonry Unit, Bond Beam.
12. **CMU-08C**: Glazed Concrete Masonry Unit.
13. **CMU-10**: Concrete Masonry Unit.
14. **CMU-12**: Concrete Masonry Unit.
15. **CMU-12A**: Concrete Masonry Unit.
16. **PCCM-01**: Precast Concrete Masonry Trim.
17. **MA-xx:** Miscellaneous Masonry Accessories, as indicated on the drawings and as described within these specifications. Specific keynote code/tags may not be

noted in these specifications, but material descriptions are covered within. Refer to the keynote legend on the drawings.

D. Related Requirements:

1. Section 033000 Cast-In-Place Concrete for accessories embedded in concrete and furnished under this Section.

2. Section 080350 "Exterior Enclosure, General".

3. Section 081113 Hollow Metal Doors and Frames and installed under this Section.

4. Section 099100 Painting for CMU surface sealing.

1.2 REFERENCES

A. Reference Standards:

1. General: Comply with the applicable provisions and recommendations of the referenced standards except as modified by governing codes and by the Contract Documents. Where a recommendation or suggestion occurs in the referenced standards, such recommendation or suggestion shall be considered mandatory. In the event of conflict between referenced standards, this specification or within themselves, the more stringent standard or requirement shall govern.

2. American Concrete Institute (ACI):

a. ACI 530.1/ASCE 6/TMS602 "Specifications for Masonry Structures".

b. ACI 216.1/TMS-0216 "Code Requirements for Determining Fire Resistance of Concrete and Masonry Construction Assemblies".

3. National Concrete Masonry Association (NCMA): "TEK" Information Series".

4. American Society for Testing and Materials (ASTM):

a. ASTM C33 "Standard Specification for Concrete Aggregates"

b. ASTM C90 "Standard Specification for Loadbearing Concrete Masonry Units"

c. ASTM C91/C91M "Standard Specification for Masonry Cement"

d. ASTM C140 / C140M "Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units"

e. ASTM C150 "Standard Specification for Portland Cement"

f. ASTM C331 "Standard Specification for Lightweight Aggregates for Concrete Masonry Units"

g. ASTM C780 "Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry"

h. ASTM C1232 “Standard Terminology for Masonry”

i. ASTM C1586 “Standard Guide for Quality Assurance of Mortars”

5. South Coast Air Quality Management District (SCAQMD)

a. Rule 1168 “Adhesive and Sealant Applications”

1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-installation Meetings: Prior to the start of the Work, meet at the Project site to review methods and sequence of masonry construction, special masonry details and conditions, standard of work, testing and quality control requirements, job organization and other pertinent topics related to the Work.

1.4 SUBMITTALS

A. Product Data: Submit for Professional’s action. Manufacturer’s literature, specifications and installation instructions describing the general properties of each material and accessory to be used in the Work. Include the following:

1. Environmental Product Declaration (EPD): For each product (where available).

2. Sourcing of Raw Materials: Corporate sustainability report for each Manufacturer.

3. Adhesives and Sealants: For installation adhesives and coatings, indicate VOC compliance with SCAQMD, Rule 1168.

4. Recycled Content: For pre-consumer and post-consumer recycled content of materials used.

5. Global Warming Potential (GWP): Provide document noting GWP value(s). Value(s) listed shall be converted from scientific notation to useable numbers before submitting.

6. Reference Service Life Certificates: Manufacturer’s estimated reference service life for each system reported in embodied carbon per year.

B. Shop Drawings: Submit for Professional’s action. Manufacturer approved shop drawings for the fabrication and installation of the Work. Prepare details at appropriate scale to show the Work. Provide the following.

1. Submit block shape drawings, from the manufacturer, for face block units.

2. Submit shop drawings for fabrication, bending and placement of reinforcement bars and details for reinforced masonry. Comply with ACI 315 "Details and Detailing of Concrete Reinforcing". Submit bar schedules, stirrup spacing, bending diagrams for bars and arrangement of masonry reinforcement. Shop drawings shall bear the seal of a Professional Structural or Civil Engineer registered in the Commonwealth of Pennsylvania.

C. Samples: Submit for Professional’s action. Label samples to indicate product, characteristics, and location in the Work. Samples will be reviewed for color and appearance only. Furnish sufficient samples to establish the full range of colors and

textures for materials exposed in the finished work. Compliance with other requirements is the responsibility of the Contractor.

D. Provide samples of the following:

1. Samples for each face block shape: one of each.

2. Reinforcement and accessories embedded in the masonry: one of each.

3. Precast concrete sills and copings: 12 in. x full width.

4. Special shapes of unit masonry: one of each.

5. Colored masonry mortar samples, showing full extent of colors available: 2 of each color, 8 in. long.

E. Delegated Design Submittals: Comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer, registered in the Commonwealth of Pennsylvania, responsible for their preparation.

F. Quality Control Submittals: Submit for Professional's information.

1. Quality Control Testing and Inspection Reports:

a. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to TMS 602/ACI 530.1/ASCE 6.

b. Preconstruction and field test reports for mortar indicating conformance of mortar materials to property specifications of ASTM C270.

c. Test reports, per ASTM C780, for mortar mixes required to comply with property specification.

d. Preconstruction and field test reports of grout in conformance with ASTM C1019.

e. Independent laboratory test reports for seismic reinforcement accessories.

2. Certifications:

a. Document Review: Before commencing work, submit a written statement signed by the Contractor and the Applicator certifying that the Contract Documents, shop drawings and product data have been reviewed with material manufacturers' qualified technical representatives and that they agree the selected materials are proper, compatible with contiguous materials and adequate for the application shown.

b. Producer's Certificates:

1) Submit certificates stating cements are from production facilities that are members of the Portland Cement Association.

2) Submit concrete masonry unit(s) producer's certificates, from an independent testing laboratory, stating concrete unit masonry comply with UL 618 or NCMA TEK 7-1C for two (2) hour or better (as required) referencing full scale fire test reports in conformance with ASTM E119.

3) Submit producer's certification that the concrete unit masonry oven dry density is less than 105 lbs/ ft^3 and that the type aggregate utilized in the production of the concrete unit masonry are 100% lightweight aggregate.

4) Health Product Declaration (HPD): For each product (where available).

c. Mill Certificates: Submit steel producer's certificates of mill analysis, tensile and bend tests for reinforcement steel.

3. Procedures: Submit, for Professional's information, hot and cold-weather construction procedures evidencing compliance with requirements specified in referenced unit masonry standard ACI 530.1/ASCE 6 "Specifications for Masonry Structures".

4. Manufacturer's Qualifications: Submit evidence that the specified materials have been manufactured by the same source and successfully utilized for a minimum of 5 years on projects of a similar scope to that shown and specified for this Project.

G. List of Materials Used in Constructing Mockups: Submit, for Professional's information, a list of generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates. Submittal is for information only. Neither receipt of list nor approval of mockup constitutes approval of deviations from the Contract Documents, unless deviations are specifically brought to the attention of the Professional and approved in writing.

H. Closeout Submittals: Submit for Department's documentation.

1. Warranties: Special warranties as specified.

2. Maintenance Manuals: Furnish complete manuals describing the materials, devices and procedures to be followed in cleaning and maintaining the Work. Include manufacturers' brochures and parts lists describing the actual materials used in the Work, including metal alloys, finishes, sealants, gaskets and other major components. Assemble manuals for component parts into single binders identified for each system.

1.5 QUALITY CONTROL

A. Contractor's Quality Control Responsibilities: Contractor is solely responsible for quality control of the Work.

1. Contractor's Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C1093 to conduct the testing indicated.

B. Sole Source Responsibility:

1. Obtain exposed unit masonry units from one source of a single manufacturer. Obtain accessory products used in conjunction with masonry from the unit masonry manufacturer or from sources acceptable to the manufacturer. The manufacturer shall furnish evidence that the specified materials have been manufactured by the same source and successfully utilized on a yearly basis for a minimum of 5 years on projects of a similar scope to that shown and specified for this Project.

C. Regulatory Requirements: Comply with applicable requirements of the laws, codes, ordinances and regulations of authorities having jurisdiction. Obtain necessary approvals from all such authorities.

1. Fire-Resistance Ratings: Where indicated, provide units that comply with requirements for fire-resistance ratings indicated as determined by testing according to ASTM E119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

2. Requirements for fire–rated or lateral support conditions are not necessarily fully defined on the Drawings or specified; comply with applicable regulations.

3. Inspections of the unit masonry work shall comply with IBC "Special Inspections" statutory requirements for "Unit Masonry" and for the requirements of the component materials, their fabrication and installation.

D. Qualified Installer: Installer shall provide evidence of successful completion of work of similar scope to that shown and specified for this Project.

E. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation. Provide personnel to install unit masonry in exterior or specialty wall mock-up who will be the same personnel who will be performing the actual Work.

1. Build mockup of exterior CMU wall as indicated on Drawings, complete with flashings, insulation and reinforcement; using materials, bond, jointing and pattern as specified for final work. Include a typical control joint in each wall sample. Where extent of mock-up is not shown, provide wall sample 10 ft.high x 5 ft. wide x full depth.

a. Build face block mock-up on the site in a location to receive direct sunlight.

b. Clean mock-ups with materials and techniques intended for use on the Project.

c. Obtain Professional's acceptance of visual qualities of each sample panel before proceeding with the final work.

2. Testing Mock-up: Perform testing on mockups according to requirements in "Field Quality Control" Article.

3. Facade Mock-Up Testing: Provide unit masonry products and materials for testing mock-ups in composite configurations with windows and window walls as specified in Section 080355 "Exterior Wall Mock-Ups and Testing".

4. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Professional specifically approves such deviations in writing.

5. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

6. Demolish and remove mockups when directed unless otherwise indicated.

F. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to exceed tolerances and to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not uses units where such defects, including dimensions that vary from specified dimensions by more than stated tolerances, will be exposed in the completed Work or will impair the quality of completed masonry.

G. Field Samples: Prior to the Pre-Construction Conference, provide a field sample for each type of concrete masonry unit in the building at area to be designated by the Professional. Utilize the same materials and installation methods in the sample as required for the final Work. Schedule the installation so that the sample may be examined, and any necessary adjustments made, at least 1 week prior to date scheduled for commencing installation of the Work. When accepted, sample areas shall serve as the standard for materials, workmanship, and appearance for such Work throughout the project and shall remain a part of the final Work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. General: Deliver and store materials in manufacturer's original unopened containers, bundles, pallets or other standard packaging devices; fully identified with name, type, grade, color and size.

B. Sequence deliveries to avoid delays, but minimize on-site storage.

C. Storage and Protection: Store on platforms off the ground, in a dry location and protect from weather, soiling and damage. Store aggregates where grading and other required characteristics can be maintained and contamination avoided. Store masonry accessories including metal items to prevent corrosion and accumulation of dirt and oil. Do not use metal reinforcing, ties, or other components which are coated with loose rust or other deleterious matter that will reduce or destroy bond with mortar and grout.

1.7 FIELD / SITE CONDITIONS

A. Ambient Conditions:

1. Cold Weather Conditions: Do not erect masonry when the temperature is below 40 deg. F. unless provisions for heating and drying the materials and protecting the completed work comply with the requirements specified in Paragraph 1.8 of ACI 530.1/ASCE 6/TMS 602 "Specifications for Masonry Structures". Do not build upon frozen work. Do not lay unit masonry having a film of water or frost on their surfaces.

2. Hot Weather Conditions: Do not erect masonry when the temperature is above 100 deg. F. or 90 deg. F with a wind velocity greater than 8 mph to comply with the requirements specified in Paragraph1.8 of ACI 530.1/ASCE 6/TMS 602 "Specifications for Masonry Structures".

1.8 WARRANTY

A. General: Warranties and guaranties specified in this Article shall not deprive the Department of other rights the Department may have under other provisions of the Contract Documents and are in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 PERFORMANCE AND DESIGN CRITERIA

A. Design Criteria:

1. Products of other manufacturers will be considered only if evidence is furnished showing compliance with the minimum design and performance requirements specified.

B. Performance Criteria: For information only. Reinforcing bar schedule and locations are shown on the drawings.

1. Exterior Performance Criteria: Comply with the applicable requirements specified in Section 080350 Exterior Enclosure, General.

2. Load and Deflection Criteria:

a. Construct interior unit masonry walls to withstand a lateral loading of minimum 5 psf positive and negative pressure, except where more stringent requirements are indicated.

b. Walls of Atria: Minimum 15 psf loading.

c. Walls of Air Plenum Shafts: Minimum 10 psf loading.

d. Walls of Elevator Shafts: Minimum 5 psf loading.

e. Walls of Stair Wells: Minimum 5 psf loading.

C. Sustainable Design Requirements: Provide the Work, and submit documentation, as necessary for compliance with sustainable requirements noted herein:

1. Recycled content: 15% Minimum

2.2 UNIT MASONRY MATERIALS

A. Concrete Unit masonry: ASTM C90, modified as follows:

1. Aggregates for Normal Weight CMU: Complying with ASTM C33 “Standard Specification for Concrete Aggregates”, and graded from No. 4 to 0 to assure constant texture. The blending of screenings or other deleterious substances is prohibited.

a. Normal Weight CMU Density: The oven dry density of the concrete masonry unit shall not exceed 125 lbs/ ft^3

2. Compressive Strength: Based on net area as follows:

   a. Minimum compressive strength of one unit: 1700 psi.

   b. Minimum average compressive strength of three units: 1900 psi.

3. Face Size: Nominal 8 in.x 16 in. , unless otherwise shown. Width or thickness as indicated.

4. Linear Shrinkage: Not over 0.065% at delivery when tested in accordance with ASTM C426.

5. Maximum Water Absorption

   a. Lightweight CMU

      1) Maximum water absorption of one unit: 20 lbs/ ft^3

      2) Maximum water absorption of three units: 18 lbs/ ft^3

   b. Normal Weight CMU

      1) Maximum water absorption of one unit: 15 lbs/ ft^3

      2) Maximum water absorption of three units: 13 lbs/ ft^3

6. Provide special shapes where indicated and as follows:

   a. For lintels, corners, jambs, sash, control joints, headers, bonding and other special conditions.

   b. Provide square edged units for outside corners except as otherwise shown or specified.

7. Exposed Units: Provide units for exposed construction with fine textured surface, sharp straight arises, and without chips, cracks or other defects on exposed edges or surfaces which would impair appearance.

8. Manufacturers: Subject to compliance with requirements, provide unit masonry products of one (1) of the following:

   a. Westbrook Concrete Block.

   b. Echelon – Cordova Stone.

   c. York Building Products.

   d. Or approved equal.

B. Decorative Masonry Units: ASTM C90, Type I Moisture Controlled Units, complying with criteria specified above in paragraph "Concrete Unit Masonry" with specified finish, Colors shall be as selected by the Professional. The units shall be free from chips, cracks, or other imperfections that would detract from the overall appearance of the wall.

1. Provide special sizes and shapes where indicated, as required by wall assembly descriptions and details, and as follows:

    a. For lintels, corners, jambs, sash, control joints, headers, bonding and other special conditions.

    b. Provide square edged units for outside corners except as otherwise shown or specified.

2. Split Faced Products: Concrete masonry units with faces formed by splitting. Subject to compliance with requirements, provide one of the following:

    a. Westbrook Concrete Block

    b. Echelon – Cordova Stone

    c. York Building Products

    d. Or approved equal.

3. Ground Faced Products: Concrete masonry units with faces ground to expose selected aggregates. Subject to compliance with requirements, provide one of the following:

    a. Westbrook Concrete Block

    b. Echelon – Cordova Stone

    c. York Building Products

    d. Or approved equal.

4. Polished Faced Products: Subject to compliance with requirements, provide one of the following:

    a. Westbrook Concrete Block

    b. Echelon – Cordova Stone

    c. York Building Products

    d. Or approved equal.

C. Integral Water Repellent: Provide units made with integral water repellent for exposed units and where indicated. Provide liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength. Units made with integral water repellent, when tested as a wall assembly made with mortar containing integral water-repellent manufacturer's mortar additive according to ASTM E514, with test period extended to 24 hours, show no visible water or leaks on the back of test specimen. Provide one of the following:

    1. “Block Plus W-10” (Addiment Incorporated).

    2. “Dry-Block” (GCP Applied Technologies).

3. “MasterPel 240” (Master Builders Solutions of BASF).

4. Or approved equal.

D. Precast Concrete Sills and Copings: Custom fabricated shapes, precast with air-entrained concrete and hot-dip galvanized steel reinforcing. ASTM C39 , minimum 5500 psi compressive strength at 28 days ASTM C140, maximum 5% moisture absorption. Color and texture selected by Professional. Sizes and configurations as indicated.

2.3 CONCRETE MASONRY UNIT AND PRECAST CONCRETE SCHEDULE

A. **CMU-01:** Concrete Masonry Unit, Split Face.

1. Manufacturer: WESTBROOK
   Size: 8" X 24" X 4"
   Color: SF-608
   Finish: SPLIT FACE
   Bond: STACK

2. Manufacturer: ECHELON - CORDOVA STONE
   Size: 8" X 24" X 4"
   Color: MIDNIGHT ROCK FACE
   Finish: ROCK FACE
   Bond: STACK

3. Manufacturer: YORK BUILDING PRODUCTS
   Size: 8" X 24" X 4"
   Color: CHARCOAL
   Finish: SPLIT FACE
   Bond: STACK

B. **CMU-01A**: Concrete Masonry Unit, Split Face.

1. Manufacturer: WESTBROOK
   Size: 8" X 24" X 8"
   Color: SF-608
   Finish: SPLIT FACE
   Bond: STACK

2. Manufacturer: ECHELON - CORDOVA STONE
   Size: 8" X 24" X 8"
   Color: MIDNIGHT ROCK FACE
   Finish: ROCK FACE
   Bond: STACK

3. Manufacturer: YORK BUILDING PRODUCTS
   Size: 8" X 24" X 8"
   Color: CHARCOAL
   Finish: SPLIT FACE
   Bond: STACK

C. **CMU-02**: Concrete Masonry Unit, Ground Face

1. Manufacturer: WESTBROOK
   Size: 8" X 24" X 8"

Color: GF-608
Finish: GROUND FACE
Bond: STACK

2. Manufacturer: ECHELON - CORDOVA STONE
Size: 8" X 24" X 8"
Color: MIDNIGHT GROUND FACE
Finish: GROND FACE
Bond: STACK

3. Manufacturer: YORK BUILDING PRODUCTS
Size: 8" X 24" X 8"
Color: CHARCOAL
Finish: GROUNDFACE
Bond: STACK

D. **CMU-03**: Concrete Masonry Unit, Ground Face.

1. Manufacturer: WESTBROOK
Size: 8" X 24" X 4"
Color: GF-608
Finish: GROUND FACE
Bond: STACK

2. Manufacturer: ECHELON - CORDOVA STONE
Size: 8" X 24" X 4"
Color: MIDNIGHT GROUND FACE
Finish: GROND FACE
Bond: STACK

3. Manufacturer: YORK BUILDING PRODUCTS
Size: 8" X 24" X 4"
Color: CHARCOAL
Finish: GROUNDFACE
Bond: STACK

E. **CMU-04**: Concrete Masonry Unit:

1. Size: 8" X 16" X 4"

F. **CMU-04A**: Concrete Masonry Unit, Split Face.

1. Manufacturer: WESTBROOK
Size: 8" X 16" X 4"
Color: GF-608
Finish: SPLIT FACE
Bond: STACK

2. Manufacturer: ECHELON - CORDOVA STONE
Size: 8" X 16" X 4"
Color: MIDNIGHT ROCK FACE
Finish: ROCK FACE
Bond: STACK

3. Manufacturer: YORK BUILDING PRODUCTS
Size: 8" X 16" X 4"
Color: CHARCOAL
Finish: SPLIT FACE
Bond: STACK

G. **CMU-06**: Concrete Masonry Unit.

1. Size: 8" X 16" X 6"

H. **CMU-6A**: Concrete Masonry Unit, Ground Face.

1. Manufacturer: WESTBROOK
Size: 8" X 24" X 6"
Color: GF-608
Finish: GROUND FACE
Bond: STACK

2. Manufacturer: ECHELON - CORDOVA STONE
Size: 8" X 24" X 6"
Color: MIDNIGHT GROUND FACE
Finish: GROND FACE
Bond: STACK

3. Manufacturer: YORK BUILDING PRODUCTS
Size: 8" X 24" X 6"
Color: CHARCOAL
Finish: GROUNDFACE
Bond: STACK

I. **CMU-06C**: Concrete Masonry Unit, Glazed Face.

1. Manufacturer: WESTBROOK
Size: 8" X 16" X 6"
Color: Charcoal
Finish: Spectra Glazed
Bond: STACK

2. Or approved equal as manufactured by the following:

a. Echelon – Cordova Stone

b. York Building Products

c. Approved equal.

J. **CMU-08**: Concrete Masonry Unit.

1. Size: 8" X 16" X 8"

K. **CMU-08A**: Concrete Masonry Unit, Ground Face.

1. Manufacturer: WESTBROOK
   Size: 8" X 16" X 8"
   Color: GF-608
   Finish: GROUND FACE
   Bond: STACK

2. Manufacturer: ECHELON - CORDOVA STONE
   Size: 8" X 16" X 8"
   Color: MIDNIGHT GROUND FACE
   Finish: GROND FACE
   Bond: STACK

3. Manufacturer: YORK BUILDING PRODUCTS
   Size: 8" X 16" X 8"
   Color: CHARCOAL
   Finish: GROUNDFACE
   Bond: STACK

L. **CMU-08B**: Concrete Masonry Bond-Beam Unit.

1. Size: 8" X 16" X 8"

M. **CMU-08C**: Concrete Masonry Unit, Glazed Face.

1. Manufacturer: WESTBROOK
   Size: 8" X 16" X 8"
   Color: Charcoal
   Finish: Spectra Glazed
   Bond: STACK

2. Or approved equal as manufactured by the following:

   a. Echelon – Cordova Stone

   b. York Building Products

   c. Approved equal.

N. **CMU-10**: Concrete Masonry Unit.

1. Size: 8" X 16" X 10"

O. **CMU-12**: Concrete Masonry Unit.

1. Size: 8" X 16" X 12"

P. **CMU-12A**: Concrete Masonry Unit.

1. Manufacturer: WESTBROOK
   Size: ~~8" X 16" X 12"~~ **8" X 24" X 12"**
   Color: GF-608
   Finish: ~~GROUND~~ **SPLIT** FACE
   Bond: STACK

2. Manufacturer: ECHELON - CORDOVA STONE
Size: ~~8" X 16" X 12"~~ **8" X 24" X 12"**
Color: MIDNIGHT ~~GROUND FACE~~
Finish: ~~GROND~~ **SPLIT** FACE
Bond: STACK

3. Manufacturer: YORK BUILDING PRODUCTS
Size: ~~8" X 16" X 12"~~ **8" X 24" X 12"**
Color: CHARCOAL
Finish: ~~GROUNDFACE~~ **SPLIT FACE**
Bond: STACK

Q. **PCCM-01**: Precast Concrete Masonry Trim.

1. Manufacturer: WESTBROOK
Size: ~~XX" X 24" X XX", as indicated on drawings.~~ **24" length, height and depth as indicated on the Drawings.**
Color: 323
Texture: ARCHITECTURAL CAST STONE TO MATCH SF-608

2. Or the following:

a. Echelon – Cordova Stone

b. York Building Products

c. Approved equal.

2.4 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

B. Hydrated Lime: ASTM C207, Type S.

C. Aggregate for Mortar: ASTM C144, except for joints less than 1/4 in.use aggregate graded with 100% passing the No. 16 sieve. In areas requiring white mortar use natural white sand or ground white stone.

D. Aggregate for Grout: ASTM C404.

E. Admixtures: Set accelerators, anti-freeze compounds, mortar extenders and air-entraining and other admixtures are prohibited.

F. Water Repellent Mortar Admixtures: Liquid water-repellent mortar admixture intended for use with concrete masonry units, containing integral water repellent by same manufacturer. Use waterproofing admixtures only for CMU single wythe wall construction with integral water repellant, on the exterior to the building envelope or for CMU single wythe wall construction with integral water repellant such as planters, site masonry, screen walls. Provide one of the following:

1. “Mortar Tite” (Addiment Incorporated).

2. “Dry-Block Mortar Admixture” (GCP Applied Technologies).

3. “MasterPel 240” (Master Builders Soliutions of BASF).

G. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides of high purity, nonfading and limeproof, compounded for use in mortar mixes and in compliance with ASTM C979; color as selected. Use only pigments with record of satisfactory performance in masonry mortars/

H. Water: Clear, potable and free of harmful amounts of acid, alkalies, salts, organic materials or other deleterious material which would impair the Work.

2.5 MASONRY ACCESSORIES

A. **MA-xx** - Refer to the keynote legend on the drawings.

B. Anchors and Ties: ASTM A82 Steel, hot-dipped heavily galvanized steel in accordance with ASTM A153 , Class B-2, conforming with ASTM A951 and complying with the following requirements:

1. Partition Top Anchors: Provide hot dip galvanized steel partition top anchors developed to provide lateral shear resistance at the upper limit of the masonry walls and permitting vertical deflection of the slab above; Provide "#PTA420 Partition Top Anchor" and/or "#PTA422 Partition Top Anchor" (Hohmann & Barnard, Inc.) or approved equal. Provide at a maximum spacing of 48 in. and to resist a lateral force of 200 lbs/ft. or as otherwise noted on the drawings or as required.

2. Anchor Bolts: 1/2 in.dia., complying with ASTM A307, Grade A, hot-dipped galvanized in accordance with ASTM A153 , Class C; 12 in. long with a 2 in. turned leg, unless otherwise shown. Provide bolts with galvanized hex nuts and flat washers.

3. Column and Beam Anchors: ASTM A36 steel, 1/4 in. minimum thickness; hot-dipped galvanized in accordance with ASTM A153 , Class B-1. Provide units of profiles and sizes as required for locations shown.

4. Seismic Veneer Anchor: 3/16 in. wire loop, 12 gauge backplate.

5. Wire Ties: 10-gauge looped at both ends.

6. Wire Mesh Ties: 16-gauge , 1/2 in. mesh, 3 in. wide, length as required.

7. Hardware Cloth: 16-gauge , 1/2 in. mesh, size as required.

8. Anchor Straps: 1-1/4 in. x 1/8 in. by length required, with ends turned up 2 in. .

C. Dovetail Slots: 22-gauge , felt, plastic foam or fiber filled; sized to receive flexible anchors. Place slots at locations shown or as recommended. Provide "#305 Dovetail Slot " (Hohmann & Barnard, Inc.) or approved equal.

1. Flexible Anchors for Dovetail Slots: 16-gauge end and 3/16 in. dia. wire, of length required; Provide "#315-BL Flexible Dovetail Brick Tie" (Hohmann & Barnard, Inc.) or approved equal.

2. Flexible Anchors for Dovetail Slots: 16-gauge end and 3/16 in. dia. wire, of length required; Provide "#315-BT Flexible Dovetail Brick Tie" (Hohmann & Barnard, Inc.) or approved equal.

D. Channel Slots for Surface Attachment to Structural Steel and Masonry: 12-gauge steel; sized to receive flexible gripstay anchors. Provide "#360 Gripstay Channels" (Hohmann & Barnard, Inc.) or approved equal. Place slots at locations shown or as recommended.

1. Flexible Gripstay Anchors for Welded Channel Slots: 16-gauge dovetail end and 3/16 in. dia. wire, of length required; Provide "#363-BL Flexible Gripstay Brick Anchor" (Hohmann & Barnard, Inc.) or approved equal.

2. Flexible Gripstay Anchors for Welded Channel Slots: 16-gauge dovetail end and 3/16 in. dia. wire, of length required; Provide "#363-BT Flexible Gripstay Brick Anchor" (Hohmann & Barnard, Inc.) or approved equal.

E. Horizontal Joint Reinforcement: Truss type, fabricated from 9-gauge cold drawn steel wire complying with ASTM A82; hot dip galvanized as per ASTM A153 Class B2; conforming with ASTM A951 deformed side rods; smooth cross rods; out to out spacing of side rods not less than 2 in. less than nominal wall dimension. Provide manufacturer's standard or custom fabrications to comply with the specified requirements.

1. Single Wythe Concrete Unit masonry Walls: One piece truss type horizontal joint reinforcement with prefabricated corner and tee units. Sizes as required for walls shown.

a. "Dur-O-Wal D/A 3100 Truss" (Dur-O-Wal, Inc.).

b. "Single Wythe Wall with #120 Truss Mesh" (Hohmann & Barnard, Inc.).

c. “Two Wire System 300" (WIRE-BOND).

2. Composite Walls: One piece truss type horizontal joint reinforcement with prefabricated corner and tee units. Sizes as required for walls shown.

a. "Dur-O-Wal D/A 3100 TR Truss Tri Rod" (Dur-O-Wal, Inc.).

b. "Composite Wall with #130 Truss Tri Mesh" (Hohmann & Barnard, Inc.).

c. “Truss Type Series 300" Single Wythe (WIRE-BOND).

3. Cavity Walls (Two Piece) With Concrete Unit Masonry Backup: Truss type horizontal joint reinforcement fabricated from 9-gauge cold drawn steel wire complying with ASTM A82 ; hot dip galvanized as per ASTM A153 Class B2 conforming with ASTM A951; sized for the inner wythe masonry construction with loose, adjustable pintle type wire anchors sized for the outer wythe masonry construction. Fabricate pintles from 9-gauge) cold-drawn steel wire, hot-dipped galvanized, designed to snugly engage 3/16 in. eyelet sections fabricated onto the truss and located at 16 in. o.c. Size pintles to extend to within 1 in. from the exterior face of the outer wythe. Provide prefabricated tee and corner units.

a. "Dur-O-Eye D/A 3700 " (Dur-O-Wal).

b. "Lox-All Adjustable Truss Type #170" (Hohmann & Barnard, Inc.).

c. "Series 900 Cavity Hook and Eye" (WIRE-BOND).

4. Cavity Walls (Two Piece) With Concrete Unit masonry Backup For Seismic Applications: Truss type horizontal joint reinforcement specifically manufactured and tested for seismic applications and approved by local authorities having jurisdiction; fabricated from 9-gauge cold drawn steel wire complying with ASTM A82 ; hot dip galvanized as per ASTM A153 Class B2 conforming with ASTM A951; sized for the inner wythe masonry construction with loose, adjustable anchors sized for the outer wythe masonry construction and designed for seismic applications. Provide prefabricated tee and corner units.

   a. "D/A 3700 S Seismic Dur-O Eye " (Dur-O-Wal).

   b. "Lox-All Adjustable Truss Type #170 with Seismiclip Interlock System" (Hohmann & Barnard, Inc.).

   c. "Series 900 Cavity Hook and Eye Wire-Bond Clip" (WIRE-BOND).

5. Horizontal Wire Reinforcement for Block Veneer: 9-gauge cold-drawn steel wire complying with ASTM A82 , hot-dipped galvanized.

F. Reinforcement:

1. Rod Reinforcement: 1/4 in.steel pencil rods free from mill scale and loose rust or other deleterious matter.

2. Deformed Bar Reinforcement: ASTM A615 steel, Grade 60; hot-dipped galvanized in accordance with ASTM A123 free from mill scale and loose rust or other deleterious matter. Provide sizes and spacing as shown.

G. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells with loops for holding reinforcing bars in center of cells. Units are formed from 0.14 in. steel wire, hot-dip galvanized after fabrication. Provide units with either two loops or four loops as needed for number of bars indicated. Provide one of the following:

1. “D/A 810, D/A 812 or D/A 817” (Dur-O-Wal).

2. “No. 376 Rebar Positioner“ (Heckmann Building Products Inc.).

3. “#RB or #RB-Twin Rebar Positioner” (Hohmann & Barnard, Inc.).

4. “O-Ring or Double O-Ring Rebar Positioner” (WIRE-BOND).

H. Expansion and Control Joint Fillers: Provide a system of joint fillers for unit masonry work of sizes and profiles shown. Provide fillers in joints to receive sealant sized to allow space for sealant and back-up materials.

1. Concrete Unit Masonry Control Joints: ASTM D2000, Shore A Durometer 80 +/- 5. Preformed closed-cell synthetic rubber, size and shape intended for use with concrete masonry sash blocks, unless otherwise shown.

2. Control Joint: ASTM D1056, closed cell neoprene, capable of 35% compression.

I. Full Mortar Bed Height Weep/Vents (**MA-02**):

1. Cellular Plastic Weep/Vent: One piece, flexible extrusion made form UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch (3.2mm) less than depth of outer wythe, in color selected from manufacturer's standard.

    a. 16QVQUADRVENT (Hohmann & Barnard, Inc.) or approved equal.

J. Cavity Drainage Material (**MA-03**): Free-draining mesh, made from polymer strands that will not degrade within the wall cavity. Provide one of the following:

1. "Mortar Break II" (Advanced Building Products Inc.).

2. "DA1008 Mortar Net" (Dayton Superior Corporation, Dur-O-Wal Division).

3. "Mortar Net" (Mortar Net USA, Ltd.).

4. "Driwall Mortar Deflection" (Keene Building Products, Inc.).

K. Metal Flashing Trim: Stainless steel, ASTM A167, Type 304, dead soft fully annealed except where harder temper required for forming or performance; 24-gauge unless otherwise shown, finish No. 2D. Provide factory preformed and crimped edge. Comply with Section 076200 Sheet Metal Flashing and Trim.

L. Insulation: Provide insulation specified in Section 072100 "Thermal Insulation".

M. Air and Water Barrier: Provide air and water barriers as specified in Section 072700 Air and Water Barriers.

2.6 MORTAR MIXES

A. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C109 for compressive strength, ASTM C1506 for water retention, and ASTM C91 for air content.

2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

B. Chloride Content of Mix: The total chloride (CL) ion content in the entire mortar or grout mix shall not exceed 0.10% of the weight of cement. Mortar and grout with excess chlorides will be subject to removal.

C. Mortar for Unit Masonry: ASTM C270, Portland Cement-Lime Mortar; Type N for interior work and exterior wall work except use Type S mortar for reinforced unit masonry. Do not use quicklime or masonry cement for mortar.

1. In mortar used for polished concrete unit masonry, sand shall pass a No. 16 sieve.

D. Waterproof Mortar: For exterior solid wall construction, add mortar waterproofing admixture to the mix in accordance with the manufacturer's recommendation, but do not exceed 2% admixture by volume.

E. Pigmented Colored Mortar: For pigmented mortars, use colored Portland cement-lime mix of formulation required to produce color indicated, or if not indicated, as selected from manufacturer's standard formulations. Pigments shall not exceed 10 % of Portland cement by weight for mineral oxides nor 2% for carbon black. Provide individual mortar mixes to match the Professional's sample, containing mortar pigment for the following:

1. Face Block: Provide custom colors for each color and type of face block scheduled, as selected by the Professional.

F. Fire Clay Mortar: For fire block construction, mix in accordance with manufacturer's recommendations.

G. Grout: ASTM C476, Portland Cement Grout; provide individual mixes for fine aggregate grout and coarse aggregate grout as specified. Provide grout with a slump of 8 to 11 inches as measured in accordance with ASTM C143 .

H. Measurement and Mixing of Mortar Materials: Comply with ASTM C270 for measuring and mixing of mortar materials and for retempering of mixed mortar. Measure and mix mortar to provide the following properties:

1. Compressive Strength: Minimum 28-day strength as follows:

a. Type N: 750 psi..

b. Type S for Reinforced Masonry Only: 1800 psi.

2. Water Retention: 75%, minimum.

3. Air Content: 12%, maximum.

I. Measurement and Mixing of Grout Materials: Comply with ASTM C476 for measuring and mixing of grout materials. Control batching procedure to ensure proper volume proportions of grout materials and to achieve a grout slump of 8 in. to 11 in., and a 28-day minimum compressive strength of 2500 psi in accordance with ASTM C1019.

J. Measuring Devices: Use accurate measuring devices to mix materials by volume. The use of shovels for measurement is prohibited.

K. Mixing of Pigmented Colored Mortars: Mix colored mortars separately to prevent contamination from other mortars.

L. Mixture and Retempering Procedures: Mix only sufficient mortar as required at a given time. Retemper stiffened mortar as required, except discard mortar not utilized within 2 hrs. of initial mixing. Do not retemper colored mortar.

2.7 SOURCE QUALITY CONTROL

A. Contractor’s Quality Control Responsibilities: Contractor is solely responsible for quality control of the Work.

B. General: Provide and maintain an effective Quality Control program and perform sufficient inspections, surveys and tests of the Work, including those of other trades, to ensure compliance with the Contract Documents. Furnish appropriate facilities, accurately calibrated instruments and testing devices required to perform the quality control operations and with sufficient work forces to cover the construction operations

within the actual construction sequences. Coordinate this work with the quality control requirements of other technical Sections of the Specifications and with requirements of the Department and governing authorities having jurisdiction.

C. Contractor's Testing: Perform testing in an independent certified testing laboratory. Furnish the laboratory sufficient quantities of specimens to comply with referenced testing standards. Test and furnish test reports for materials specified.

1. Concrete Masonry Unit Testing: After the Professional's review of samples, test each type, class and grade of concrete masonry unit specified in accordance with ASTM C140. Provide testing specimens from actual production batches. Perform the following tests:

   a. Compressive strength

   b. Absorption

   c. Moisture content

   d. Weight

   e. Dimensions

2. Prism Test: Provide a prism test for each type of wall construction indicated. Prism test concrete unit masonry to determine the actual f'_m of the concrete unit masonry wall construction. Construct and test concrete unit masonry prisms in accordance with ASTM C1314, and to comply with requirements of local authorities having jurisdiction. Test grouted and hollow concrete unit masonry wall specimens. Test concrete unit masonry thickness and mortar types intended for use on the Project. Test prisms a minimum of 16 in. in height.

3. Aggregate Testing: Test aggregate as follows:

   a. Mortar Aggregate: ASTM C144

   b. Grout Aggregate: ASTM C404

4. Mortar Testing: Test mortar samples in accordance with ASTM C780 for mortar compression strength, composition and properties. Test each mortar mix, type and color each week. Prior to commencement of Work, provide preconstruction tests to establish a basis for comparison.

5. Grout Testing: Test and submit test reports of grout samples in accordance with ASTM C1019 for compression strength. Test grout during construction for each 5000 ft^2. ^{2} of wall area or portion thereof. Prior to commencement of Work, provide preconstruction tests to establish a basis for comparison.

6. Chloride Ion Testing: Test each mortar and grout mix to verify that the total chloride (Cl) ion content of each mix is within the specified limits. Perform chloride tests in accordance with ASTM C1152

PART 3 - EXECUTION

3.1 GENERAL

A. Manufacturer's Instructions: Prepare substrates and erect the Work of this Section; including components, accessories in accordance with the manufacturer's instructions, except where more stringent requirements are shown or specified, and where project conditions, require extra precautions or provisions to ensure satisfactory performance of the Work.

3.2 EXAMINATION

A. Verification of Conditions: Examine the areas to receive the Work and the conditions under which the Work would be performed. Remedy conditions detrimental to the proper and timely completion of the Work. Do not proceed until unsatisfactory conditions have been corrected. Examine rough-in and built-in construction to verify actual locations of piping and other connections prior to installation.

3.3 PREPARATION

A. Substrate Acceptability: Commencement of installation shall constitute acceptance of substrate conditions by the Installer.

B. Surface Preparation: Clean surfaces scheduled for unit masonry, before installation to remove dirt, dust, debris, loose material and other foreign matter detrimental to proper bonding.

C. Lay Out of Walls: Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurate locating of openings, movement-type joints, returns, and offsets. Avoid the use of less-than-half-size units at corners, jambs, and where possible at other locations

3.4 INSTALLATION

A. General Requirements: Provide unit masonry construction in accordance with the referenced standards and the manufacturers' recommendations for conditions of each particular application, except where more stringent requirements are shown or specified.

1. Concrete Masonry: ACI 530 and ACI 530.1 standards.

B. General: Lay masonry plumb, true to line with level and accurately spaced courses; corners plumb and true; each course breaking joint with the course below, except as may be otherwise indicated or specified. Maintain plumb bond. Comply with tolerances as specified in "References" and the following:

1. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/4 in. in 20 ft. , nor 1/2 in. maximum.

2. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 in. in 10 ft. or 1/2 in., maximum.

3. For conspicuous horizontal lines, such as exposed lintels, sills, parapets, and reveals, do not vary from level by more than 1/4 in. , in 20 ft. , nor 1/2 in. maximum.

4. For exposed bed joints, do not vary from thickness indicated by more than plus or minus 1/8 in., with a maximum thickness limited to 1/2 in. Do not vary from bed-joint thickness of adjacent courses by more than 1/8 in .

5. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 in. . Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 in.

C. Leave openings for equipment to be installed before completion of masonry. After installation of equipment, complete masonry to match construction immediately adjacent to the opening.

D. Stopping and Resuming Work: In each course, rack back 2-unit length for one-half running bond or 1/3 unit length for 1/3 running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay unit masonry lightly (if required), and remove loose unit masonry and mortar prior to laying fresh masonry.

E. Condition of Exposed Masonry: No cracked, chipped, broken, discolored, defaced or open celled units will be permitted on exposed masonry.

F. Cutting, patching and repairing in connection with masonry work as required to accommodate the work of other trades shall be performed under this Section.

G. Use of Motor Driven Diamond Saw: Use motor driven diamond saw designed to cut unit masonry with clean sharp corners. Cut units as required to provide pattern shown and to fit adjoining work neatly. Use full units without cutting wherever possible. If required, locate less than half-sized units at inside corners. Do not use less than half-size units at outside corners, jambs and at other conspicuous locations.

H. Joints:

1. Exterior: Tool exposed joints slightly concave unless otherwise shown. Lay masonry unit with uniform joint widths. Tool joints to squeeze mortar back into joints. Tool after mortar has taken its initial set. At inside face of exposed masonry air shafts, strike joints flush.

2. Interior: Exposed joints shall be raked unless otherwise shown. Lay masonry unit with uniform joint widths. Tool joints to squeeze mortar back into joints. Tool after mortar has taken its initial set. At inside face of exposed masonry air shafts, strike joints flush.

I. Anchors and Ties: Provide loose anchors and ties where shown and where required to supplement other reinforcement specified and in accordance with the applicable requirements of governmental authorities having jurisdiction.

1. Anchor, tie, reinforce and bond masonry at corners and intersections in accordance with the applicable requirements of governmental authorities having jurisdiction.

2. Space loose anchors and ties a maximum of 16 in o.c. horizontally and vertically.

3. Set anchors, with vertical legs, within the core of the masonry wythe and fill core solid with mortar or grout.

4. Provide wire mesh ties, hardware cloth, or expanded lath below core space to retain mortar or grout at embedded anchors.

5. Provide loose anchors at columns, beams and other structural elements as shown and as required to support imposed loads. Install anchors to structural elements to prevent rattle and lateral displacement in any direction.

J. Flashing and Weep Holes: Install embedded flashing including weep holes if required, in masonry construction at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall as indicated and as specified.

1. Prepare masonry and concrete surfaces so they are smooth and free from projections that could puncture flashing. Unless otherwise indicated, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.

2. At lintels and shelf angles, extend flashing a minimum of 4 in. into masonry at each end. At heads and sills, extend flashing 4 in. at ends and turn flashing up not less than 2 in. to form a pan. Protect flashing from damage during construction.

3. Extend sheet metal flashing beyond face of masonry at exterior and turn flashing down to form a drip, as indicated on the drawings.

4. Install metal drip edges beneath elastomeric flashing at exterior face of wall. Stop elastomeric flashing 1/2 in. back from outside face of wall and adhere to top of metal drip edge.

5. Install weep holes in the head joints in exterior wythes of the first and second course (staggered) of masonry immediately above embedded flashing.

6. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.

K. Installation of Loose Lintels, Relieving Angles and Other Miscellaneous Support Steel: Install loose lintels, relieving angles and other miscellaneous support steel where shown. Adjust as required to provide square, level, plumb and true openings for attachment and alignment of other work. Grout lintels fully. Provide minimum lintel bearing at each jamb of 4 in. for openings which do not exceed 6 ft. and 8 in. for openings in excess of 6 ft.

1. Fill cores in hollow concrete unit masonry with grout 3 courses 24 in. under bearing plates, beams, lintels, posts, and similar items, unless otherwise shown.

2. At underside of relieving angles and other miscellaneous support steel where shown or required, provide compressible filler.

L. Built-In Work: Build in frames, struts, hangers, miscellaneous metal and other items of work furnished under other Sections. Prepare for, build in and protect flashings, reglets, anchors and other similar items occurring in connection with work of this Section. Set and grout loose lintels. Build in anchors, furnishing such as may be required exclusively by reason of work under this Section.

1. Access Doors, Frames and Access Panels: Install access doors, frames and access panels occurring in masonry construction where shown and required for access to mechanical and electrical installations and equipment.

2. Chases, Slots, Reglets or Openings: Chases, slots, reglets or openings necessary for the proper installation of work of other trades shall be formed as required. Keep chases and reglets free from mortar or other debris..

M. Mortar Cants: Provide mortar cants in elevator shafts and stair halls where concrete and/or steel beams abut and project from masonry walls.

N. Pointing: At completion of any portion of work, point holes in joints of exposed masonry surfaces by completely filling with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application. After pointing has hardened clean the masonry surfaces. Clean masonry in small sections prior to the installation of contiguous work by other trades.

3.5 LAYING CONCRETE UNIT MASONRY

A. Procedures for Erection of Concrete Unit masonry: Erect concrete unit masonry (CMU) where shown. Solidly bed each course in mortar. Butter vertical joints their entire length. Lay concrete unit masonry with units in running bond with vertical joint in each course centered on units in courses above and below. Bond each course at corners and intersections and bond into or anchor to adjacent construction with metal anchors spaced not over 32 in. o.c. in both directions. Do not use units with less than nominal 4 in. horizontal face dimensions at corners or jambs.

B. Procedures for Setting Units: Set units with care around frames so as not to bulge the sides or change the position of the frames. Break joints in units set around the tops of door frames so as to minimize the danger of loosening the units due to door jarring. Set units tightly against metal frames and fill voids completely. Build frame anchors into joints. Cut units accurately to fit around pipes, ducts, openings, etc. and fill voids full. Fill jambs and head of hollow metal frames solid with mortar.

C. Partitions: Build partitions of thickness shown. Give sufficient opportunity to the various trades to install built-in work before proceeding with the partitions, leaving openings where required for testing, etc.; such openings to be closed later. Except where first course is shown to be laid on a concrete curb, lay first course directly on structural slab with cells vertical and fill cells with mortar to one-half the height of the unit. Construct masonry partitions full height and terminate against underside of structure above unless otherwise shown.

1. Stop installation of partition, leaving a minimum gap of 3/4 in. at top, to allow for deflection of floor slab. Fill void with continuous compressible filler of min. width 1 in. less than width of concrete masonry unit, centered unit leaving a 1/2 in. gap on each side. Seal gap on both sides with sealant type shown.

    a. Sealants and compressible fillers are specified under Section 079200 Joint Sealants.

2. In areas where walls are fire rated, stop installation of partition 3/4 in. from top of structure above and leave ready for firestopping.

3. Provide specified galvanized steel partition top anchors at top of concrete unit masonry partitions in accordance with manufacturer's written instruction so as to laterally tie wall to structure and allow for deflection.

D. Appearance of Work: Line up courses of exposed work throughout to obtain a uniform appearance. Install units at locations where conduits, pipes, etc. are to be enclosed in a manner to produce the regular jointing pattern of the adjacent surfaces. Provide necessary reinforcement for bonding where block units are used. Holes made in exposed units for attachment of handrail brackets and similar items shall be neatly drilled. Provide necessary special jamb, irregular and regular angle units where required to obtain smooth, evenly jointed and regular patterns throughout exposed surfaces.

E. Joint Reinforcement: Place joint reinforcement in horizontal mortar joints on 16 in. centers unless otherwise shown. Make reinforcement continuous except at control joints and expansion joints. Lap reinforcement 6 in. at ends and use prefabricated "T" and "L" sections at corners and intersections to provide continuity. Place reinforcement to obtain min. 5/8 in. mortar cover at side rods. Provide reinforcement in first and second bed joints above lintels and below sills extending 2 ft. beyond jamb openings.

F. Control Joints: Construct continuous control joints to provide an unbroken vertical separation through the entire thickness of walls, in the manner shown by the details, complying with referenced standards and at locations shown. Locations of control joints not shown shall be approved by the Professional prior to the start of construction. Where locations are not shown, construct control joints throughout the unbroken length of walls as follows:

1. Not to exceed 25 ft. on center in same plane as wall.

2. Where joints occur in construction supporting masonry wall.

3. Where masonry abuts dissimilar construction or structural element such as a column.

4. At one jamb for major openings less than 6 ft. in width and at both jambs for wider openings. (Control joints can be omitted if adequate tensile reinforcement, as approved by the Professional, is placed above and below wall openings.)

5. Where a change occurs in masonry wall height or thickness, and at chases and recesses in the masonry wall.

G. Joint for Sealant: Leave an open joint for sealing entirely around metal frames in exterior and interior concrete masonry walls. Unless otherwise indicated on the Drawings, size of joint shall be 1/4 in. wide and 3/4 in.deep, left clean and ready for sealing.

H. Concrete Bond Beams and Lintels: Provide concrete bond beams and masonry lintels consisting of specially formed units, with reinforcing bars and fill with grout, wherever shown and wherever openings in concrete masonry of more than 1 ft. are shown without structural steel or other supporting lintels. Unless otherwise shown provide one bar for each 4 in. thickness of wall, and use bars of a size number not less than the number of feet of opening width. Provide minimum lintel bearing at each jamb of 4 in. for openings which do not exceed 6 ft. and 8 in. for openings in excess of 6 ft.. Precast lintels or form lintels in place with adequate temporary support. Cure precast lintels thoroughly before handling and installing

I. Miscellaneous Masonry Items: Install structural steel lintels and supports for unit masonry as indicated and as specified in Section 055000, “Metal Fabrications”. Build sleeves, frames, or other miscellaneous metal items into masonry, and fill solidly around each built-in item as Work progresses.

3.6 REINFORCED UNIT MASONRY

A. Reinforcement Placement:

1. Clean reinforcement of loose rust, mill scale, or other deleterious materials. Do not use reinforcement with kinks or reduced cross-section due to excessive rusting or other causes. Do not use reinforcement with bends other than shown on final shop drawings.

2. Position reinforcement accurately at spacing shown. Support and secure bars against displacement.

a. Provide laps of dimension shown; if not shown, as required by governing authority.

b. Anchoring: Anchor masonry work to supporting structure as indicated. At intersection of reinforced masonry walls with non-reinforced masonry, provide anchorage as shown.

B. Temporary Shoring: Provide temporary shoring as required to support masonry elements; to conform to masonry shapes, lines and dimensions shown.

C. Installation of Reinforced Concrete Unit Masonry: Lay concrete unit masonry with full-face shell mortar beds. Use Type S mortar for reinforced unit masonry. Fill vertical head joints (end joints between units) solidly with mortar from face of unit to a distance behind face equal to not less than the thickness of longitudinal face shells. Solidly bed cross-webs of starting courses in mortar. Maintain head and bed joint widths shown, or if not shown, provide 3/8 in. joints.

D. Walls:

1. Pattern Bond: Lay concrete unit masonry wall units in half running bond with vertical joints in each course centered on units in courses above and below, unless otherwise indicated. Bond and interlock each course at corners and intersections. Use special-shaped units where shown, and as required for corners, jambs, sash, control joints, lintels, bond beams and other special conditions.

a. Maintain vertical continuity of core or cell cavities, which are to be reinforced and grouted, to provide minimum clear dimensions indicated and to provide minimum clearance and grout coverage for vertical reinforcement bars. Keep cavities free of mortar. Solidly bed webs in mortar where adjacent to reinforced cores or cells.

2. Where horizontal reinforced beams (bond beams) are shown, use special units or modify regular units to allow for placement of continuous horizontal reinforcement bars. Place small mesh expanded metal lath or wire screening in mortar joints under bond beam courses over cores or cells of non-reinforced vertical cells, or provide units with solid bottoms.

3. Grouting: Install grout in accordance with ACI 530.1/ASCE 6.

   a. Use "Fine Grout" for filling spaces less than 3 in. in both horizontal directions.

   b. Use "Coarse Grout" for filling 3 in. spaces or larger in both horizontal directions.

4. Low-Lift Grouting:

   a. Provide minimum clear dimension of 2 in. and clear area of 8 $in.^2$ in vertical cores to be grouted.

   b. Place vertical reinforcement prior to laying of concrete unit masonry. Extend above elevation of maximum pour height as required to allow for splicing. Support in position utilizing metal supports, centering clips, spacers, ties or caging devices located near the ends of each bar and at intermediate vertical intervals not exceeding 192 bar diameters nor 10 ft.

   c. Lay concrete unit masonry to maximum pour height. Do not exceed 4 ft. height, or if bond beam occurs below 4 ft. height stop pour at course below bond beam.

   d. Pour grout using container with spout or by chute. Rod or vibrate grout during placing. Place grout continuously; do not interrupt pouring of grout for more than one hour. Terminate grout pours 1-1/2 in. below top course of pour except at the finish course. Puddle or agitate grout thoroughly to eliminate voids. Remove masonry displaced by grouting operation and re-lay in alignment with fresh mortar.

   e. Bond Beams: Stop grout in vertical cells 1-1/2 in. below bond beam course. Place horizontal reinforcement in bond beams; lap at corners and intersections as shown. Place grout in bond beam course before filling vertical cores above bond beam.

E. Movement (Control) Joints: Provide horizontal and vertical movement (control) joints to separate masonry into segments to prevent cracking.

1. Vertical control joints shall be placed where shown on the drawings and if not shown either at corners or two joints placed no more than 20 ft. apart around the corners. Straight solid walls shall not exceed 40 ft. without a control joint. Coordinate with column placement and backup construction as required.

2. Coordinate control joints with continuous and non-continuous openings such as doors and windows in accordance with the manufacturers recommendations.

3. Keep movement joints free of mortar, debris, and reinforcement.

4. Locate as shown on the Drawings, 3/8 to 1/2 in.depending on building movement, kept watertight with pre-molded foam or neoprene pad, with exterior sealant backer rod and commercial sealant that can withstand the calculated movement including temperature, moisture movement, creep in concrete, horizontal and vertical deflections, location of horizontal angles, lintels and other supports.

F. Installation

1. Do not install cracked, broken, chipped, or otherwise damaged block masonry units.

2. Lay-out and adjust each coursing to each wall space so that no course finishes at an external corner or jamb with less than a half size unit. Bond of each course at jamb openings shall be symmetrical.

3. Lay block masonry units plumb and true to lines, head joints to align and be plumb. Lay with completely filled mortar joints; bed joints should not be deeply furrowed and masonry units buttered with sufficient mortar to fill head joints except at weep holes.

4. Adjust units to line and level while mortar is soft and plastic. Do not disturb unit once in place except to completely remove and set in fresh bed of mortar. If head joints are opened during adjusting, refill head joints.

5. Do not pound corners and jambs to fit stretcher units after they are set in position. Where an adjustment must be made after mortar has started to harden, remove mortar and replace with fresh mortar.

G. Back Joints and Frames: Back joints against concrete, metal or other units shall be slushed, grouted or shoved full as the course is laid. Fill jambs and head of metal frames solid with mortar as the work progresses.

H. Joint for Sealant: Leave an open joint for sealing entirely around metal frames in exterior and interior block walls. Unless otherwise indicated on the Drawings, size of joint shall be 1/4 in. wide and 3/4 in.deep, left clean and ready for sealing under Section 079200 "Joint Sealants".

3.7 CAVITY WALL CONSTRUCTION

A. General: Construct cavity walls as shown; consisting of an outer wythe of face block, an air space, cavity insulation, weepholes, fillers, flashings, vapor barrier and an inner wythe of concrete unit masonry and/or cast-in-place concrete. The outer and inner masonry wythes shall be tied together with horizontal joint reinforcement.

1. Cavity Space: Care shall be taken to keep the cavity space free from mortar droppings and other deleterious materials. Use wood strips temporarily placed in cavity to collect mortar droppings. As work progresses, remove strips, clean off mortar droppings, and replace in cavity.

2. Flashing and Weephole Ventilators: At bottom terminations of cavity, install flashing continuously with weepholes. Provide weephole ventilators at bottom of cavity, not more than 2 ft. o.c. in the vertical block joint resting on the horizontal leg of the relieving angle above the flashing.

3. Open Cell Filler Materials, Stainless Steel Edging and End Dams: At the bottom terminations of the cavity and at other flashing locations, install continuous open-cell filler material above flashing for the full width of the cavity and 8 in. vertically within the cavity. Provide stainless steel edging as shown adhered to mortar with double face tape overlapped 4 in. every 24 ft. o.c. Coordinate with the related flashing work specified elsewhere. Provide end dams at flashing terminations, extending the full height of the flashing.

4. Vapor Barrier: Provide continuous cavity mastic vapor barrier within the cavity under scheduled building insulation. Provide a continuous vapor barrier.

5. Horizontal Joint Reinforcement: Provide continuous horizontal joint reinforcement at a maximum interval of 16 in. o.c. vertically, unless otherwise shown. Lap reinforcement not less than 6 in. at ends. Place reinforcement to obtain min. 5/8 in. mortar cover at side rods. Install reinforcement to engage between joints in the cavity insulation and mechanically lock the insulation in place to prevent displacement.

6. Additional Reinforcement: In locations where two-piece truss-type joint reinforcement is shown or required, provide an additional continuous horizontal wire or truss-type reinforcement within the face block wythe at a maximum of 16 in. o.c. vertically. Locate wire reinforcement consistently one joint coursing above or below the adjustable pintle reinforcement and a minimum of 1 in. inward from the exterior face of the mortar joint.

7. Cavity Insulation: Provide cavity insulation in masonry cavity construction horizontally between rows of masonry wall reinforcement bonded to the inner masonry wythe. Install insulation in accordance with insulation manufacturer's printed instructions. Cut and shape insulation to fit snugly around cavity projections and openings. Provide a continuous air space, sized as shown, between the outer masonry wythe and the cavity insulation. Extend insulation full thickness over entire area to be insulated. Install in a single layer unless otherwise shown.

8. Use of Compatible Mastic Adhesive to Secure Insulation: Secure insulation to the substrate utilizing a compatible mastic adhesive recommended by the insulation manufacturer and following the manufacturer's printed instructions; butter insulation edges, cutouts and seams to insure continuous sealed joints.

    a. Apply mastic barrier/adhesive to surfaces to receive cavity insulation. Comply with mastic manufacturer's requirements for preparation of substrates and application of mastic. Apply mastic uniformly to substrates with smooth edged trowels.

    b. Apply mastic with special attention and care to provide a complete seal at masonry anchors and other cavity projections.

9. Sheet Membrane: Embed sheet membrane to mastic coated surfaces at joints between masonry and other contiguous cavity substrates. Follow manufacturer's instructions for overlap and related installation requirements.

B. Coordination of Installation Sequence: Coordinate installation sequence with flashing and other materials in cavity construction.

3.8 DEPARTMENT’S QUALITY ASSURANCE SERVICES

A. Quality Assurance Services: Independent Testing and Inspection Agency(ies), engaged at the Department’s expense through the Professional, will monitor the Contractor’s Quality Control Services. The Department's Quality Assurance Services monitoring of activities do not relieve the Contractor of responsibilities under the Contract.

B. Contractor's Assistance to the Quality Assurance Services: Furnish the Department's Quality Assurance Services with access to the Work, materials and facilities as required

by the Agency(ies). Provide adequate notice of construction activities to allow timely inspections and observation of Contractor tests, and be available for pre-installation meetings. Furnish the Department's Testing and Inspection Agency(ies), with on-site office facilities.

3.9 ADJUSTING

A. Remove and replace defective materials; correct defective workmanship; leave masonry clean.

3.10 POINTING AND CLEANING

A. Upon completion of the Work, remove unused materials, debris, containers, equipment and mortar droppings daily. Remove mortar droppings on connecting or adjoining work before it has attained final set.

B. Cleaning of Concrete Masonry: Concrete unit masonry which are to remain exposed in the finished work shall be cleaned down daily at the end of each day's Work by the use of wire brushes or other method which will produce a satisfactory surface and in accordance with NCMA "TEK Note 45, Removal of stains from Concrete Masonry Walls".

C. Cleaning of Block: Comply with "No. 20, Cleaning Brick Masonry" of the Brick Institute of America for masonry cleaning utilizing the "Bucket and Brush Method". Protect surfaces not intended to be cleaned.

1. Face Block: Wet block surfaces exposed in the finished work and then clean with a diluted solution of muriatic (Hydrochloric) acid or proprietary cleaning solutions as recommended by the block manufacturer. Solution strength by volume shall be as recommended by the block manufacturer and as successfully utilized on the visual mock-up. Apply with stiff fiber brushes leaving the masonry clean, free of mortar daubs and with tight mortar joints throughout. The acid solution shall be controlled so as not to unduly come in contact with adjacent surfaces. Immediately after cleaning, the masonry surfaces shall be thoroughly rinsed down with clean water.

3.11 PROTECTION

A. General: Protect masonry from rain and snow until the work is complete and the mortar has set.

B. Waterproof Covering: Protect on-going and completed portions of work with strong waterproof membrane well secured in place, or other suitable protective methods. Where one wythe of multi-wythe masonry walls is completed in advance of other wythes, secure waterproof cover a minimum of 24 in. down face next to unconstructed wythe and hold cover in place.

C. Loads: Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.

D. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Remove immediately grout, mortar, and soil that come in contact with masonry. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface. Protect sills, ledges, and projections from mortar droppings. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes from mortar droppings.

END OF SECTION

SECTION 055000

METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Stipulations:

1. The specifications sections “General Conditions to the Construction Contract”, “Special Conditions” and “Division 01 - General Requirements” form a part of this Section by this reference thereto, and shall have the same force and effect as if printed herewith in full.

B. General: Provide metal fabrications in accordance with requirements of the Contract Documents.

C. Section includes, but is not limited to the following:

1. **BO-01**: Bollard.

2. **BO-02**: Bollard.

3. **BO-04**: Bollard.

4. **GRT-01**: Normal-type heavy duty, welded-type bar grating

5. **LDR-01**: Ladder.

6. **LDR-02**: Ladder.

7. **LDR-03**: Ladder.

8. **MTLST-03**: Metal Stairs.

9. **GDRL-03**: Metal Pipe Handrail.

10. **GDRL-04**: Metal Pipe Handrail.

11. **MFAB-01**: Pull Up Ladder.

12. **MFAB-03**: Loading Dock Canopy.

13. MFAB-xx: Miscellaneous Metal Fabrications, as indicated on the drawings and as described within these specifications. Specific keynote code/tags may not be noted in these specifications, but material descriptions are covered within.

~~13.~~**14. MFABA-xx**: Miscellaneous Metal Fabrication Accessories, as indicated on the drawings and as described within these specifications. Specific keynote code/tags may not be noted in these specifications, but material descriptions are covered within. ~~Refer to the keynote legend on the drawings.~~

D. Related Requirements

1. Items embedded in concrete, such as curb nosings, edge angles, stair nosings, frames for pits, bollards are furnished under this Section and installed under Section 033000 Cast-in-Place Concrete.

2. Loose lintels, relieving angles, anchor bolts and miscellaneous supports for masonry walls are furnished under this Section and installed under Section 042000 Unit Masonry.

3. Steel framing and subframing and supports for interior and exterior stone panels are furnished under this Section and installed under in Section 043000 Stonework.

4. Decorative metal work including aluminum gratings with coated finish are in Section 057000 Decorative Metal.

5. Section 080350 "Exterior Enclosure, General".

6. Finish painting is specified in Section 099100 Painting.

1.2 REFERENCES

A. General: Comply with the applicable provisions of the referenced standards except as modified by governing codes and the Contract Documents. Where a recommendation or suggestion occurs in the referenced standards, such recommendation or suggestion shall be considered mandatory. In the event of conflict between referenced standards, this specification or within themselves, the more stringent standard or requirement shall govern.

1. ASTM International

a. ASTM E935, "Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings."

b. ASTM E985, "Standard Specification for Permanent Metal Railing Systems and Rails for Buildings."

c. ASTM E1481, "Standard Terminology of Railing Systems and Rails for Buildings."

d. ASTM F2656, "Standard Test Method for Crash Testing of Vehicle Security Barriers."

2. American National Standards Institute (ANSI)

a. ANSI A14, "American National Standard for Ladders — Portable Metal — Safety Requirements."

3. American Society of Civil Engineers (ASCE): ASCE-7 "Minimum Design Loads for Buildings and Other Structures."

4. American Welding Society (AWS)

a. AWS D1.1, "Structural Welding Code - Steel."

b. AWS D1.2, "Structural Welding Code - Aluminum."

c. AWS D1.3, "Structural Welding Code - Sheet Steel."

d. AWS D1.6, "Structural Welding Code - Stainless Steel."

5. National Association of Architectural Metal Manufacturers (NAAMM)

a. ANSI/ NAAMM MBG-532, "Heavy Duty Metal Bar Grating Manual."

b. NAAMM AMP-500, "Metal Finishes Manual for Architectural and Metal Products."

c. NAAMM AMP-510, "Metal Stairs Manual."

d. NAAMM AMP-521, "Pipe Railing Systems Manual."

6. The Society for Protective Coatings (SSPC): "Steel Structures Painting Manual, Volume 2, Systems and Specifications."

7. Industrial Fasteners Institute (IFI): IFI, "Inch Fastener Standards Book."

8. United States Department of Labor, Part 1910 "Occupational Safety and Health Standards."

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate installation of anchorages for metal fabrications. 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.

2. Coordinate installation of steel weld plates and angles for casting into concrete that are specified in this Section but required for work of another Section. Deliver such items to Project site in time for installation.

B. Preinstallation Meetings: Prior to the start of the Work, meet at the Project site to review methods and sequence of metal fabrication installation, special details and conditions, standard of workmanship, testing and quality control requirements, job organization and other pertinent topics related to the Work. Refer to Section 013100 Project Management and Coordination for specific requirements.

1.4 SUBMITTALS

A. Delegated Design Submittals, General: Submittals for metal fabrication items indicated shall comply with performance criteria, including analysis data signed by the Contractor's qualified Professional Engineer registered in the Commonwealth of Pennsylvania responsible for their preparation.

B. Product Data: Submit for Professional’s action. Furnish manufacturer’s literature describing the general properties of each product to be used in the Work. Include, manufacturer’s technical data documenting the primary function, quality and performance of each system and containing specification for each material, load tables, dimension diagrams and installation instructions, or other such information as required by the drawings and specifications. Also include the following:

C. Shop Drawings: Submit for Professional's action Provide shop drawings detailing fabrication, installation and erection of each metal fabrication item, including dimensioned plans and elevations, drawn at a minimum scale of 1 in. = 1 ft. and details of sections, connections, anchorage and accessory items, drawn at a minimum scale of 3 in. = 1 ft. . Provide templates for anchors and bolts specified for installation under other Sections. Shop drawings shall contain the seal of Contractor's qualified Professional Engineer as part of Delegated Design.

D. Setting Drawings: Provide setting drawings and templates for the location of metal fabrications items that are to be embedded in or anchored to concrete or masonry.

E. Samples: Submit for Professional's action. Label samples to indicate product, characteristics, and location in the Work. Samples will be reviewed for color and appearance only. Furnish sufficient samples to establish the full range of colors and textures for materials exposed in the finished work. Compliance with other requirements is the responsibility of the Contractor. Provide samples of the following:

1. Bollards: One of each type.

2. Grating Assemblies: 24 in. square sample of each type complete with frame.

3. Rolled Steel Floor Plate Assemblies: 24 in. square sample of each type.

4. Castings: One of each type.

5. Brackets, Flanges and Anchors: Each type and finish.

6. Abrasive Castings and Steel Treads: 12 in. lengths of each type.

F. Structural Calculations: Submit, for Professional's information. Calculations shall be prepared by and contain the seal of Contractor's qualified Professional Engineer as part of Delegated Design where installed metal fabrications are required to comply with certain design loadings, include structural computations, material properties, and other information needed for structural analysis.

G. Quality Control Submittals: Submit the following for Professional’s information:

1. Reports: copies of welder pre-qualification and other welding procedures in form prescribed in AWS "Structural Welding Code."

2. Certificates:

a. Security Bollard Certification: Provide manufacturer's/ fabricator's test data and certification by independent testing agency certifying that security bollards have been tested to meet the requirements of ASTM F2656 "Standard Test Method for Crash Testing of Vehicle Security Barriers," or previous standard U.S. Department of State SD-STD-02.01,

for each required type of security bollard penetration or barrier rating indicated.

3. Health Product Declaration (HPD): For each product, where available.

H. Closeout Submittals: Submit for Department's documentation.

1. Warranties: Special warranties as specified.

2. Maintenance Manuals: Furnish complete manuals describing the materials, devices and procedures to be followed in cleaning and maintaining the Work. Include manufacturers' brochures and parts lists describing the actual materials used in the Work, including metal alloys, finishes, sealants, gaskets and other major components. Assemble documents in accordance with Section 017000 Execution and Closeout Procedures.

1.5 QUALITY CONTROL

A. Basis of Design: When particular manufacturers' materials, products or processes are specified for an item of Work, any one thereof is acceptable for the Contractor to choose. An alternative material, product or process will be considered if the Contractor submits a written substitution request together with such information as may be necessary to assist the Professional in determining whether the proposed substitution is acceptable; the burden of proof rests solely upon the Contractor.

B. Qualified Installer: The metal fabrications work shall be performed by a firm having 5 years' experience in the installation of specified materials on comparable projects. The firm shall have the approval of the metal fabrications materials manufacturer. The applicator shall provide evidence of successful completion of work of similar scope to that shown and specified for this Project using similar metal fabrications systems.

C. Sole Source Responsibility: Obtain each type metal fabrication from one source of a single manufacturer and with sufficient production capacity to produce required units without causing delay to the Work. Obtain accessory products used in conjunction with metal fabrications from the metal fabrications manufacturer or from sources acceptable to the metal fabrications manufacturer. The manufacturer shall furnish evidence that the specified materials have been manufactured by the same source and successfully utilized on a yearly basis for a minimum of 5 years on projects of a similar scope to that shown and specified for this Project.

D. Gratings Manufacturer: A manufacturer specializing in the fabrication of the type of units required who has tested the units for load-bearing strength and deflection, and has currently published load tables based on recognized test procedures.

E. Regulatory Requirements: Comply with applicable requirements of the laws, codes, ordinances and regulations of Federal, State and Municipal authorities having jurisdiction. Obtain necessary approvals from authorities having jurisdiction.

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

1. Build mockup of masonry window opening support as indicated on Drawings.

2. Testing shall be performed on mockups according to requirements in "Field Quality Control" Article.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Professional specifically approves such deviations in writing.

4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

5. Demolish and remove mockups when directed unless otherwise indicated.

G. Field Samples: Prior to the Pre-Construction Conference, provide a field sample for each type of bollard and masonry window opening support in the building at area to be designated by the Professional. Utilize the same materials and installation methods in the sample as required for the final Work. Schedule the installation so that the sample may be examined, and any necessary adjustments made, at least 1 week prior to date scheduled for commencing installation of the Work. When accepted, sample areas shall serve as the standard for materials, workmanship, and appearance for such Work throughout the project and shall remain a part of the final Work.

1.6 DELIVERY STORAGE AND HANDLING

A. Storage and Handling: Store metal fabrications items under cover and off the ground. Handle in a manner so as to protect surfaces and to prevent distortion of, and any other type of damage to, fabricated pieces.

1. Items delivered in manufacturer's original packaging, shall be labeled to show name, brand, type, and grade. Store materials in protected location off ground in accordance with manufacturer's instructions.

1.7 WARRANTIES

A. General: Warranties and guaranties specified in this Article shall not deprive the Department of other rights the Department may have under other provisions of the Contract Documents and are in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

B. Special Warranty: Submit for Department’s documentation. Furnish five (5) written warranty in form stipulated by Professional, signed by the Contractor and Installer, agreeing to repair or replace Work which has failed as a result of defects in materials or workmanship. Upon notification of such defects, within the warranty period, make necessary repairs or replacement at the convenience of the Department. Other guarantees or warranties may not be substituted by the Contractor for the terms of this special warranty.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

A. Delegated Design: Contractor shall engage a qualified professional engineer licensed in the Commonwealth of Pennsylvania to design metal fabrications items listed in compliance with performance requirements.

B. General: Comply with requirements of ANSI A14, and Part 1910 of "Occupational Safety and Health Standards" as applicable to stairs, handrails and protection of openings.

C. Performance Requirements

1. Catwalks, Walkways, and Adjacent Framing: Provide catwalks, walkways and framing designed to support a live load of 100 lbf/ft.^{2} and a concentrated load of 300 lbf on an area of 4 in.^{2}, whichever produces the greater stress. Limit deflection to L/360 or 1/4 in. whichever is less.

2. Ladders: Provide metal ladders as shown, designed and constructed to support at least two loads of 250 pounds (114 kg) each, concentrated between any two consecutive attachments, and a live load of 250 lbs./ft^2 applied in the middle of the step or rung. Fixed ladders also must support added anticipated loads caused by ice buildup, winds, rigging and impact loads resulting from using ladder safety devices.

   a. Provide landing platforms designed to support a live load of 100 lbf/ft.^{2} and a concentrated load of 300 lbf.

   b. Industrial Type Ladders: Provide Industrial type ladders as shown, designed and constructed to support a live load of 100 lbf/ft.^{2} and a concentrated load of 300 lbf

3. Open Riser Stairs: Provide open riser stairs as shown, designed and constructed to support a live load of 100 lbf/ft.^{2} and a concentrated load of 300 lbf.

   a. Provide landing platforms designed to support a live load of 100 lbf/ft.^{2} and a concentrated load of 300 lbf.

4. Railings, Guardrails and Supports

   a. Design and construct to withstand a concentrated load of 200 lbf. applied at any point and in any direction and for a uniform load of 50 lbs./ft. applied in any direction. The concentrated and uniform loading conditions shall not be applied simultaneously.

   b. Infill Area: Provide infill areas of railings and guardrails capable of withstanding a horizontal concentrated load of 200 lbf applied to 1 ft.^{2} ^{2}at any point in system, including panels, intermediate rails, balusters, or other elements composing infill area of railings or guardrails. Load need not be assumed to act concurrently with loads on top rails in determining stress.

5. Metal Gratings

   a. Normal Type Gratings: Unless otherwise shown, design gratings for a live load of 100 lbf/ft.^{2} and a concentrated load of 300 lbf on an area of 4 in.^{2}, whichever produces the greater stress. Limit deflection to L/360 or 1/4 in., whichever is less.

      1) Comply with accessibility requirements where used for pedestrian foot traffic.

b. Vehicular Load, Sidewalk Type Gratings: Unless otherwise shown, design gratings capable of withstanding a uniform load of 250 lbf/ft.^{2} or a concentrated load of 8000 lbf, whichever produces the greater stress. Limit deflection to L/360 or 1/4 in. whichever is less.

1) Comply with accessibility requirements where used for pedestrian foot traffic.

6. Security/Anti-Ram Vehicle Bollards: Provide metal security bollards covers, compliant with the testing requirements of ASTM F2656, or U.S. Department of State SD-STD-02.01 for the following anti-ram vehicle barrier minimum impact condition designations and penetration ratings, and barrier ratings where designated on Drawings:

a. K4 Bollards: 15,000 lb vehicle traveling at 30 mph; Maximum penetration depth of 1m (approximately 3 ft.).

1) Impact Condition Penetration Rating: M30 (ASTM F2656).
2) Penetration Rating: P1 (ASTM F2656).
3) Barrier Rating: K4 (SD-STD-02.01).

7. Desks, Countertops, Built-in Seating and all Other Built-in Casework Items:

a. Design, fabricate and install metal support framing for all countertops, vanities built-in seating, and all other built-in casework items indicated on Drawings and specified in other applicable Related Sections.

1) Unless otherwise shown, design steel framing supports for desks, countertops, built-in seating and all other built-in casework items to support weight of specified materials incorporated into such items, in addition to withstand a concentrated load of 300 psf.

2) Limit deflection to 1/8-in.

8. Toilet Compartments:

a. Design, fabricate and install concealed metal support framing for toilet partitions indicated on Drawings and specified in other applicable Related Sections.

1) Unless otherwise shown, design steel framing supports for toilet compartment items for partition anchorage as required to sustain imposed loads and to limit deflections to L/360 between hangers.

9. Temperature Change Provisions: Design, fabricate and install exterior components to provide for expansion and contraction over an ambient temperature range of 120 deg. F. and a surface temperature range of 180 deg. F. without buckling, undue stress on members or anchors, and other detrimental effects. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

D. Design Modifications: Make design modifications of work shown only as may be necessary to meet performance requirements and coordinate the work. Variations in

details and materials which do not adversely affect appearance, durability or strength shall be submitted to the Professional for review. Maintain the general design concept without altering profiles and alignments shown.

E. Sustainable Design Criteria

1. Steel – Provide documentation for the following:

a. Raw materials shall come from a plant that recycles water from processing as a baseline.

b. Provide mild carbon (low carbon) with .02%-.25% carbon content.

c. Recycled Content: The post-industrial and/or post-consumer recycled content (by weight) of the major metal components shall be identified and documented.

d. Provide steel with minimum 25% total recycled content.

e. Raw material itself shall be minimum 93% recycled content, or wholly scrap-based

2.2 METAL MATERIALS

A. Metal Surfaces, General: For metal fabrications work which will be exposed to view in the finished work, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness. Remove blemishes by grinding, or by welding and grinding, prior to cleaning, treating, and applying surface finishes.

B. Steel

1. Structural Steel Shapes, Plates and Bars: ASTM A36.

2. Rolled Steel Floor Plates: ASTM A786 rolled from plate complying with ASTM A36 or ASTM A283, Grade C or D. Thickness shown for raised pattern safety plates is exclusive of projected pattern.

3. Steel Tubing: ASTM A500; Cold-formed, welded or seamless process. For exterior use and other locations noted, provide hot-dip galvanized (minimum spangle) tubing in accordance with ASTM A153.

4. Steel Pipe: ASTM A53, Type S, Grade B, suitable for close coiling, black finish unless galvanizing is required; standard weight (Schedule 40), unless otherwise indicated or required to satisfy performance criteria.

5. Steel Bars and Bar Size Shapes: ASTM A675, Grade 65, or ASTM A36.

6. Cold Finished Steel Bars: ASTM A108, grade as selected by fabricator.

7. Cold Rolled Carbon Steel Sheets: Commercial quality, or structural quality, complying with ASTM A1008, Grade A, unless another grade is required by design loads, stretcher leveled if exposed, free from scale, pitting or other defects.

8. Galvanized Carbon Steel Sheets: ASTM A653, hot-dip galvanized with G90 coating (minimum spangle), either commercial quality or structural quality, Grade 33, unless another grade is required for design loads.

9. Uncoated, Hot-Rolled Steel Sheet: Commercial quality, or structural quality, complying with ASTM A1011, Grade 30, unless another grade is required by design loads.

10. Steel Wire: ASTM A 510.

C. Aluminum: Provide alloy and temper recommended by aluminum producer or finisher for type of use and finish specified or shown, and with not less than the strength and durability properties of the alloy and temper designated below for each aluminum form required.

1. Extruded Bar and Shapes: ASTM B221, 6063-T6.

2. Extruded Pipe and Tube: ASTM B429, 6063-T6.

3. Plate and Sheet: ASTM B209, 6061-T6.

4. Aluminum-Alloy Rolled Tread Plate: ASTM B632, aluminum alloy 6061-T4 for treads. Thickness shown for raised aluminum pattern plates is exclusive of projected pattern.

5. Aluminum Finishes: Finish designations prefixed by "AA" conform to the system established by the Aluminum Association for designating aluminum finishes.

a. As Fabricated Finish: AA-M10; (Mechanical Finish as fabricated, unspecified).

D. Stainless Steel: ASTM A240; Provide the most suitable austenitic alloy, form and finish required to produce the Work. Provide Type 304 (interior) or Type 316 (exterior) and low carbon Type 304L or 316L for components to be welded, unless otherwise noted.

1. Plate and Sheet: ASTM A480, Stretcher level sheets.

2. Bar Stock and Shapes: ASTM A276.

3. Round, Square and Rectangular Welded Tubing: ASTM A554, Grades MT 304, MT 304L, MT 316, or MT 316L, as standard with manufacturer.

4. Pipe: ASTM A312, Grade TP 304.

5. Castings: ASTM A743, Grade CF8 or CF20.

6. Rolled-Stainless-Steel Floor Plate: ASTM A793; thickness shown for raised pattern stainless steel plates is exclusive of projected pattern.

E. Castings

1. Gray Iron Castings: ASTM A48, Class 30 unless another class is indicated or required by structural loads.

2. Malleable Iron Castings: ASTM A47, Grade 32510.

3. Ductile Iron Castings: ASTM A536, grade as selected by fabricator.

4. Abrasive Castings: Metal shown or specified, of suitable alloy for casting and for structural strength, with an evenly distributed exposed surface treatment of not less than 2 oz./ft.^{22}of abrasive granules. Provide electric furnace produced virgin aluminum oxide granules ranging in size from No. 16 to No. 24 and fired into the metal surface.

2.3 FASTENER AND ANCHORAGE MATERIALS

A. Concrete Inserts and Anchors: Anchors and inserts capable of sustaining, without failure, the load imposed within a safety factor of 4 as determined by tested in accordance with ASTME488. Threaded or wedge type, galvanized ferrous castings, either malleable iron ASTM A47 or cast steel ASTM A27. Provide bolts, washers and shims as required, hot dip galvanized, ASTM A153, Class A.

B. Fasteners and Anchorage Devices: Provide fasteners complying with the requirements of Industrial Fasteners Institute standards. Type, grade, class and style best suited for the respective purpose. Use countersunk flat-head Phillips type machine screws for exposed fasteners, except where Allen head screws are required. Use galvanized steel or stainless steel fasteners for exterior construction and for fastening components fabricated of galvanized steel.

1. Provide Type 304 or 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, where built into exterior walls and fastening components fabricated of galvanized steel.

2. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563; and, where required, flat washers

3. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, nuts and, where required, flat washers; ASTM F593 for bolts and ASTM F594 for nuts.

4. Aluminum: For fastening aluminum components use the following:

   a. Aluminum Rivets: ASTM B316, alloy 6053-T4 or 6061-T6.

   b. Fasteners for Aluminum Gratings: Use fasteners made of same basic metal as fastened metal except use galvanized fasteners complying with ASTM A153 where specified or shown. Do not use metals that are corrosive or incompatible with metals joined.

C. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E488, conducted by a qualified independent testing agency.

1. Material for Indoor Conditions: Carbon-steel components zinc-plated to comply with ASTM B633, Class Fe/Zn 5.

2. Material for Exterior Conditions: Alloy Group 1 or 2 stainless-steel bolts complying with ASTM F593 and nuts complying with ASTM F594.

D. Grout

1. Non-metallic Shrinkage Resistant Grout: Premixed, nonmetallic, noncorrosive, nonstaining, shrinkage resistant product containing selected silica sands, Portland cement, shrinkage compensating agents, plasticizing and water-reducing agents, complying with CE-CRD-C621 and ASTM C1107, free of gas-producing or gas-releasing agents, oxidizing catalysts, inorganic accelerators and chlorides. Provide one of the following:

a. "Five Star Grout" (Five Star Products, Inc.)

b. "Masterflow 713" (Master Builders Solutions/ BASF)

c. "L&M Crystex" (L&M Construction Chemicals/ Laticrete International, Inc.)

d. "Sure-Grip High Performance Grout" (Dayton Superior).

2.4 PAINT MATERIALS

A. Paint: Provide primer and finish paint as supplied by a single manufacturer for the entire project.

1. Exterior Ferrous Metal Primer: Compatible with finish coats of paint; shop apply primer to the respective dry film mil thickness specified or as recommended by the manufacturer; Provide one of the following:

a. "Hi-Build Epoxoline II Series N69" (Tnemec Co. Inc.); 4.0 - 6.0 mils d.f.t.

b. "Carboguard 888 Series" (Carboline Co.); 4.0 - 6.0 mils d.f.t.

c. “Interseal 670HS (International Paint), 4.0-8.0 mils min d.f.t.

2. Finish Paint for Exterior Exposed Ferrous Metals, Loose Lintels, Shelf and Relieving Angles and Dunnage: Color as selected by the Professional. Shop finish paint apply to the respective dry film mil thickness specified or as recommended by the manufacturer; one of the following:

a. "Carbothane 133 Series/833" (Carboline Co.). 3.0 - 5.0 mils d.f.t.

b. "Endura-Shield II 1075" (Tnemec Co. Inc.); 3.0 - 5.0 mils d.f.t.

c. “Interthane 870UHS” (International Paint), 5.0- 8.0 mils min d.f.t.

3. Interior Ferrous Metal Primer: Compatible with the finish coats of paint (see Section 099000 "Painting" for finish coats of Paint); shop apply primer to the respective dry film mil thickness specified or as recommended by the manufacturer; Provide one of the following:

a. "Series 10-99" (Tnemec Co. Inc.); 2.0 - 3.5 mils d.f.t.

b. "Carbocoat 115" (Carboline Co.); 1.5 - 2.0 mils d.f.t.

c. “Interprime 298” (International Paint), 3.0-4.0 mils min d.f.t.

4. Galvanizing Repair Paint: Zinc rich paint for repairing galvanized surfaces and field welds complying with requirements of ASTM A780. Thickness of applied galvanizing repair paint shall be not less than coating thickness required by ASTM A123 or ASTM A153 as applicable.

5. Dielectric Separator: Heavy coating of epoxy paint in minimum 2.0 milsdry film.

2.5 FABRICATION, GENERAL

A. Supplementary Parts: Include supplementary parts necessary to complete metal fabrications work though not definitely shown or specified. Such parts include, but are not limited to, interface components necessary for the installation or anchorage to Work.

B. Verification of Measurements and Dimensions and Coordination and Schedule of Work: Verify measurements and dimensions at the job site and cooperate in the coordination and scheduling of the work of this Section with the work of related trades (with particular attention given to the installation of items embedded in concrete and masonry).

C. Formation of Exposed Work: Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32 in. , unless otherwise shown. Form bent metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Formation of Exposed Connections: Form exposed connections with hairline joints, flush and smooth; using concealed fasteners where possible. Exposed threaded portion of bolts and screws shall be cut off flush with adjacent metal. Cut, drill, punch and tap as required for the installation and attachment of other work to metal fabrications work. Shear and punch metals cleanly and accurately. Remove burrs. Remove sharp or rough areas on exposed traffic surfaces.

E. Formation of Metal Work: Form metal work built in with concrete or masonry for anchorage, or provide suitable anchors, expansion shields, or other anchoring devices shown or required to provide support for intended use. Furnish metal work in ample time for setting and securing in place.

F. Procedures for Joints and Welds: Make joints as strong and rigid as adjoining sections. Make welds continuous along entire line of contact, except where spot welding is indicated. Grind exposed welds flush and smooth to match and blend with adjoining surfaces. Welded connections may be used where bolted connections are shown. Fabricate joints exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

1. Make up threaded connections tight so that threads are entirely concealed. Shoulder and head, dowel and pin abutting bars. Provide bolt and screw heads flat and countersunk in exposed work. Carefully machine, fit and secure removable members by means of Allen-head set screws of proper size and spacing.

G. Galvanizing

1. ASTM A153, Classes A and B, for galvanizing iron and steel hardware.

2. ASTM A123, for galvanizing rolled, pressed and forged steel shapes, plates, bars, strip 1/8 in. thick and heavier and for assembled steel

3. Items to be Galvanized: Galvanize ferrous metal utilized on the exterior and items embedded in concrete whether interior or exterior, unless otherwise specified. Galvanize other items where specified or shown.

H. Preassembly of Items: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Following trial fit, disassemble units only as necessary for shipping and handling. Clearly mark units for reassembly. Provide alignment and splice plates for accurate field fit.

2.6 LADDERS – LDR-01, LDR-02, and LDR-03

A. Steel Ladders

1. Provide galvanized steel ladders as shown, complete with supporting brackets, stringers, railings and rungs.

2. Provide non-slip surface on the top of each rung, either by coating the rung with aluminum oxide granules set in epoxy resin adhesive, or by using a type of manufactured rung which is filled with aluminum oxide grout.

3. Provide safety cages, where vertical ladders exceed 20 ft. in unbroken length, provide landings for each 30 ft. or fraction thereof when cages are provided or for each 20 ft. or fraction thereof when cages are not provided, fabricated from galvanized structural steel flat bars assembled by welding or riveting. Unless otherwise indicated, provide 3/8-in. thick x 5-in. high top and bottom hoops and intermediate hoops spaced not more than 20-ft. on center; space 3/8-in. thick x 2-in. high hoops 4-ft. on center between top, bottom and intermediate hoops, and 3/8-in. thick x 2-in. wide vertical bars secured to each hoop spaced 9-in. on center maximum. Fasten assembled safety cage to ladder rails and adjacent construction as shown.

4. Provide galvanized steel landing platforms complete with gratings, toe guards, guard rails, galvanized structural steel framing and support members. Comply with the requirements specified for railings.

B. Industrial Type Steel Ladders (Ship's Ladders)

1. Provide galvanized steel stringers, supporting brackets, toe guards, carrying angles, treads, platforms and railings. Comply with requirements specified hereinafter for railings.

2. Steel treads shall be light duty welded plain surfaced steel with abrasive coated steel nosing. Provide one of the following:

a. "Welded Tread with Mebac Nosing" (IKG Industries).

b. "Light Duty Welded W Series" (Ohio Gratings Inc.)

c. "Standard Tread" (SeidelHuber Metal Products, Inc.)

d. "Quality Stair Tread" (McNichols Company).

C. Finishes:

1. **LDR-01:** Hot-dipped galvanized.

2. **LDR-02: PT-05.**

3. **LDR-03: MTL-10**

2.7 STAIRS

A. Open Riser Stairs – **MTLST-03**

1. Provide galvanized steel stringers, supporting brackets, toe guards, carrying angles, treads, platforms and railings. Comply with requirements specified hereinafter for railings. Provide bracing of steel framing as required to sustain torsional loads applied by hanging stairs from the framing.

2. Provide galvanized steel landing platforms complete with gratings, toe guards, guard rails, galvanized structural steel framing and support members. Comply with the requirements specified for railings.

3. Steel treads shall be light duty welded plain surfaced steel with an abrasive coated steel nosing. Provide one of the following:

a. "Welded Tread with Mebac Nosing" (IKG Industries).

b. "Light Duty Welded W Series" (Ohio Gratings Inc.)

c. "Standard Tread" (SeidelHuber Metal Products, Inc.)

d. "Quality Stair Tread" (McNichols Company).

2.8 RAILINGS, GUARDRAILS AND SUPPORTS – INCLUDING GDRL-03 AND GDRL-04

A. Provide galvanized steel pipe railings, guardrails and supports as shown, with smooth bends and welded joints; complete with sleeves, brackets, bolts and fastening devices as required for a complete installation.

B. Provide removable sections where shown. Provide wall returns at ends of wall mounted handrails unless otherwise shown. Close exposed ends of pipe railing by welding prefabricated fittings. Provide wall brackets, end closures, flanges, miscellaneous fittings and anchors for interconnections of pipe and attachment of railings and handrails to other work. For railing posts set in concrete, provide sleeves fabricated from steel pipe not less than 6 in. long and with an inside diameter not less than 1/2 in. greater than the outside diameter of the post. Provide a steel plate closure welded to bottom of sleeve.

C. Provide expansion joints at intervals not to exceed 40 ft. unless otherwise shown. Provide slip joints with internal sleeves extending 2 in. minimum beyond joint each side. Fasten internal sleeve securely to one side without exposed fasteners. Locate joints within 6 in. of posts as shown.

D. If required to accommodate expansion and contraction, provide pressure relief holes at bottom ends of pipe in concealed locations.

E. Form simple and compound curves by bending pipe in jigs to produce uniform curvature; maintain cylindrical cross-section of pipe throughout entire bend without buckling, twisting or otherwise deforming exposed surfaces of pipe.

F. At tee and cross-section provide coped joints and at elbow bends provide mitered joints, unless otherwise indicated.

G. Unless otherwise indicated, after installation is complete, finish paint steel pipe railings, guardrails and support systems in accordance with requirements specified in Section 099100 Painting.

2.9 WALKWAYS, PLATFORMS AND ASSOCIATED FRAMING – GRT-01

A. General: Walkways, Platforms and Adjacent Framing: Provide walkways, catwalks and adjacent framing, complete with gratings, toe guards, railings, steel framing, bracing and support members. Comply with requirements specified for railings.

1. Steel Walkways, Platforms and Framing: Provide hot-dip galvanized ASTM A786.

B. Provide galvanized steel gratings or aluminum gratings where indicated, including supplementary framing and supports. Provide gratings of welded type or pressure lock type construction as scheduled, rectangular pattern, with plain surface top bars in the same plane; accurately fabricated free from warps, twists or other defects affecting their serviceability or appearance.

1. Provide removable grating sections where shown, with end-banding bars for each panel and each opening, saddle clip anchors designed to fit over bearing bars, and stud bolts with washers and nuts, unless otherwise shown.

2. Provide cutouts in grating sections for penetrations indicated. Edge band openings in grating that interrupt 4 or more bearing bars with bars of same size and material as bearing bars.

C. Acceptable Manufactures: Subject to compliance with specified requirements, provide metal gratings by the following manufacturers or approved equal:

1. Ohio Gratings, Inc.

2. IKG Industries.

3. McNichols Company.

D. Grating Schedule

1. Normal-type gratings for use at Loading Area, Mechanical Platforms, Areaway Covers, and Back-of-House locations and complying with specified performance criteria.

a. Type: Welded-type bar grating, galvanized steel.

b. Manufacturer: McNichols.

c. Item #: 6602141332

d. Product: Heavy-Duty Welded, Rectangular Bar, GHB-150, 19-W-4 spacing.

e. Material: Carbon Steel, Hot Rolled, 1 ½ in. x ¼ in. rectangular bar.

f. Finish: Hot-dip galvanize; Smooth surface.

g. Open Area: 73%.

2. Pressure-locked grating for use at sump pit and complying with specified performance criteria.

a. Type: Heavy duty, swaged bar grating.

b. Manufacturer: Ohio Gratings.

c. Product: SG Series.

d. Material: Aluminum.

e. Finish: Manufacturer's standard.

2.10 OPENING FRAMES, GUARDS AND COVERS

A. Opening Frames, Guards and Curbs: Provide frames and strips of the sizes, shapes and profiles shown or, if not shown, of the required dimensions to receive adjacent grating, plates, doors or other work to be retained by the framing. Fabricate from structural steel shapes and plates and steel bars, using welded construction with mitered corners, welded brackets and splice plates and a minimum number of joints for field connection. cut, drill and tap units to receive hardware and similar items to be anchored to the work.

B. Anchors: Equip units with integrally welded anchor straps for casting into concrete or building into masonry. Unless otherwise noted, space anchors 24 in. o.c., and provide minimum 1/4 in. thick anchor units of 1-1/4 in. x 8 in. steel straps.

C. Pipe Guards: Provide pipe guards of 3 in. x 3 in. x 5/16 in. steel angles, extending from floor to 3 ft. 4 in. above floor. Provide with 3/8 in. steel base plates for bolting to floor, and with 1/4 in. x 2 in. steel strap braces at top. Provide at least 2 vertical angles at each location, except at internal corners, and extend strap between angles and from each angle to wall or column.

D. Pipe Guards: Custom fabricate to the sizes shapes and profiles shown using bent steel plate or steel shapes as indicated. Provide system for anchoring into structure.

E. Corner Guards: Provide steel angle corner guards of size as shown, with anchors welded to backs of angles at 2 ft. centers with a minimum of three (3) anchors per unit.

F. Curb Nosings: Provide where shown 13 in.high x 3/8 in. thick galvanized steel plate curb nosing complete with 1/2 in. dia. anchors welded to back of nosing at 1 ft.staggered centers. Top of nosing shall be rounded to a 1 in. inside radius as shown.

G. Edge Angles

1. Provide edge angles of size as shown, with welded-on strap or stud anchors 2 ft. on centers.

2. Provide angles in as long lengths as possible. Miter and weld corners and provide splice plates for alignment between sections.

H. Saddles: Provide abrasive surfaced cast iron, aluminum, nickel or bronze saddles of types and profiles shown for the respective locations. Units shall be free of warp and twist, and shall be in single piece for each location. Coordinate with Section 087000 Hardware.

I. Stair Nosings:

1. Concrete Stairs: Provide stair nosings 3 in. deep by full width of treads in single piece fabricated of aluminum oxide cross hatched abrasive surfaced cast nickel bronze with cast or welded-on concealed anchors spaced not more than 12 in. on center. Provide one of the following:

a. "Style AX" (Safe-T-Metal Co).

b. "No. 101" (Wooster Products Inc.).

c. "Style 801" (American Safety Tread Co., Inc.)

J. Dumpster Skid Plates: Provide where shown dumpster skid plates fabricated with raised-pattern from rolled-steel floor plate of 3/8 in.thickness and in a standard diamond pattern. Provide holes for countersunk expansion bolts. Prime and finish paint with appropriate epoxy paint system as specified in Section 099100 Paints and Coatings.

K. Ejector Pit Cover and Frame: Provide hot dipped galvanized steel ejector pit cover and frame in locations as shown, consisting of 4 in. x 3 in. x 1/4 in. thick steel angle continuously welded to a 1 in. x 1/2 in. steel bar with anchors welded to backs of angles at 2 ft. centers with a minimum of eight (8) anchors per unit, and cast iron pit cover fabricated to be secured to support frame.

L. Sump Pit Frame: Provide hot dipped galvanized steel sump pit frame in locations as shown, consisting of 4 in x 3 in. x 1/4 in. thick steel angle continuously welded to a 1 in. x 1/2 in. steel bar with anchors welded to backs of angles at 2 ft. centers with a minimum of eight (8) anchors per unit.

M. Trench Drain Covers: Trench drain assemblies, gratings and frames fabricated from heavy duty ductile iron castings or gray iron castings designed for vehicular loads, of size as shown. Provide units with continuous machined surfaces, integral anchors, outlet pipes, end closures, bolts, and machined joints.

1. Cast-Iron Trench Drain Cover: Provide the following cast-iron type rated for vehicular loading as manufactured by Zurn, or similar type by McKinley Iron Works, Neenah Foundry Co., or J.R. Smith Manufacturing Co.:

a. "Z2665" (Zurn).

2.11 BOLLARDS

A. Security Bollards: Provide metal security bollards, consisting of individual units, of profiles and dimensions shown, with base plates anchored to reinforced concrete structural slab and footing below finish and wear slabs, with concrete fill, clad with alloy 2305 duplex austenitic/ferritic stainless steel, and capped with matching stainless steel cap meeting requirements of specified security bollard rating:

1. Security Bollard Ratings: Provide stainless steel site security bollards, fixed types, in ratings indicated for locations designated on Drawings.

2. Provide painted steel bollard and stainless steel bollard sleeve covers **(BO-01).**

    a. Designs and Configurations: As indicated.

    b. Material: Stainless steel pipe; minimum 0.165-inch wall thickness.

    c. Heights, Diameters and Spacing: As required to fit/completely cover steel pipe security bollards.

    d. Finish: No. 4 (directional brushed). Direction of grain shall be circular on bollard top surface and horizontal on bollard vertical surfaces.

3. Provide painted steel bollard **(BO-02).**

    a. Designs and Configurations: As indicated.

    b. Diameter: 6 in.

    c. Material: Steel pipe; minimum 0.165-inch wall thickness.

    d. Heights and Spacing: As indicated.

    e. Finish: Painted (**PT-05**).

4. **(BO-03)** – Not Used

5. Provide painted steel bollard system **(BO-04).**

    a. Designs and Configurations: As indicated.

    b. Basis of Design: A-Safe iFlex Heavy Duty Bollard System

        1) Height: 48" tall nominal

        2) Diameter: 8 in. nominal

    c. Heights and Spacing: As indicated.

    d. Tested Impact Energy: 8800 Joules (6.1 tons x 4 mph at 90 degrees)

    e. Installation: Surface Mounted Bollard.

    f. Finish: Factory Powder Coated, Safety Yellow.

B. Accessibility Bollards: Aluminum bollard with integral column-mountable or full-height push button, compatible with fire pull and card reader requirements as specified in Section 087100 “Door Hardware.” Provide one of the following where indicated:

1. Freestanding: Wikk Industries or approved equal.

a. Dimensions: 6 in. wide x 6 in. deep x 42 in. tall.

b. Finish: To match adjacent metal finish.

C. Other Bollards: Provide bollards of steel pipe, diameter and height as shown, welded to steel baseplate and filled with concrete, with concrete top crowned to a smooth radius, as shown. Where bollards are used in decorative areas omit concrete and provide welded-on caps.

2.12 MISCELLANEOUS METAL FABRICATIONS

A. **MFAB-01**: Pull Up Ladder.

1. Fabricate Pull Up Ladder.to size, shape and profile shown. Fabricate from structural steel shapes and plates and steel bars, of welded construction using mitered joints for field connection, except where otherwise shown. Cut, drill and tap units to receive hardware and similar items.

a. Provide pull up ladder as indicated on drawings and as required for a complete installation. Performance requirements per Ladder requirements of this specification section.

b. Finish: Painted, **PT-05**

B. **MFAB-02**: Not Used

C. **MFAB-03**: Loading Dock Canopy and Outdoor Condenser Support Structure.

1. Fabricate Loading Dock Canopy and Outdoor Condenser Support Structure to size, shape and profile shown. Fabricate from structural steel shapes and plates and steel bars, of welded construction using mitered joints for field connection, except where otherwise shown. Cut, drill and tap units to receive hardware and similar items.

a. Provide Loading Dock Canopy and Outdoor Condenser Support Structure and metal grating platform as indicated on drawings and as required for support of specified equipment.

b. Provide standing seam roofing, gutter, and downspout as indicated on drawings.

c. Finish: Painted, **PT-03**

2.13 SUPPORTS FOR MASONRY

A. Provide hot dipped galvanized steel Masonry Wall Components, including but not limited to the following.

B. Loose Lintels:

1. Furnish loose steel lintels as shown and/or as required over openings in masonry walls, partitions and shafts. Include lintels for mechanical openings as required. Furnish lintels 16 in. longer than the opening widths. Where metal door frames are provided with integral head reinforcement, furnish loose lintels only for openings 3 ft. 4 in. wide and wider. Weld adjoining members together to form a single unit where indicated. Shop finish with exterior ferrous metal primer system as specified.

C. Loose Lintel Schedule (Angle Sizes): Unless otherwise shown, provide lintels in accordance with the following schedule:

Opening Width (Max.)	6 in. Wall	8 in. Wall*	10 in. and 12 in. Wall*
2 ft.	5 x 5 x 5/16	3-1/2 x 3-1/2 x 1/4	8 x 4 x 1/2
3 ft.	5 x 5 x 5/16	3-1/2 x 3-1/2 x 1/4	8 x 4 x1/ 2
4 ft.	5 x 5 x 5/16	3-1/2 x 3-1/2 x 1/4	8 x 4 x 1/2
5 ft.	5 x 5 x 5/16	3-1/2 x 3-1/2 x 1/4	8 x 4 x 1/2
6 ft.	5 x 5 x 5/16	3-1/2 x 3-1/2 x 1/4	8 x 4 x 1/2
7 ft.	5 x 5 x 5/16	3-1/2 x 3-1/2 x1/4	8 x 4 x 1/2
8 ft.	5 x 5 x 5/16	4 x 3-1/2 x 1/4	8 x 4 x 5/8

* Furnish two angles at all openings in 8 in., 10 in. and 12 in. CMU walls. Furnish a lintel angle for each masonry wythe.

D. Loose Bearing and Leveling Plates: Provide galvanized steel loose bearing and leveling plates for steel items bearing on masonry or concrete construction, fabricated flat, free from warps or twists and of required thickness and bearing area. Provide integral anchorages as indicated or if not indicated as required for a complete installation.

E. Shelf and Relieving Angles: Furnish shelf and relieving angles fabricated from steel angles of sizes indicated and for attachment to concrete framing. Provide slotted holes to receive 3/4 in. dia. bolts, spaced not more than 6 in. from ends and not more than 24 in. on center, unless otherwise shown or specified. Shop finish with exterior ferrous metal primer system specified.

1. Fabricate units in convenient lengths from field measurements for each location of use, provide joint gaps in angles at locations of masonry control joints and expansion joints. Size joint gaps to match width of the masonry joints in the location of use. Provide joints in other locations, as required for fabrication only, with tight joints.

2. Provide slotted holes to allow adjustment of shelf and relieving angles to building substrates and to allow for proper installation of masonry elements.

3. Provide units at corners and other transitions fabricated into one piece.

4. Provide units shop primed and shop finish painted on all surfaces after fabrication.

2.14 MISCELLANEOUS FRAMING AND SUPPORTS

A. Steel Framing, Subframing and Supports: Provide steel framing and subframing and supports for applications shown and not specifically provided as part of the work of other trades. Provide engineered steel framing for the following items of work:

1. Exterior masonry as specified in Section 042000 Unit Masonry.

2. Stonework as specified in Section 043000 Stonework.

B. Steel Weld Plates and Angles: Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with not less than two integrally welded steel strap anchors for embedding in concrete.

C. Items Required for Framing and Supporting Woodwork and Other Types of Items: Furnish bent, or otherwise custom-fabricated, bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes as required for framing and supporting woodwork and other type items, and for anchoring or securing woodwork and other type items, to concrete or other structures. Fabricate items to sizes, shapes, and dimensions required. Furnish malleable-iron washers for heads and nuts that bear on wood structural connections, and furnish steel washers elsewhere.

D. Fabrication of Miscellaneous Units: Fabricate miscellaneous units to sizes, shapes and profiles shown or, if not shown, of required dimensions to receive adjacent work to be retained by framing. Fabricate from structural steel shapes and plates and steel bars, of welded construction using mitered joints for field connection, except where otherwise shown. Cut, drill and tap units to receive hardware and similar items.

E. Anchors and Inserts: Provide units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts if units must be installed after concrete is placed.

1. Space anchors 24 in. o.c. and provide minimum anchor units of 1-1/4 in. x 8 in. x 3 in. steel straps, except as otherwise shown.

F. Steel Tube Supports for Countertops, Vanities, Built-in Seating and Other Built-in Casework Items: Utilize steel tube supports sized to support dead loads of countertops, vanities, lobby desk, benches, and all other similar built-in casework as specified in Section 064000 Architectural Woodwork, and in addition a uniform live as specified in performance requirements. Where exposed in the finish work, provide welded connections, ground smooth and primed for field painting specified in Section 099100 Painting. Where concealed, utilize bolts and connectors of capacity required to support imposed live and dead loads. Anchor steel tubes to structural walls and slabs as required for a secure and rigid installations. Fasten tubes to built-in casework items with fasteners applied through the tubes into the underside of tops, and in sufficient quantity for a secure installation.

G. Framing for Toilet Compartments:

1. Provide continuous steel framing for toilet partition supports, coordinated with the toilet partitions and including provisions for partition anchorage as required to comply with specified performance requirements.

    a. Provide steel rods, 1/2 in. dia., spaced not more than 36 in. o.c. Thread rods to receive anchor and stop nuts. Fit hangers with wedge shape washers for full bearing on sloping flanges of support beam.

    b. Coordinate installation with toilet partition manufacturer's written instructions and recommendations for the project-specific condition(s).

H. Steel Frames for Rolling Doors: Provide shop prime painted steel door frames for rolling doors fabricated from structural shapes in accordance with the requirements of the door manufacturer. Plug weld built-up members and continuously weld exposed joints. For securing door frames into adjacent masonry or concrete, provide steel strap anchors 1/8 in. thick x 2 in. wide length required for a minimum 8 in. embedment, unless otherwise shown. Weld anchors to frame jambs not more than 12 in. from both bottom and head of frame and space anchors not more than 30 in. apart. Extend bottom of frames to floor elevation indicated with steel angle clips welded to frames. Reinforce, drill, tap and prepare as required to receive finish hardware.

2.15 SHOP CLEANING AND PAINTING

A. Metal Fabrications Work: Shop paint metal fabrications work, except members or portions of members to be embedded in concrete or masonry, surfaces and edges to be field welded and stainless steel, unless otherwise specified.

B. Removal of Oil, Grease and Similar Contaminants: Remove oil, grease and similar contaminants in accordance with SSPC SP-1 "Solvent Cleaning," prior to additional surface preparation specified.

C. Metal Surfaces: Clean and prepare metal surfaces before applying shop coat. Remove rust and mill scale in accordance with SSPC SP-3 "Power Tool Cleaning," and SSPC SP-6 for exterior exposed ferrous metal.

D. Application of Primer: Immediately after surface preparation, apply primer in accordance with manufacturer's instructions. Use painting methods which will result in full coverage and dry film thickness specified.

E. Procedures for Primer and Finish Paint: Apply one shop coat of primer to fabricated metal items, except apply 2 coats of primer to surfaces inaccessible after assembly or erection. In addition, apply one shop coat of finish paint to entire surfaces of exterior loose lintels, shelf and relieving angles, dunnage and other items as noted or specified. Change color of second or finish coat to distinguish it from the first coat. Color of paint shall be as selected by Professional. Use thinners only as specified by the coating manufacturer. The entire coating system shall be as supplied by a single manufacturer.

F. Dissimilar Materials: Separate dissimilar metals with coating of dielectric separator. Do not extend coating onto exposed or finished surfaces.

2.16 SOURCE QUALITY CONTROL

A. Contractor’s Quality Control Responsibilities: Contractor is solely responsible for quality control of the Work.

B. Contractor's Inspection and Testing Agency: Contractor shall employ, at its own expense, an independent full time inspection agency to perform testing and inspection services for metal fabrication work. Non-conforming Work shall be retested and paid for by Contractor.

~~C.~~**1.** Shop Inspection of Connections: Perform 100% visual inspection at ~~bolted and~~ welded connections in the Work. Examine the size, quality and placement of each connection to verify installation in accordance with Contract Documents and actioned shop drawings.

PART 3 - EXECUTION

3.1 GENERAL

A. Manufacturer's Instructions: Prepare substrates and install the work of this Section, including, components and accessories in accordance with the manufacturer's instructions, except where more stringent requirements are shown or specified, and where project conditions require extra precautions or provisions to ensure satisfactory performance of the Work.

3.2 EXAMINATION

A. Verification of Conditions: Examine the areas to receive the Work and the conditions under which the Work would be performed. Contractor shall remedy conditions detrimental to the proper and timely completion of the Work. Do not proceed until unsatisfactory conditions have been corrected.

3.3 COORDINATION

A. Coordinate installation of anchorages for metal fabrications. 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.

B. Coordinate installation of steel weld plates and angles for casting into concrete that are specified in this Section but required for work of another Section. Deliver such items to Project site in time for installation.

3.4 PREPARATION

A. Substrate Acceptability: Commencement of installation shall constitute acceptance of substrate conditions by the Installer.

3.5 INSTALLATION

A. General: Install work as shown, plumb, level and in line with adjacent materials where required. Provide fastenings as indicated on the Drawings, specified herein or as shown on final shop drawings. Fit exposed connections accurately together to form tight hairline joints.

1. Steel Weld Plates and Angles: Coordinate installation of steel weld plates and angles for casting into concrete construction that are specified in this Section but

required for work of another Section. Deliver such items to Project site in time for installation.

2. Anchorages: Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions and directions for installation of anchorages, including steel weld plates and angles, concrete inserts, sleeves, anchor bolts and other miscellaneous items having integral anchors that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to the project site. Deliver items which are to be built into the work of other Sections in time so as not to delay the progress of the Work.

B. Procedures for Fastening Metal Work: Except where otherwise specified for a particular item for built-in work, fasten metal work to concrete or solid masonry with embedded anchors or expansion bolts, and to hollow block with toggle bolts. Fastening to wood plugs will not be permitted. Drill holes for bolts to the exact diameter of the bolt. Provide screws threaded full length to the screw head.

C. Field Welding: Comply with AWS Welding Code for procedures related to field welding as related to appearance and quality of welds made and for methods used in correcting welding work. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals. Obtain fusion without undercut or overlap. Remove welding flux immediately. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and contour of welded surface matches those adjacent.

D. Protection of Finished Surfaces: Protect finished surfaces against damage during construction and remove protection at time of substantial completion.

E. Dissimilar Materials: Separate dissimilar metals with heavy coating of dielectric separator. Do not extend coating onto exposed or finished surfaces.

F. Vertical Ladders, Industrial Type Ladders or Open Riser Stairs: Provide vertical ladders, industrial type ladders or open riser stairs at all locations requiring access to equipment, catwalks or gratings.

G. Procedures for Securing Vertical Ladders: Secure vertical ladders to masonry or concrete with a minimum of two ½ in diameter expansion bolts at each bracket, unless additional attachments are required to sustain imposed loads.

H. Gratings: Install grating in accordance with requirements of ANSI/NAAMM MBG 531 "Metal Bar Grating Manual" including installation clearances and standard anchoring details. Weld gratings to supporting steel, except for sections which are hinged or required to be removable. Secure removable units to supporting members with type and size of clips and fasteners as recommended by grating manufacturer for type of installation conditions shown. Do not notch bearing bars at supports to maintain elevation. Secure toe plates to gratings by welding.

I. Railings: Mount handrails only on completed walls. Do not support handrails temporarily by means not satisfying structural performance requirements. Mount handrails only on gypsum board assemblies reinforced to receive anchors, and where the location of concealed anchor plates has been clearly marked. Adjust railings prior to anchoring to ensure matching alignment at abutting joints. Locate posts at spacing indicated, or if not indicated, at equal intervals as required by design loadings.

1. Anchor posts of railings into concrete by means of pipe sleeves preset and anchored into concrete. Set sleeves in concrete with tops flush with finish surface elevations and protect sleeves from water and concrete entry. After posts have been inserted into sleeves, solidly fill annular space between post and sleeve with non-shrink non-metallic grout. Cover anchorage joint with a round steel flange welded to post after placement of anchoring material.

2. Anchor posts to steel members with steel oval flanges, angle type or floor type as required by conditions, welded to posts and bolted to steel supporting members.

3. Secure handrails to wall with wall brackets and end fittings. Provide brackets of design shown, with flanges tapped for concealed anchorage and with not less than 1-1/2 in. clearance from inside face of handrail and finished wall surface. Located brackets as indicated, or if not indicated, at equal spacings as required by design loads.

J. Loose Plates: Prior to setting loose bearing and setting plates, clean concrete and masonry bearing surfaces of bond reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates. Set on wedges or other adjustable devices. After members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims, but if protruding, cut off flush with the edge of the plate before packing with grout. Pack grout solidly between bearing surfaces and plates to ensure no voids remain.

K. Bollards:

1. Securely anchor bollards to structural slab as shown, prior to casting of concrete finish slab, utilizing a minimum of 4 anchor bolts. Leave an annular space at the perimeter of the bollard to be filled following casting of the finish slab, with non-shrink, nonmetallic grout. Mix and place grout to comply with manufacturer's directions.

2. Anchor bollards in concrete with pipe sleeves preset and anchored into concrete. After bollards have been inserted into sleeves, fill annular space between bollard and sleeve solidly with non-shrink, nonmetallic grout, mixed and placed to comply with grout manufacturer's directions.

3. Fill bollards solidly with concrete. Weld top plate to steel bollard, grinding down welds smooth.

    a. In non-decorative areas where no metal cover is used, mound top surface of concrete to profile approved by Professional.

L. Installation of Pipe Guards: Anchor pipe guards to concrete or masonry construction as shown.

M. Nosings, Treads, and Thresholds: Install with anchorage system indicated or if not indicated to comply with manufacturer's written instructions and recommendations. Seal thresholds exposed to exterior with elastomeric sealant complying with Section 079200 Joint Sealants to provide a watertight installation.

N. Loading Dock Canopy and Outdoor Condenser Support Structure: Install work as shown, plumb, and level unless otherwise indicated. Provide fastenings as indicated on the

Drawings, as required for support or as shown on final shop drawings. Fit exposed connections accurately together to form tight hairline joints.

3.6 FIELD QUALITY CONTROL

A. Contractor's Quality Control Responsibilities: Contractor is solely responsible for quality control of the Work.

B. Connection Identification: Assign each bolting crew and welder an identifying symbol, and require them to mark every connection, so that an inspector may identify the person(s) making each connection.

C. Qualification for Field Welding: Qualify the welding operators and welding procedures in accordance with AWS D1.1 and D1.3 requirements.

D. Field Inspection of Connections: Perform 100% visual inspection at bolted and welded connections in the Work. Examine the size, quality and placement of each connection to verify installation in accordance with Contract Documents and actioned shop drawings.

3.7 ADJUSTING

A. Procedures for Cleaning, Painting and Touch-Up: Immediately after erection, clean field welds, bolted connections, marred and abraded surfaces. Paint and touch-up paint with the specified paint system. Touch up galvanized surfaces in accordance with ASTM A780.

END OF SECTION

SECTION 079513

EXPANSION JOINT COVER ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. Stipulations:

1. The specifications sections “General Conditions to the Construction Contract”, “Special Conditions” and “Division 01 - General Requirements” form a part of this Section by this reference thereto, and shall have the same force and effect as if printed herewith in full.

B. General: Provide expansion joint cover assemblies in accordance with requirements of the Contract Documents.

C. Section Includes, but not limited to, the following:

1. **EJC-01** through **EJC-07**: Expansion Joint Cover assemblies.

D. Related Requirements:

1. Section 080350 “Exterior Enclosure – General”

1.2 REFERENCES

A. General: Comply with the applicable provisions of the referenced standards except as modified by governing codes and the Contract Documents. Where a recommendation or suggestion occurs in the referenced standards, such recommendation or suggestion shall be considered mandatory. In the event of conflict between referenced standards, this specification or within themselves, the more stringent standard or requirement shall govern.

1. American Architectural Manufacturers Association (AAMA)

a. AAMA 2605 "Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels".

b. AAMA 2603 "Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels".

2. American Welding Society (AWS)

a. AWS D1.1 “Structural Welding Code, Steel”.

b. AWS D1.2 “Structural Welding Code, Aluminum”.

3. National Association of Architectural Metal Manufacturers (NAAMM): NAAMM "Metal Finishes Manual".

4. American Society for Testing and Materials (ASTM): ASTM E1399 “Standard Test Method for Cyclic Movement and Measuring the Minimum and Maximum Joint Widths of Architectural Joint Systems”.

5. Industrial Fasteners Institute (IFI): "Fastener Standards Book".

1.3 DEFINITIONS

A. Architectural Joint System: Any filler or cover used to span, fill, cover, or seal a joint, except expanding foam seals and poured or foamed in-place sealants.

B. Cyclic Movement: Periodic change between widest and narrowest joint widths in an automatically mechanically controlled system.

C. Fire Barriers: Any material or material combination, when fire tested after cycling, designated to resist passage of flame and hot gases through a movement joint.

D. Maximum Joint Width: Widest linear gap a joint system tolerates and performs its designed function without damaging its functional capabilities.

E. Minimum Joint Width: Narrowest linear gap a joint system tolerates and performs its designed function without damaging its functional capabilities.

F. Movement Capability: Value obtained from the difference between widest and narrowest widths of a joint opening typically expressed in numerical values (mm or inches) or a percentage of nominal value of joint width.

G. Nominal Joint Width: Width of linear gap indicated as representing the conditions existing when architectural joint systems will be installed or, if no nominal joint width is indicated, a width equal to the sum of maximum and minimum joint widths divided by two.

H. Failure: the inability of the architectural joint system to perform its designated task or an apparent deleterious defect.

1.4 SUBMITTALS

A. Combined Submittals: In addition to requirements specified herein, see special procedure for combined submittals work specified in Section 080350 "Exterior Enclosure, General".

B. Product Data: Submit for Professional’s action. Submit manufacturer's specifications and installation instructions and other data as may be required to show compliance with the Contract Documents. In addition, submit manufacturer's method for vulcanizing rubber components for both shop and field conditions.

C. Shop Drawings: Submit for Professional’s action. Submit shop drawings for the fabrication and installation of the Work. Prepare details at not less than 3 in. = 1 ft. minimum scale showing full extent of expansion joint cover assemblies; include details as follows:

1. Line diagrams showing entire route of each joint system, plans, elevations, sections, details, profiles of each type of expansion joint system, locations of splice joints between sections, joinery with other types, special end conditions, anchorages, fasteners, and relationship to adjoining work and finishes.

2. Where joint systems change planes, isometric drawings depicting how

components interconnect to achieve continuity of joint covers and fillers.

3. Description of materials and finishes.

4. Locations of internal gutter systems, locating water runoff points, pitch of gutters, connections to drainage systems and clearing showing locations of water exits and relationship to contiguous materials.

5. Locations and fire rating of expansion joints requiring fire barriers.

6. Composite Shop Drawings: Obtain details from other trades so as to incorporate system into composite shop drawings of each expansion joint cover detail, between transitions to contiguous materials, transition to elastomeric and sheet metal flashing as well as other intricate transitions. These combined shop drawings shall show the Contractor's and manufacturer's intentions regarding how these different systems shall be integrated in the final work.

7. Setting Drawings: Provide, for Professional’s information, setting drawings, dimensions and templates for the location of items and anchorages that are to be embedded in or anchored to concrete, precast concrete or masonry.

D. Samples: Submit for Professional’s action. Label samples to indicate product, characteristics, and location in the Work. Samples will be reviewed for color and appearance only. Furnish sufficient samples to establish the full range of colors and textures for materials exposed in the finished work. Compliance with other requirements is the responsibility of the Contractor. Provide the following:

1. Composite Samples: Sample (for each type expansion joint cover) as a composite showing components, external and internal with specified gutters, and attachment devices. Provide sample of each type of joint showing intended method of transition in aspects (T's, L's, X's, and horizontal and vertical offsets) and bonding or vulcanizing process.

2. Transition Samples: Provide sample for each transition at directional changes in expansion joint.

3. Metal Samples: Sample finishes on aluminum having the specified alloy, temper, substrate preparation treatment and thickness of metal required for the Work. Provide 12 in. lengths for extrusions and 12 in. squares for sheet or plate; showing the maximum range or variation in color and shade.

E. Quality Control Submittals: Submit for Professional’s information

1. Test Reports

a. Product Test Reports: Product test reports from a qualified testing agency indicating each specified architectural joint system complies with requirements, based on comprehensive testing of current products.

2. Certificates

a. Document Review: Before commencing work, submit a written statement signed by the Contractor and the Applicator certifying that the Contract Documents, shop drawings and product data have been reviewed with material manufacturers' qualified technical representatives and that they

agree the selected materials are proper, compatible with contiguous materials and adequate for the application shown.

b. Manufacturer's and fabricator's certification that the PVDF coating complies with the Contract Documents and AAMA 2605.

c. Manufacturer's and fabricator's certification indicating that pigmented organic coating complies with the Contract Documents and AAMA 2603.

d. Manufacturer's and fabricator's certification indicating that anodic coating complies with the Contract Documents

B. Closeout Submittals: Submit for Department's documentation

1. Warranties: Special warranties as specified.

2. Maintenance Data:

a. Two (2) copies of a bound maintenance manual, describing the materials, and procedures for cleaning and maintaining expansion joint cover assemblies. Include manufacturer's data describing the materials and finishes used in the work.

1.5 QUALITY CONTROL

A. Qualified Installer: The expansion joint cover assemblies work shall be performed by a firm having 5 years of experience in the installation of specified materials on comparable projects. The firm shall have the approval of and have been trained by the expansion joint cover assemblies materials manufacturer. The installer shall provide evidence of successful completion of work of similar scope to that shown and specified for this project using similar expansion joint cover assembly systems.

B. Single-Source Responsibility: Obtain expansion joint cover assemblies and accessories from one source from a single manufacturer for each type of expansion joint cover. Manufacturer awarded the Project shall be experienced in successfully producing assemblies similar to those indicated for this Project, shall have sufficient production capacity to produce required units without causing delay in the Work. and shall be required to provide and sign a warranty with the installer as specified herein.

C. Manufacturer's Representatives: Do not install expansion joint cover assemblies until the manufacturer has a qualified representative at the project site or exterior wall fabricator's plant at the start of the Work and periodically during the work, to ensure proper installation of the system.

D. Regulatory Requirements: Comply with applicable requirements of the laws, codes, ordinances and regulations of Federal, State and Municipal authorities having jurisdiction. Obtain necessary approvals from authorities.

E. Mock-Ups

1. Visual Mock-Ups: Prior to commencement of production, erect minimum 4 ft. long mock-ups for each type of expansion joint cover, to demonstrate aesthetic effects as well as qualities of materials and execution. Alter or revise mock-up, as directed, to obtain the approval of the Department and the Professional. The approved mock-ups shall serve as a standard of quality for specified items for the

project and may remain as a permanent part of the Work if in same condition as new at time of final acceptance. The approval of the visual mock-up does not relieve the Contractor of its obligation to perform the work in accordance with the Contract Documents

2. Testing Mock-Up: Provide expansion joint cover assemblies, components and related accessories for testing mock-up in composite configurations designed to fulfill the performance criteria, and representing the elements which will be used in the final work. Extent of mock-up is shown on the Drawings. Provide personnel to construct exterior wall mock-up utilizing expansion joint cover assemblies who will be the same personnel who will be performing the actual Work.

F. Pre-Installation Meetings: Prior to the start of the Work, meet at the project site to review methods and sequence of expansion joint cover assembly installations, special details and conditions, standard of workmanship, testing and quality control requirements, job organization and other pertinent topics related to the Work.

G. Pre-Installation Meeting: See Section 080350 “Exterior Enclosure, General”, for requirements for pre-installation meetings

1.6 DELIVERY, STORAGE AND HANDLING

A. Packing, Shipping, Handling, and Unloading: Deliver materials in manufacturer's unopened containers fully identified to show name, brand, type, grade and thickness.

B. Storage and Protection: Store, protect and keep materials dry. Cover joints with exposed finished metal with manufacturer's standard protective paper or wrapping. Store in clean, dry locations, away from uncured concrete and masonry. Cover with waterproof paper, tarpaulin or polyethylene sheeting in a manner that permits air circulation within covering.

1.7 WARRANTIES

A. Warranties specified in this Article shall not deprive the Department of other rights the Department may have under other provisions of the Contract Documents and are in addition to and run concurrent with other warranties and guaranties made by the Contractor under requirements of the Contract Documents.

1. Special Warranty: Provide a written warranty for a period of 5 (five) years, signed by the manufacturer of the joint assembly and installer awarded the Work, warranting that the expansion joint cover assemblies will be free of defects in material or workmanship and free of leaks resulting from defects (if exterior joint) during the warranty period. Failures, include but are not limited to:

a. Failure of the system to meet performance requirements including but not limited to visual metal fatigue, disengagement of components, excessive deflection, inability to move over complete range of scheduled displacement, failure to return to original position, racking, warpage, damage to materials integral with or attached to;

b. Excessive water leakage or air infiltration for exterior joints.

c. Faulty operations including loss of component recovery.

d. Deterioration of metals, metal finishes and other materials beyond normal weathering.

e. Tearing (cohesive failure) of component and loss of component bonding (adhesive failure);

f. Upon notification of defect, within the warranty period, make the necessary repairs at the convenience of the Department.

2. Other Special Warranties: See warranty section for warranty of exterior wall Work specified in Section 080350 "Exterior Enclosure, General".

3. Special Warranty, PVDF Coatings: Provide a written warranty, from the manufacturer (formulator) of PVDF coating system and the finisher for a period of (20) twenty years, warranting against the loss of film integrity, chalking, fading, non-uniformity, corrosion and the overall performance of color of the PVDF coatings. Upon notification of defects, within the warranty period, make the necessary replacements at the convenience of the Department.

a. Color retention not to exceed 5ΔE Units (Hunter) color change as calculated in accordance with ASTM D2244 on exposed surfaces cleaned with clean water and a soft cloth.

b. Degree of chalking not to exceed rating No. 8 for colors and No. 6 for whites when measured in accordance with ASTM D4214 Test Method, Test Method-A on exposed unwashed surfaces.

4. Special Warranty Organic Coated Finish: Provide a written warranty for a period of (5) five years, warranting that the organic coated finish will not fade, stain or discolor excessively or to a non-uniform appearance, and will not corrode, crack, craze, peel, or deteriorate due to weather and atmospheric exposure. Upon notification of defects, within the warranty period, make the necessary replacements at the convenience of the Department

5. Special Warranty, Anodized Coatings: Provide a written warranty for a period of 3 years warranting that the anodized aluminum will not develop excessive fading or excessive non-uniformity of color or shade, and will not crack, peel, pit, or corrode; within limits defined as follows:

a. "Excessive fading": means a change in appearance which is perceptible and objectionable as determined by the Professional when viewed visually in comparison with the original color range standards.

b. "Excessive non-uniformity": means non-uniform fading during the period of the guarantee to the extent that adjacent panels have a color difference greater than the original acceptable color range.

c. "Will not crack, peel, pit or corrode": means there shall be no cracking, peeling, pitting or other type of corrosion discernible from a distance of 10 ft., resulting from the natural elements in the atmosphere.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. System Description

1. General: Factory-fabricated architectural joint systems capable of withstanding the types of loads and of accommodating the kinds of movement and accommodating building tolerances, and the other functions for which they are designed including those specified below, without failure.

    a. Vehicular Traffic Joints: Support vehicular traffic across joint.

    b. Pedestrian Traffic Joints: Support pedestrian traffic across joint.

    c. Exterior Joints: Maintain continuity of weather enclosure.

    d. Joints in Fire-Resistance-Rated Assemblies: Maintain fire-resistance ratings of assemblies.

    e. Joints in Smoke Barriers: Maintain integrity of smoke barrier.

    f. Joints in Acoustically Rated Assemblies: Inhibit passage of airborne noise.

    g. Other Joints: Where indicated, provide joint systems that prevent penetration of water, moisture, and other substances deleterious to building components or content.

    h. Seismic Joints: Remain in place on exposure to seismic activity (movement).

    i. Joints in Surfaces with Architectural Finishes: Serve as finished architectural joint closures.

B. Performance Criteria

1. Exterior Enclosure Performance Criteria: Comply with the requirements shown on the drawings and specified in the Paragraph "Performance Criteria" in Section 080350 "Exterior Enclosure, General" and as specified herein.

2. Loads: Design, engineer, fabricate and install expansion joint cover assemblies so that the installed joints will withstand the live loads and dead loads and the inward and outward pressures (including wind uplift) per codes, shown on the drawings, and found in the appendix of the specifications.

3. Traffic Joints: For areas where joints are utilized in the horizontal position and pedestrian traffic is anticipated, design web structure of seal with features that exhibit the ability to support pedestrian traffic and with top of seal with suitable surface that is non-slip and complies with ADA guidelines when installed. The installed joint shall be capable of withstanding a uniform load of 100 lbf/ft. applied in any direction and a concentrated load of 300 lbf on a 4 sq. in. area. Deflection shall be 1/16 in. at neutral position.

4. Movement: Design, fabricate and install expansion joint systems that is capable of accommodating movement and variation in joint widths through compression and flexure of its internal web structure. Design structure of seal with truss like features that exerts continuous and uniform pressure against joint sidewalls effectively providing a watertight seal. In addition, design, fabricate and install expansion joint systems so that the installed joints will withstand the following:

a. Vertical Shear: upward and downward

b. Horizontal Shear: outward and inward

c. Rotation: outward and inward

5. Temperature: Design, fabricate and install component parts to provide for expansion and contraction of the joint covers over an ambient temperature range of 120 deg. F. and a surface temperature range of 180 deg. F without buckling, joint failure, undue stress on members or anchors, and other detrimental effects.

6. Drainage: Design, fabricate and install expansion joint cover assemblies so that each joint exposed to the weather shall contain an internal, concealed, continuous, pitched gutter with sealed downspouts draining to locations shown or where not shown, draining to the exterior of the building. Indicate on shop drawings, the location of drains or weeps pertaining to gutter system. (Refer to Finley Question on markup)

7. Seismic Requirements: Design to withstand minimum lateral movements per floor shown and per Section 080350 “Exterior Enclosure – General”

C. Fire Rated Joint Covers: Where shown or required, provide expansion joint cover assemblies with continuous, standard, flexible fire barrier seals under covers at locations indicated or required to provide fire resistive ratings not less than the rating of adjacent construction.

1. Fire Barriers: Designed for indicated or required dynamic structural movement without material degradation or fatigue when tested according to ASTM E1399. Tested in maximum joint width condition with a field splice as a component of an expansion joint cover per ANSI/UL 263, NFPA 251, U.B.C. 43–1, or ASTM E119, including hose stream test of vertical wall assemblies by a nationally recognized testing and inspecting agency acceptable to authorities having jurisdiction. Provide fire barrier assemblies complete with metal retainers with ends prepared splicing in the field. Fire barrier assemblies shall be miter cut in the field to accommodate changes in direction. Provide UL listed intumescent fire caulking compound in areas as required. Fire resistance rating shall be not less than the rating of adjacent construction. Comply with requirements for firestopping as specified in Section 078400 “Firestopping”.

D. Product Options: Information on Drawings and in Specifications establishes requirements for expansion joint 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 sight lines and relationships to one another and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including established engineering methodology (i.e., calculations) preconstruction testing, field testing, and/or in-service performance.

E. Aesthetic Effects: Do not modify intended aesthetic effects, as judged solely by Professional, except with Professional's approval and only to the extent needed to comply with performance requirements. Where modifications are proposed, submit comprehensive explanatory data to Professional for review.

F. Design Modifications: Make design modifications of work shown only as may be

necessary to meet performance requirements and coordinate the Work. Maintain the general design concept without altering profiles and alignments shown and submit to the Professional for review, variations in details and materials which do not adversely affect appearance, durability or strength.

2.2 MANUFACTURERS

A. Acceptable Manufacturers: Provide each type of expansion joint cover assemblies, including accessories and fasteners as produced by one manufacturer. Products specified herein by proprietary designation are as manufactured by the following and establish the quality standards required. Equivalent products produced by other manufacturers will be considered provided they meet those established standards.

1. Construction Specialties, Inc.

2. CS Group

3. Watson Bowman Acme

4. MM Systems Corporation

5. Balco Inc.

2.3 METAL MATERIALS

A. Aluminum Extrusions: ASTM B221 ; sizes and minimum gages as shown, standard with the manufacturer and as required to fulfill performance requirements. Suitable alloy and proper temper for forming and fabricating with adequate structural characteristics, and suitable for finishing as specified.

B. Aluminum Sheet and Plate: ASTM B209 ; sizes, thickness and minimum gages as shown, standard with the manufacturer and as required to fulfill performance requirements. Suitable alloy and proper temper for forming and fabricating with adequate structural characteristics, and suitable for finishing as specified.

C. Galvanized Carbon Steel Sheets: ASTM A653 , G90 coating (minimum spangle), either commercial quality or structural quality, Grade 33, unless another grade is required for design loads.

D. Stainless Steel: ASTM A167 or ASTM A666 , Type 304 or Type 316 with 2B finish, unless indicated otherwise, for plates, sheet, centering bars, pantographs, and strips.

2.4 SEALS

A. Visual Seal: Single or multilayered silicone rubber extrusions as classified under ASTM D2000; designed with or without continuous, longitudinal, internal baffles and formed to fit compatible frames; custom colors as selected by Professional; supplied in longest lengths available.

B. Secondary Moisture Barrier Seal: Provide manufacturer's standard secondary moisture barrier consisting of a continuous, waterproof membrane within joint and attached to substrate on sides of joint below the primary cover, consisting of either a fabric reinforced flexible ethylene propylene diene monomer, (EPDM), , PVC or flexible neoprene as standard with the expansion joint manufacturer; obtained in longest sheets available, supported with standard extruded aluminum retainers or side lugs that mechanical lock

seal into aluminum profile.. System shall be designed to allow complete assembly and servicing with access from one side only, either above or below, dependent on location. One edge of elastomeric gutter shall be designed to pull out of frame, without damage to frame or elastomeric gutter, only when movement rating is exceeded.

1. Secondary Moisture Barrier Drain Tube Assemblies: Equip secondary moisture barrier with drain tubes and seals to direct collected moisture to drain as indicated on Drawings or if not indicated to closest drain assembly.

C. Strip Seals: Elastomeric membrane or tubular extrusions with a continuous longitudinal internal baffle system throughout complying with ASTM E1783; used with compatible frames, flanges, and molded-rubber anchor blocks

2.5 FASTENERS, ANCHORAGE DEVICES AND SUPPORTS

A. Fasteners: Stainless steel Type 300 Series; type, grade, class and style best suited for the respective purpose. Use countersunk flathead Phillips type machine screws for exposed fasteners except where Allen head screws are required. Where fasteners screw-anchor into aluminum less than 1/8 in. thick. Reinforce the interior surface with aluminum or non-magnetic type stainless steel to receive screw threw threads or provide standard non-corrosive pressed-in splined grommet nuts. All screwed connections shall be drilled.

B. Anchorage Devices: Adjustable anchors that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer/fabricator.

1. Concrete and Masonry Inserts: Galvanized ferrous castings, either malleable iron ASTM A47 or cast steel ASTM A27 . Provide bolts, washers and shims as required, hot dip galvanized, ASTM A153 , Class A.

2. Structural Steel Anchor Assemblies: Anchor assemblies secured to structural steel framing shall be fabricated in accordance with the criteria governing structural steel.

2.6 AUXILIARY MATERIALS

A. Fire Barriers: Any material or material combination, when fire tested after cycling, designated to resist the passage of flame and hot gases through a movement joint without material degradation or fatigue when tested according to ASTM E1399. Provide fire barrier assemblies complete with metal retainers with ends prepared splicing in the field. Fire barrier assemblies shall be miter cut in the field to accommodate changes in direction.

B. Self-Centering Bars and Pantograph Mechanisms: Manufacturer’s standard pre-assembled systems which both lock and slide with corresponding aluminum extrusions which allow freedom of movement and flexure in all directions including vertical displacement. Provide sufficient number of self-centering bars, pantograph control mechanisms frame fasteners and similar accessories so as to comply with specified performance criteria.

C. Accessories: Manufacturer's standard set screws, spacers, flexible barrier and filler materials, drain tubes, additional reinforcing indicated on Drawings, and other accessories compatible with material in contact, as indicated or required for complete installations

D. Shim Material: Neoprene block Shore A 90 durometer hardness.

E. Sealant: Manufacturer's recommended sealant for use shown and compatible with adjacent construction and materials. Comply with requirements specified in Section 079200 “Joint Sealants”.

F. Lubricant Adhesive: One part moisture curing polyurethane and aromatic hydrocarbon solvent mixture complying with ASTM D4070 and standard with the manufacturer.

G. All Other Materials: Provide all standard materials recommended by the manufacturer of expansion joint cover assemblies as required for a complete airtight and watertight installation.

2.7 PAINTS AND COATINGS

A. Paint

1. Dielectric Separator: Cold applied, asphalt emulsion type complying with ASTM D1187, non-sagging, resistant to severe corrosion conditions; applied in two coats for an overall minimum dry film thickness of 25 mils or heavy coating of epoxy paint in minimum 2.0 mil dry film thickness.

2. Exterior Ferrous Metal Primer for Ferrous Metals Not Galvanized: Compatible with finish coats of paint; shop apply primer to the respective dry film mil thickness specified or as recommended by the manufacturer; Provide one of the following:

   a. "Hi-Build Epoxoline II Series N69" (Tnemec Co. Inc.); 4.0 - 6.0 mils d.f.t.

   b. "Carboguard 888 Series" (Carboline Co.); 4.0 - 6.0 mils d.f.t.

   c. “Interseal 670HS (International Paint), 4.0-8.0 mils min d.f.t.

3. Interior Ferrous Metal Primer for Ferrous Metals Not Galvanized: Compatible with the finish coats of paint (see Section 099000 "Painting" for finish coats of Paint); shop apply primer to the respective dry film mil thickness specified or as recommended by the manufacturer; Provide one of the following:

   a. "Series 10-99" (Tnemec Co. Inc.); 2.0 - 3.5 mils d.f.t.

   b. "Carbocoat 115" (Carboline Co.); 1.5 - 2.0 milsd.f.t.

   c. “Interprime 298” (International Paint), 3.0-4.0 mils (7min d.f.t.

4. Galvanizing Repair Paint: Zinc rich paint for repairing galvanized surfaces and field welds complying with requirements of ASTM A780. Thickness of applied galvanizing repair paint shall be not less than coating thickness required by ASTM A123 or ASTM A153 as applicable.

2.8 FABRICATION

A. General: Provide expansion joint cover assemblies of design, basic profile, materials, and operation indicated, or as required. Select units comparable to those indicated or required to accommodate joint size, variations in adjacent surfaces, and structural movement. Provide expansion joint cover assemblies consisting of continuous extruded

preformed seals of profiles and dimensions shown in longest lengths available. Furnish extrusions designed for embedment or attachment to architectural precast concrete, concrete, masonry and aluminum extrusions and mechanical retention of lugs of field-installed extruded preformed seals.

B. Fabricate expansion joint cover assemblies true to line and level with accurate angles, surfaces and edges. Make joints as strong and rigid as adjoining sections. Vulcanize, weld or heat-seal splices (if any) continuous along entire line of contact to ensure hermetic joint condition. Transitions between different shapes shall be shop fabricated and heat sealed. Furnish units in longest practicable lengths to minimize number of end joints. Provide water-tight hairline mitered corners where joint changes directions or abuts other materials. Include closure materials and transition pieces, tee-joints, corners, cross-connections, and other accessories as required to provide complete and continuous joint covers.

C. Measurements: Before fabrication, verify measurements and locations of walls and other construction to which expansion joint cover assemblies must fit, and show recorded measurements on shop drawings (with particular attention given to the installation of items embedded in precast concrete, concrete and masonry). Coordinate fabrication schedule with construction progress to avoid delaying Work.

D. Prefabricated Sections: Provide prefabricated sections of joint covers for tee, crossover, corner and horizontal directional changes and for transitions and terminations at vertical surfaces. Provide size of joint covers as recommended by the manufacturer to suit the joint sizes shown and to comply with performance criteria specified. Provide joint covers in maximum manufactured lengths. Miter-cut directional changes and join prefabricated sections complying with strict quality control requirements including testing and inspection prior to shipment.

E. Separate aluminum surfaces in contact with concrete or masonry, and dissimilar metals with a dielectric separator. Do not extend coatings onto exposed surfaces.

F. Preassembly: Preassemble items in shop to greatest extent possible to avoid field seaming. Shop fabricate all corners and transitions. Following trial fit, disassemble units only as necessary for shipping and handling. Clearly mark units for reassembly. Provide alignment and splice plates for accurate field fit.

G. Secondary Moisture Barrier: Where shown or required provide continuous, standard, flexible vinyl moisture barrier under covers at locations indicated.

H. Fire-Rated Joint Covers: Where shown or required, provide expansion joint cover assemblies with continuous, standard, flexible fire barrier seals under covers at locations indicated to provide fire-resistive rating not less than the rating of adjacent construction.

2.9 **FINISHES**

A. General: As shown for the respective units and matching the reviewed samples. Remove scratches, abrasions, dents, die markings and other defects prior to finishing operations. Perform this work in addition to finish treatment specified. Comply with NAAMM "Metal Finishes Manual" for finish designations and application recommendations unless otherwise specified.

B. Stainless Steel

1. **Metal Type MTL04**: No. 4 (bright directional polish).

C. Fluoropolymer PVDF coating 2 Coat System **for Interior Expansion Joint Covers**: Standard 2-coat, thermocured system composed of specially formulated inhibitive primer and fluoropolymer color topcoat complying with AAMA 2605 and AA-C12C42R1x in colors and gloss as selected, using 70% minimum polyvinylidene fluoride resin by weight either "Kynar 500 or Hylar 5000 Fluorocarbon Resin" (Arkema Inc. or Solvay Solexis, Inc.), applied to a total dry film thickness of 1.2 mils.

1. Color: Match adjacent wall finish.

D. Fluoropolymer PVDF coating 3 Coat System **for Exterior Expansion Joint Covers**: Standard 3-coat, thermocured system composed of specially formulated inhibitive primer, fluoropolymer color coat, and clear fluorocarbon topcoat complying with AAMA 2605 and AA-C12C42R1x in custom colors and gloss as selected, using 70% minimum polyvinylidene fluoride resin by weight either "Kynar 500 or Hylar 5000 Fluorocarbon Resin" (Arkema Inc. or Solvay Solexis, Inc.), applied to a total dry film thickness of 1.6 mils.

1. Color: Match adjacent wall finish.

PART 3 - EXECUTION

3.1 GENERAL

A. Manufacturer's Instructions: Prepare substrates and install the work of this Section, including components, and accessories in accordance with the manufacturer's instructions, except where more stringent requirements are shown or specified, and where project conditions require extra precautions or provisions to ensure satisfactory performance of the Work

3.2 EXAMINATION

A. Verification of Conditions: Examine the substrates, adjoining construction and the conditions under which the Work is to be installed with expansion joint manufacturer's representative. Follow instructions for the repair of substrates and obtain manufacturer's acceptance of substrate prior to the start of work. Do not proceed with the Work until unsuitable conditions have been corrected.

3.3 PREPARATION

A. Substrate Acceptability: Commencement of installation shall constitute acceptance of substrate conditions by the Installer.

B. Coordination: Coordinate and furnish anchorages, setting drawings, templates, and instructions for installation of expansion joint cover assemblies to be embedded in concrete or have recesses formed into edges of concrete slab for later placement and grouting-in of frames. Provide items to be placed during the installation of other work at the proper time to avoid delays.

C. Field Measurements: Verify dimensions of supporting structure by field measurements so that custom fabricated seismic and expansion joint covers will be accurately designed, fabricated and fitted to the structure. Tolerances for supporting structure are specified in other Sections.

D. Elastomeric Seal: Prior to installation of expansion joint cover assemblies, unroll elastomeric seal and place adjacent to joint for one day prior to anchoring to relieve coiling.

3.4 INSTALLATION

A. Design Temperature: Dimensions shown on Drawings are based on an assumed design temperature of 70 deg. F. . Fabrication and erection procedures shall take into account the ambient temperature range at the time of the respective operations.

B. Fastening to in-Place Construction: Provide anchorage devices and fasteners where necessary for securing expansion joint cover assemblies to in-place construction, including threaded fasteners with drilled-in expansion shields for masonry and concrete where anchoring members are not embedded in concrete. Provide fasteners of metal, type, and size to suit type of construction indicated and provide for secure attachment of expansion joint cover assemblies.

C. Cutting, Fitting and Placement: Perform cutting, drilling, and fitting required for installation of expansion joint cover assemblies. Install expansion joint cover assemblies in true alignment and proper relationship to adjoining finished surfaces measured from established lines and levels. Allow adequate free movement for thermal expansion and contraction of metal to avoid buckling. Set covers at elevations to be flush with adjacent finished floor materials. Securely attach in place with required accessories. Locate anchors at interval recommended by manufacturer, but not less than 3 in. from each end and not more than 24 in. o.c. In areas where expansion joints are scheduled for installation back to back, stagger self-centering bars, pantographs, shear hinge linkages and other interior mechanisms in accordance with instructions and recommendations so as to allow for minimum widths. In areas as shown or as required make accommodations for the installation of insulation systems specified elsewhere.

D. Joinery and Continuity: Maintain continuity of expansion joint cover assemblies with end joints held to a minimum. Cut and fit ends to produce joints that will accommodate thermal expansion and contraction. Adhere flexible filler materials (if any) to frames with adhesive or pressure-sensitive tape as recommended by manufacturer. Terminate exposed ends of exterior joint assemblies with factory-fabricated termination devices to maintain waterproof system.

E. Dissimilar Materials: Separate dissimilar metals and metals in contact with concrete or masonry with dielectric separator or gaskets. Do not extend coatings onto exposed surfaces.

F. Installation of Extruded Preformed Seals: Install seals with minimum number of end joints. for straight sections provide preformed seals in continuous lengths. Vulcanize or heat-seal field splice joints in preformed seal material to provide watertight joints using recommended procedures. Apply approved adhesive, epoxy, or lubricant-adhesive to both frame interfaces prior to installing preformed seal and seal transitions. In areas visible to public on both sides of joint, install additional extruded primary seal and aluminum frame on non-weathering side.

G. Secondary Seal: Provide custom shapes as required to follow offsets, vertical and horizontal transitions as shown and as required in the field to maintain and provide a continuous water seal. Utilize fasteners and sealants as recommended, installing in strict compliance with written instructions as required for a water-tight seal.

H. Fire Barriers: Install fire barriers, including transitions and end joints, according to

instructions so that fire-rated construction is continuous and in compliance with listed systems.

3.5 ADJUSTING

A. Touch-Up Painting: Field paint marred or abraded shop paint and welds after cleaning these areas.

3.6 PROTECTION

A. Finish Protection: Do not remove strippable protective material until finish work in adjacent areas is complete. When protective material is removed, clean exposed metal surfaces.

B. Protection: Upon completion of installation, cleaning and touchup install protection. Protect finished surfaces against damage during subsequent construction operations and remove protection at time of substantial completion

3.7 EXPANSION JOINT COVER ASSEMBLIES SCHEDULE

A. **Joint Cover Type EJC-01**: Exterior wall expansion and seismic joint cover, in sizes as noted or as required to comply with performance criteria, consisting of primary visual seal of custom color fabricated from thermoplastic compound (Santoprene) elastomeric flexible seal with type "A" durometer hardness of 64 +/-3, complete with stainless steel self-centering bar or pantograph, shear hinge linkage, extruded aluminum frame with **MTL-01** finish, secondary internal continuous moisture barrier with outlet tubes, and a concealed aluminum frame as shown. In locations where fire rated construction is shown on the drawings, the Contractor shall provide a fire barrier and required accessories for a complete system. Provide one of the following:

1. “SF Series” (CS Group)
2. “Series VSS” (MM Systems Corp.).
3. "Series SW" (Watson Bowman Acme).
4. "FCWW Series" (Balco Inc.).

B. **Joint Cover Type EJC-02**: Exterior roof to roof joint cover in sizes as noted and consisting of formed extruded aluminum cover in sizes as noted and **MTL-01** finish PVDF coated finish, centering or turn bar of standard material, concealed gaskets and secondary internal continuous moisture barrier with outlet tubes. Provide one of the following:

1. “SRJ Series” (CS Group)
2. “Series RFL” (Watson Bowman Acme).
3. "Type FR" (Balco Inc.).

C. **Joint Cover Type EJC-03**: Exterior roof to wall joint cover in sizes as noted and consisting of formed extruded aluminum cover with **MTL-01** finish PVDF coated finish in colors as selected by Professional, centering or turn bar of standard material concealed gaskets and secondary internal continuous moisture barrier with outlet tubes. Provide custom heights for turned up legs where shown or required. Provide one of the following:

1. “SRJW Series” (CS Group)

2. “Series RXJ” (MM Systems Corp.).

3. “Series RFH/C” (Watson Bowman Acme).

4. "Type FRE" (Balco Inc.).

D. **Joint Cover Type EJC-04**: Exterior wall to wall joint cover in sizes as noted and consisting of formed aluminum cover **MTL-01** finish PVDF coated finish, centering or turn bar of standard material, extruded aluminum frames, continuous gaskets, and fasteners required for a complete installation. Provide one of the following:

1. “SFW Series” (CS Group)

2. "CM-3-6" (Balco Inc.).

3. “Series WFX” (Watson Bowman Acme)

E. **Joint Cover Type EJC-5, EJC-05A, and EJC-05B**: Interior floor expansion and seismic joint cover specially designed to receive scheduled flooring with **MTL-01** finish extruded aluminum frame with continuous 1/2 in. wide face, continuous 3/8 in. thick pan, depth as required for scheduled flooring, center plate welded to clear anodized continuous extruded aluminum pan nosing, continuous extruded aluminum turnbar frame, steel channel turnbar, and spring loaded flush screw assembly. In locations where fire rated construction is shown on the drawings or required, the Contractor shall provide a fire barrier joint cover and required accessories for a complete system as scheduled and required. Provide one of the following:

1. “SSR Series” (CS Group).

2. “SPJ Custom Size & Design” (Watson Bowman Acme).

3. “PDS Series-Custom Size” (MM Systems Corporation).

4. "PS Series" (Balco Inc.).

F. **Joint Cover Type EJC-06 and EJC-06A**: Interior wall to wall expansion and seismic joint cover specially designed to receive adjacent finish, **MTL-01** finish, extruded aluminum frame with 1/2 in wide face, continuous 3/8 in. thick pan depth as required for finish installation, center plate welded to clear anodized continuous extruded aluminum pan nosing, continuous extruded aluminum turnbar frame, steel channel turnbar and spring loaded flush screw assembly. In locations where fire rated construction is shown on the drawings or required, the Contractor shall provide a fire barrier and required accessories for a complete system as scheduled and required. Provide one of the following:

1. “SSR Series” (CS Group).

2. “SPJ Custom Size & Design” (Watson Bowman Acme).

3. "PS Series" (Balco Inc.).

G. **Joint Cover Type EJC-07**: Interior flush mounted extruded aluminum acoustical tile ceiling (or gypsum board ceiling) to partition cover plate snap-locked to mounting clips 24

in. on center. Free floating cover plate held in place by cover plates and protected from scratching by continuous seals. Provide baked on organic coating paint **MTL-01** finish in custom colors as selected by the Professional. Provide one of the following:

1. “SGWC Custom Size” (CS Group).

2. “CTR Custom Size and Custom Configuration" (Watson Bowman Acme).

3. "95GWC Series" (Balco Inc.).

END OF SECTION

SECTION 092116

GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. Stipulations:

1. The specifications sections “General Conditions to the Construction Contract”, “Special Conditions” and “Division 01 - General Requirements” form a part of this Section by this reference thereto, and shall have the same force and effect as if printed herewith in full.

B. General: Provide gypsum board systems in accordance with requirements of the Contract Documents.

C. Section includes, but not limited to, the following:

1. **GWB-01**: 5/8” Type “X” Gypsum Wallboard.
2. **GWB-02:** 5/8" Impact Resistance Gypsum Wallboard.
3. **GWB-03:** 5/8" Gypsum Sheathing.
4. **GWB-04:** Cement Board (Tile Backer)
5. **GWB-05:** Not Used
6. **GWB-06:** 5/8” Abuse Resistant Gypsum Board.
7. **GWB-08**: 7/8” Acoustical Gypsum Panels.
8. **GWB-09:** Gypsum Sheathing.
9. **GBC-01**: Suspension Members for Ceilings
10. Gypsum Wallboard Accessories.

D. Related Requirements:

1. Section 054000 Cold-Formed Metal Framing
2. Section 078400 Firestopping
3. Sealants and joint fillers other than specified herein installed at interface of gypsum board assemblies and other building components are specified under Section 079200 Joint Sealants.
4. Section 083100 Access Doors and Panels for access doors and panels to be installed under this section.

1.2 REFERENCES

A. Definitions:

1. Gypsum Board System Construction Terminology: Refer to ASTM C11 for definitions of terms for gypsum board system construction not defined in this Section or in other referenced standards.

2. "Equivalent Gauge" Thickness (Steel Studs and Runners only): Members that can show certified third party testing with gypsum board in accordance with ICC ES-AC86 need not meet the minimum thickness limitation or minimum section properties set forth in ASTM C645 .

B. General: Comply with the applicable provisions of the referenced standards except as modified by governing codes and the Contract Documents. Where a recommendation or suggestion occurs in the referenced standards, such recommendation or suggestion shall be considered mandatory. In the event of a conflict between referenced standards, this specification or within themselves, the more stringent standard or requirement shall govern:

C. Reference Standards:

1. American National Standards Institute (ANSI): ANSI A118.9, “Specification for Cementitious Backer Units”.

2. ASTM International (ASTM):

a. ASTM A123, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

b. ASTM A641, Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.

c. ASTM B221, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

d. ASTM C11 Standard Terminology Relating to Gypsum and Related Building Materials and Systems.

e. ASTM C475, Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.

f. ASTM C645, Standard Specification for Nonstructural Steel Framing Members.

g. ASTM C665, Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.

h. ASTM C754, Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.

i. ASTM C834, Standard Specification for Latex Sealants.

j. ASTM C840, Specification for Application and Finishing of Gypsum Board.

k. ASTM C919, Use of Sealants in Acoustical Applications.

l. ASTM C954, Specification for Steel Drill Screws for the Application of Gypsum Panel Products.

m. ASTM C1002, Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products.

n. ASTM C1047, Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.

o. ASTM C1177, Specification for Glass Mat Gypsum Substrate for Use as Sheathing.

p. ASTM C1264 Standard Specification for Sampling, Inspection, Rejection, Certification, Packaging, Marking, Shipping, Handling, and Storage of Gypsum Panel Products.

q. ASTM C1396, Standard Specification for Gypsum Board.

r. ASTM C1629, Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels.

s. ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.

t. ASTM E336, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings.

u. ASTM E413, Classification for Rating Sound Insulation.

3. Gypsum Association (GA):

a. GA-214; Recommended Specification: Levels of Gypsum Board Finish.

b. GA-216, Application and Finishing of Gypsum Panel Products.

c. GA-226, Application of Gypsum Board to Form Curved Surfaces.

d. GA-253, Application of Gypsum Sheathing.

e. GA-600, Fire Resistance Design Manual.

4. South Coast Air Quality Management District (SCAQMD):

a. Rule 1168 "Adhesives and Sealant Applications", current edition.

a. Rule 1113 “Architectural Coatings, current edition”

5. Steel Stud Manufacturers Association (SSMA): "Product Technical Information”.

6. Steel Recycling Institute (SRI).

1.3 SUBMITTALS

A. Product Data: Submit for Professional's action. Manufacturer's literature, specifications and installation instructions describing the general properties of each material and accessory to be used in the Work. Include the following:

1. Environmental Product Declaration (EPD): For each product (where available).

B. Shop Drawings: Submit for Professional's action. Manufacturer approved shop drawings for the fabrication and installation of the Work. Prepare details at appropriate scale to show the Work. Provide the following.

1. Details of unusual conditions in connection with gypsum board system construction.

2. Proposed locations of control joints that are required but not shown.

3. Locations of access doors occurring in gypsum board system construction.

4. Details of attachment to primary ceiling supports.

5. Details of typical and atypical interior soffit construction.

6. Details of rated assemblies with copies of their respective approvals. Coordinate with Section 078400 "Firestopping" to provide combined submittals for partition head details and penetration details at rated partitions. Identify each assembly design in a legend with a type designation to correspond with a specific assembly indicated on the Drawings, and list the products to be used in each assembly.

7. Details of STC-rated assemblies with copies of their respective test reports. Identify each assembly design in a legend with a type designation to correspond with a specific assembly indicated on the Drawings, and list the products to be used in each assembly.

C. Gypsum Board Location Schedule: Submit for Professional's information. Provide a gypsum board location schedule utilizing the same room designations shown on Drawings listing special gypsum board types, thicknesses of partitions, composition of assemblies, and any special requirements if any, for each room scheduled for special gypsum drywall installation.

D. Samples: Submit for Professional's action. Label samples to indicate product, characteristics, and location in the Work. Samples will be reviewed for color and appearance only. Furnish sufficient samples to establish the full range of colors and textures for materials exposed in the finished work. Compliance with other requirements is the responsibility of the Contractor. Provide samples of the following:

1. 12 in. long sample of each type of metal trim and control joints.

E. Calculations: Submit for Professional's information complete engineering data for design of framing, ceilings, and soffits as specified herein for elements of steel framing. Calculations shall contain the seal of a licensed Professional Engineer licensed to practice in the Commonwealth of Pennsylvania. Coordinate calculations with calculations required in other sections of work. Provide the following:

1. Description of design criteria.

2. Engineering analysis depicting stress and deflection (stiffness) requirements for each framing application.

3. Selection of framing components, accessories and welded connection requirements.

4. Verification of attachments to structure and adjacent framing components.

5. Engineering calculations to show that maximum deflections do not exceed specified performance requirements under full design loading and that selected components comply with specified requirements.

F. Delegated Design Submittals: Comply with performance requirements and design criteria, including calculations and analysis data signed and sealed by the qualified professional engineer in the Commonwealth of Pennsylvania responsible for their preparation.

G. Quality Control Submittals: Submit for Professional's information.

1. Certificates

a. Document Review: Before commencing work, submit a written statement signed by the Contractor and the Applicator certifying that the Contract Documents, shop drawings and product data have been reviewed with material manufacturers' qualified technical representatives and that they agree the selected materials are proper, compatible with contiguous materials and adequate for the application shown.

b. Certification signed by manufacturer of gypsum board system components certifying that their products comply with specified requirements, comply with UL designations shown and is approved for use by local authorities having jurisdiction.

H. Closeout Submittals: Submit for Department's documentation.

1. Warranties: Special warranties as specified.

2. Maintenance Manuals: Furnish complete manuals describing the materials, devices and procedures to be followed in cleaning and maintaining the Work. Include manufacturers' brochures and parts lists describing the actual materials used in the Work. Assemble manuals for component parts into single binders identified for each system.

1.4 QUALITY CONTROL

A. Contractor's Quality Control Responsibilities: Contractor is solely responsible for quality control of the Work.

B. Regulatory Requirements: Comply with applicable requirements of the laws, codes, ordinances and regulations of authorities having jurisdiction. Obtain necessary approvals from all such authorities.

1. Requirements of Regulatory Agencies: Wherever a fire resistance classification is shown involving gypsum board systems (3-hr., 2-hr. and similar designations),

provide materials, accessories and application procedures which have been listed by UL or tested according to ASTM E119 to achieve the rating required.

2. Provide materials for fire rated assemblies, including framing, accessories and fasteners, produced by one manufacturer, or, when products of more than one manufacturer are utilized in a rated system, they shall be acceptable to authorities having jurisdiction.

C. Basis of Design: When particular manufacturers' materials, products or processes are specified for an item of Work, any one thereof is acceptable for the Contractor to choose. An alternative material, product or process will be considered if the Contractor submits a written substitution request together with such information as may be necessary to assist the Professional in determining whether the proposed substitution is acceptable; the burden of proof rests solely upon the Contractor.

D. Sole Source

1. Single-Source Responsibility for Steel Framing: Obtain steel framing members for gypsum board systems from a single manufacturer acceptable to the gypsum board system manufacturer. Steel framing and related accessories shall be manufactured by a current member of the Steel Stud Manufacturers Association.

2. Single-Source Responsibility for Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.

3. Single-Source Responsibility for Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board systems and other panel products or from a manufacturer acceptable to gypsum board system manufacturer.

E. Installer Qualifications: The gypsum board work shall be performed by a firm having five (5) years of experience in the application of gypsum board systems on projects similar in size and scope to this Project.

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

1. Build mockup of Gypsum Board Assemblies, 20 ft. wide x full height (min.) or as indicated on Drawings.

2. Testing shall be performed on mockups according to requirements in "Field Quality Control" Article.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Professional specifically approves such deviations in writing.

4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

5. Demolish and remove mockups when directed unless otherwise indicated.

G. Field Samples: Prior to the Pre-Construction Conference, provide a field sample for each type of wallboard in the building at area to be designated by the Professional. Utilize the same materials and installation methods in the sample as required for the final Work.

Schedule the installation so that the sample may be examined, and any necessary adjustments made, at least 1 week prior to date scheduled for commencing installation of the Work. When accepted, sample areas shall serve as the standard for materials, workmanship, and appearance for such Work throughout the project and shall remain a part of the final Work.

1.5 DELIVERY, STORAGE, AND HANDLING

A. General: Deliver and store materials in manufacturer's original packaging, labeled to show name, brand, type, and grade. Store materials in protected location off ground in accordance with manufacturer's instructions. Handle gypsum board to prevent damage to edges, ends, and surfaces. Do not bend or otherwise damage metal corner beads and trim.

B. Storage and Protection: Store materials inside, above grade in a dry, ventilated space, under cover and in accordance with manufacturer's instructions. Protect from soiling or damage Avoid exposure of material to the weather by using protective covers. Handle materials to avoid damage. Neatly stack gypsum panels flat to prevent sagging.

1.6 PROJECT / SITE CONDITIONS

A. Project Conditions: Establish and maintain project conditions for applying and finishing gypsum board to comply with ASTM C840 requirements or gypsum board manufacturer's recommendations, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

D. Temperature Limitations: Installation of gypsum board joint treatments shall not start when outside temperature is below 55 deg. F, unless building is enclosed and heated to maintain a continuous and uniform temperature of not less than 55 deg. F, from one week prior to beginning of joint treatment until joint treatment is completed and thoroughly dry. Ventilation, either natural or supplied by fans, circulators or air conditioning systems shall be provided to remove excess moisture during joint treatment. Temperature requirements may be waived only on recommendation of gypsum board materials manufacturer.

1.7 WARRANTY

A. General: Warranties and guaranties specified in this Article shall not deprive the Department of other rights the Department may have under other provisions of the Contract Documents and are in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

B. Special Warranty, Exterior Sheathing: Submit for Department’s documentation. Furnish a written warranty, for a five (5) year period, in a form stipulated by the Professional, signed by the Contractor, manufacturer, and installer, against manufacturing defects. Upon notification of such defects, within the warranty period, make the necessary repairs and replacements, at the convenience of the Department. Other guarantees or warranties may not be substituted by the Contractor for the terms of this special warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Gypsum Board and Related Products: Subject to compliance with requirements, provide gypsum board products by one of the following, or approved equal:

1. USG Corporation
2. Continental Building Products
3. GP Gypsum Corporation
4. National Gypsum Company
5. CertainTeed Corp.

B. Non-Load-Bearing Steel Framing and Furring: Subject to compliance with requirements, provide steel framing and furring products by one of the following, or approved equal:

1. ClarkDietrich Building Systems
2. MarinoWare; Division of Ware Industries, Inc.
3. Scafco Corporation
4. Telling Industries

C. Specialty Trim Products for Gypsum Board Assemblies: Subject to compliance with requirements, provide specialty trim products for gypsum board assemblies by the following, or approved equal:

1. Gordon, Inc.
2. Pittcon Inc.
3. Fry Reglet Architectural Metals

D. Products of other manufacturers will be considered only if evidence is furnished showing compliance with the minimum design and performance requirements specified.

2.2 PERFORMANCE AND DESIGN CRITERIA

A. Performance Criteria, General:

1. Building Movement: Provide gypsum board ceiling and partition systems to withstand building movements including loading deflections, shrinkage, creep, thermal, and similar movements. Engineer for simultaneous occurrence of all specified movements. No reductions shall be applied to individual movements or to combinations of movements.

B. Performance Requirements, Partitions: For information only. Partition schedule and locations are shown on the drawings.

1. Loading Criteria, Typical Partitions: Provide gypsum board system components so that the completed partition will withstand a minimum inward and outward pressure of 5 psf normal to the plane of the wall.

    a. In areas where top of partitions are dependent on ceiling system for lateral support, coordinate design and installation to comply with typical partition loading and deflection criteria.

2. Loading Criteria, Special Partitions: Provide gypsum board system components so that the completed system will withstand the minimum inward and outward pressure of not less than 10 psf normal to the plane of the wall. These criteria shall apply to the following areas:

    a. Partitions surrounding stairs.

    b. Partitions surrounding plenum and air shafts.

    c. Partitions surrounding atriums.

3. Loading Criteria for Partitions Surrounding Elevators Shafts

    a. Provide elevator gypsum shaftwall enclosure components so that the completed system will withstand the minimum inward and outward air pressure recommended by the elevator manufacturer, but in no case less than 10 psf without failing and while maintaining an airtight and smoke-tight seal. Apply design loads transiently and cyclically under in-service conditions for maximum heights of partitions indicated.

    b. Evidence of failure includes deflections exceeding those indicated below, bending stresses causing studs to break or to distort, and end-reaction shear causing runners to bend or to shear and studs to become crippled.

4. Deflection Criteria

    a. Deflection, Support Framing Gypsum Board Partitions: Deflection of support framing for gypsum board partition systems shall be limited to 1/240 of the span in height, except as otherwise shown or specified.

    b. Deflection, Support Framing Shaftwall Systems: Deflection of shaftwall systems shall be limited to 1/240 of the span in height.

        1) In areas where room side finish is veneer plaster, lath and plaster or ceramic tile, deflection of shaftwall systems shall be limited to 1/360 of the span in height.

        2) In areas where room side finish is dimension stone facing, deflection of shaftwall systems shall be limited to 1/720 of the span in height.

5. Performance Requirements, Ceilings and Soffits:

a. Deflection, Support Framing Gypsum Board Ceilings and Soffits: Gypsum board suspended ceilings shall be designed for deflection not to exceed 1/360 of the distance between supports.

C. Temperature Criteria: Provide component parts scheduled for installation on the exterior, to provide for expansion and contraction over an ambient temperature range of 120 deg. F. and a surface temperature range of 180 deg. F. without buckling, sealed joint failure, undue stress on members or anchors, and other detrimental effects.

D. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

E. Sound Characteristics for Assemblies: For gypsum board system with STC ratings, provide materials and construction identical to those of assemblies whose STC ratings were determined according to ASTM E90 and classified according to ASTM E413 by a qualified independent testing agency.

F. Sustainable Design Requirements: Provide the Work, and submit documentation, as necessary for compliance with sustainable requirements specified in Section 018113, "Sustainable Design Requirements".

G. Design Modifications: Make design modifications only as may be necessary to meet performance requirements and coordinate the Work. Variations in details and materials which do not adversely affect appearance, durability or strength shall be submitted to the Professional for review.

2.3 STEEL FRAMING AND FURRING

A. Non Load-Bearing Steel Framing and Accessories: Steel framing and furring components specified herein by proprietary designation are as manufactured by Dietrich Industries, Inc. and establish the quality standards required. Equivalent products of other manufacturers will be considered provided they meet those established standards:

1. Runners: ASTM C645 , roll formed galvanized steel or dimpled galvanized steel (equivalent gauge thickness), channel or angle shape, type, size and gauge as recommended by the gypsum board manufacturer for the wall system indicated. Provide the following, or approved equal:

a. “Drywall (Nonstructural) Track (TR-Series)” or "ProTRAK" (Clark Dietrich Building Systems.

2. Metal Studs: ASTM C645 , roll-formed galvanized steel studs or dimpled steel studs, size and gauge as recommended by the gypsum board manufacturer for the wall system and height indicated; the following types:

a. "ProSTUD" (ClarkDietrich Building Systems), for interior partitions, ceilings and column fireproofing.

b. “ViperStud Drywall Framing System” (Marino\Ware).

3. Metal Shaftwall Framing Systems: ASTM C645 , hot-dip galvanized G40 zinc coating, roll-formed steel shaftwall studs, size and gauge as recommended by the gypsum board manufacturer for the wall system and height indicated; the following types, or approved equal:

a. “Shaftwall System” (ClarkDietrich Building Systems).

b. Steel "C-Stud" (ClarkDietrich Building Systems) for solid shaftwall construction.

c. “CT Shaftwall System” (Marino\Ware).

4. Slip-Type Head Joints: Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs. Provide the following or approved equal:

   a. "MaxTrack Slotted Deflection Track" (ClarkDietrich Building Systems).

   b. "MaxTrack 2D Slotted Deflection and Drift Track" (ClarkDietrich Building Systems).

   c. “Slotted Track, 2-1/2 Leg” (Marinoware)

5. Firestop Deflection Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs. Provide one of the following or approved equal:

   a. "BlazeFrame Firestop Deflection Track" (Clark Dietrich Building Systems).

   b. “Fire Trak System” (Fire Trak Corp.).

   c. “FlameSafe FlowTrak System” (Grace Construction Products).

   d. “The System” (Metal-Lite, Inc.)

6. Furring Channels: ASTM C645 , roll-formed galvanized steel, flanged channel type, 7/8 in. deep; for wall furring and ceiling attachment. Provide the following, or approved equal:

   a. "FC Series Furring Channel" (ClarkDietrich Building Systems).

   b. "Hat/Furring Channel" (ClarkDietrich Building Systems).

   c. “Furring Channel” (Marino\Ware).

7. Furring Brackets: Serrated-arm type, adjustable, fabricated from corrosion-resistant steel sheet complying with ASTM C645 , minimum thickness of base (uncoated) metal of 0.033 in, designed for screw attachment to steel studs and steel rigid furring channels used for furring. Provide the following, or approved equal:

   a. “FCWB Adjustable Wall Furring Bracket” (ClarkDietrich Building Systems.).

8. Resilient Channel: ASTM C645 steel components with ASTM A924 hot-dip galvanized G40 zinc coating. Provide one of the following. Provide the following, or approved equal:

   a. "RC Deluxe Resilient Channel" (ClarkDietrich Building Systems)

   b. "RC-1" (ClarkDietrich Building Systems).

   c. “Resilient Channel RC-1” (Marino\Ware)

9. Metal Furring Zee Strips: ASTM C645 25 gauge steel components with ASTM A924 hot-dip galvanized G40 zinc coating, sizes as indicated on drawing. Provide the following, or approved equal:

   a. "Z-Furring Channels" (ClarkDietrich Industries, Inc.)

   b. “Z-Furring Channel” (Marino\Ware).

B. Sheet Metal Grounds (Backer Plates): ASTM A653 Structural Quality steel with hot-dip galvanized G60 zinc coating. Minimum 16 ga. thick and sized as required for fastening to studs for supporting wall-mounted fixtures, equipment or required for attachment of other work.

C. Corner Angles and Elevator Jamb Struts: Formed galvanized steel sheet angles, size and gauge as recommended by the gypsum board manufacturer for the wall system indicated.

1. “CA-Series Corner Angle” (ClarkDietrich Building Systems)

D. Ties: Comply with the requirements of Underwriters' Laboratories, Inc., and the gypsum board manufacturer for the following types:

1. ASTM C754 18 gauge tie wire.

2. 1/2 in. wide x 0.015 in. . thick steel strapping.

E. Primary Suspension Members for Ceilings **(Type GBC-01)**

1. General: Size and provide ceiling support components to comply with ASTM C754 .

2. Wire Hanger Inserts: No. 6 galvanized wire loop and 26 gauge galvanized steel shell or 14 gauge galvanized steel strap with 5/16 in. dia. holes.

3. Strap Iron Hanger Inserts: Mild steel flats hot dip galvanized or with manufacturer’s standard rust inhibiting coating, 1 in. x 3/16 in. x 3 in. with 7/16 in. dia. holes punched on center line and lower ends, designed to develop the full strength of hangers.

4. Hanger Anchorage Devices: Screws, clips, bolts or other devices applicable to the indicated method of structural anchorage for ceiling hangers. Provide anchorage devices sized for five (5) times the calculated load supported.

5. Hangers: Galvanized, one of the following:

   a. 3/16 in. x 1 in. steel straps

b. ASTM A510 ; 1/4 in. diameter mild carbon steel rods.

c. ASTM A641 , Class zinc coating, soft temper 8 gauge soft steel wire.

6. Carrying Channels: ASTM C754, cold rolled steel channels, 1-1/2 in , 414 lbs. per 1000 linear ft .

7. Clips: Provide support clips, clamps, fasteners, and other attachment devices as required to connect components and transfer imposed loads of primary suspension system.

8. Manufacturers:

a. “Drywall Grid System” (Armstrong) (EPD, GWP 4.76 kg CO2 eq, HPD)

b. “Drywall Suspension System” (CertainTeed)

c. “Drywall Suspension System” (USG) (HPD)

F. Suspension Members for Support of Exterior Soffits: Refer to Section 054000 "Cold-Formed Metal Framing."

G. Shaft Wall: Components as required to provide fireproof assemblies for the hourly rating shown or required and complying with UL listing.

2.4 GYPSUM BOARD MATERIALS

A. Gypsum Board

1. Provide Abuse Resistant Panels for the first 8 ft. of all gypsum board partitions **in corridors**, unless otherwise indicated.

2. Gypsum Board **(Type GWB-01):** Type “X”: ASTM C1396 "Type X", with tapered edges. Where fire ratings are indicated, use thickness required to comply with testing. Provide one of the following:

a. "SHEETROCK Brand EcoSmart Panels Firecode X" (USG Corporation).

b. “Gold Bond Fire-Shield” (National Gypsum Company).

c. “ProRoc Type X/EVENWALL Type X” (CertainTeed Gypsum).

3. Impact-Resistant Gypsum Board **(Type GWB-02)**: ASTM C1396, and ASTM C1629 with Hard Body Impact Resistance of Level 3, 5/8 in. thick unless otherwise shown or specified, specifically manufactured to resist abuse; “Type X”; provide one of the following:

a. “DensArmor Plus Impact-Resistant Interior Panel” (Georgia-Pacific Gypsum).

b. "Gold Bond EXP Interior Extreme IR Gypsum Panel" (National Gypsum Company).

c. "Sheetrock Brand Mold Tough VHI Firecode Core" (USG).

4. Exterior Sheathing **(Type GWB-03)**: Meet or exceed the physical property requirements of ASTM C1177. 5/8 in. thick unless otherwise shown or specified; provide one of the following:

   a. “GlasRoc Sheathing Type X” (BPB America, Inc.).

   b. “DensGlass Fireguard” (G-P Gypsum Company).

   c. “Securock Glass-Mat Sheathing” (USG Corporation).

5. Abuse Resistant Gypsum Board **(Type GWB-06)**: ASTM C1629 Classification Level 2, 5/8 in. thick unless otherwise shown or specified, specifically manufactured to produce greater resistance to surface indentation and through-penetration than standard gypsum board panels; provide one of the following:

   a. "SHEETROCK Brand Abuse-Resistant Gypsum Panels" (USG Corp.)

   b. "Hi-Abuse XP Wallboard" (National Gypsum Company).

   c. “ToughRock Abuse-Resistant Gypsum Board” (G-P Gypsum Corporation).

6. Gypsum ShaftLiner Board, Backing Board and Coreboard: ASTM C1396 , 1 in. thick with moisture-resistant paper faces. Shaftliner board specially manufactured for shaft wall construction, rated Type X when tested in accordance with ASTM E119.

   a. Proprietary Moisture Resistant Gypsum ShaftLiner Board, Backing Board and Coreboard: In accordance with requirements of ASTM C1396 ,, specifically manufactured to produce greater resistance to moisture than standard gypsum shaft liner panels. Provide one of the following:

      1) "SHEETROCK Brand Glass-Mat Liner Panels" (USG Corporation).

      2) "Mold Defense Shaftliner (Continental Building Products”).

      3) “ProRoc Shaftliner Type X” (CertainTeed Gypsum).

      4) “Gold Bond Fire-Shield Shaftliner XP” (National Gypsum Company”).

7. Moisture and Mold Resistant Gypsum Board: ASTM C1396 5/8 in. thick unless otherwise shown or specified, " Type X", with long edges tapered and either rounded or beveled returns for prefilling. Moisture and mold resistant gypsum board shall comply with ASTM D3273 and a mold resistance of a score of 10 as rated according to ASTM D3274. Provide equivalent gypsum board “Type C” at ceiling application.

   a. “Sheetrock, EcoSmart Mold Tough Firecode X” (U.S. Gypsum) (EPD, GWP 256 kg CO2 eq, HPD)

   b. “ProRoc Moisture Resistant” (CertainTeed Gypsum). (EPD, GWP 386 kg CO2 eq, HPD)

c. “Gold Bond XP Gypsum Board” (National Gypsum Company)

8. Soffit Board: ASTM C1396 , especially intended for indirect weather exposure; 5/8 in. thick unless otherwise shown or specified, "Type X", with manufacturer's standard edges. Provide the following, or approved equal:

   a. "SHEETROCK Brand Exterior Gypsum Ceiling Board" (USG Corporation).

   b. “Gold Bond Exterior Soffit Board” (National Gypsum Company).

9. **GWB-08**: 7/8” Acoustical Gypsum Panels.

   a. ARMSTRONG

      1) ACOUSTIBuilt

      2) Fine

      3) Mineral Fiber

      4) NRC. 80

      5) Custom color: Light blue

   b. USG

      1) Ensemble Acoustical Drywall Ceiling

      2) NRC .80

      3) Custom color: Light Blue

10. Exterior Sheathing **(Type GWB-09)**: Meet or exceed the physical property requirements of ASTM C1177. ½ in. thick unless otherwise shown or specified; provide one of the following:

    a. “GlasRoc Sheathing Type X” (BPB America, Inc.).

    b. “DensGlass Fireguard” (G-P Gypsum Company).

    c. “Securock Glass-Mat Sheathing” (USG Corporation).

2.5 CEMENTITIOUS UNITS

A. Backing Units for General Purpose, Stone and Tile

1. Cementitious Backer Board **(Type GWB-04)**: Provide cementitious backer units complying with ANSI A118.9, ASTM C1288 or ASTM C1325; 1/2 in. thick and in maximum lengths available to minimize end-to-end butt joints; Provide one of the following:

   a. "Durock Cement Board" (USG Corp.)

b. "PermaBase" (National Gypsum Co.

c. "Wonder-Board" (Custom Building Products).

d. "Util-A-Crete Concrete Backer Board" (FinPan, Inc.).

B. Exterior Cement Board Sheathing

1. Exterior Cement Board Sheathing: Meet or exceed the physical property requirements of ASTM C1325. 5/8 in. thick unless otherwise shown or specified. Provide the following, or approved equal:

a. "Durock Brand Next Gen e+ Cement Board" (USG Corporation).

2.6 FASTENERS

A. Metal Framing to Structure: Power driven fasteners providing not less than 200 lbf. pull-out strength and 700 lbf. ultimate shear strength.

1. Extra Long Fastener: Provide in lengths as appropriate to fasten into mass timber or steel structure.

B. Steel Drill Screws for Gypsum Board Systems: ASTM C1002, Type G, Type S, or Type W screws, and suitable for fastening into steel not greater than 20 gauge thickness. ASTM C954, for fastening into steel of 20 gauge to 12 gauge thickness. Pan head for metal to metal connections. Bugle head for fastening gypsum board.

C. Concrete and Masonry: For securing to concrete or masonry use 9 gauge case-hardened and quenched steel nails of sufficient length to provide permanent fastening.

D. Other Applications: For other applications involving gypsum board comply with gypsum board manufacturer's printed recommendations

E. Fasteners for Cementitious Board: For fastening cementitious backer units use corrosion resistant coated steel drill screws of size and type recommended by board manufacturer.

2.7 TRIM ACCESSORIES

A. General: ASTM C1047; galvanized steel; Basis-of-Design (BoD) accessories specified herein by proprietary designation are as manufactured by Clark Dietrich Building Systems. and establish the quality standards required; products shall meet BPDO requirement for industry-wide environmental product declaration (EPD). Equivalent products of other manufacturers will be considered provided they meet those established standards. For fire rated assemblies, provide materials, including accessories and fasteners produced by one manufacturer, or, when products of more than one manufacturer are used in a rated system, they shall be acceptable to authorities having jurisdiction.

1. Corner Reinforcement: ASTM C1047; galvanized steel, smooth rigid nose and perforated-knurled flanges suitable for joint treatment. Install in one piece when manufactured in length required. Provide one of the following:

a. BoD: "103 Delux" (Clark Dietrich Building Systems) smooth rigid nose and perforated-knurled flanges suitable for joint treatment. Install in one piece when manufactured in length required. (EPD, GWP 2.39 kg CO2 eq, HPD)

b. “1-1/4 Corner Bead” (Marino\Ware). (EPD, GWP 2.41 kg CO2 eq, HPD)

2. Metal ‘U’ Trim: ASTM C1047; galvanized steel. Provide for protection of exposed gypsum board edges around openings. Galvanized steel, J-shape trim with beaded nose and perforated-knurled flange suitable for joint treatment. Sized for 1/2 in. or 5/8 in. gypsum board; install in one piece when manufactured in length required.

   a. BoD: "Metal U-Trim #200" (ClarkDietrich Building Systems). (EPD, GWP 2.39 kg CO2 eq, HPD).

   b. "U Trim” (Marino\Ware). (EPD, GWP 2.41 kg CO2 eq, HPD)

3. Aluminum Trim: ASTM B221 ; extruded or formed aluminum trim with with 1/4 in. dia. holes in fins for attachment to gypsum board, staggered 1/2 in. on center; longest lengths available; in sizes indicated on Drawings; primed for finish painting; provide one of the following for each type specified:

   a. "L-Trim Molding": Angle type, sized for 1/2 in. or 5/8 in. gypsum board; install in one piece when manufactured in length required.

      1) BoD: (ClarkDietrich Building Systems).

      2) DL Series" (Brand X Metals)

      3) L Trim Series" (Fry Reglet Architectural Metals).

      4) “L Trim Series” (Marino\Ware).

   b. J-Trim Molding: Channel type; install in one piece when manufactured in length required

      1) BoD: (ClarkDietrich Building Systems).

      2) "J-50, J-75, J-100 Series" (Brand X Metals).

      3) "J Trim Series" (Fry Reglet Architectural Metals).

      4) “J Trim Series” (Marino\Ware).

4. Control Joint Trim: ASTM C1047. One-piece joint assembly of roll-formed zinc or extruded vinyl with perforated flange suitable for joint treatment. Provide one of the following:

   a. "No. 093" (ClarkDietrich Building Systems).

   b. “Zinc Control Joint” (Marino\Ware). (EPD, GWP 2.41 kg CO2 eq, HPD)

B. Metal Specialty Accessories

1. Aluminum Trim: ASTM B221 ; extruded or formed aluminum trim with 1/4 in. dia. holes in fins for attachment to gypsum board, staggered 1/2 in. o.c.; longest lengths available; primed for finish painting. Provide the following, or approved equal, for each type specified:

a. Jamb Reveal

1) "Series 300 312-1/2" (Gordon Inc.)

2) "STR-050-050" (Pittcon Industries)

3) "DRMZ-50-50" (Fry Reglet Architectural Metals)

b. Channel Wall Reveal, unless other size noted in drawings

1) "Series 500 512-1/2" (Gordon Inc.).

2) "SWR-050-050" (Pittcon Industries)

3) "DRM-50-50" (Fry Reglet Architectural Metals)

~~c. Rounded Outside Corner~~

~~1) "SO-9-200" (Pittcon Industries).~~

~~2) "DRMC-OS-100" (Fry Reglet Architectural Metals).~~

~~3) "Series 110-90" (Gordon Inc.).~~

~~d. Base Reveal: Extruded aluminum with chemical conversion coating~~

~~1) "Reveal Base Series" (Fry Reglet Architectural Metals)~~

~~2) "Series 800" (Gordon Inc.)~~

~~3) "DZ Series" (Brand X Metals)~~

~~e.~~**c.** W-Reveal

1) "W Series" (Fry Reglet Architectural Metals)

~~f.~~**d.** Corner Trim

1) “Corner Trim“ (Fry Reglet Architectural Metals)

2) “Series 911” (Gordon)

3) “DCT” (Brand X-Metals)

~~g. Column Collar~~

~~1) "DE.1 Column Collar Series" (Fry Reglet Architectural Metals)~~

~~h. Partition End Caps: Extruded aluminum end closure with chemical conversion coating, sizes as noted; provide one of the following:~~

~~1) "Series 911" (Gordon Inc.)~~

~~2) “Drywall Molding End Closure" (Fry Reglet Corp.)~~

~~3) "Drywall End Closure" (Flannery, Inc.)~~

~~i.~~**e.** Acoustic Partition End Closers: Continuous closed cell neoprene compressible filler complying with ASTM D1056; with pressure sensitive temporary positioning adhesive on both sides; thickness and width as shown, or as required to provide a complete sound seal at curtain wall mullions and glass curtain walls.

1) Performance Requirements

a) At Acoustical Partitions: Sound Transmission: As scheduled.

b) At Fire-Rated Partitions: Fire-Rating: Assembly fire rating of 2 hour per UL Joint System No. WW-S-1041.

c) Thermal Movements: Mullion trim cap to be sized to accommodate thermal movement from ambient and surface temperature changes.

2) Approved Products:

a) Mull-it-Over Products

b) Mullion Mate (Gordon, Inc).

3) Product Description:

a) Aluminum extrusion size and end caps: Provide manufacturer's sizes and lengths to coordinate with gypsum board partition size and height.

b) Color: Match curtain wall mullion paint.

c) Compressible Foam: Between edge of extrusion and interior face of curtain wall glass, Light Gray.

d) Accessories

(1) Fasteners: As provided by manufacturer.

(2) Snap Cover as provided by manufacturer.

~~j.~~**f.** Acoustical Sound Sealant: Acrylic latex based.

~~k.~~**g.** Partition Attachment Clips: Coordinate with the requirements of Section 095100 "Acoustical Ceilings" to provide partition attachment clips recommended by the exposed suspension system manufacturer for securing gypsum board partitions to ceiling suspension system. Provide a complete system, including fasteners and other items, in sufficient quantity to perform the Work.

2.8 AUXILIARY MATERIALS

A. Joint Treatment Materials: Provide joint treatment materials complying with ASTM ASTM C475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application shown.

1. Joint Tape for Gypsum Board: Paper reinforcing tape, unless otherwise shown. Use pressure-sensitive or staple-attached open-weave glass-fiber reinforcing tape with compatible joint compound where recommended by manufacturer of gypsum board and joint treatment materials for application indicated.

2. Joint Tape for Cementitious Backer Units: Polymer-coated, open glass-fiber mesh.

3. Drying Type Joint Compounds for Gypsum Board: Factory packaged and mixed vinyl based ready mix formulation. Product shall meet BPDO requirement for industry-wide environmental product declaration (EPD).

4. Joint Compound for Cementitious Backer Unit: Material recommended by cementitious backer unit manufacturer. Product shall meet BPDO requirement for industry-wide environmental product declaration (EPD).

5. Tape for Foil Faced Gypsum Board: Pressure-sensitive tape of type recommended by foil faced gypsum board manufacturer for sealing joints and penetrations in foil faced gypsum board.

6. Silicone Emulsion Sealant for Glass-Mat Gypsum Exterior Sheathing: Product complying with ASTM C834, compatible with sheathing tape and gypsum sheathing, recommended by sheathing and tape manufacturers for use with glass-fiber sheathing tape and for covering exposed fasteners.

7. Glass-Fiber Sheathing Tape for Glass-Mat Gypsum Exterior Sheathing: Self-adhering glass-fiber tape, minimum 2 in. wide, 10 by 10 or 10 by 20 threads per inch, of type recommended by sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing board and with a history of successful in-service use. Provide one of the following:

a. "Perma-Tite Tape--PGM 207A" (PermaGlas-Mesh, Inc.)

b. "Quik-Tape" (Quik-Tape, Inc.)

B. Laminating Adhesive: Special adhesive or joint compound recommended for laminating gypsum base panels to face panels in multilayer construction. Use adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. Acoustical Sealant: Nonsag, paintable, nonstaining, latex sealant complying with ASTM C834 with a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24). Sealant shall effectively reduce airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90. Provide one of the following:

1. "SHEETROCK Acoustical Sealant" (USG Corporation).

2. “Smoke and Sound” (Specified Technologies, Inc.). (HPD)

3. “AC-20 FTR” (Pecora Corporation)

4. “Acoustical Sealant” (Tremco Mfg. Co.).

5. “Quiet Seal ProAC-20 + Silicone” (Serious Energy, Inc.).

D. "SAFB Sound Attenuation Fire Blankets and "SAB" Sound Attenuation Blankets: ASTM C665, Type I Unfaced mineral-fiber blanket insulation with water-resistant binders produced by combining mineral fibers of glass, slag wool, or rock wool type with thermosetting resins (blankets without membrane facing) thermal conductivity of "k" = 0.25 Btu in./hr. ft.^{2} ^{o} F. ^{o}at 75 deg. F. . Minimum 3 pcf ^{3}density. ASTM E84, flame spread 15, smoke developed 10, or less. Provide manufacturer's standard sizes in thickness indicated. For fire-resistance rated assemblies comply with mineral-fiber requirements of assembly. Provide one of the following, or approved equal:

1. "ThermaFiber Sound Attenuation Fire Blankets (SAFB)" (Owens-Corning/ Thermafiber LLC)

2. "Rockwool AFB Acoustical Fire Batt" (Rockwool Inc.)

3. “Sound Attenuation Fire Blankets” (CertainTeed Corporation)

4. “Delta SA Fire Board (Sound Attenuation)” (RockWool Manufacturing Company, Inc.)

5. “Fibrex Sound Attenuation Fire Batt insulation (SAFB)” (Fibrex Inc.).

E. “SAB”, Sound Attenuation Blankets: Provide at non-rated partitions, in accordance with the Partition Schedule indicated on the drawings. ASTM C665, Type I unfaced blanket insulation with water-resistant binders produced by combining fiberglass with thermosetting resins. Provide one of the following:

1. “Sound Control Batts” (Johns Manville). Includes at least 20% post-consumer and 5% pre-consumer recycled content. Contains no formaldehyde. Classified as 25/50 in accordance with ASTM E84.

2. “QuietZone Sound Attenuation Batt Insulation” (Owens Corning). Includes at least 9% post-consumer and 26% pre-consumer recycled content. Classified as 25/50 in accordance with ASTM E84.

F. Fire Safing, Fire Sealant, and Cementitious Seals: Refer to Section 078400 “Firestopping”.

G. Water: Clean and free of deleterious material.

PART 3 - EXECUTION

3.1 GENERAL

A. Manufacturer’s Instructions: Prepare substrates and install the Work of this Section; including components, accessories in accordance with the manufacturer’s instructions, except where more stringent requirements are shown or specified, and where project

conditions, require extra precautions or provisions to ensure satisfactory performance of the Work.

3.2 EXAMINATION

A. Verification of Conditions: Examine the areas to receive the Work and the conditions under which the Work would be performed. Remedy conditions detrimental to the proper and timely completion of the Work. Do not proceed until unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Substrate Acceptability: Commencement of installation shall constitute acceptance of substrate conditions by the Installer.

3.4 INSTALLATION, GENERAL

A. Application Requirements

1. Gypsum Board: Install gypsum board and accessories in accordance with ASTM C840, unless otherwise shown or specified. Install gypsum panels with face side out. Do not install imperfect, damaged, or damp panels.

2. Metal Stud: Install metal stud components in accordance with ASTM C754, unless otherwise shown or specified. Space metal studs a maximum of 16 in. o.c., unless otherwise shown. Install steel studs so flanges point in the same direction and leading edge or end of each gypsum board panel can be attached to open (unsupported) edges of stud flanges first.

3. Sprayed-on-Fireproofing: If sprayed-on fireproofing has been applied, remove only as much fireproofing as needed to complete installation of gypsum board construction. Protect fireproofing that remains from damage.

B. Framing

1. Isolation from Structure: Isolate framing from building structure to prevent transfer of loading imposed by structural movement both horizontally and vertically, at the following locations:

   a. Where edges of suspended ceilings abut building structure horizontally at ceiling perimeters or penetration of structural elements.

   b. Where partition and wall framing abuts overhead structure. Provide slip or cushioned type joints to attain lateral support and avoid axial loading.

2. Do not bridge building expansion and control joints with steel framing or furring members; independently frame both sides of joints with framing or furring members.

3. Isolation from Curtain Wall: Where partitions adjoin surfaces of window mullions at exterior curtain wall, provide an isolation joint between partition framing and window mullion to obtain an acoustical seal and prevent transfer of movement. Install continuous strip of vinyl foam isolation tape, neatly centered along entire length of framing member for full height of partition, and install framing to obtain nominal 30% compression seal of tape in joint with curtain wall mullion.

4. Runners/Tracks: Provide continuous tracks sized to match studs. Align runner tracks accurately to the partition layout at both floor and ceiling. Where partitions abut other construction, provide vertical runner track securely attached to construction. Secure runner tracks as recommended by the manufacturer for the floor and ceiling construction involved, except do not exceed 24 in. o.c. spacing for nails or power-driven fasteners, nor 16 in. o.c. for other types of attachment. Provide fasteners at corners and ends of runner tracks.

   a. Install runners/tracks at floors, ceilings and structural walls and columns where stud system abuts other work, except as otherwise indicated. Install fasteners a maximum of 2 in. from each corner and end of tracks.

   b. Coordination position of fasteners at top track slip joint to accommodate movement due to structural dead loading.

5. Channel Studs: Space studs as shown on Drawings but no more than 16 in. on center, unless otherwise shown. Use full length studs between runner tracks wherever possible. If necessary, splice studs by nesting with a minimum lap of 8 in. and fasten laps with 2 screws through each flange. Friction fit studs to runner tracks by positioning and rotating into place. Provide positive attachment to runner tracks for studs located at partition corners and intersections, and adjacent to openings using 3/8 in. screws or stud clinching tool on both flanges of studs.

6. Furring Channels: Space furring channels not more than 16 in o.c. maximum, unless otherwise noted. Secure to studs with self-tapping screws at each intersection. Attach to concrete or masonry with tempered steel concrete nails. Where splices occur, overlap ends not less than 8 in. with flanges interlocked and fastened, but do not splice furring channels between supports. Place channels within 2 in. of corners, abutments, framed openings or other interruptions in the continuity of the furring system.

7. Provide steel studs at door openings in accordance with the following schedule:

Door Width	Studs
Single doors to 2 ft.-8 in.	Two 25 gauge studs or one 20 gauge stud at each jamb and one additional stud no more than 6 in. from stud. At fire rated openings, use one 20 gauge stud only.
Single doors greater than 2 ft.- 8 in. to 4 ft.	One 20 gauge stud at each jamb and one additional stud no more than 6 in. from jamb studs
Single doors greater than 4 ft. and pairs of doors	Two 20 gauge studs at each jamb and one additional stud no more than 6 in. from jamb studs

   a. Provide runner track and typical studs above door openings with studs spaced not more than 24 in. o.c..

b. At welded frames with fixed anchor clips secure stud reinforcing to jamb anchor clips with not less than two self-tapping screws per clip.

c. Provide additional framing, reinforcing and bracing at door head locations as required to provide a rigid installation. Bracing shall be attached to structural elements, beams, slabs, etc. Attachment to mechanical or electrical components will not be permitted.

8. Additional Framing: Provide additional framing, reinforcing and blocking as required to support gypsum board at openings and cutouts and to support built-in anchorage, fixtures, equipment, or similar construction and attachment devices.

9. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.

a. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.

b. At fire rated partitions, where items are recessed mounted in the partition (including but not limited to metal toilet accessories and water fountains), comply with manufacturer's written installation instructions required to maintain partition rating.

C. Panel Materials

1. General: Install Impact Resistant Panels for the first 8 ft. of ~~all~~ gypsum board partitions **in Gymnasium**. Install materials in accordance with ASTM C840, unless otherwise shown. Gypsum wallboard, gypsum lath, or gypsum plaster shall not be installed until weather protection for the installation is provided.

2. Provide boards thicknesses as shown on Drawings, but not less than 5/8 in. thickness for multi-layer construction, and 5/8 in. thickness for single-layer construction, unless otherwise noted.

3. Install gypsum board with face side out. Do not install imperfect or damaged boards, or if damp or wet.

4. Butt wallboard joints loosely together. Butt panels together for a light contact at edges and ends with not more than 1/16 in. of open space between panels. Do not place butt ends against recessed or tapered edges. Allow a maximum gap of 1/4 in. at end joints.

5. Install maximum practical lengths of gypsum board to span walls with minimum number of end butt joints. Where butt joints are necessary, stagger joints and locate as far as possible from center of walls.

6. Edges and Ends: Locate both edge or end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Position adjoining panels so that tapered edges abut tapered edges, and field-cut edges abut field-cut edges and ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions. Avoid joints at corners of framed openings where possible. Attach gypsum panels to steel studs so that the leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

7. Walls: Apply panel materials on walls horizontally for ceiling heights less than 8 ft. Where ceiling heights are over 8 ft. or over or wall is 4 ft. wide or less, apply panels vertically.

8. Control Joints: Install control joints in locations and as required. Obtain Professional's approval for all locations. In fire rated partitions, install control joints so as not to compromise specified ratings. Note locations of control joints on shop drawings.

9. Install metal trim at exposed edges, frames, and other locations as shown. Fasten trim securely. Spot grout door frames at quarter points and jamb anchors. Use specified spot grout joint compound and apply before inserting face layer into frame.

10. Fitting at Door Frames: At hollow metal door frames, cut gypsum boards to fit around hardware reinforcement or mortar boxes. Spot grout frames with a quick setting grout or compound at each jamb anchor clip just prior to inserting of boards into frame at tenant entry doors and base building doors. Insert boards into frame so that its edge is fully bedded against inside surface of the frame. Butter the edge of boards with joint compound if necessary to achieve full bedding.

11. Curved Gypsum Board: Form curved gypsum board surfaces to provide a finish surface which is a smooth, even curve without flat faces or other imperfections. Comply with Gypsum Association GA-226 "Application of Gypsum Board to Form Curved Surfaces".

12. Fire-Resistance-Rated Partitions: Install gypsum board to comply with fire-resistance-rated assembly indicated and to make partitions continuous from floor to underside of solid structure.

13. Openings: Cut openings in gypsum board for electrical outlets, piping and other penetrations. Maintain close tolerances so that edges will be covered by plates and escutcheons. Cut both face and back paper. Do not install electrical outlets back to back on opposing sides of partitions.

14. Install fasteners not less than 3/8 in. from ends or edges of gypsum board sheets, spacing fasteners opposite each other on adjacent ends or edges. Begin fastening from center of gypsum board and proceed toward edges and corners. Apply pressure on surface of gypsum board adjacent to fasteners being driven to ensure that gypsum board will be secured tightly to supporting members. Drive fastener with shank perpendicular to face of board. Set heads of screws slightly below surface of paper without cutting paper. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard.

15. Partition Attachment Clips: Install partition attachment clips recommended by the exposed mechanical suspension system manufacturer to comply with performance requirements specified herein and in Section 095100 "Acoustical Ceilings" and as follows:

    a. Install a minimum of 2 ft. o.c.; alternating direction of each clip, along entire length of runner for each partition which is dependent on the ceiling system for lateral support.

D. Acoustic Sealing Requirements: Provide acoustical sealant at perimeter of gypsum board areas as follows unless otherwise shown or noted:

1. At partition walls, provide continuous beads of acoustical sealant at juncture of both faces of runners or plates with floor and ceiling construction, and wherever gypsum board abuts dissimilar materials (i.e., doors and windows). Apply prior to installation of gypsum board.

2. At ceilings, provide continuous beads of acoustical sealant wherever gypsum board abuts dissimilar materials.

3. Provide continuous bead of acoustical sealant behind faces of control joints. Apply prior to installation of surface-applied control joint accessories and locate at proper depth in joint to allow for insertion of expansion portion of control joint accessory.

4. At openings and cutouts, fill open spaces between gypsum board and fixtures, cabinets, ducts and other flush or penetrating items, with continuous bead of acoustical sealant.

5. Provide acoustical sealant at sides and backs of electrical boxes to completely seal openings and joints.

6. Sound Flanking Paths: Where sound-rated partition walls intersect non-rated gypsum board partition walls, extend sound-rated construction to completely close sound flanking paths through non-rated construction. Provide acoustical sealant at joints between face layers at vertical interior angles of intersecting partitions.

7. Partition End Fillers: Install compressible filler continuously between window wall mullion and gypsum board partition end filler panels, maintaining a min. of 3/4 in. spacing to allow for curtain wall deflection. Utilize self-adhesive to position end fillers on curtain wall mullion. Adhesively apply compressible filler continuously from floor to ceiling including underside of soffit. Do not penetrate curtain wall mullion with any type of fastenings. Prior to installing partition studs or vertical support members, apply adhesive to side facing partition to allow for two-sided adhesion and a continuous seal. Where acoustic end fillers are used follow manufacturer's installation instructions.

3.5 GYPSUM BOARD SINGLE LAYER APPLICATION

A. Walls: Apply gypsum board on walls horizontally for ceiling heights less than 8 ft. 1 in. . Where ceiling heights are over 8 ft. 1 in. or wall is 4 ft. wide or less apply gypsum board vertically. Where horizontal application is used on walls, apply top panel first and butt tight to ceiling. Where vertical application is used apply gypsum board from ceiling to floor by single length of gypsum board. Hold joints back at least 8 in. from corners of door frames. Space nails not more than 8 in. o.c., and space screws not more than 16 in. o.c.

B. Ceilings and Interior Soffits: On ceilings and interior soffits, apply gypsum panels prior to wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.

3.6 GYPSUM BOARD DOUBLE LAYER APPLICATION

A. Walls

1. Base Layer: Apply on walls vertically with long joints on framing members. Space nails not more than 8 in. o.c., and space screws not more than 16 in. o.c.

2. Face Layer: Laminate face layer to base layer with laminating adhesive, with joints on surface spaced minimum 10 in. from the parallel joints in the base layer. Cut and fit boards before applying adhesive. For fire-rated construction provide screw attachment or apply adhesive uniformly over entire back surface to comply with UL listing for the rating shown. For non-rated construction apply adhesive in 3/8 in. x 2 in. beads and support as recommended by the gypsum board manufacturer until proper bond is developed. Remove temporary bracing and supports.

B. Ceilings and Interior Soffits: Apply base layer prior to applying base layer on walls/partitions; apply face layers in same sequence. Offset face-layer joints at least 10 in. from parallel base-layer joints. Apply base layers at right angles to framing members unless otherwise indicated.

3.7 SOUND CONTROLLED PARTITIONS

A. Sound-rated partition construction details must be consistent with good acoustical design practice. All full height STC-rated partitions must conform to the instructions stated in Section III of the Gypsum Association 2018 Fire Resistance Design Manual. The practices outlined below should be incorporated where a specific acoustic requirement is to be met.

B. Sound Flanking Paths: Where sound-rated partition walls intersect non-rated gypsum board partition walls, extend sound-rated construction to completely close sound flanking paths through non-rated construction. Caulk joints between face layers at vertical interior angles of intersecting partitions.

C. Provide the combination of gypsum boards and framing as shown.

1. Provide continuous beads of non-hardening caulk on both sides of the top and bottom stud runner, along each intersection of the runner, floor, and drywall.

2. Apply acoustical sealant in beads under gypsum board each side of partitions at perimeters and at intersections. Size and place beads to ensure the STC rating of the wall system.

3. Electrical and service outlets in a common wall serving adjacent rooms are to be positioned minimum 16 in. apart and in separate stud spaces. Provide acoustical sealant beads in back of control joints, around outlet boxes, and at perimeter of cutouts to completely seal openings and joints.

4. No drywall layers are to be continuous between two adjacent rooms.

5. Demising partitions should seal directly to the base building construction, such as at column enclosures, etc.

6. Multiple layers of drywall should be applied with staggered joints. Joints should be positioned a minimum of 16-inches apart.

7. Return air transfer and pathways are to be coordinated with mechanical engineers.

8. Penetrations that interrupt studs should be framed out; the framing should maintain less than a 2-inch gap around the penetrating element. There should be no direct contact between the penetrating element and the partition.

9. Penetrations (ducts, pipes, conduit, etc.) through acoustical partitions are to be handled as follows:

   a. Gap up to 1/2 in. : Acoustical sealant or similar non-hardening, ever-resilient caulking compound.

   b. Gap from 1/2 in. up to 1 in. : Compressed foam backer rod with acoustical sealant or similar non-hardening, ever-resilient caulking compound.

   c. Gaps between 1 in. and 2-in. : Filled tightly with batt insulation, then sealed with heavy-density putty.

D. Install acoustical insulation where shown. Form continuous layer for full height of partition and tightly abutting web of studs. Fit carefully behind electrical outlets and other penetrations. Attach to back face of gypsum board in accordance with manufacturer's instructions.

E. Cable trays should not be located within acoustical partitions. If cable trays are required within acoustical partitions, all space to be packed tightly with firestop pillows and sealed heavy density putty, as above, once cables are pulled.

3.8 WATER-RESISTANT GYPSUM BOARD INSTALLATION

A. Use as a substrate for ceramic wall tile and elsewhere as wall application in wet areas as shown. Do not use for ceiling applications.

B. Pre-cut panels to required size and make necessary cut-outs. Treat cut or exposed panel edges before installation and maintain factory made paper edge at bottom of panels.

C. In areas to receive ceramic tile finish, treat all joints, penetrations and fastener heads with specified joint treatment.

D. Treat joints and fastener heads with water-resistant compound. Fill tapered edges in gypsum panel completely with water-resistant compound, embed reinforcing tape firmly, and wipe off excess compound. Immediately apply a second or skin coat over the taping coat, being careful not to crown joint or to leave excess compound. Apply water-resistant compound and tape to vertical angles in similar manner. Fill and seal openings around pipes, fittings and fixtures with water-resistant compound.

E. Shower Substrates: Cement board. At cement board manufacturer’s recommendation, install vapor retarder on inside face of cement board. Tape vapor retarder to metal studs, overlapping film edges by 1 in. . Completely seal edges with tape. Seal vapor retarder around any penetrations and openings in the cement board substrate.

3.9 GYPSUM BOARD CEILING AND INTERIOR SOFFIT INSTALLATION

A. Provide hangers and inserts necessary to support suspended ceilings and interior soffits below concrete slab before concrete is cast and in time to avoid delay in work. Give particular attention to the correct location and alignment of hangers and inserts. Frame openings with furring strips so that recessed items finish flush, unless shown.

B. Provide sufficient hangers for runner channels on each side of light fixtures, ceiling diffusers and grilles, access panels and other items penetrating the ceiling and/or interior soffits.

C. Where ceilings and/or interior soffits are suspended below ductwork, piping or other building elements which are not suitable for ceiling attachment due to strength limitations, or restrictions of local authorities having jurisdiction, provide additional supplemental framing, supports and related work as required to span beneath these elements from suitable support locations. Keep hangers and braces 2 in. clear of ducts, pipes and conduits.

D. Secure furring channels to primary carrying channels by clips or wire ties. Fasten gypsum board with screws to furring channels on 12 in. o.c.

3.10 SUSPENDED EXTERIOR SOFFIT INSTALLATION

A. Provide hangers and inserts necessary to support suspended soffits below concrete slab before concrete is poured and in time to avoid delay in work. Give particular attention to the correct location and alignment of hangers and inserts. Provide brass wedges and other materials as required to make metal furring installation rigid. Frame openings with furring strips so that recessed items finish flush. Provide cross-bracing and additional framing as required to resist wind uplift.

B. Provide sufficient hangers for runner channels on each side of light fixtures, access panels and other items penetrating the soffits.

C. Apply exterior gypsum soffit board perpendicular to supports, with end joints staggered over supports. Install with 1/4 in. open space where boards abut other construction. Fasten with corrosion resistant screws as recommended by the manufacturer.

D. Finish exterior gypsum soffit board using setting-type joint compounds to prefill joints and embed tape, and for first, fill (second) and finish (third) coats, with the last coat being a sandable product. Smooth each coat before joint compound hardens to minimize need for sanding. Sand between coats and after finish coat.

3.11 CEMENTITIOUS BACKER BOARD INSTALLATION

A. Pre-cut board to required sizes, making necessary cut-outs. Fasten boards to studs with screws spaced not more than 8 in. center to center. Apply 2 in. wide fiberglass reinforcement tape over joints and corners; embed with mortar or adhesive used to set tile.

3.12 INSTALLATION OF CHASES

A. Align two parallel rows of floor and ceiling runners and secure as hereinbefore specified for partitions. Position metal studs vertically in runners, 16 in. o.c. and secure to runners with screws. Brace studs with 2-1/2 in. metal studs installed horizontally at 48 in. o.c. Install gypsum board as specified for partitions.

3.13 SHAFT WALL INSTALLATIONS

A. Provide consisting of metal runners, studs, gypsum board and fasteners. Provide fireproof assemblies for the hourly rating shown or required and complying with UL listing.

B. Do not bridge building expansion joints with shaft wall system, frame both sides of joints with furring and other support as indicated.

C. Install supplementary framing, blocking and bracing to support gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings and similar work which cannot be adequately supported directly by regular framing of gypsum board shaft wall system.

D. Support elevator hoistway door frames independently of shaft wall framing system, or reinforce system in accordance with system manufacturer's instructions.

E. Where handrails are indicated for direct attachment to gypsum board shaft wall system, provide not less than an 18 gauge thick by 4 in. wide galvanized steel reinforcement strip, accurately positioned and secured behind not less than one gypsum board face layer of 5/8 in. thickness.

F. Coordinate gypsum board shaft wall construction with sprayed-on fireproofing of the structure, so that both remain complete and undamaged. Patch or replace sprayed-on fireproofing removed or damaged during the installation of the shaft wall system.

1. Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling runners (tracks) to surfaces indicated to receive sprayed fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 24 in. o.c.

2. After sprayed fire-resistive materials are applied, remove them only to extent necessary for installation of gypsum board assemblies and without reducing the fire-resistive material thickness below that which is required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.

G. Fire-Resistance-Rated Partitions: Install gypsum board shaftwall to comply with fire-resistance-rated assembly indicated.

H. Integrate stair hanger rods with gypsum board shaft wall system where indicated (and where possible); by locating rod in cavity of system as required to enclose rods.

I. At penetrations in shaft wall, maintain fire resistance rating of entire shaft wall assembly by installing supplementary fire protection behind boxes containing wiring devices, elevator call buttons, elevator floor indicators, and similar items.

J. Isolate shaft wall system from transfer of structural loading to system, both horizontally and vertically. Provide slip or cushioned type joints to attain lateral support and avoid axial loading. Comply with details shown and with manufacturer's instructions.

K. Seal gypsum board shaft walls at perimeter of each section which abuts other work and at joints and penetrations within each section. Install acoustical sealant to withstand dislocation by air pressure differential between shaft and external spaces; comply with ASTM C919.

L. In elevator shafts where gypsum board shaft wall system cannot be positioned within 2 in. of shaft face of structural beams, floor edges and similar projections into shaft, install 5/8 in. thick gypsum board cants covering tops of projections as follows:

1. Slope cant panels not more than 15 deg. from vertical. Set base-edge of panels in gypsum board adhesive and secure top edges to shaft walls at 24 in. o.c. with screws fastened to shaft wall framing.

2. Where cants exceed 2 in. , support gypsum board with steel studs spaced 24 in. o.c.; extend studs from top of projection to shaft wall framing behind cant.

M. Runners shall be securely attached at the floor and ceiling to structural element members in such a manner that provides lateral resistance in excess of the equivalent energy of Soft Body Impact Classification Level 2 of ASTM C1629. The installation of top and bottom runner tracks shall be subject to controlled inspection.

3.14 PRESSURIZED VESTIBULES AND STAIRWAYS

A. General: Where scheduled as pressurized, construct wall and ceiling enclosure as specified for other fire rated construction to attain UL hourly rating shown.

B. Sealing: Seal perimeter joints between outlet boxes and other built-in items, and other penetrations through gypsum board. Use sealant as specified under Section 079200 “Sealants”, other acceptable materials, and methods as necessary to make installation airtight; no air leakage permitted.

3.15 EXTERIOR SHEATHING BOARD INSTALLATION

A. Exterior Sheathing: Install in accordance with GA-253. Space fasteners in accordance with manufacturer’s recommendations. Apply weather resistant barriers specified in other sections.

1. Cut boards at penetrations, edges, and other obstructions of the work; fit tightly against abutting construction, except provide a 3/8 in. setback where non-load-bearing construction abuts structural elements.

2. Coordinate sheathing installation with flashing and joint sealant installation so these materials are installed in the sequence and manner that prevent exterior moisture from passing through completed exterior wall assembly.

3. Apply fasteners so screw heads bear tightly against face of sheathing boards but do not cut into facing.

4. Do not bridge building expansion joints with sheathing; cut and space edges to match spacing of structural support elements.

5. Vertical Installation: Install 48 in. wide gypsum sheathing boards vertically with vertical edges centered over flanges of steel studs. Abut ends and edges of each board with those of adjacent boards. Screw-attach boards at perimeter and within field of board to each steel stud as follows:

    a. Fasteners spaced approximately 8 in. o.c. and set back a minimum of 3/8 in. from edges and ends of boards.

6. Sealing Sheathing Joints: Seal joints according to sheathing manufacturer's written recommendations and as follows:

    a. Apply elastomeric sealant on joints and fasteners and trowel flat. Apply sufficient quantity of sealant to completely cover joints and fasteners after troweling. Seal other penetrations and openings.

7. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing board joints and apply and trowel silicone emulsion sealant to embed sealant in entire face of

tape. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.

3.16 MISCELLANEOUS INSTALLATIONS

A. Gypsum board Application to Rigid Insulation: Use mastic compatible with rigid insulation and gypsum board, to provide bond at interface and permit differential movement. Use mastic and application approved by the gypsum board and insulation manufacturer.

B. Fireproofing

1. Columns: Provide fireproof assemblies for the hourly rating shown or required consisting of studs, angles, wire and gypsum board layers. Install in accordance with manufacturer's instructions to comply with UL listing.

2. Beams: Provide fireproof assemblies for the hourly rating shown or required consisting of metal runners, fasteners and gypsum board layers. Install in accordance with manufacturer's instructions to comply with UL listing.

C. Fire-Resistive Joint Systems

1. General: Install fire-resistive joint systems to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.

2. Install forming materials and other accessories of types required to support fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

a. After installing fill materials and fire-resistive spray materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system.

3. Install fill materials and fire-resistive spray materials for fire-resistive joint systems by proven techniques to produce the following results:

a. Fill voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.

b. Apply fill materials and fire-resistive spray materials so they contact and adhere to substrates formed by joints.

c. For fill materials and fire-resistive spray materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.17 GENERAL FINISHING REQUIREMENTS

A. Level 5 Finish for Areas Exposed to View: In all areas exposed to view, finish gypsum board in accordance with ASTM C840, Level 5, unless otherwise shown or specified. Level 5 consists of embedding the tape in joint compound at joints and angles and applying (2) two separate additional coats of joint compound over joints, angles, fastener heads, and flanges of trim accessories. Apply a thin skim coat of joint compound or

material manufactured especially for this purpose to the entire surface. Panel surfaces and joint compound must be smooth and free of tool marks and ridges and applying a skim coat of joint compound over entire surface. Surfaces must be smooth and free of tool marks and ridges.

B. Level 4 Finish for Non-Public Spaces: In mechanical equipment rooms, elevator machine rooms, electrical closets, utility rooms and other similar type rooms not exposed to view, finish gypsum board in accordance with ASTM C840, Level 4, unless otherwise shown or specified. Level 4 consists of embedding the tape in joint compound at joints and angles and applying (2) two separate additional coats of joint compound over joints, angles, fastener heads, and flanges of trim accessories. Panel surfaces and joint compound must be smooth and free of tool marks and ridges.

C. Level 3 Finish for Appearance Areas that are to Receive Heavy – or Medium-Texture Finishes Before Final Painting or where Heavy Grade Wallcoverings are to be Applied: Finish gypsum board in accordance with ASTM C840, Level 3, unless otherwise shown or specified. Level 3 consists of embedding the tape in joint compound at all joints and interior angles and wiping down with a joint knife leaving a thin coating of joint compound over all joints and interior angles. One additional coat of joint compound shall be applied over all joints and interior angles. Fastener heads and accessories shall be covered with two separate coats of joint compound. All joint compound shall be smooth and free of tool marks and ridges. The prepared surface shall be coated with a drywall primer prior to the application of final finishes.

D. Level 2 Finish for Gypsum Board Utilized as Substrate for Ceramic Tile or Other Tile Like Finishes: In areas scheduled for installation of ceramic tile or other tile like finishes, finish gypsum board in accordance with ASTM C840, Level 2, unless otherwise shown or specified. Level 2 consists of embedding the tape in joint compound at joints and angles and applying (1) one separate coat of joint compound over joints, angles, fastener heads, and flanges of trim accessories. Panel surfaces and joint compound must be smooth and free of tool marks and ridges.

E. Acoustical Sealant: Fill openings around cutouts, penetrations and other openings with acoustical sealant.

F. Reinforcement: Reinforce joints at tapered edges and interior corners with joint reinforcing tape set in joint compound in accordance ASTM C840, levels of finish as specified.

G. Installation of Metal Trim: For trim accessories with back flanges, fasten to framing with the same fasteners used to fasten gypsum board.

3.18 DEPARTMENT’S QUALITY ASSURANCE SERVICES

A. Quality Assurance Services: Independent Testing and Inspection Agency(ies), engaged at the Department’s expense through the Professional, will perform the following activities to monitor the Contractor’s Quality Control Services. The Department's Quality Assurance Services monitoring of activities do not relieve the Contractor of responsibilities under the Contract.

B. Contractor's Assistance to the Quality Assurance Services: Furnish the Department's Quality Assurance Services with access to the Work, materials and facilities as required by the Agency(ies). Provide adequate notice of construction activities to allow timely inspections and observation of Contractor tests, and be available for pre-installation meetings. Furnish the Department's Testing and Inspection Agency(ies), with on-site office facilities.

3.19 FIELD QUALITY CONTROL

A. Contractor's Quality Control Responsibilities: Contractor is solely responsible for quality control of the Work.

B. Tolerances

1. Lightgauge framing within 1/8 in. in 10 ft. (non-cumulative) for plumbness and level., +/- 1/8 in. for fastening surfaces of adjacent framing members and for deviation from specified spacing.

2. Finish board surfaces within 1/4 in. in 10 ft. (non-cumulative) for plumb, level, warp and bow.

3. Finish board surfaces within+/- 1/4 in. from plan location.

4. Finish board surfaces within 1/16 in. between planes of board faces.

C. Testing for STC Ratings: Conduct Sound Transmission Class field ratings tests in accordance with ASTM E336 for partitions in sound controlled spaces ~~where shown~~ **indicated, unless otherwise noted**. The Department may designate similar sized spaces, in lieu of those shown, for conducting STC testing. **Conduct STC rating tests in the following locations:**

1. One (1) dorm room in MAQ
2. One (1) classroom in MAQ
3. Auditorium (M-0220)
4. Editing Room (M-0331)
5. Video Studio (M-0339)
~~C.~~**6. Major's Office (M-0355)**

3.20 CLEANING

A. Upon completion of the Work, remove unused materials, debris, containers and equipment from the project site. Leave floors broom clean

3.21 PROTECTION

A. General: Protect fixtures, frames, inserts and other contiguous work from rusting, soiling or clogging due to gypsum board installation. Protect and maintain the work through the construction period so that it will be without indication of damage at the time of acceptance by the Department.

B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

pennsylvania
DEPARTMENT OF GENERAL SERVICES

UNIT PRICE SCHEDULE

Project: Pennsylvania State Police Academy Core Buildings, BESO & Sitework

Project Number: DGS C-0211-0005 - 005

Contract Number: DGS C-0211-0005.1 - 005

FOR AN EXPLANATION OF UNIT PRICES SEE SECTION 010250 OF THE SPECIFICATIONS AND ANY ADDENDUM THAT MODIFIES SECTION 010250

The unit prices are for adjusting the quantities of work listed below and listed and described in the Contract Documents to reflect actual installed quantities. **Only one Unit Price is entered which will apply to both the ADD and the DEDUCT adjustment for actual quantity.**

UNIT PRICE SCHEDULE				
ITEM NO.	DESCRIPTION	UNIT OF MEASUREMENT	QUANTITY	UNIT PRICE
MARQUEE Building				
1	Foundation concrete	Cu. Yds	100	$
2	Foundation reinforcement	Tons	2	$
3	Anchor rods – 1 1/2" x 30" ASTM F1554 Grade 55	Each	4	$
4	Rock anchors – Type 1	Each	2	$
5	Foundation wall penetrations – 12" dia.	Each	4	$
6	Foundation wall penetrations – 6" dia.	Each	6	$
7	Grade beam penetrations – 6" dia.	Each	5	$
8	Floor slab concrete	Cu. Yds	50	$
9	Slab reinforcement	Tons	0.5	$
10	Steel deck – 3" 18 GA	SF	250	$
11	CLT – 5 ply 6 7/8"	SF	250	$
12	Metal Deck Closure	LF	500	$

13	Structural steel framing (identified prior to fabrication)	Tons	30	$
14	Structural steel framing (identified after erection complete)	Tons	2	$
15	Shop installed circular beam penetrations -6" dia.	Each	75	$
16	Shop installed rectangular beam penetrations -10"x20" reinforced	Each	10	$
17	Field installed circular beam penetrations – 6" dia.	Each	10	$
18	Headed shear studs – ¾" x 6" long	Each	500	$
PEMB Foundation				
19	Concrete	Cu. Yds	100	$
20	Reinforcement	Tons	2	$
Other buildings (not including PEMB)				
21	Foundation concrete	Cu. Yds	50	$
22	Foundation reinforcement	Tons	1	$
23	Structural steel framing	Tons	2	$
24	8" Structural CMU wall	SF	250	$
25	Glulam 6 ¾" x 18"	LF	50	$
ACM Waterproofing Material Work				
26	Main Building (Buildings A, B, C, D, E and H). Foundations	SF	10,000	$
27	Main Building (Buildings A, B, C, D, E and H). Structural and masonry components behind face brick	SF	20,000	$
28	Pool Area of Main Building. Waterproofing associated with the Pool and its surroundings	SF	2,000	$
29	Maintenance Building. Foundations	SFG	2,000	$
30	Maintenance Building. Structural and masonry components behind face	SF	2,000	$
31	Miscellaneous Concealed Spaces. Allowance for ACM waterproofing discovered during demolition/site activities	SF	2,000	$

Excavation Work				
32	Over-excavated materials	Cu. Yd	1	$
Temporary Heat Days				
33	Temporary Heat Days	Day	1	$

pennsylvania
DEPARTMENT OF GENERAL SERVICES

UNIT PRICE SCHEDULE

Project: Pennsylvania State Police Academy Core Buildings, BESO & Sitework

Project Number: DGS C-0211-0005 - 005

Contract Number: DGS C-0211-0005.2 - 005

FOR AN EXPLANATION OF UNIT PRICES SEE SECTION 010250 OF THE SPECIFICATIONS AND ANY ADDENDUM THAT MODIFIES SECTION 010250

The unit prices are for adjusting the quantities of work listed below and listed and described in the Contract Documents to reflect actual installed quantities. **Only one Unit Price is entered which will apply to both the ADD and the DEDUCT adjustment for actual quantity.**

UNIT PRICE SCHEDULE				
ITEM NO.	DESCRIPTION	UNIT OF MEASUREMENT	QUANTITY	UNIT PRICE
1	Insulated Chilled Water Pipe ½”	Per foot	100	$
2	Insulated Chilled Water Pipe 3/4”	Per foot	100	$
3	Insulated Chilled Water Pipe 1”	Per foot	100	$
4	Insulated Chilled Water Pipe 1 1/4”	Per foot	100	$
5	Insulated Chilled Water Pipe 1 1/2”	Per foot	100	$
6	Insulated Chilled Water Pipe 2”	Per foot	100	$
7	Insulated Chilled Water Pipe 2 1/2”	Per foot	100	$
8	Insulated Chilled Water Pipe 3”	Per foot	100	$
9	Insulated Chilled Water Pipe 4”	Per foot	100	$
10	Insulated Chilled Water Pipe 5”	Per foot	100	$
11	Insulated Chilled Water Pipe 6”	Per foot	100	$
12	Insulated Chilled Water Pipe 8”	Per foot	100	$
13	Insulated Chilled Water Pipe 10”	Per foot	100	$

14	Insulated Hot Water Pipe ½”	Per foot	100	$
15	Insulated Hot Water Pipe 3/4”	Per foot	100	$
16	Insulated Hot Water Pipe 1”	Per foot	100	$
17	Insulated Hot Water Pipe 1 1/4”	Per foot	100	$
18	Insulated Hot Water Pipe 1 1/2”	Per foot	100	$
19	Insulated Hot Water Pipe 2”	Per foot	100	$
20	Insulated Hot Water Pipe 2 1/2”	Per foot	100	$
21	Insulated Hot Water Pipe 3”	Per foot	100	$
22	Insulated Hot Water Pipe 4”	Per foot	100	$
23	Insulated Hot Water Pipe 5”	Per foot	100	$
24	Insulated Hot Water Pipe 6”	Per foot	100	$
25	Insulated Hot Water Pipe 8”	Per foot	100	$
26	Insulated Hot Water Pipe 10”	Per foot	100	$
27	Condenser Water Piping 2”	Per foot	100	$
28	Condenser Water Piping 2 1/2”	Per foot	100	$
29	Condenser Water Piping 3”	Per foot	100	$
30	Condenser Water Piping 4”	Per foot	100	$
31	Condenser Water Piping 5”	Per foot	100	$
32	Condenser Water Piping 6”	Per foot	100	$
33	Condenser Water Piping 8”	Per foot	100	$
34	Condenser Water Piping 10”	Per foot	100	$
35	Condenser Water Piping 12”	Per foot	100	$
36	Galvanized sheet metal all gauges	Per Lb.	250	$
37	Specified Duct Insulation	Per Square Foot	50	$
38	Chilled Water Fan Coil Units	Per Unit	5	$
39	Fan Powered VAV Boxes	Per Unit	5	$
40	Shut Off VAV boxes	Per Unit	5	$

41	DOAS Terminal Boxes	Per Item	5	$
42	Lay-in 24”x24” Ceiling Diffuser	Per Item	5	$
43	Lay-in 12”x12” Ceiling Diffuser	Per Item	5	$
44	Sidewall Grille – 0-10 Square Inches	Per Item	5	$
45	Sidewall Grille – 10-50 Square Inches	Per Item	5	$
46	Sidewall Grille – 50-100 Square Inches	Per Item	5	$
47	Sidewall Grille – 100-200 Square Inches	Per Item	5	$
48	Sidewall Grille – 200-500 Square Inches	Per Item	5	$
49	Sidewall Grille – 500-1000 Square Inches	Per Item	5	$
50	Linear Slot Diffuser – 4’	Per Item	5	$
51	Analog Control Points	Per Item	10	$
52	Digital Control Points	Per Item	10	$
53	Fire Damper – 0-50 Square Inches	Per Item	1	$
54	Fire Damper – 50-200 Square Inches	Per Item	1	$
55	Fire Damper – 200-500 Square Inches	Per Item	1	$
56	Fire Damper – 500-1000 Square Inches	Per Item	1	$
57	Fire Damper – 1000-1500 Square Inches	Per Item	1	$
58	Fire Damper – 1500-2000 Square Inches	Per Item	1	$
59	Smoke Damper – 0-50 Square Inches	Per Item	1	$
60	Smoke Damper – 50-200 Square Inches	Per Item	1	$
61	Smoke Damper – 200-500 Square Inches	Per Item	1	$
62	Smoke Damper – 500-1000 Square Inches	Per Item	1	$
63	Smoke Damper – 1000-1500 Square Inches	Per Item	1	$
64	Smoke Damper – 1500-2000 Square Inches	Per Item	1	$
65	Volume Control Damper – 0-50 Square Inches	Per Item	5	$

66	Volume Control Damper – 50-200 Square Inches	Per Item	5	$
67	Volume Control Damper – 200-500 Square Inches	Per Item	5	$
68	Volume Control Damper – 500-1000 Square Inches	Per Item	5	$
69	Volume Control Damper – 1000-1500 Square Inches	Per Item	5	$
70	Volume Control Damper – 1500-2000 Square Inches	Per Item	5	$
71	Specified Valves – ½"	Per Item	5	$
72	Specified Valves – ¾"	Per Item	5	$
73	Specified Valves – 1"	Per Item	5	$
74	Specified Valves – 1 ¼"	Per Item	5	$
75	Specified Valves – 1 ½"	Per Item	5	$
76	Specified Valves – 2"	Per Item	5	$
77	Specified Valves – 2 ½"	Per Item	5	$
78	Specified Valves – 3"	Per Item	5	$
79	Specified Valves – 4"	Per Item	5	$
80	Specified Valves – 5"	Per Item	5	$
81	Specified Valves – 6"	Per Item	5	$
82	Specified Valves – 8"	Per Item	5	$
83	Specified Valves – 10"	Per Item	5	$
84	Specified Valves – 12"	Per Item	5	$
Temporary Heat Days				
85	Temporary Heat Days	Day	1	$

pennsylvania
DEPARTMENT OF GENERAL SERVICES

UNIT PRICE SCHEDULE

Project: Pennsylvania State Police Academy Core Buildings, BESO & Sitework

Project Number: DGS C-0211-0005 - 005

Contract Number: DGS C-0211-0005.3 - 005

FOR AN EXPLANATION OF UNIT PRICES SEE SECTION 010250 OF THE SPECIFICATIONS AND ANY ADDENDUM THAT MODIFIES SECTION 010250

The unit prices are for adjusting the quantities of work listed below and listed and described in the Contract Documents to reflect actual installed quantities. **Only one Unit Price is entered which will apply to both the ADD and the DEDUCT adjustment for actual quantity.**

UNIT PRICE SCHEDULE				
ITEM NO.	DESCRIPTION	UNIT OF MEASUREMENT	QUANTITY	UNIT PRICE
22 05 23 GENERAL DUTY VALVES FOR PLUMBING				
1	Ball Valves, Soldered or Threaded			
	1/2" Ball Valve	EA	1	
	3/4" Ball Valve	EA	1	
	1" Ball Valve	EA	1	
	1-1/2" Ball Valve	EA	1	
	2" Ball Valve	EA	1	
2	Gate Valve, Soldered or Threaded			
	1" Gate Valve	EA	1	
	1-1/2" Gate Valve	EA	1	
	2" Gate Valve	EA	1	
	2-1/2" Gate Valve	EA	1	

	3" Gate Valve	EA	1	
3	Check Valve, Soldered or Threaded			
	1/2" Check Valve	EA	1	
	1" Check Valve	EA	1	
	1-1/2" Check Valve	EA	1	
	2" Check Valve	EA	1	
4	Butterfly Valve, Soldered or Threaded			
	1" Butterfly Valve	EA	1	
	2" Butterfly Valve	EA	1	
5	Globe Valve, Soldered or Threaded			
	1/2" Globe Valve	EA	1	
	1" Globe Valve	EA	1	
	2" Globe Valve	EA	1	
	3" Globe Valve	EA	1	
22 07 19 PLUMBING PIPING INSULATION				
1	1" Mineral Wool insulation			
	1/2" diameter pipe	LF	100	
	3/4" diameter pipe	LF	100	
	1-1/2" diameter pipe	LF	100	
	4" diameter pipe	LF	100	
	6" diameter pipe	LF	100	
2	2" Mineral Wool insulation			
	1/2" diameter pipe	LF	100	
	3/4" diameter pipe	LF	100	
	1-1/2" diameter pipe	LF	100	
	2" diameter pipe	LF	100	

	4" diameter pipe	LF	100	
	6" diameter pipe	LF	100	
3	1" Fiber Glass with service jacket			
	1/2" diameter pipe	LF	100	
	3/4" diameter pipe	LF	100	
	1-1/2" diameter pipe	LF	100	
	2" diameter pipe	LF	100	
	4" diameter pipe	LF	100	
	6" diameter pipe	LF	100	
4	2" Fiber Glass with service jacket			
	1/2" diameter pipe	LF	100	
	3/4" diameter pipe	LF	100	
	1-1/2" diameter pipe	LF	100	
	2" diameter pipe	LF	100	
	4" diameter pipe	LF	100	
	6" diameter pipe	LF	100	
5	30 mil thick PVC jacket			
	1-1/2" diameter insulation	LF	100	
	2" diameter insulation	LF	100	
	5" diameter insulation	LF	100	
	6" diameter insulation	LF	100	
22 11 13 FACILITY WATER DISTRIBUTION PIPING				
1	Type ‘K’ including fittings, couplings, and hanger assemblies			
	1/2" Pipe	LF	100	
	3/4" Pipe	LF	100	
	1-1/2" Pipe	LF	100	
	2" Pipe	LF	100	
	4" Pipe	LF	100	
	6" Pipe	LF	100	
2	Type 'L' including fittings, couplings and hanger assemblies			
	1/2" Pipe	LF	100	
	3/4" Pipe	LF	100	
	1-1/2" Pipe	LF	100	

	2" Pipe	LF	100	
	4" Pipe	LF	100	
	6" Pipe	LF	100	
3	Ductile Iron Pipe including Couplings and Hangers			
	3" Pipe	LF	100	
	4" Pipe	LF	100	
	6" Pipe	LF	100	
	8" Pipe	LF	100	
22 13 16 SANITARY WASTE AND VENT PIPING				
1	Hubless Cast-Iron Soil Pipe including Coupling and hangers			
	2" Hubless Cast Iron	LF	100	
	3" Hubless Cast Iron	LF	100	
	4" Hubless Cast Iron	LF	100	
	6" Hubless Cast Iron	LF	100	
2	Hub and Spigot Cast-Iron Soil Pipe including Coupling and hangers			
	2" Hub and spigot Cast Iron	LF	100	
	3" Hub and spigot Cast Iron	LF	100	
	4" Hub and spigot Cast Iron	LF	100	
	6" Hub and spigot Cast Iron	LF	100	
	8" Hub and spigot Cast Iron	LF	100	
	10" Hub and spigot Cast Iron	LF	100	
	12" Hub and spigot Cast Iron	LF	100	
	15" Hub and spigot Cast Iron	LF	100	
3	Plumbing Fixtures			
	Dorm Water Closet + Seat	EA	1	
	Dorm Lavatory	EA	1	
	Commercial Water Closet +Seat	EA	1	
	Commercial Lavatory	EA	1	
	Commercial Urinal	EA	1	
	Commercial Showers	EA	1	
	Water Closet Flushometers	EA	1	
	Urinal Flushometer	EA	1	
	Lavatory Accessories	EA	1	
	Shower Accessories	EA	1	
21 13 13 WET SPRINKLER PIPE				
1	SCH 40 Ductile Iron Pipe, Grooved joint, Couplings and Hangers			

	3" Pipe	LF	100	
	4" Pipe	LF	100	
	6" Pipe	LF	100	
	8" Pipe	LF	100	
	5.6 K Factor sprinklers	EA	10	
	25.2 K Factor sprinklers	EA	10	
	5" Storz type FDC	EA	1	
	4" FCVA	EA	1	
	6" FCVA	EA	1	
Temporary Heat Days				
1	Temporary Heat Days	Day	1	

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DEPARTMENT OF GENERAL SERVICES

UNIT PRICE SCHEDULE

Project: Pennsylvania State Police Academy Core Buildings, BESO & Sitework

Project Number: DGS C-0211-0005 - 005

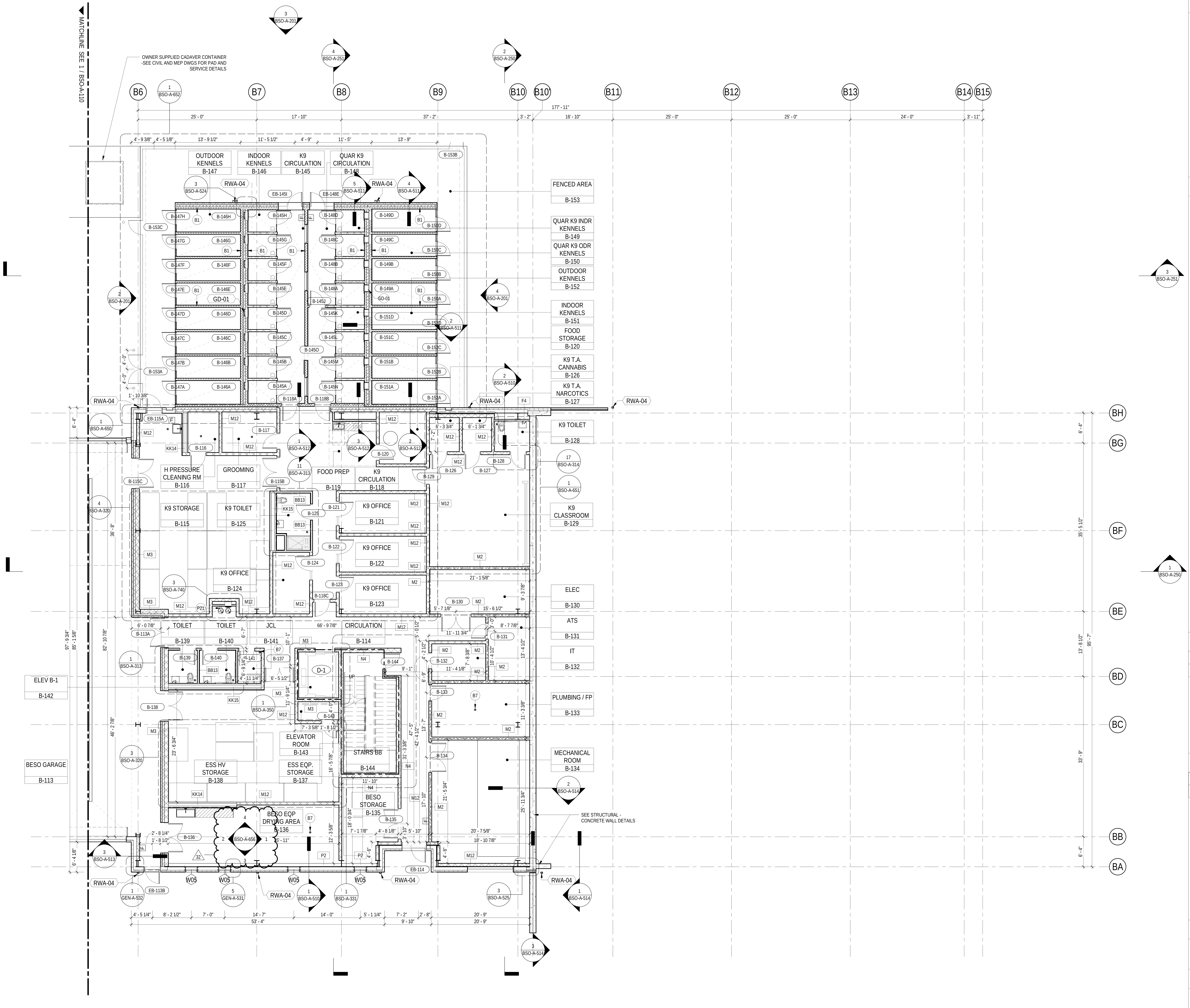
Contract Number: DGS C-0211-0005.4 - 005

FOR AN EXPLANATION OF UNIT PRICES SEE SECTION 010250 OF THE SPECIFICATIONS AND ANY ADDENDUM THAT MODIFIES SECTION 010250

The unit prices are for adjusting the quantities of work listed below and listed and described in the Contract Documents to reflect actual installed quantities. **Only one Unit Price is entered which will apply to both the ADD and the DEDUCT adjustment for actual quantity.**

UNIT PRICE SCHEDULE				
ITEM NO.	DESCRIPTION	UNIT OF MEASUREMENT	QUANTITY	UNIT PRICE
1	Junction boxes for mechanical equipment for control wiring	Per Unit	1	$
2	¾" Conduit for control wiring per mechanical equipment.	LF	50	$
3	20A duplex receptacle for mechanical controls	Each	1	$
4	Brach circuit wiring for control equipment (2#10+1#10G in ¾" conduit)	LF	100	$
5	Junction boxes and supports for each control equipment	Per Unit	1	$
6	208 volts, 2 pole NEMA-4X, 30 amp Disconnect switch-	Each	1	$
7	208 volts, 2 pole NEMA-4X, 30 amp Disconnect switch-	Each	1	$
8	Weather proof 20A duplex receptacle for outdoor area	Each	1	$

9	20A Duplex receptacle, GFCI	Each	1	$
10	20A Duplex receptacle	Each	1	$
11	20A Quadruplex receptacle	Each	1	$
12	NEMA L6-20R Receptacle	Each	1	$
13	NEMA L6-30R Receptacle	Each	1	$
14	NEMA L5-20R Receptacle	Each	1	$
15	Floor Boxes	Each	1	$
16	Poke thrus	Each	1	$
17	¾" EMT conduit	LF	100	$
18	1" EMT conduit	LF	100	$
19	¾" RGC conduit	LF	100	$
20	Type THHN/THWN-2, 12 AWG	LF	100	$
21	Type THHN/THWN-2, 10 AWG	LF	100	$
22	Type THHN/THWN-2, 8 AWG	LF	100	$
Temporary Heat Days				
23	Temporary Heat Days	Day	1	$



1 FLOOR PART PLAN - LEVEL 1
SCALE: 1/8" = 1'-0"

LEGEND

FIRE RATINGS
- 1/2 HOUR FIRE RATING
- 1 HOUR FIRE RATING
- 2 HOUR FIRE RATING
- 3 HOUR FIRE RATING
- SCOPE REFERENCE HATCH
- MILLWORK
- B.P. BUILDING BASE POINT
- W.P. WORK POINT
- XX DRAWING NOTE
- PARTITION TYPE
- XX C INDICATES COLD-FORMED METAL FRAMING

GENERAL NOTES

1. ALL BUILDING ELEVATIONS ARE REFERENCED TO THE BUILDING REFERENCE DATUM, ELEVATION 0'-0". REFER TO GEN-G-100 FOR NAVD 88 DATUMS FOR EACH BUILDING.
2. REFER TO GEN-G-100 FOR GENERAL NOTES
3. REFER TO GEN-G-101 FOR ACCESSIBILITY AND ADAPTABILITY GENERAL NOTES AND REQUIREMENTS
4. REFER TO GEN-G-102 FOR SYMBOLS, ABBREVIATIONS AND LEGENDS
5. REFER TO GEN-G-103 MOUNTING HEIGHTS.
6. REFER TO GEN-G-104 FOR MATERIAL LISTS AND EQUIPMENT LISTS.
7. REFER TO LS SERIES FOR CODE ANALYSIS AND REQUIRED WALL FIRE RATINGS
8. REFER TO SITE DRAWINGS FOR SITE ORIGIN AND BUILDING ORIGIN POINTS.
9. REFER TO GEN-G-500 FOR EXTERIOR WALL ASSEMBLIES
10. REFER TO GEN-G-730 FOR WINDOW SCHEDULES
11. REFER TO GEN-G-710 - 712 FOR PARTITION SCHEDULES
12. REFER TO GEN-G-715 - 719 FOR TYPICAL PARTITION DETAILS
13. ALL SLAB PENETRATIONS FOR PIPES, CONDUITS, ETC OUTSIDE OF RATED SHAFTS ARE TO BE FIRESAFED TO MATCH THE RATING OF THE SLAB.
14. ALL PENETRATIONS THROUGH RATED WALL ASSEMBLIES ARE TO HAVE A FIRESTOP ASSEMBLY SYSTEM TO MATCH THE RATING OF THE WALL.
15. THE PRECISE NUMBER, SIZE AND LOCATION OF ALL HOUSEKEEPING PADS REQUIRED TO SUPPORT OR MAINTAIN MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION EQUIPMENT SHALL BE CONFIRMED WITH THE EQUIPMENT SUPPLIER
16. ALL STRUCTURAL MEMBERS SHALL BE FIRE-PROOFED IN ACCORDANCE WITH THE NOTES ON GEN-G-100
17. PARTITIONS AT PERIMETER OF ALL TOILET ROOMS/JANITOR'S CLOSETS ADJACENT TO MECHANICAL SHAFTS AND AT ALL LAUNDRY ROOMS/MECHANICAL ROOMS WITH WATER SHALL HAVE A CURB. AT GYPSUM PARTITIONS PROVIDE A 6" X 6" CURB. WHERE AT MASONRY WALLS, PROVIDE 6" TALL CURBS WITH WIDTH TO MATCH MASONRY ASSEMBLY.
18. ALL DOORS TO BE INSTALLED 4" ON HINGE SIDE FROM PERPENDICULAR PARTITIONS U.O.N.
19. FLOOR PLANS ARE CUT 4'-0" AFF TYPICAL.
20. INTERIOR LAYOUT DIMENSIONS ARE SHOWN TO FINISHED FACE OF GWB U.O.N
21. PROVIDE SUPPLEMENTAL FRAMING, BLOCKING AND BRACING WHERE REQUIRED FOR WALL MOUNTED FIXTURES AND EQUIPMENT AT GWB WALL.
22. SOM DIRECTED REMOVAL OF BSO EXPLOSIVE STORAGE TO ANOTHER LOCATION ON SITE - SEE BLAST ENGINEER DRAWINGS FOR BSO EXPLOSIVE STORAGE DESIGN AND LAYOUT

DRAWING NOTES

B1	LOAD BEARING CMU WALL - SEE STRUCTURAL
B7	FLOOR DRAIN, REFER TO PLUMBING DRAWINGS

KEYNOTES

GD-01	083400 GUILLOTINE DOOR
RWA-04	077000 3" X 4 1/2" SHEET METAL DOWNSPOUT

WALL HATCHES

- NON-LOAD BEARING CMU WALL
- LOAD BEARING CMU WALL

VERIFY SCALE

BAR IS ONE (1) INCH LONG ON ORIGINAL DRAWING:
0 1
IF BAR IS NOT ONE (1) INCH LONG, ADJUST SCALE ACCORDINGLY

CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS. VARIANCE FROM CONTRACT DOCUMENTS NOT PERMITTED WITHOUT PROFESSIONAL & BUREAU OF CONSTRUCTION APPROVAL.

TACTICAL TRAINING DESIGN
Tactical Design North
231 E. Buffalo St #502, Milwaukee, WI 53202

LOCAL ARCHITECT
Jacobs Wyper Architects
1232 Chancellor St, Philadelphia, PA 19107

STRUCTURAL ENGINEER
Skidmore, Owings & Merrill LLP
250 Greenwich St, New York, NY 10007

ELECTRICAL, PLUMBING, FIRE PROTECTION, FIRE ALARM ENGINEER
A & J Consulting Engineering Services, P.C.
164 Brighton Rd, Clifton, NJ 07012

MECHANICAL, AV/IT ENGINEER
Interface Engineering, Inc.
2000 M Street NW, Suite 270, Washington, DC 20036

ACOUSTICAL ENGINEER
Cerami
1001 Ave of the Americas, 4th Floor, New York, NY 10018

CODE CONSULTING
CCI
215 W 40th St, 10th Floor, New York, NY 10018

CIVIL ENGINEER
Langan
1818 Market St #3300, Philadelphia, PA 19103

VERTICAL TRANSPORT
Michael Blades & Associates Ltd.
5409 Rapidan Ct, Lothian, MD 20711

SIGNAGE CONSULTANT
Patricia Hord Graphik Design
119 S. St. Asaph St, Alexandria, VA 22314

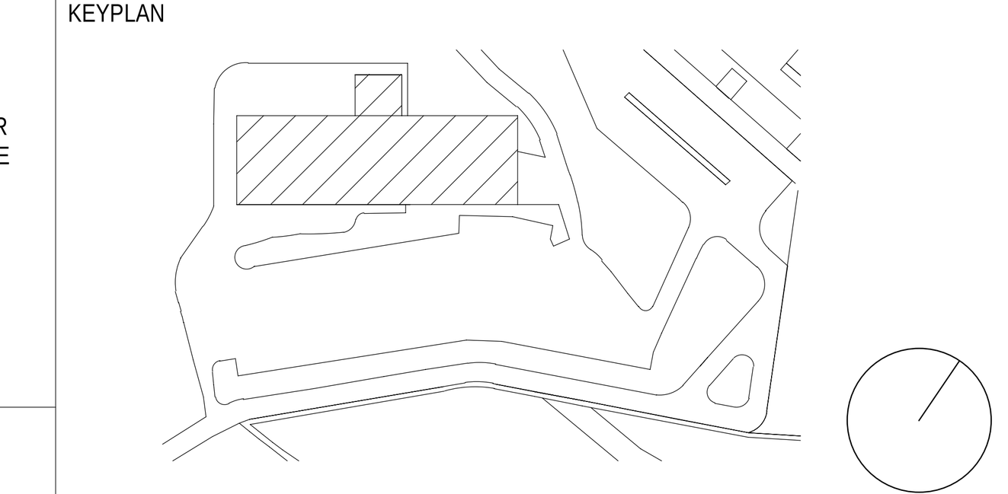
LANDSCAPE
Lee and Associates, Inc.
638 I Street NW, Washington, DC 20001

LIGHTING
MCLA
1000 Patomac St NW, Suite 121, Washington, DC 20007

FOOD SERVICE
Hopkins Foodservice Specialists, Inc.
7906 MacArthur Blvd, Suite 100, Cabin John, MD 20818

COST ESTIMATING
AECOM
1700 Market St, Suite 1600, Philadelphia, PA 19103

KEYPLAN



NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
32	14 JUL 2023	ADDENDUM #32			
1	19 MAY 2023	ISSUED FOR BID			

RECORD REVISIONS

SIGNATURE DATE

ARCHITECT
SOM
Skidmore, Owings & Merrill LLP
250 Greenwich St, New York, 10007

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

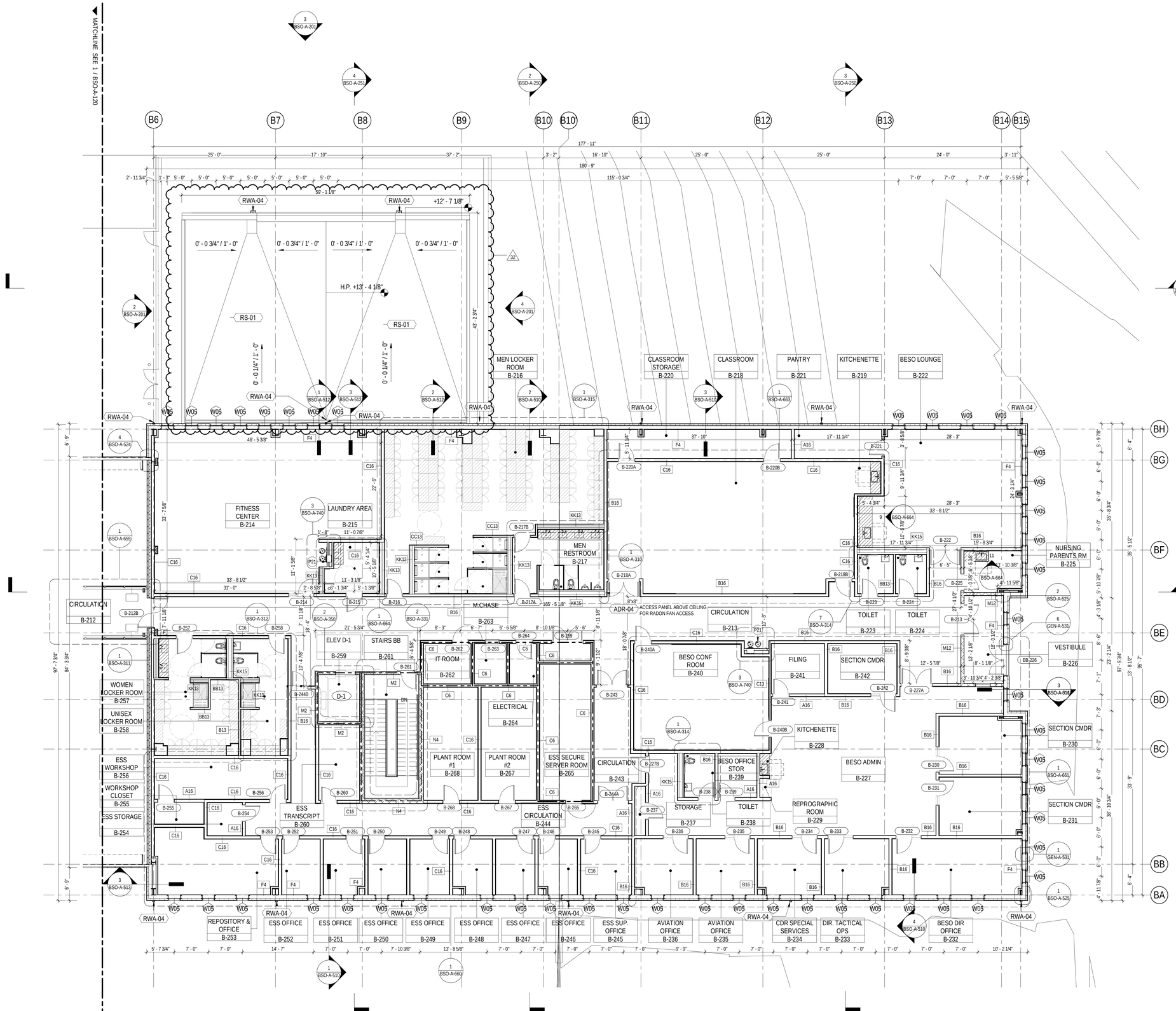
D.G.S. PROJECT No.
C-0211-0005 PHASE 5

Pennsylvania State Police Academy
Core Buildings, BESO & Sitework
PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

FLOOR PART PLAN B - LEVEL 1

SHEET No. BSO-A-111

DRAWN BY	CHECKED BY	DATE	SCALE
TDN	TDN	MAY 2023	AS NOTED



1 FLOOR PART PLAN - LEVEL 2

SCALE: 1/8" = 1'-0"

0 4'-0" 8'-0" 16'-0" 32'-0"

LEGEND

FIRE RATINGS

- 1/2 HOUR FIRE RATING
- 1 HOUR FIRE RATING
- 2 HOUR FIRE RATING
- 3 HOUR FIRE RATING

SCOPE REFERENCE HATCH

MILLWORK

B.P. BUILDING BASE POINT

W.P. WORK POINT

XX DRAWING NOTE

XX PARTITION TYPE

INDICATES COLD-FORMED METAL FRAMING

GENERAL NOTES

1. ALL BUILDING ELEVATIONS ARE REFERENCED TO THE BUILDING REFERENCE DATUM, ELEVATION 0'-0". REFER TO GEN-G-100 FOR NAVD 88 DATUMS FOR EACH BUILDING.
2. REFER TO GEN-G-100 FOR GENERAL NOTES
3. REFER TO GEN-G-101 FOR ACCESSIBILITY AND ADAPTABILITY GENERAL NOTES AND REQUIREMENTS
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5. REFER TO GEN-G-103 MOUNTING HEIGHTS.
6. REFER TO GEN-G-104 FOR MATERIAL LISTS AND EQUIPMENT LISTS.
7. REFER TO LS SERIES FOR CODE ANALYSIS AND REQUIRED WALL FIRE RATINGS
8. REFER TO SITE DRAWINGS FOR SITE ORIGIN AND BUILDING ORIGIN POINTS.
9. REFER TO GEN-G-500 FOR EXTERIOR WALL ASSEMBLIES
10. REFER TO GEN-G-730 FOR WINDOW SCHEDULES
11. REFER TO GEN-G-710 - 712 FOR PARTITION SCHEDULES
12. REFER TO GEN-G-715 - 719 FOR TYPICAL PARTITION DETAILS
13. ALL SLAB PENETRATIONS FOR PIPES, CONDUITS, ETC OUTSIDE OF RATED SHAFTS ARE TO BE FIRESAFED TO MATCH THE RATING OF THE SLAB.
14. ALL PENETRATIONS THROUGH RATED WALL ASSEMBLIES ARE TO HAVE A FIRESTOP ASSEMBLY SYSTEM TO MATCH THE RATING OF THE WALL.
15. THE PRECISE NUMBER, SIZE AND LOCATION OF ALL HOUSEKEEPING PADS REQUIRED TO SUPPORT OR MAINTAIN MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION EQUIPMENT SHALL BE CONFIRMED WITH THE EQUIPMENT SUPPLIER
16. ALL STRUCTURAL MEMBERS SHALL BE FIRE-PROOFED IN ACCORDANCE WITH THE NOTES ON GEN-G-100
17. PARTITIONS AT PERIMETER OF ALL TOILET ROOMS/JANITOR'S CLOSETS ADJACENT TO MECHANICAL SHAFTS AND AT ALL LAUNDRY ROOMS/MECHANICAL ROOMS WITH WATER SHALL HAVE A CURB. AT GYPSUM PARTITIONS PROVIDE A 6" X 6" CURB. WHERE AT MASONRY WALLS, PROVIDE 6" TALL CURBS WITH WIDTH TO MATCH MASONRY ASSEMBLY.
18. ALL DOORS TO BE INSTALLED 4" ON HINGE SIDE FROM PERPENDICULAR PARTITIONS U.O.N.
19. FLOOR PLANS ARE CUT 4'-0" AFF TYPICAL.
20. INTERIOR LAYOUT DIMENSIONS ARE SHOWN TO FINISHED FACE OF GWB U.O.N
21. PROVIDE SUPPLEMENTAL FRAMING, BLOCKING AND BRACING WHERE REQUIRED FOR WALL MOUNTED FIXTURES AND EQUIPMENT AT GWB WALL
22. SOM DIRECTED REMOVAL OF BSO EXPLOSIVE STORAGE TO ANOTHER LOCATION ON SITE - SEE BLAST ENGINEER DRAWINGS FOR BSO EXPLOSIVE STORAGE DESIGN AND LAYOUT

DRAWING NOTES

KEYNOTES

ADR-04	083100 ACCESS DOORS
RWA-04	077000 3" X 4 1/2" SHEET METAL DOWNSPOUT

WALL HATCHES

NON-LOAD BEARING CMU WALL

LOAD BEARING CMU WALL

VERIFY SCALE

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TACTICAL TRAINING DESIGN
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231 E. Buffalo St #502, Milwaukee, WI 53202

LOCAL ARCHITECT
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STRUCTURAL ENGINEER
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ELECTRICAL, PLUMBING, FIRE PROTECTION, FIRE ALARM ENGINEER
A & J Consulting Engineering Services, P.C.
164 Brighton Rd, Clifton, NJ 07012

MECHANICAL, AVIT ENGINEER
Interface Engineering, Inc.
2000 M Street NW, Suite 270, Washington, DC 20036

ACOUSTICAL ENGINEER
Cerami
1001 Ave of the Americas, 4th Floor, New York, NY 10018

CODE CONSULTING
CCI
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CIVIL ENGINEER
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Core Buildings, BESO & Sitework

PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

FLOOR PART PLAN B - LEVEL 2

SHEET No. BSO-A-121

DRAWN BY	CHECKED BY	DATE	SCALE
TDN	TDN	MAY 2023	AS NOTED

LEGEND

FIRE RATINGS

- 1/2 HOUR FIRE RATING
- 1 HOUR FIRE RATING
- 2 HOUR FIRE RATING
- 3 HOUR FIRE RATING
- (XX) DRAWING NOTE

1	SWITCH	SINGLE 1A	DOUBLE 1B	QUAD 1C	CONTROL PANEL 1D
2	ELECTRICAL OUTLET	SINGLE 2A	DUPLEX 2B		QUAD 2C
3	DATA OUTLET	2 PORT 3A	6 PORT 3B		AV 3C
4	FIRE ALRAM STROBE	4			
5	THERMOSTAT	5			
6	WALL CLOCK	6			
7	PULL STATION	7			
8	SECURITY CAMERA	8			
9	CARD READER	9			
10	ADA PUSH BOTTON	10			
11	FLOOR BOX	11A	11B	11C	11D
12	WAP	12			

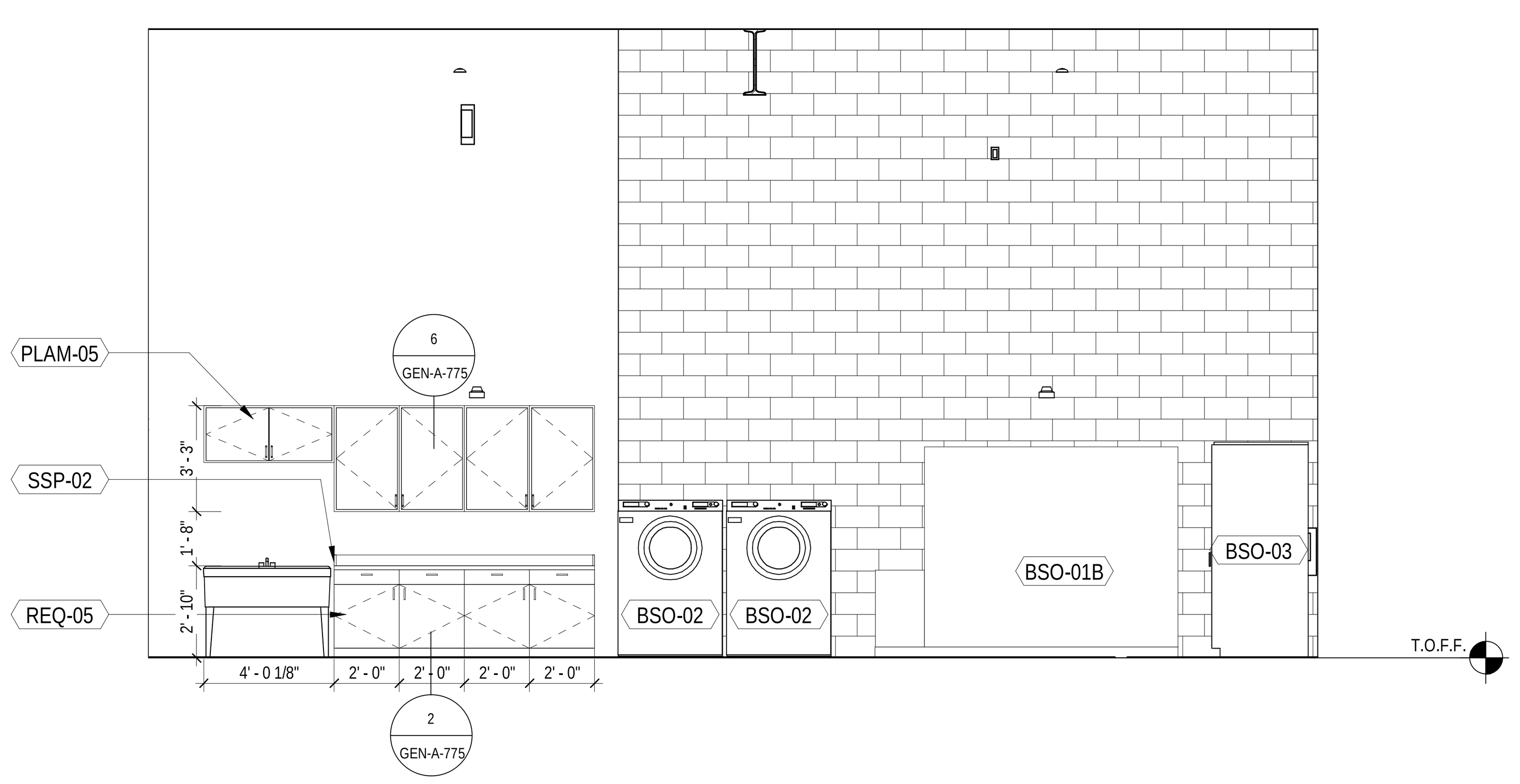
GENERAL NOTES

1. ALL DIFFUSERS, REGISTERS AND GRILLES ARE BY THE .2 HVAC CONTRACTOR AND ARE SHOWN FOR LOCATION AND COORDINATION ONLY, UNO.
2. ALL PLUMBING FIXTURES, SPRINKLERS, FHCS, AND STANDPIPES AND RELATED EQUIPMENT ARE BY THE .4 PLUMBING CONTRACTOR AND ARE SHOWN FOR LOCATION AND COORDINATION ONLY, UNO.
3. ALL RECEPTACLES, LIGHTS SWITCHES, TELE/ DATA RECEPTACLES, TELECOM EQUIPMENT AND AV EQUIPMENT ARE BY THE .4 ELECTRICAL CONTRACTOR AND ARE SHOWN FOR LOCATION AND COORDINATION ONLY, UNO.
4. REFERENCE GEN-G-103 FOR STANDARD MOUNTING HEIGHTS AND DETAILS
5. REFERENCE ALSO POWER, COMMUNICATIONS AND FINISH PLANS AND GEN-G-103 FOR STANDARD DEVICE MOUNTING ARRANGEMENTS, ALIGNMENTS AND DIMENSIONAL INFORMATION.
6. ALIGN WALL TILE JOINTS TO FLOOR TILE JOIN LINES.
7. CONFIRM FINAL TILE JOINT LAYOUT WITH PROFESSIONAL PRIOR TO INSTALLATION.

DRAWING NOTES

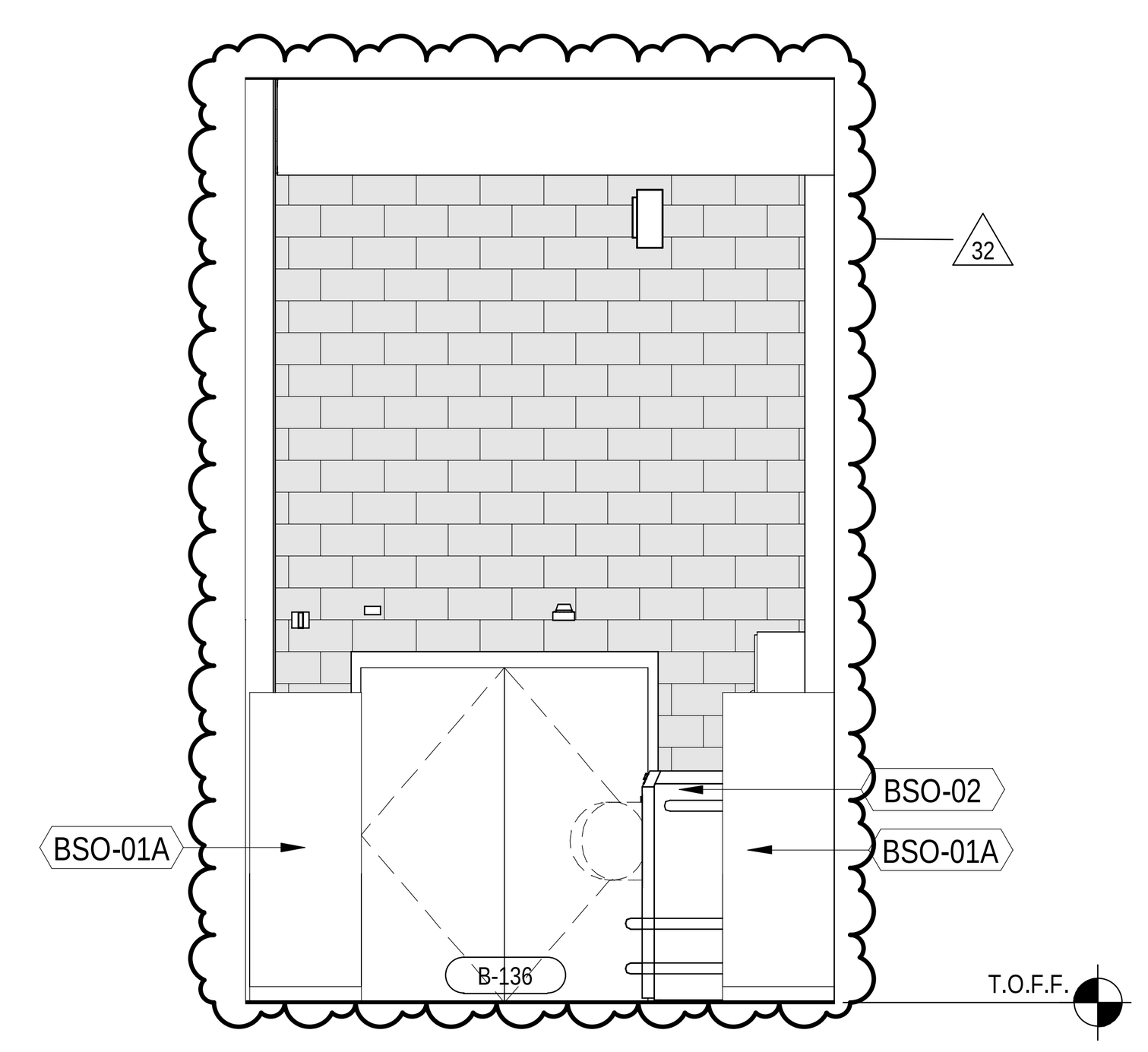
KEYNOTES

BSO-01A	119020 DRYING RACK 4 GEAR
BSO-01B	119020 DRYING RACK 8 GEAR HEATED
BSO-02	119020 WASHER EXTRACTOR
BSO-03	119020 DRYING CABINET
LVR-03	089000 MECHANICAL LOUVER
PLAM-05	064000 PLASTIC LAMINATE, DARK GRAY
REQ-05	113000 MINI REFRIGERATOR
SSP-02	064000 SOLID SURFACE - DARK GRAY



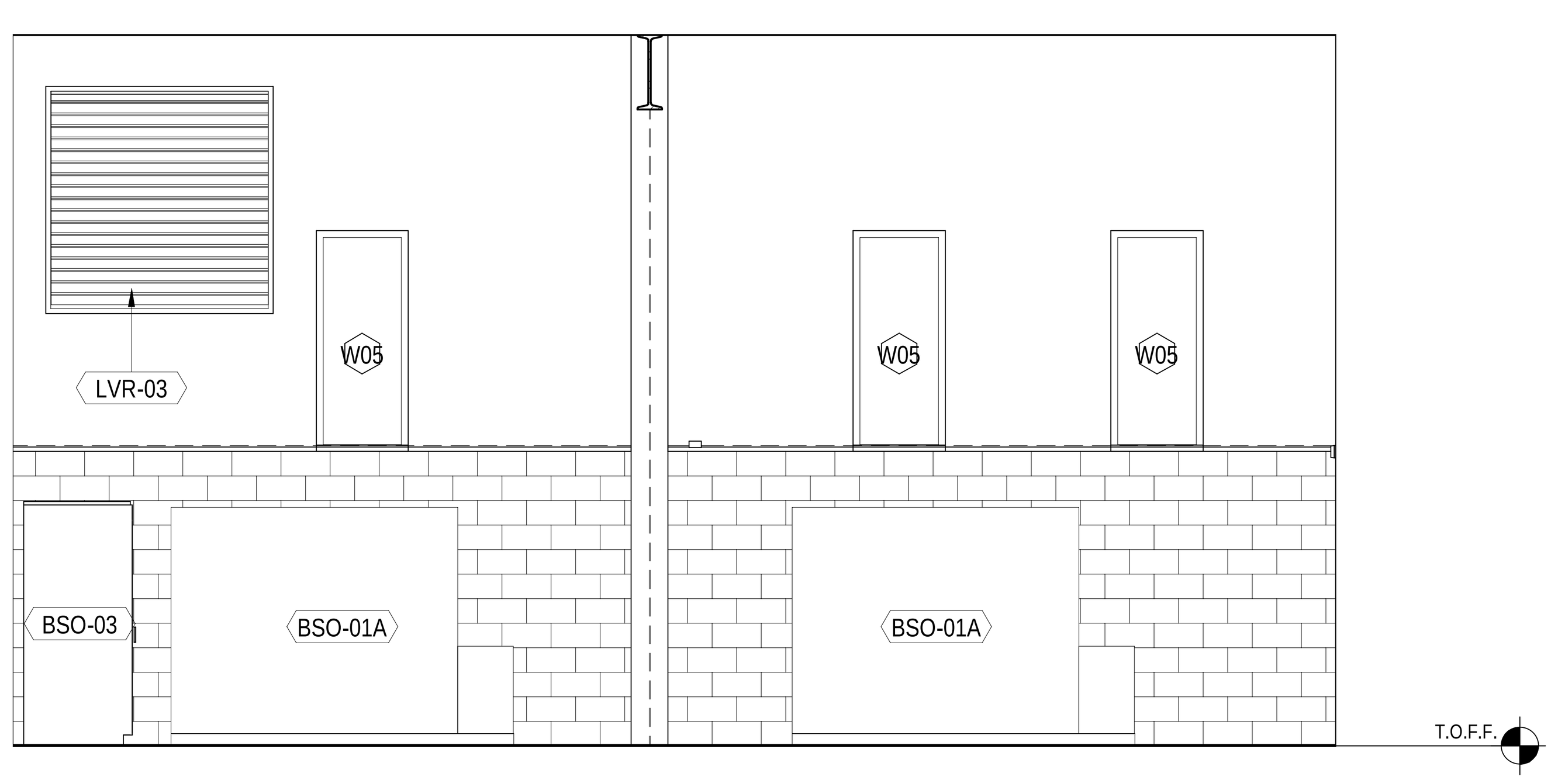
4 BESO EQP DRYING AREA NORTH

SCALE: 1/4" = 1'-0"



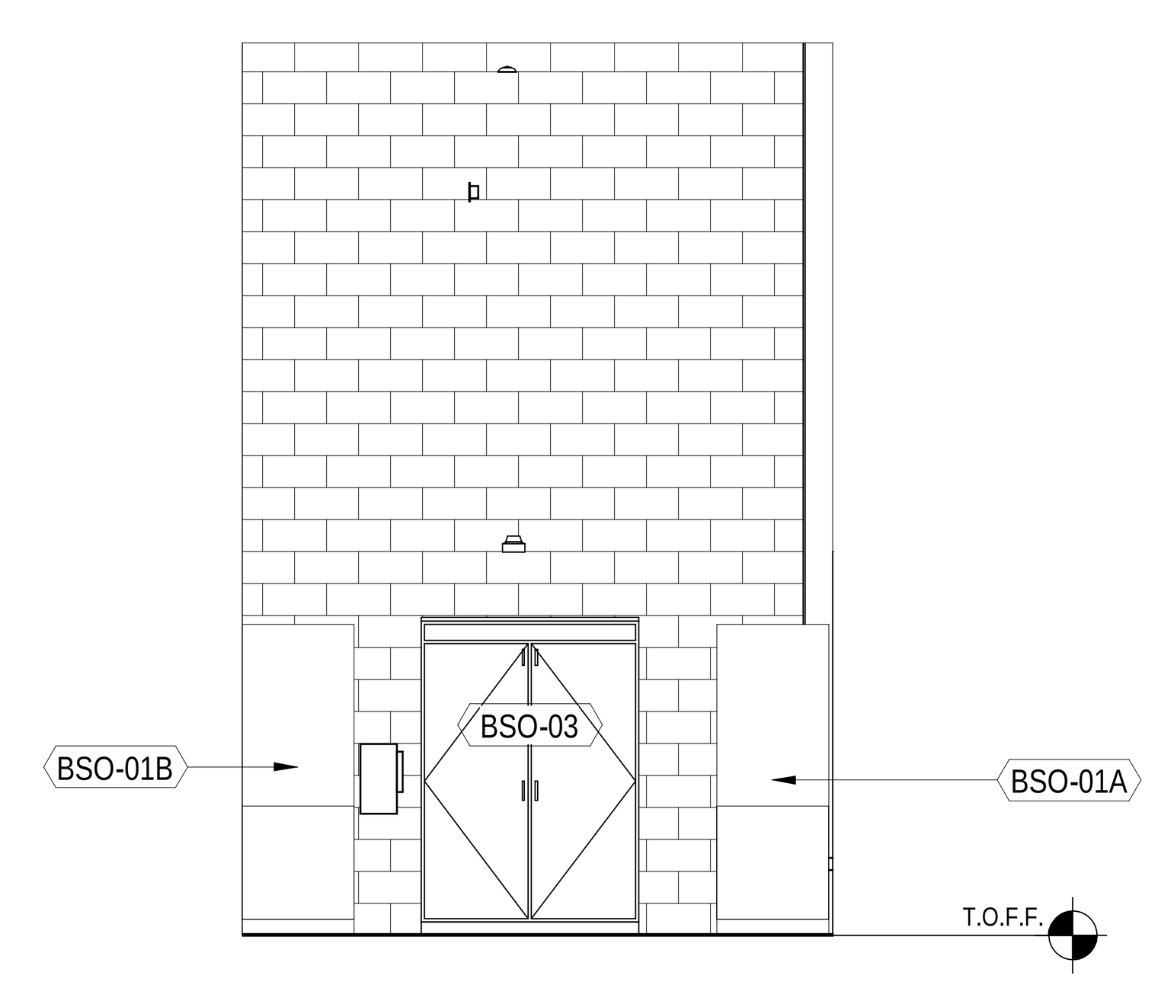
2 BESO EQP DRYING AREA EAST

SCALE: 1/4" = 1'-0"



3 BESO EQP DRYING AREA SOUTH

SCALE: 1/4" = 1'-0"



1 BESO EQP DRYING AREA WEST

SCALE: 1/4" = 1'-0"

TACTICAL TRAINING DESIGN
Tactical Design North
231 E. Buffalo St #502, Milwaukee, WI 53202

LOCAL ARCHITECT
Jacobs Wyper Architects
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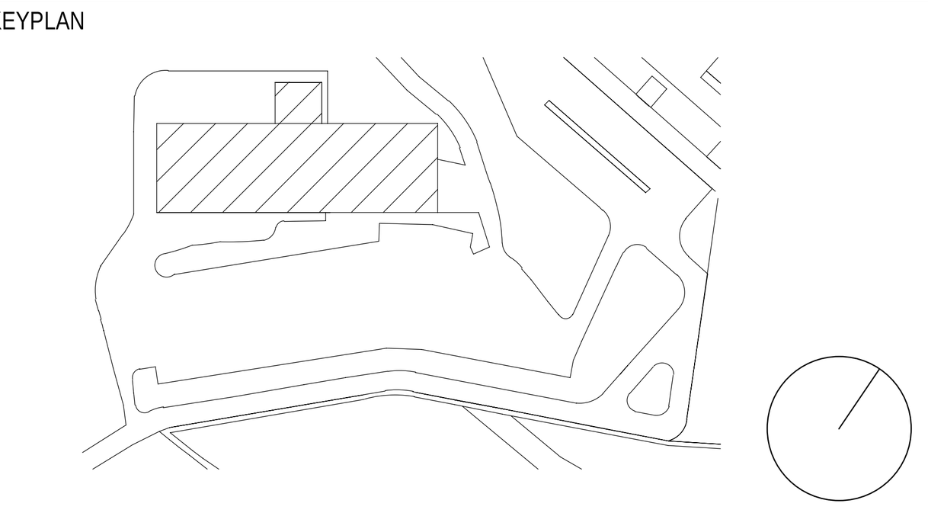
KEYPLAN



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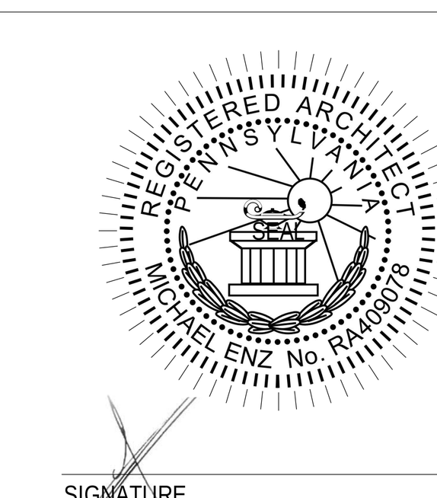

SIGNATURE DATE

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Core Buildings, BESO & Sitework
PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

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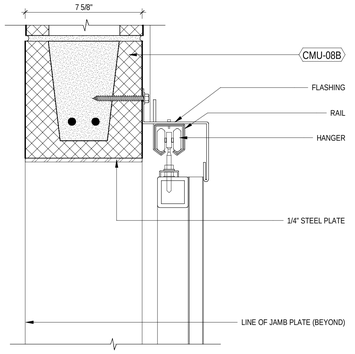
INTERIOR ELEVATION - BESO EQP DRYING AREA

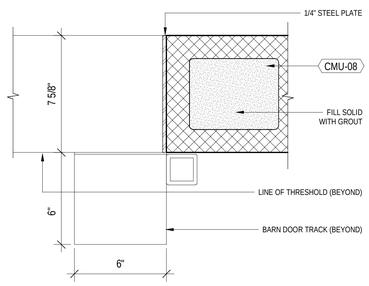
SHEET No.
BSO-A-656

DRAWN BY	CHECKED BY	DATE	SCALE
TDN	TDN	MAY 2023	AS NOTED



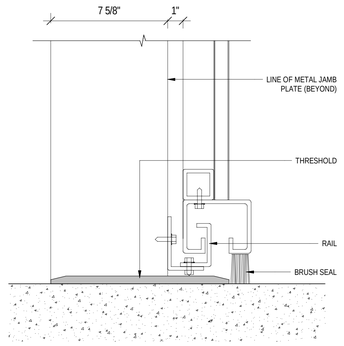
10 DETAIL - BARN DOOR HEAD

SCALE: 3" = 1'-0"



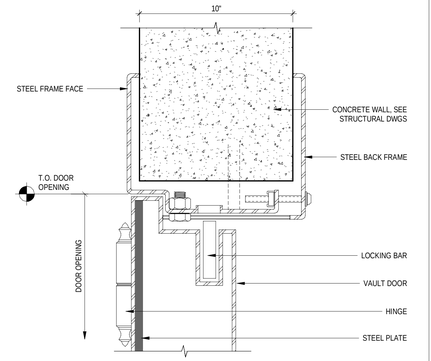
9 DETAIL - BARN DOOR JAMB

SCALE: 3" = 1'-0"



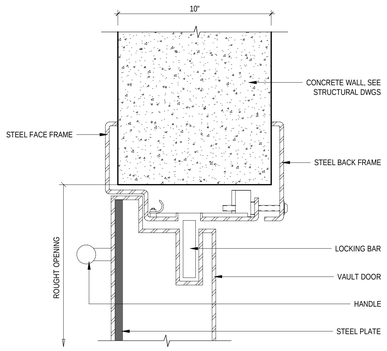
8 DETAIL - BARN DOOR SILL

SCALE: 3" = 1'-0"



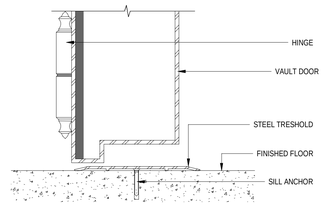
7 DETAIL - VAULT DOOR HEAD

SCALE: 3" = 1'-0"



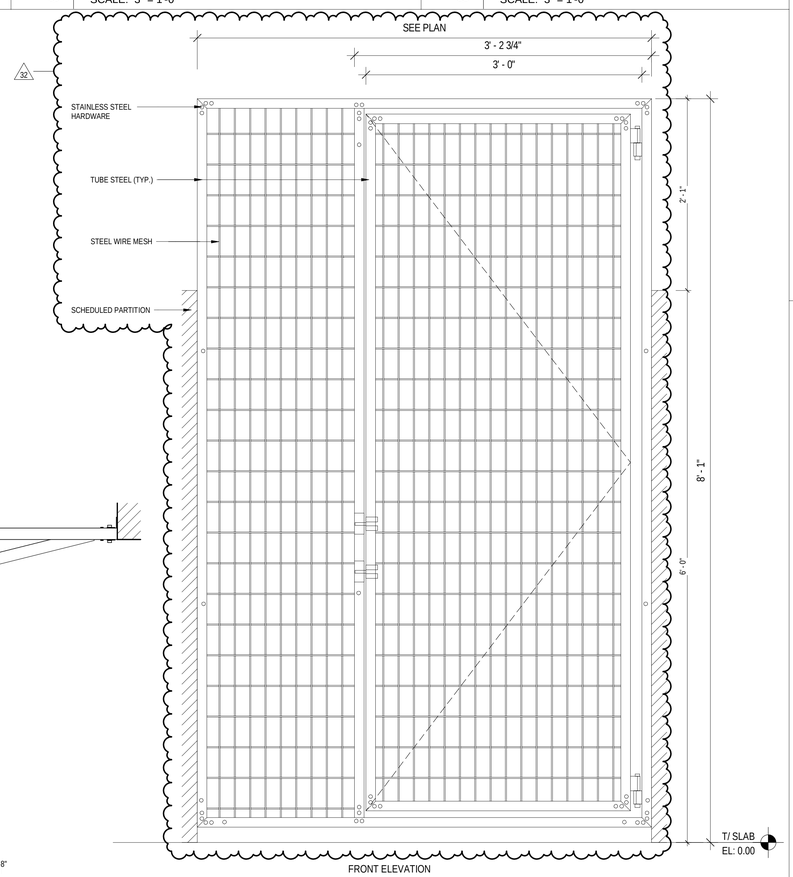
6 DETAIL - VAULT DOOR JAMB

SCALE: 3" = 1'-0"



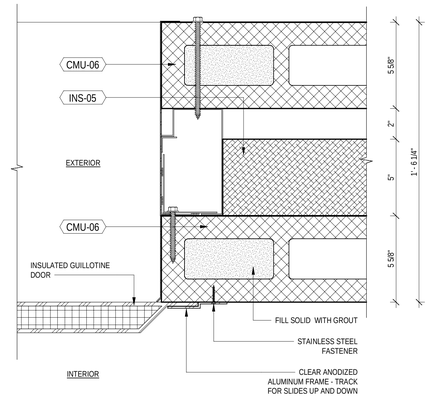
5 DETAIL - VAULT DOOR SILL

SCALE: 3" = 1'-0"



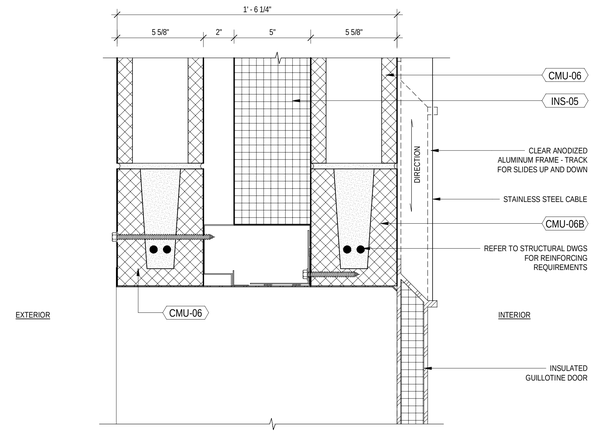
4 KEQ-07 GRILL GATE DETAIL

SCALE: 1 1/2" = 1'-0"



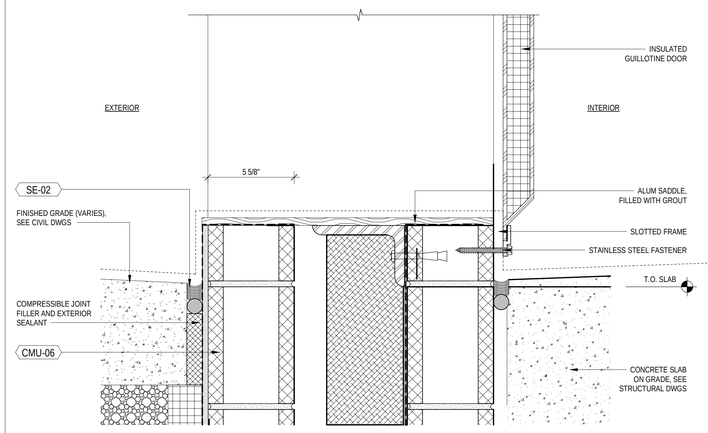
3 JAMB - GUILLOTINE DOOR

SCALE: 3" = 1'-0"



2 HEAD - GUILLOTINE DOOR

SCALE: 3" = 1'-0"



1 SILL - GUILLOTINE DOOR

SCALE: 3" = 1'-0"

KEYNOTES

CMU-06	042000 CONCRETE MASONRY UNIT, 8" X 16" X 6"
CMU-08	042000 CONCRETE MASONRY UNIT, 8" X 16" X 8"
CMU-08B	042000 CONCRETE MASONRY UNIT BOND BEAM, 8" X 16" X 8"
INS-05	072100 SEMI RIGID MINERAL FIBER INSULATION
SE-02	079200 STRUCTURAL SILICONE SEALANT, BLACK DOW

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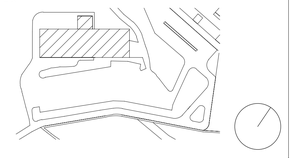

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DOOR AND GATE DETAILS

SHEET No.
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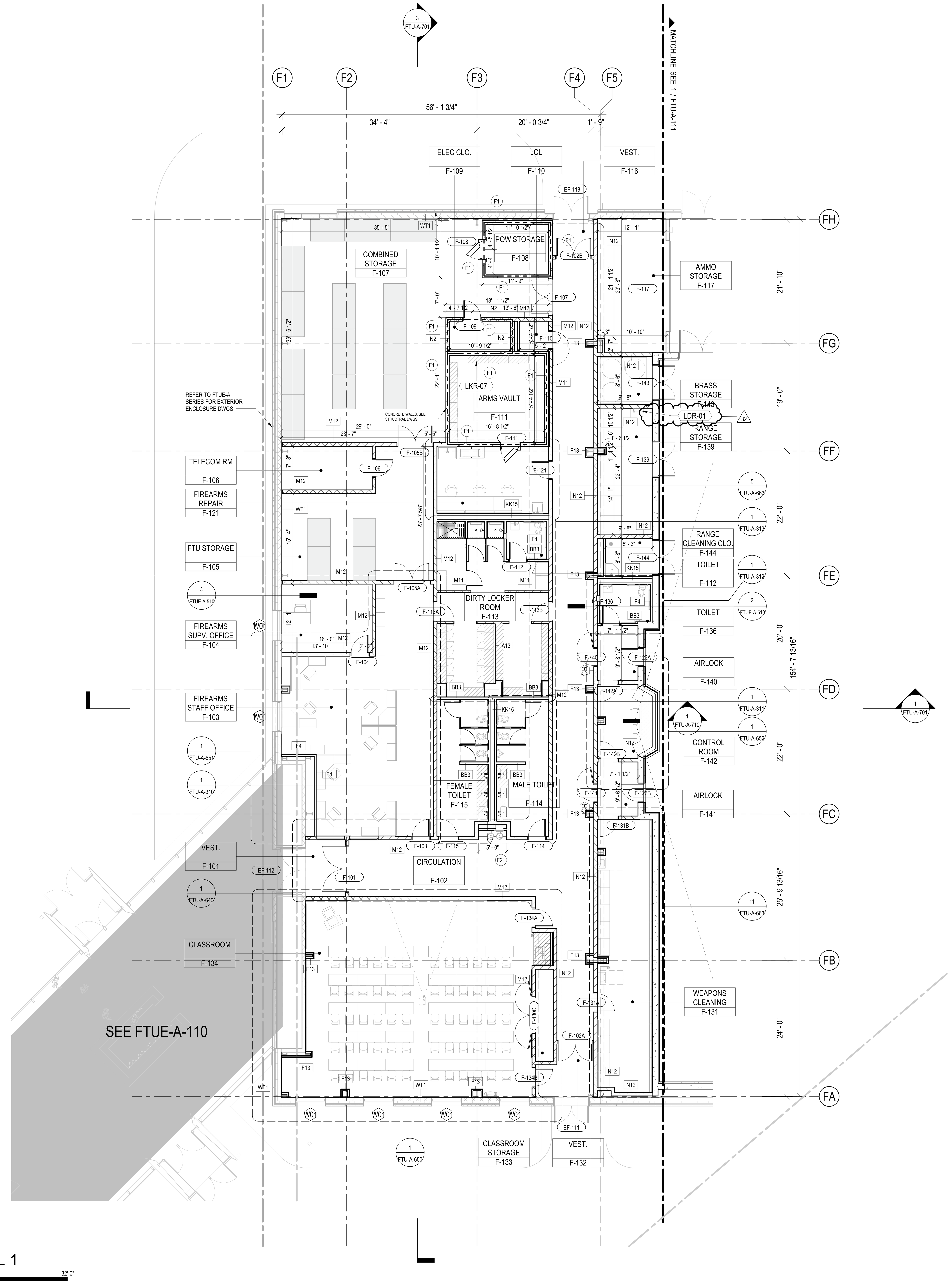

1 FLOOR PART PLAN - LEVEL 1

SCALE: 1/8" = 1'-0"

LEGEND

FIRE RATINGS

- 1/2 HOUR FIRE RATING
- 1 HOUR FIRE RATING
- 2 HOUR FIRE RATING
- 3 HOUR FIRE RATING
- SCOPE REFERENCE HATCH
- MILLWORK
- B.P. BUILDING BASE POINT
- W.P. WORK POINT
- XX DRAWING NOTE
- XX PARTITION TYPE
- C INDICATES COLD-FORMED METAL FRAMING

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16. ALL STRUCTURAL MEMBERS SHALL BE FIRE-PROOFED IN ACCORDANCE WITH THE NOTES ON GEN-G-100
17. PARTITIONS AT PERIMETER OF ALL TOILET ROOMS/JANITOR'S CLOSETS ADJACENT TO MECHANICAL SHAFTS AND AT ALL LAUNDRY ROOMS/MECHANICAL ROOMS WITH WATER SHALL HAVE A CURB. AT GYPSUM PARTITIONS PROVIDE A 6" X 6" CURB. WHERE AT MASONRY WALLS, PROVIDE 6" TALL CURBS WITH WIDTH TO MATCH MASONRY ASSEMBLY.
18. ALL DOORS TO BE INSTALLED 4" ON HINGE SIDE FROM PERPENDICULAR PARTITIONS U.O.N.
19. FLOOR PLANS ARE CUT 4'-0" AFF TYPICAL.
20. INTERIOR LAYOUT DIMENSIONS ARE SHOWN TO FINISHED FACE OF GWB U.O.N
21. PROVIDE SUPPLEMENTAL FRAMING, BLOCKING AND BRACING WHERE REQUIRED FOR WALL MOUNTED FIXTURES AND EQUIPMENT AT GWB WALL.
22. ELEVATED NOISE LEVELS WILL BE EXPERIENCED ON AND IN ALL AREAS ADJACENT TO THE RANGE AND ALL NECESSARY TRAINING, PPE, AND MONITORING IS REQUIRED TO ENSURE GOVERNMENTAL AND ORGANIZATIONAL HEALTH AND SAFETY REQUIREMENTS ARE MET.
23. CONTAMINATED AREAS IN THE FTU REQUIRE ALL NECESSARY TRAINING, PPE, AND MONITORING TO ENSURE GOVERNMENTAL AND ORGANIZATIONAL HEALTH AND SAFETY REQUIREMENTS ARE MET.
24. MAINTENANCE, MINING, AND CLEANING OF THE FTU REQUIRES ALL NECESSARY TRAINING, PPE, AND MONITORING FOR AIRBORNE AND SURFACE CONTAMINANTS.
25. **BALLISTIC RATING OF GUN RANGE:** THIS RANGE IS DESIGNED FOR SMALL ARMS INCLUDING HANDGUNS, SHOTGUNS USING 00 BUCK SHOT OR HIGHER, AND RIFLES WITH A MAXIMUM VELOCITY OF 3600 FPS AND MAXIMUM ENERGY OF 3600 FT. LBS. BIRD SHOT, .50 CAL ROUNDS, LOW VELOCITY ROUNDS, ARMOR PIERCING, ENHANCED PENETRATION, OR INCENDIARY ROUNDS ARE NOT ALLOWED.

DRAWING NOTES

F1	STRUCTURAL WALL, SEE STRUCTURAL DWGS FOR DETAILS
F21	DUAL HEIGHT ADA WATER COOLER

KEYNOTES

LDR-01	055000 MANUFACTURED FIXED BOH LADDER

VERIFY SCALE

BAR IS ONE (1) INCH LONG ON ORIGINAL DRAWING:
0 1
IF BAR IS NOT ONE (1) INCH LONG, ADJUST SCALE ACCORDINGLY

CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS. VARIANCE FROM CONTRACT DOCUMENTS NOT PERMITTED WITHOUT PROFESSIONAL & BUREAU OF CONSTRUCTION APPROVAL.

TACTICAL TRAINING DESIGN
Tactical Design North, Inc.
231 E. Buffalo St #502, Milwaukee, WI 53202

LOCAL ARCHITECT
Jacobs Wyper Architects
1232 Chancellor St, Philadelphia, PA 19107

STRUCTURAL ENGINEER
Skidmore, Owings & Merrill LLP
250 Greenwich St, New York, NY 10007

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POOL DESIGN
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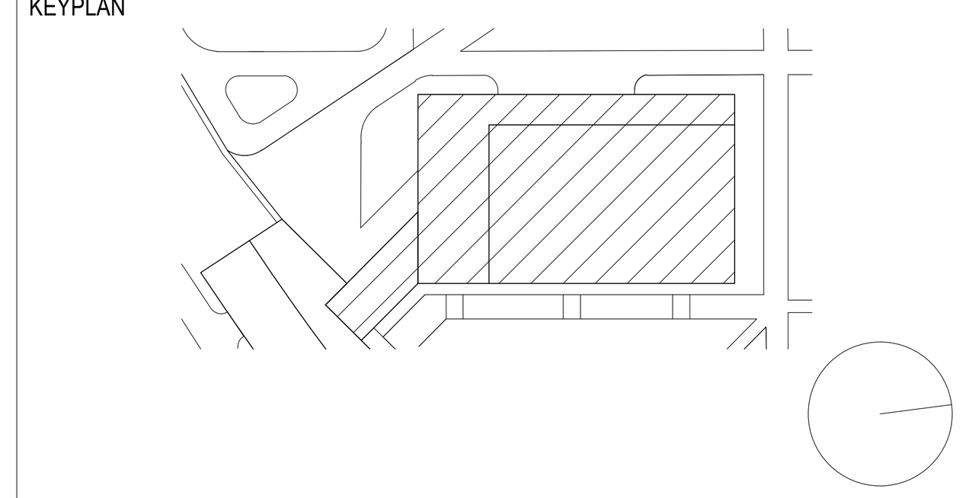
KEYPLAN



NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
32	14 JUL 2023	ADDENDUM 32			
1	19 MAY 2023	ISSUED FOR BID			

RECORD REVISIONS

SIGNATURE DATE

ARCHITECT
SOM
Skidmore, Owings & Merrill LLP
250 Greenwich St, New York, 10007

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

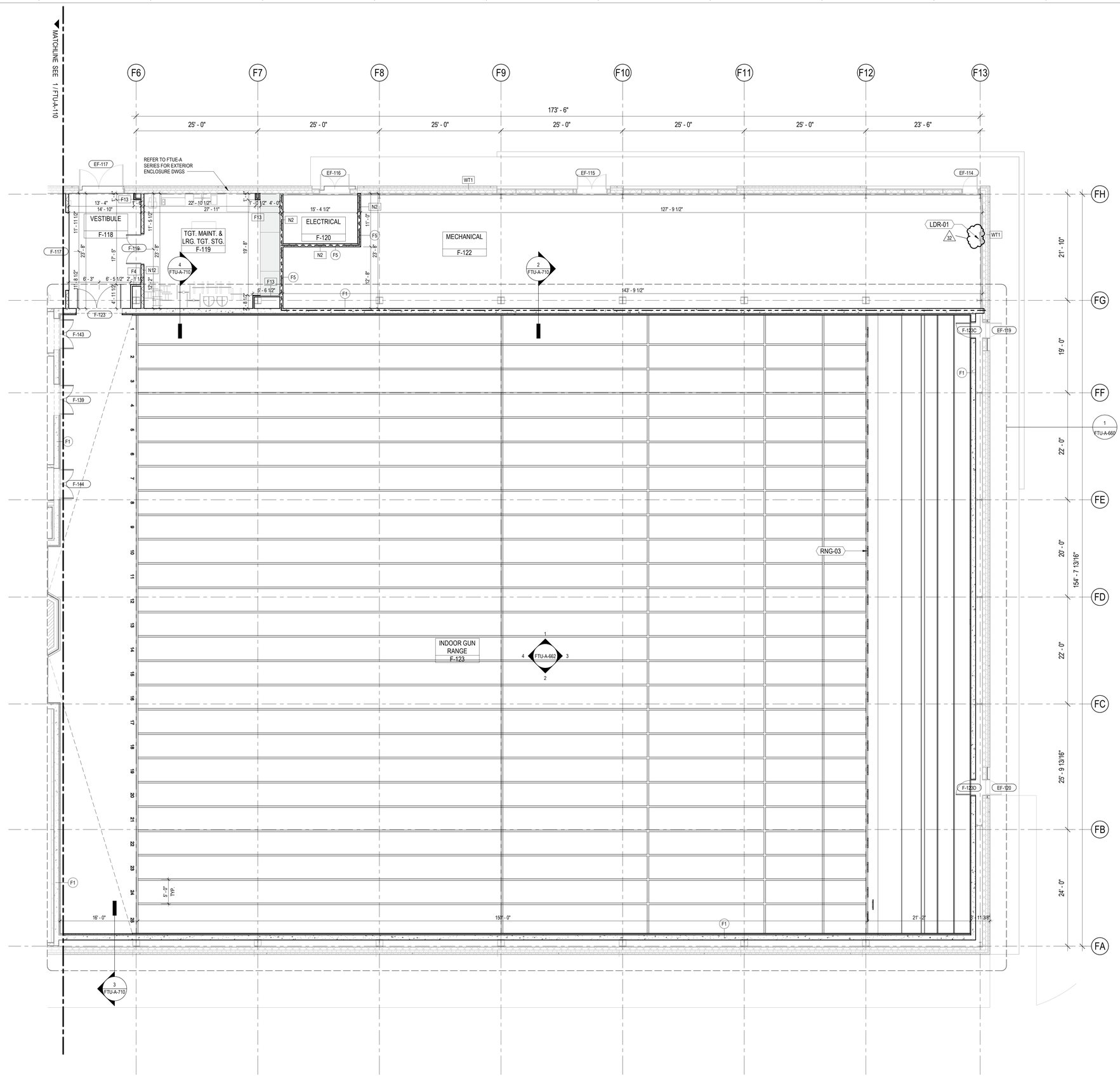
D.G.S. PROJECT No.
C-0211-0005 PHASE 5

Pennsylvania State Police Academy
Core Buildings, BESO & Sitework
PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

FLOOR PART PLAN A - LEVEL 1

SHEET No. FTU-A-110

DRAWN BY	CHECKED BY	DATE	SCALE
TDN	TDN	MAY 2023	AS NOTED



1 FLOOR PART PLAN - LEVEL 1

SCALE: 1/8" = 1'-0" 0 4'-0" 8'-0" 16'-0" 32'-0"

LEGEND

FIRE RATINGS

- 1/2 HOUR FIRE RATING
- 1 HOUR FIRE RATING
- 2 HOUR FIRE RATING
- 3 HOUR FIRE RATING

SCOPE REFERENCE HATCH

MILLWORK

B.P. BUILDING BASE POINT

W.P. WORK POINT

XX DRAWING NOTE

PARTITION TYPE

XX INDICATES COLD-FORMED METAL FRAMING

GENERAL NOTES

1. ALL BUILDING ELEVATIONS ARE REFERENCED TO THE BUILDING REFERENCE DATUM, ELEVATION 0'-0". REFER TO GEN-G-100 FOR NAVD 88 DATUMS FOR EACH BUILDING.
2. REFER TO GEN-G-100 FOR GENERAL NOTES
3. REFER TO GEN-G-101 FOR ACCESSIBILITY AND ADAPTABILITY GENERAL NOTES AND REQUIREMENTS
4. REFER TO GEN-G-102 FOR SYMBOLS, ABBREVIATIONS AND LEGENDS
5. REFER TO GEN-G-103 MOUNTING HEIGHTS.
6. REFER TO GEN-G-104 FOR MATERIAL LISTS AND EQUIPMENT LISTS.
7. REFER TO LS SERIES FOR CODE ANALYSIS AND REQUIRED WALL FIRE RATINGS
8. REFER TO SITE DRAWINGS FOR SITE ORIGIN AND BUILDING ORIGIN POINTS.
9. REFER TO GEN-G-500 FOR EXTERIOR WALL ASSEMBLIES
10. REFER TO GEN-G-730 FOR WINDOW SCHEDULES
11. REFER TO GEN-G-710 - 712 FOR PARTITION SCHEDULES
12. REFER TO GEN-G-715 - 719 FOR TYPICAL PARTITION DETAILS
13. ALL SLAB PENETRATIONS FOR PIPES, CONDUITS, ETC OUTSIDE OF RATED SHAFTS ARE TO BE FIRESAFED TO MATCH THE RATING OF THE SLAB.
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DRAWING NOTES

F1	STRUCTURAL WALL, SEE STRUCTURAL DWGS FOR DETAILS
F5	6" CONCRETE CURB

KEYNOTES

LDR-01	055000 MANUFACTURED FIXED BOH LADDER
RNG-03	119010 LATERAL TARGET TURNERS

VERIFY SCALE

BAR IS ONE (1) INCH LONG
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0 — 1

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POOL DESIGN
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7536 N. La Cholla Blvd, Tucson, AZ 85741

KEYPLAN

NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
32	14 JUL 2023	ADDENDUM# 32			
1	19 MAY 2023	ISSUED FOR BID			

RECORD REVISIONS

REGISTERED ARCHITECT — COMMONWEALTH OF PENNSYLVANIA — SEAL — NOT VALID FOR CONSTRUCTION UNLESS SIGNED AND DATED

SIGNATURE DATE

ARCHITECT
SOM
Skidmore, Owings & Merrill LLP
250 Greenwich St, New York, 10007

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 5

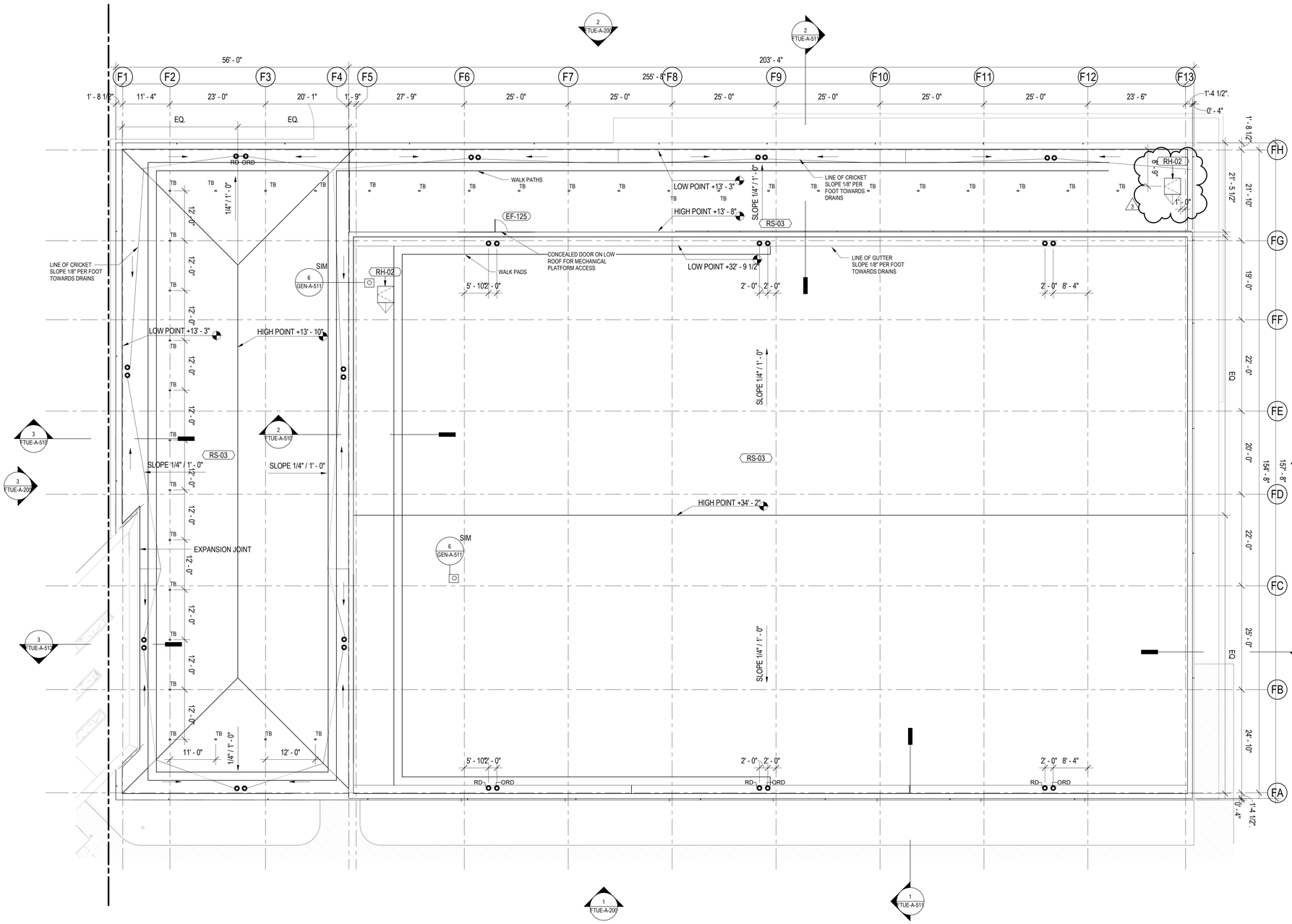
Pennsylvania State Police Academy
Core Buildings, BESO & Sitework

PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

FLOOR PART PLAN B - LEVEL 1

SHEET No. FTU-A-111

DRAWN BY	CHECKED BY	DATE	SCALE
TDN	TDN	MAY 2023	AS NOTED



1 ROOF PLAN
SCALE: 3/32" = 1'-0"
0 2'-0" 4'-0" 8'-0" 16'-0"

LEGEND

FIRE RATINGS

- 1/2 HOUR FIRE RATING
- 1 HOUR FIRE RATING
- 2 HOUR FIRE RATING
- 3 HOUR FIRE RATING
- SCOPE REFERENCE HATCH
- MILLWORK
- B.P. BUILDING BASE POINT
- W.P. WORK POINT
- XX DRAWING NOTE
- XX PARTITION TYPE
- XX INDICATES COLD-FORMED METAL FRAMING

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DRAWING NOTES

KEYNOTES

RH-02	077000 ROOF HATCH
RS-03	075200 SBS MEMBRANE ROOF ON METAL DECK

VERIFY SCALE

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ON ORIGINAL DRAWING:
0 1

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LOCAL ARCHITECT
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LANDSCAPE
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POOL DESIGN
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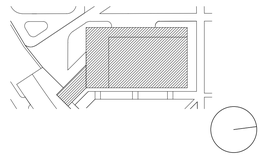
KEYPLAN



NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
3	14 JUL 2023	ADDENDUM 32			
2	12 MAY 2022	ISSUED FOR BID			
1	18 FEB 2022	ISSUED TO L&I			

RECORD REVISIONS

SEAL

SIGNATURE DATE

ARCHITECT
SOM
Skidmore, Owings & Merrill LLP
250 Greenwich St, New York, 10007

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 5

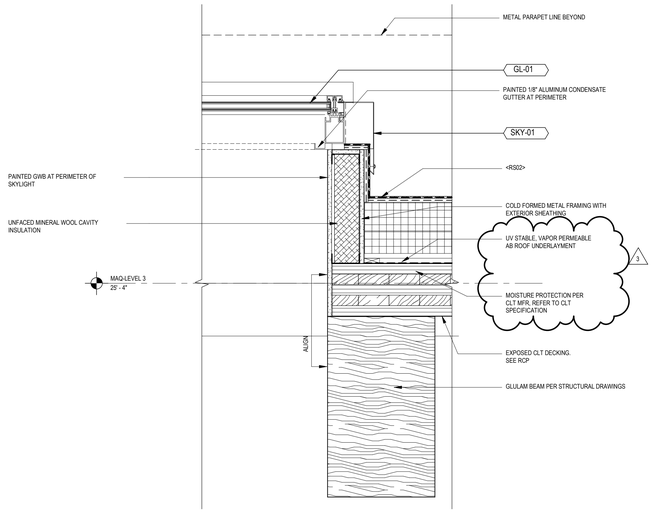
Pennsylvania State Police Academy
Core Buildings, BESO & Sitework

PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

ROOF PLAN

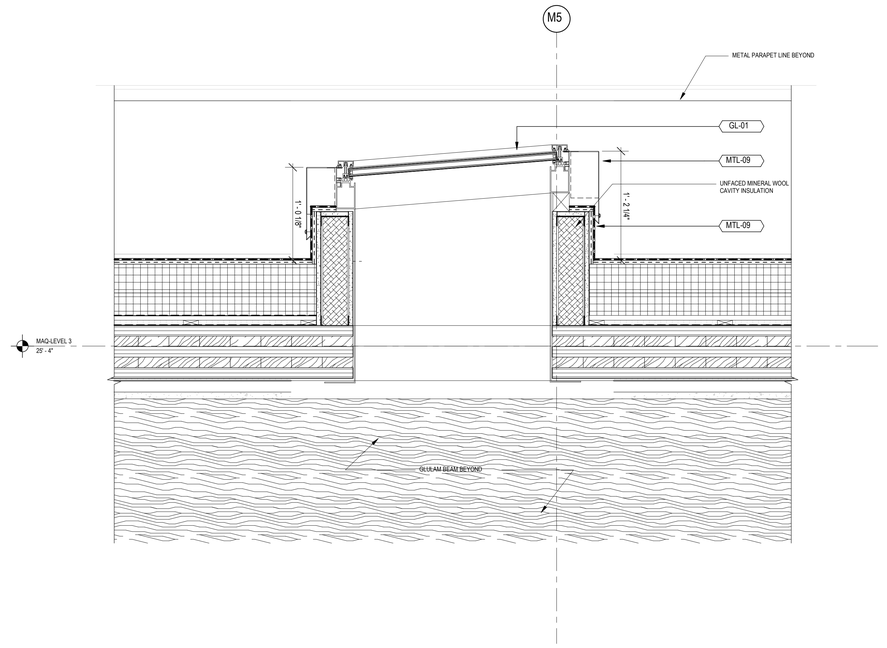
SHEET No. FTUE-A-103

DRAWN BY	CHECKED BY	DATE	SCALE
SF	TNB	APR 2022	AS NOTED



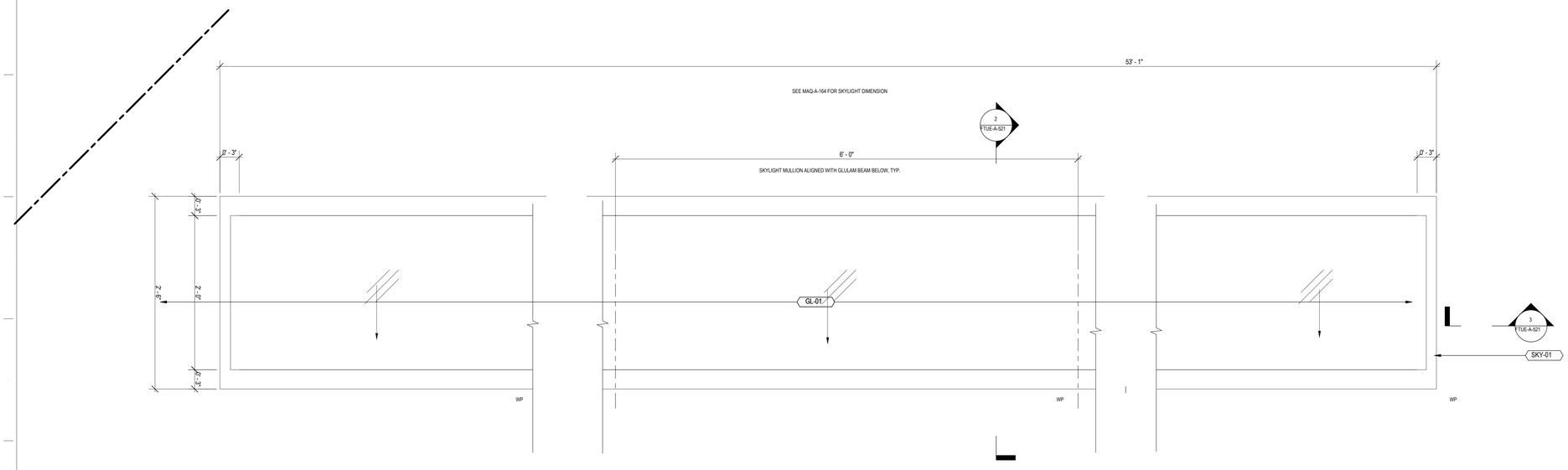
3 SECTION DETAIL - SKYLIGHT END WALL

SCALE: 1 1/2" = 1'-0"



2 SECTION DETAIL - SKYLIGHT

SCALE: 1 1/2" = 1'-0"



1 PLAN DETAL - SKYLIGHT

SCALE: 1 1/2" = 1'-0"

0 4" 8" 1'-4" 2'-8"

KEYNOTES

GL-01	088000 TYPICAL EXTERIOR IGU
MTL-09	057000 POWDER COATED ALUMINUM, DARK GRAY
SKY-01	086200 METAL FRAMED SKYLIGHTS

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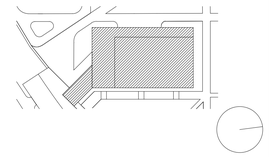

NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
2	19 MAY 2023	ISSUED FOR BID			
1	18 FEB 2022	ISSUED TO L&I	3	14 JULY 2023	ADDENDUM 32

RECORD REVISIONS

SEAL

SIGNATURE DATE

ARCHITECT

SOM

Skidmore, Owings & Merrill LLP

250 Greenwich St, New York, 10007

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES

HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.

C-0211-0005 PHASE 5

Pennsylvania State Police Academy
Core Buildings, BESO & Sitework

PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

VERIFY SCALE

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0 1

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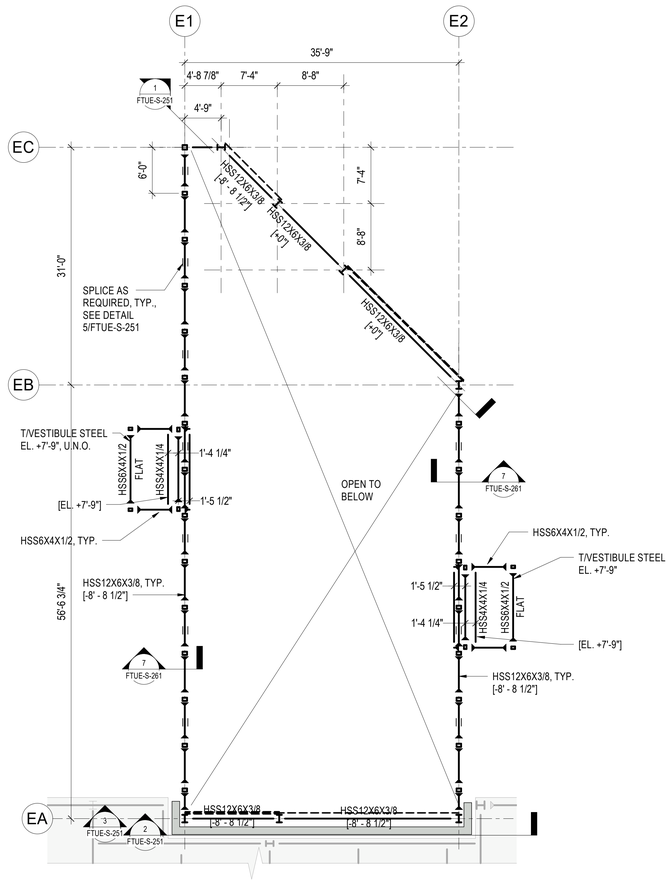
EXTERIOR DETAILS - SKYLIGHT

SHEET No.

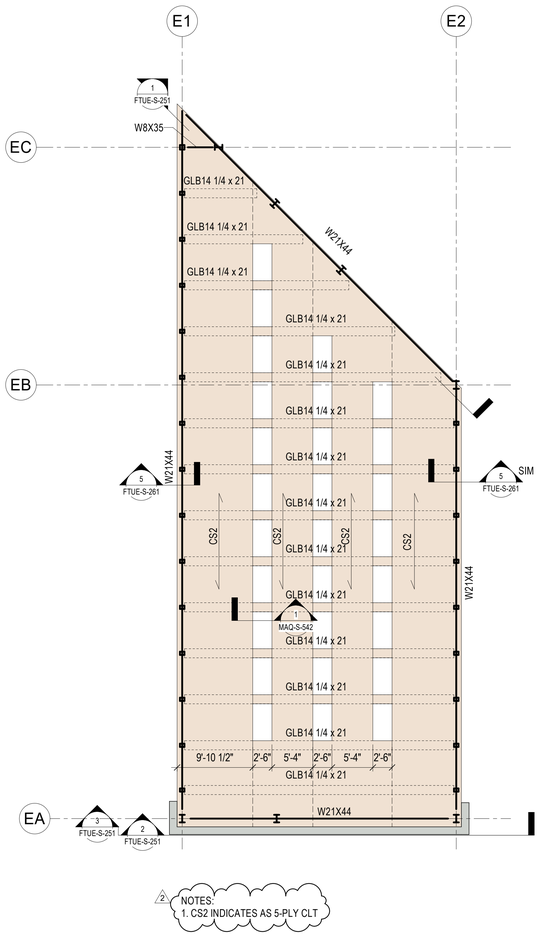
FTUE-A-521

DRAWN BY	CHECKED BY	DATE	SCALE
Author	Checker	SEPT 2022	AS NOTED



1 INTERMEDIATE FRAMING PLAN

SCALE: 1/8" = 1'-0"



2 ROOF FRAMING PLAN

SCALE: 1/8" = 1'-0"

GENERAL SHEET NOTES:

1. ALL BUILDING ELEVATIONS ARE REFERENCED TO BUILDING REFERENCE DATUM. EL. +0 = NAVD 88 DATUM, SEE GEN-G-100
2. TOP OF CLT SLAB ELEVATION IS EL. 24'-10"
3. TOP OF STEEL ELEVATION IS -6 7/8" FROM TOP OF CLT SLAB ELELVATION, THUS [+/-XX'-XX"] DENOTES VERTICAL OFFSET
4. SEE ARCHITECTURAL AND MEP DRAWINGS FOR ADDITIONAL OPENING NOT SHOWN ON PLANS.
5. SEE ARCHITECTURAL AND MEP DRAWINGS FOR CURBS, PADS, AND FILLS SIZE AND LOCATIONS.
6. SEE MAQ-S-501 FOR STEEL COLUMN DETAILS
7. SEE MAQ-S-511 FOR STEEL DETAILS
8. SEE MAQ-S-521 FOR STEEL BRACE DETAILS
9. SEE MAQ-S-531 TO 532 FOR METAL DECK SLAB DETAILS
10. SEE MAQ-S-541 FOR CLT DECK SLAB DETAILS

TACTICAL TRAINING DESIGN

Tactical Design North, Inc.
231 E. Buffalo St #502, Milwaukee, WI 53202

LOCAL ARCHITECT

Jacobs Wyper Architects
1232 Chancellor St, Philadelphia, PA 19107

STRUCTURAL ENGINEER

Skidmore, Owings & Merrill LLP
250 Greenwich St, New York, NY 10007

ELECTRICAL, PLUMBING, FIRE PROTECTION, FIRE ALARM ENGINEER

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164 Brighton Rd, Clifton, NJ 07012

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119 S. St. Asaph St, Alexandria, VA 22314

LANDSCAPE

Lee and Associates, Inc.
638 I Street NW, Washington, DC 20001

LIGHTING

MCLA
1000 Potomac St NW, Suite 121, Washington, DC 20007

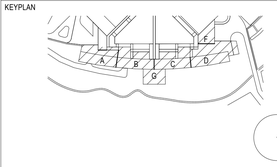
FOOD SERVICE

Hopkins Foodservice Specialists, Inc.
7906 MacArthur Blvd, Suite 100, Cabin John, MD 20818

POOL DESIGN

Aqua Design International
7536 N. La Cholla Blvd Tucson, AZ 85741

KEYPLAN



NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
2	14 JUL 2023	ADDENDUM 32			
1	19 MAY 2023	ISSUED FOR BID			

RECORD REVISIONS

COMMONWEALTH OF PENNSYLVANIA
PROFESSIONAL
BONGHWAN KIM
ENGINEER
No. PE087243
PENNSYLVANIA

SIGNATURE DATE

ARCHITECT

SOM

Skidmore, Owings & Merrill LLP
250 Greenwich St, New York, 10007

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 5

PA State Police Academy - New Construction of Three Core Buildings and BESO
PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

VERIFY SCALE

BAR IS ONE (1) INCH LONG
ON ORIGINAL DRAWING:
0 1
IF BAR IS NOT ONE (1) INCH LONG, ADJUST SCALE ACCORDINGLY

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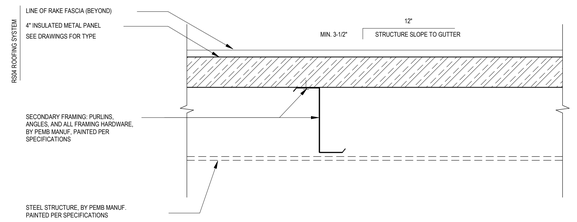
FRAMING PART PLAN E - LEVEL 2

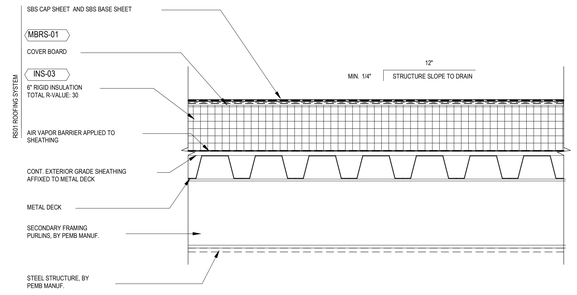
SHEET No. FTUE-S-111

DRAWN BY	CHECKED BY	DATE	SCALE
Author	Checker		AS NOTED



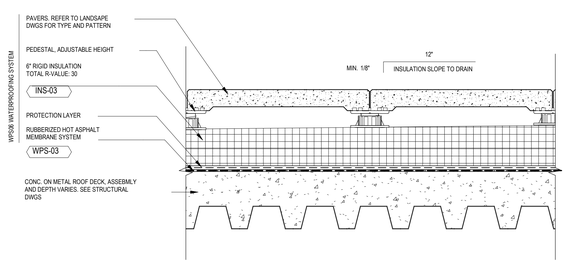
4 RS-04 - INSULATED METAL PANEL ROOFING

SCALE: 1 1/2" = 1'-0"



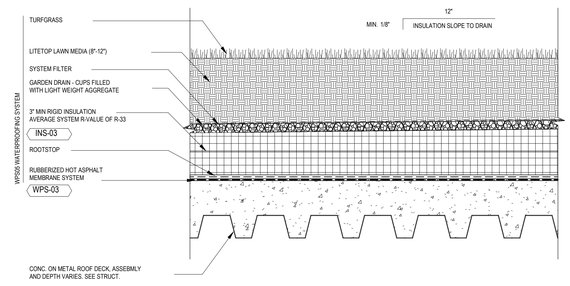
3 RS-03 - SBS MEMBRANE ROOF ON METAL DECK

SCALE: 1 1/2" = 1'-0"



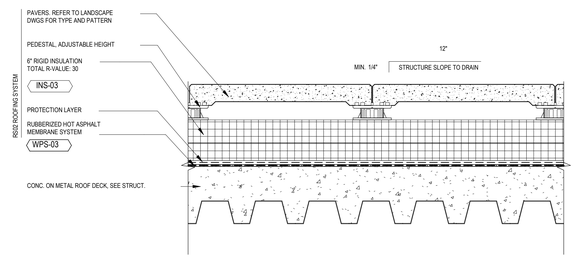
7 PRS-02 - PMR WITH PAVERS SYSTEM

SCALE: 1 1/2" = 1'-0"



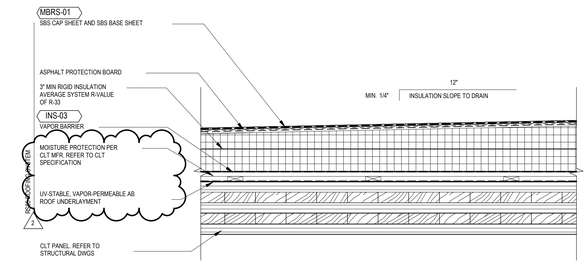
6 PRS-01- PMR WITH LAWN SYSTEM

SCALE: 1 1/2" = 1'-0"



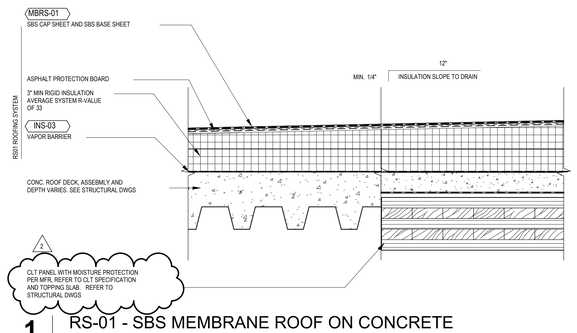
2 RS-02 - PMR WITH PAVERS ON MD CONCRETE

SCALE: 1 1/2" = 1'-0"



5 RS-05 - SBS MEMBRANE ROOF ON CLT

SCALE: 1 1/2" = 1'-0"



1 RS-01 - SBS MEMBRANE ROOF ON CONCRETE

SCALE: 1 1/2" = 1'-0"

0 4" 8" 1'-4" 2'-8"

KEYNOTES

INS-03	072100 XPS BOARD INSULATION 60 PSI
MBRS-01	075200 SBS MEMBRANE
WPS-03	075556 HOT FLUID APPLIED WATERPROOFING

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MCLA
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Hopkins Foodservice Specialists, Inc.
7906 MacArthur Blvd, Suite 100, Cabin John, MD 20818

POOL DESIGN

AQUA Design International
7536 N. La Cholla Blvd, Tucson, AZ 85741

KEYPLAN

NO.	DATE	DESCRIPTION
2	14 JULY 2023	ADDENDUM 32
1	19 MAY 2023	ISSUED FOR BID

RECORD REVISIONS

SEAL

SIGNATURE DATE

ARCHITECT

SOM
Skidmore, Owings & Merrill LLP
250 Greenwich St, New York, 10007

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 5

Pennsylvania State Police Academy
Core Buildings, BESO & Sitework

PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

EXTERIOR ROOFING AND WATERPROOFING SYSTEMS

SHEET No.
GEN-A-510

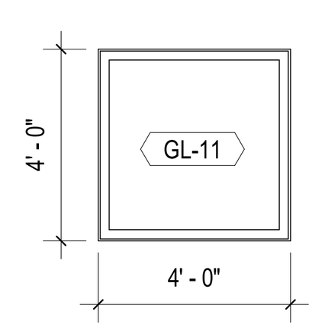
DRAWN BY	CHECKED BY	DATE	SCALE
MP	TNB	SEPT 2022	AS NOTED

DOOR SCHEDULE - TYPE																		
		DOOR					FRAME			DETAIL								
TYPE	LOCATION	TYPE	WIDTH	HEIGHT	MATERIAL	FINISH	TYPE	MATERIAL	FINISH	JAMB	HEAD	SILL	FIRE RATING	ACOUSTIC	SECURITY	HARDWARE	COMMENTS	
PH - PUMP HOUSE																		
EF		F	3' - 0"	7' - 0"	HM	PT-03	1	HM	PT-03	7/GEN-A-520	6/GEN-A-520	5/GEN-A-520	-			EXT01AT		
EF2		F2	6' - 1"	7' - 0"	HM	PT-03	2	HM	PT-03	7/GEN-A-520	6/GEN-A-520	5/GEN-A-520	-			EXT02T		
EF2		F2	6' - 1"	7' - 0"	HM	PT-03	2	HM	PT-03	J12/GEN-A-723	H13/GEN-A-722	S7/GEN-A721	-			EXT02T		

32

WINDOW SCHEDULE					
				ROUGH OPENING	
TYPE	QTY	DESCRIPTION	SILL HEIGHT	HEIGHT	WIDTH
PH - PUMP HOUSE					
W10	2		3' - 4"	4' - 0"	4' - 0"

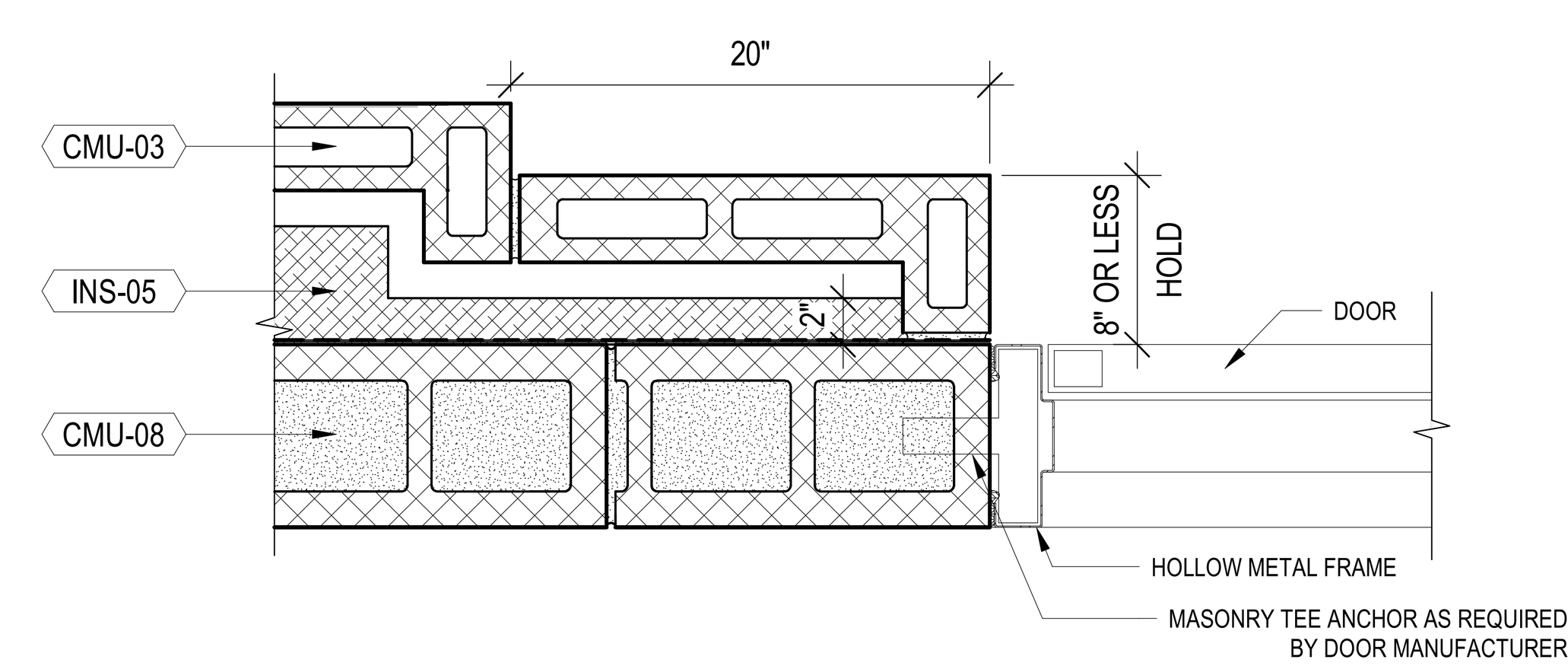
32



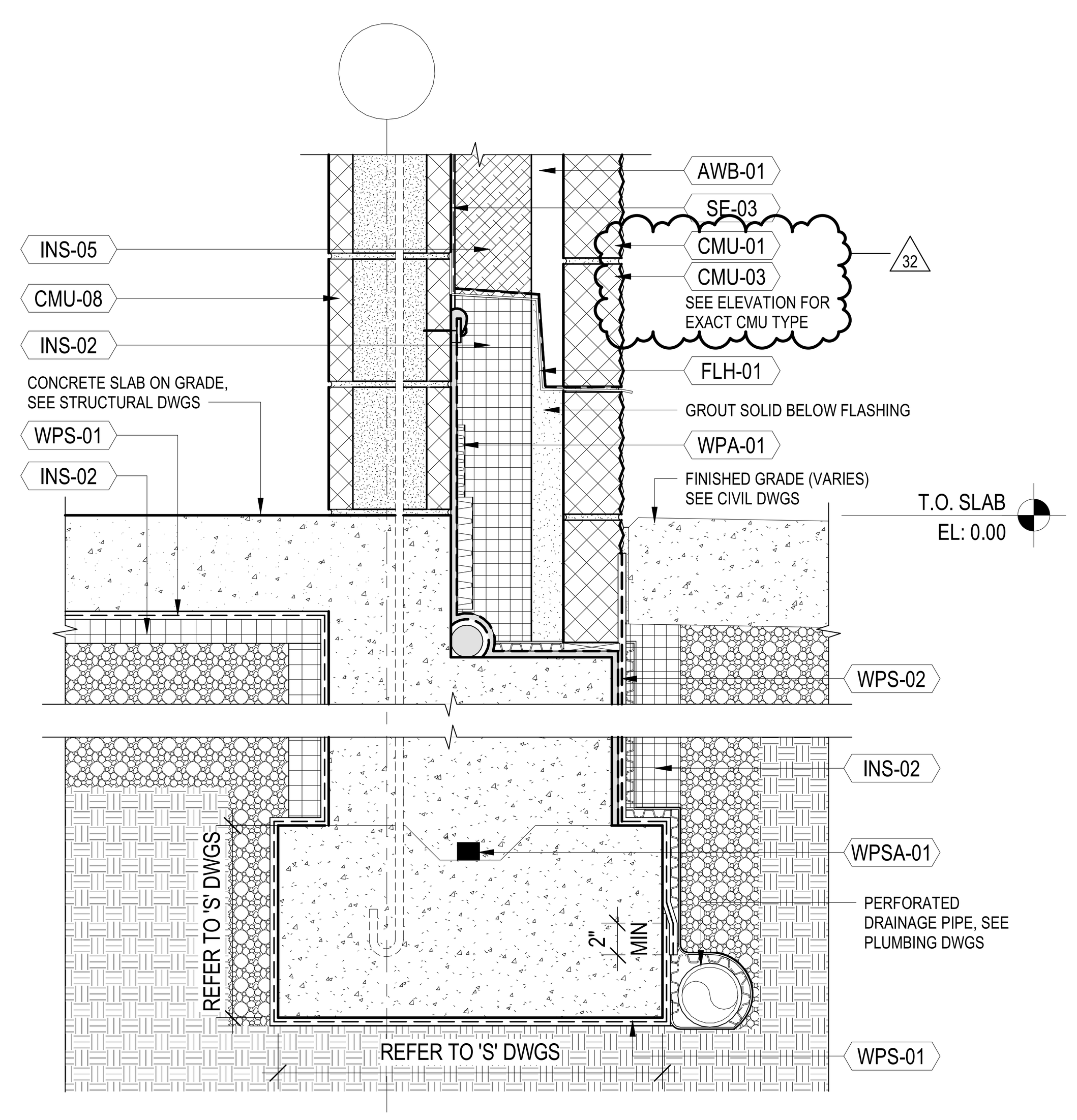
WINDOW W10

DETAIL	SHEET	DETAIL NO.
HEAD	GEN-A-520	3
SILL	GEN-A-520	2
JAMB	GEN-A-520	8

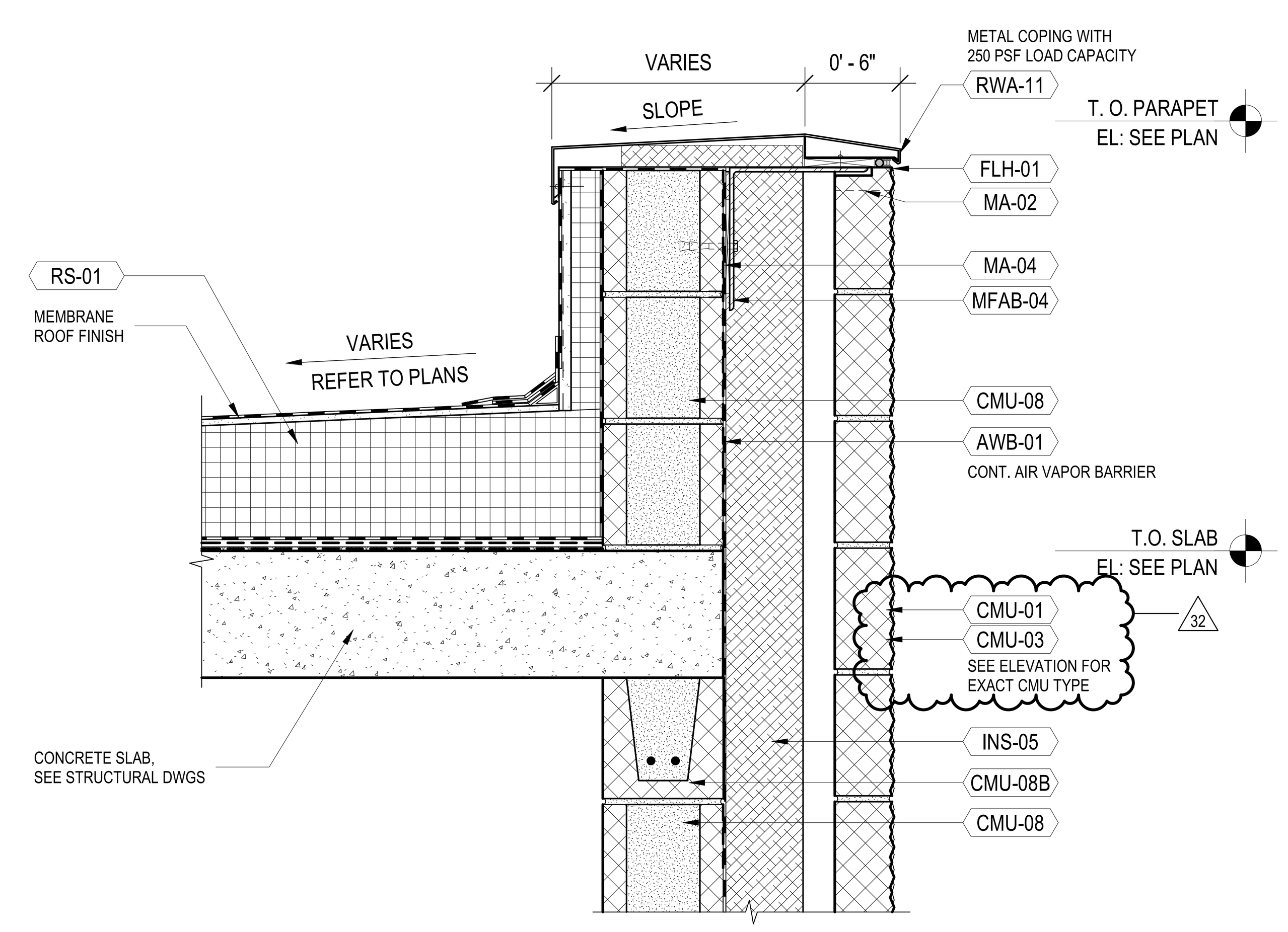
WINDOW TYPE
SCALE: 1/4" = 1'-0"



3 FV DOOR JAMB DETAIL - ADA CLEARANCE
SCALE: 1 1/2" = 1'-0"



2 FOUNDATION DTL - CONDITIONED BLDG
SCALE: 1 1/2" = 1'-0"



1 EXT DETAILS - SECTION INSULATED CMU @ PARAPET
SCALE: 1 1/2" = 1'-0"

KEYNOTES

AWB-01	072700 AIR BARRIERS
CMU-01	042000 CONCRETE MASONRY UNIT, 8" X 24" X 4" SPLIT FACE
CMU-03	042000 CONCRETE MASONRY UNIT, 8" X 24" X 4" GROUND FACE
CMU-08	042000 CONCRETE MASONRY UNIT, 8" X 16" X 8"
CMU-08B	042000 CONCRETE MASONRY UNIT BOND BEAM, 8" X 16" X 8"
FLH-01	076200 SS FLASHING
INS-02	072100 XPS BOARD INSULATION 25 PSI
INS-05	072100 SEMI RIGID MINERAL FIBER INSULATION
MA-02	042000 WEEP
MA-04	042000 THERMAL BREAK SHIM
RS-01	075200 SBS MEMBRANE ROOF ON CONCRETE
RWA-11	077000 METAL COPING CMU
SE-03	079200 SILICONE WEATHER SEAL SEALANT, BLACK DOW
WPA-01	071300 MOLDED POLYSTYRENE AND FABRIC DRAINAGE SHEET
WPS-01	071300 UNDERSLAB SHEET WATERPROOFING
WPS-02	071300 FOUNDATION WALL SHEET WATERPROOFING
WPSA-01	071300 WATERSTOP

TACTICAL TRAINING DESIGN
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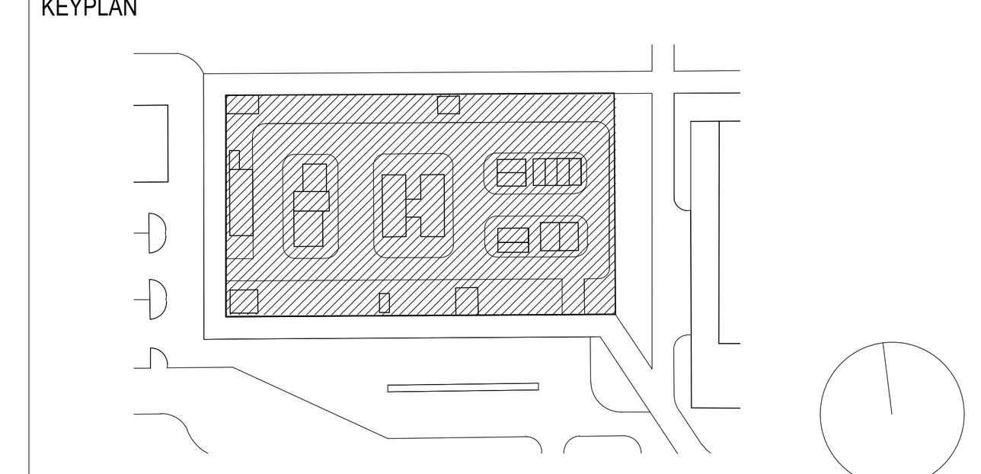
LIGHTING
MCLA
1000 Patomac St NW, Suite 121, Washington, DC 20007

FOOD SERVICE
Hopkins Foodservice Specialists, Inc.
7906 MacArthur Blvd, Suite 100, Cabin John, MD 20818

COST ESTIMATING
AECOM
1700 Market St, Suite 1600, Philadelphia, PA 19103

KEYPLAN



NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
32	14 JUL 2024	ADDENDUM #32			
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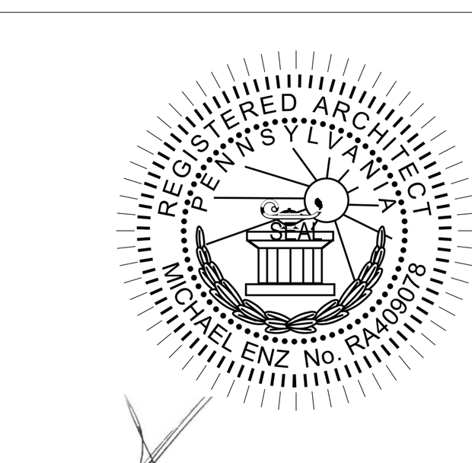
RECORD REVISIONS



SIGNATURE DATE

ARCHITECT
SOM
Skidmore, Owings & Merrill LLP
250 Greenwich St, New York, 10007

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 5

Pennsylvania State Police Academy
Core Buildings, BESO & Sitework

PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

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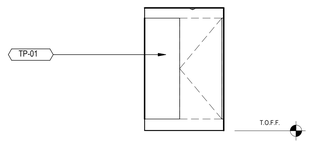
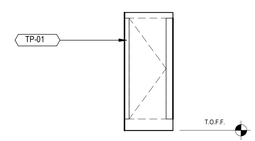
TRAINING VILLAGES ENCLOSURE DETAILS

SHEET No.			
GEN-A-580			
DRAWN BY	CHECKED BY	DATE	SCALE
TDN	TDN	MAY 2023	AS NOTED



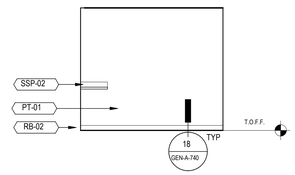
24 TYPICAL ADA SHOWER STALL - S

SCALE: 1/4" = 1'-0"



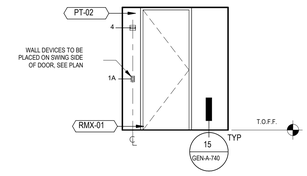
18 TYPICAL SHOWER STALL - SOUTH

SCALE: 1/4" = 1'-0"



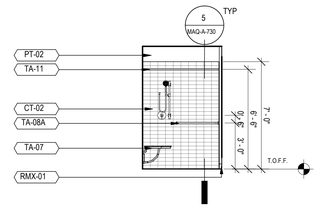
12 TYP NURSING PARENT ROOM - SOUTH

SCALE: 1/4" = 1'-0"



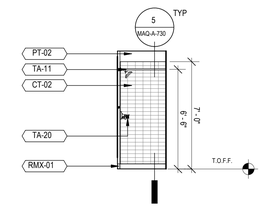
6 TYPICAL SINGLE TOILET - SOUTH

SCALE: 1/4" = 1'-0"



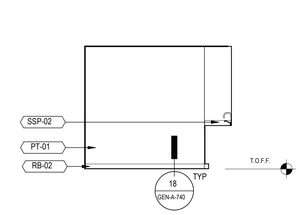
23 TYPICAL ADA SHOWER STALL - N

SCALE: 1/4" = 1'-0"



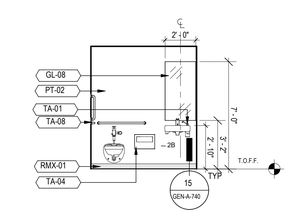
17 TYPICAL SHOWER STALL - NORTH

SCALE: 1/4" = 1'-0"



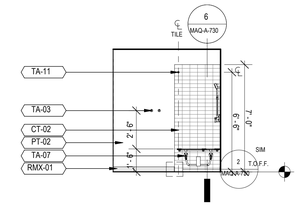
11 TYP NURSING PARENT ROOM - NORTH

SCALE: 1/4" = 1'-0"



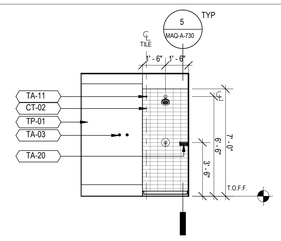
5 TYPICAL SINGLE TOILET - NORTH

SCALE: 1/4" = 1'-0"



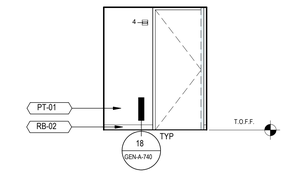
22 TYPICAL ADA SHOWER STALL - WEST

SCALE: 1/4" = 1'-0"



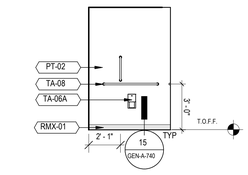
16 TYPICAL SHOWER STALL - WEST

SCALE: 1/4" = 1'-0"



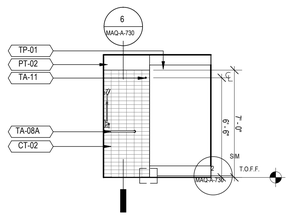
10 TYP NURSING PARENT ROOM - WEST

SCALE: 1/4" = 1'-0"



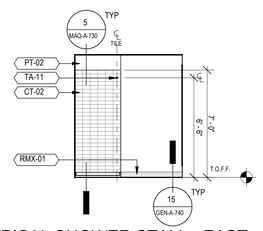
4 TYPICAL SINGLE TOILET - WEST

SCALE: 1/4" = 1'-0"



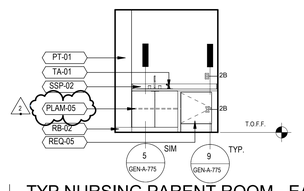
21 TYPICAL ADA SHOWER STALL - EAST

SCALE: 1/4" = 1'-0"



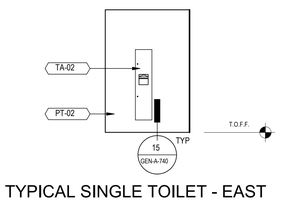
15 TYPICAL SHOWER STALL - EAST

SCALE: 1/4" = 1'-0"



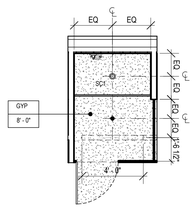
9 TYP NURSING PARENT ROOM - EAST

SCALE: 1/4" = 1'-0"



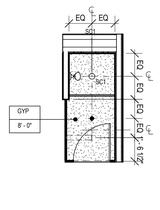
3 TYPICAL SINGLE TOILET - EAST

SCALE: 1/4" = 1'-0"



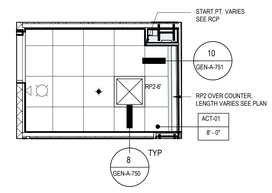
20 RCP - TYPICAL ADA SHOWER STALL

SCALE: 1/4" = 1'-0"



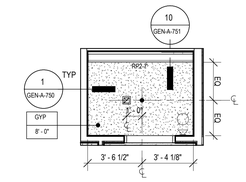
14 RCP - TYPICAL SHOWER STALL

SCALE: 1/4" = 1'-0"



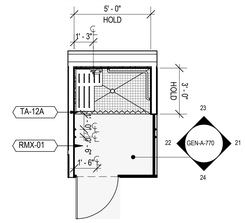
8 RCP - TYP NURSING PARENT ROOM

SCALE: 1/4" = 1'-0"



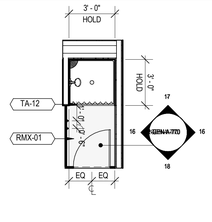
2 RCP - TYPICAL SINGLE TOILET

SCALE: 1/4" = 1'-0"



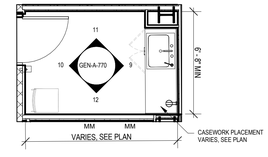
19 PLAN - TYPICAL ADA SHOWER STALL

SCALE: 1/4" = 1'-0"



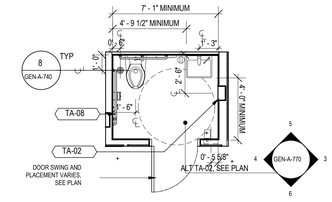
13 PLAN - TYPICAL SHOWER STALL

SCALE: 1/4" = 1'-0"



7 PLAN - TYP NURSING PARENT ROOM

SCALE: 1/4" = 1'-0"



1 PLAN - TYPICAL SINGLE TOILET

SCALE: 1/4" = 1'-0"

0 2'-0" 4'-0" 8'-0" 16'-0"

KEYNOTES

CT-02	093000 3" X 6" CERAMIC TILE WHITE
GL-08	088000 MIRROR GLASS
PLAM-05	064000 PLASTIC LAMINATE, DARK GRAY
PT-01	099100 PAINT FINISH, WHITE
PT-02	099100 PAINT FINISH, LIGHT GREY
RB-02	096500 RUBBER BASE - 2.5" - GRAY
REQ-05	113000 MINI REFRIGERATOR
RMX-01	096700 EPOXY FLOORING, GRAY
SSP-02	064000 SOLID SURFACE - DARK GRAY
TA-01	102813 SOAP DISPENSER
TA-02	102813 RECESSED COMBINATION PAPER TOWEL DISPENSER / WASTE RECEPTACLE
TA-03	102813 HOOK
TA-04	102813 TOILET SEAT COVER DISPENSER
TA-06A	102813 SINGLE SIDED TOILET TISSUE DISPENSER
TA-07	102813 ADA SHOWER SEAT
TA-08	102813 GRAB BAR
TA-08A	102813 L SHAPED GRAB BAR
TA-11	102813 SHOWER ROD WITH CURTAIN HOOKS
TA-12	102813 SHOWER CURTAIN
TA-12A	102813 SHOWER CURTAIN ADA
TA-20	102813 SHOWER SHELF
TP-01	102113 TOILET PARTITIONS

VERIFY SCALE

BAR IS ONE (1) INCH LONG ON ORIGINAL DRAWING:

0 1

IF BAR IS NOT ONE (1) INCH LONG, ADJUST SCALE ACCORDINGLY

CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS. VARIANCE FROM CONTRACT DOCUMENTS NOT PERMITTED WITHOUT PROFESSIONAL & BUREAU OF CONSTRUCTION APPROVAL.

TACTICAL TRAINING DESIGN

Tactical Design North, Inc.
231 E. Buffalo St #502, Milwaukee, WI 53202

LOCAL ARCHITECT

Jacobs Wyper Architects
1232 Chancellor St, Philadelphia, PA 19107

STRUCTURAL ENGINEER

Skidmore, Owings & Merrill LLP
250 Greenwich St, New York, NY 10007

ELECTRICAL, PLUMBING, FIRE PROTECTION, FIRE ALARM ENGINEER

A & J Consulting Engineering Services, P.C.
164 Brighton Rd, Clifton, NJ 07012

MECHANICAL, AVIT ENGINEER

Interface Engineering, Inc.
2000 M Street NW, Suite 270, Washington, DC 20036

ACOUSTICAL ENGINEER

Cerami
1001 Ave of the Americas, 4th Floor, New York, NY 10018

CODE CONSULTING

CCI
215 W 40th St, 10th Floor, New York, NY 10018

CIVIL ENGINEER

Langan
1818 Market St #3300, Philadelphia, PA 19103

VERTICAL TRANSPORT

Michael Blades & Associates Ltd.
5409 Rapidan Ct, Lothian, MD 20711

SIGNAGE CONSULTANT

Patricia Hord Graphik Design
119 S. St. Asaph St, Alexandria, VA 22314

LANDSCAPE

Lee and Associates, Inc.
638 I Street NW, Washington, DC 20001

LIGHTING

MCLA
1000 Patomic St NW, Suite 121, Washington, DC 20007

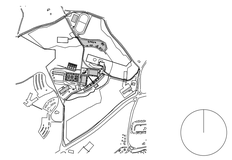
FOOD SERVICE

Hopkins Foodservice Specialists, Inc.
7906 MacArthur Blvd, Suite 100, Cabin John, MD 20818

POOL DESIGN

AQUA Design International
7536 N. La Cholla Blvd, Tucson, AZ 85741

KEYPLAN



NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
2	14 JULY 2023	ADDENDUM 32			
1	19 MAY 2023	ISSUED FOR BID			

RECORD REVISIONS

SEAL

SIGNATURE DATE

ARCHITECT

SOM
Skidmore, Owings & Merrill LLP
250 Greenwich St, New York, 10007

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 5

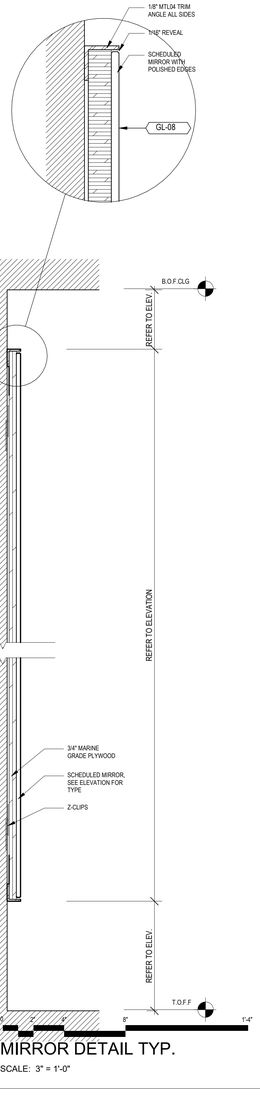
Pennsylvania State Police Academy
Core Buildings, BESO & Sitework

PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

RESTROOM DETAILS

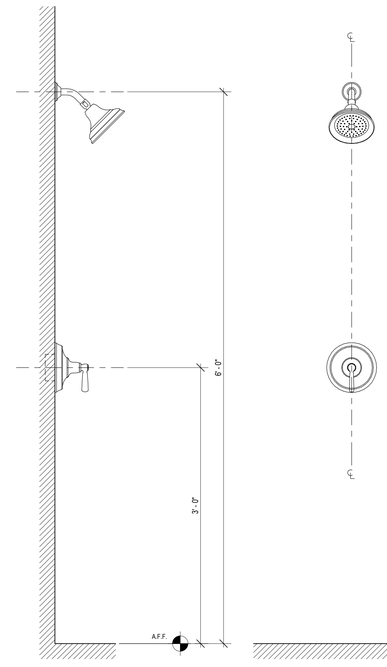
SHEET No. GEN-A-770

DRAWN BY	CHECKED BY	DATE	SCALE
SS	TNB	SEPT 2022	AS NOTED



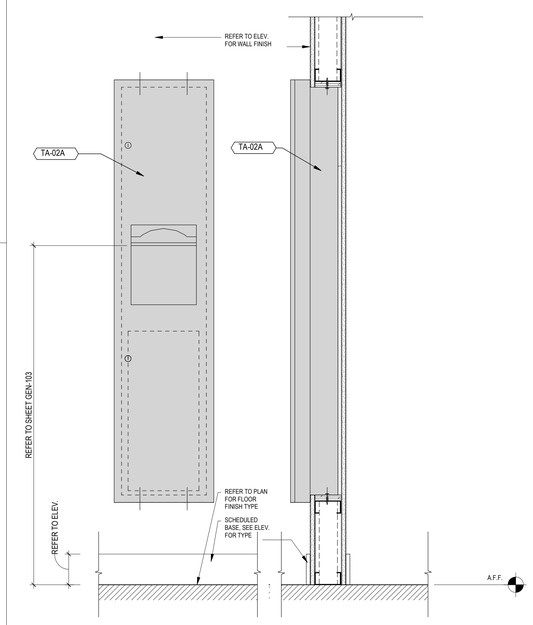
9 MIRROR DETAIL TYP.

SCALE: 3" = 1'-0"



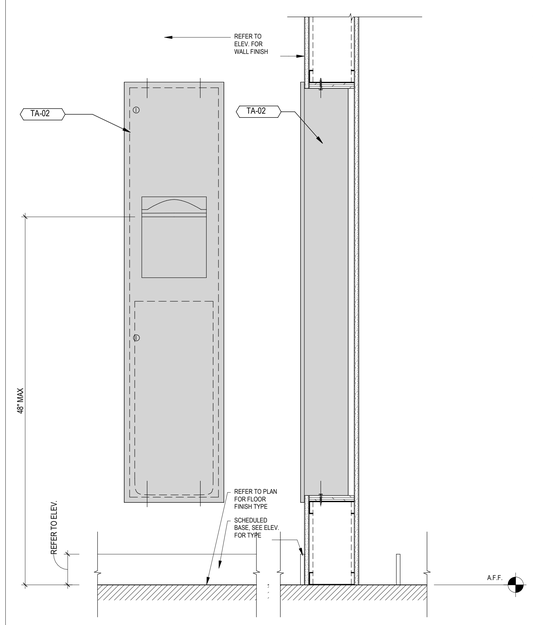
8 SHOWER HEAD / CONTROL DETAILS TYP.

SCALE: 1 1/2" = 1'-0"



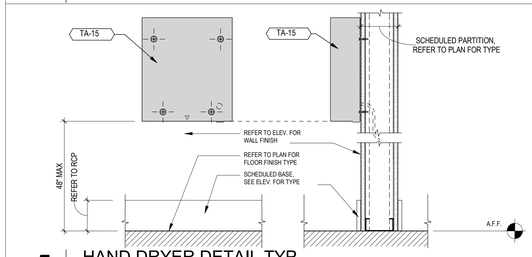
6 SEMI-RECESSED TOWER DISP. / WASTE

SCALE: 1 1/2" = 1'-0"



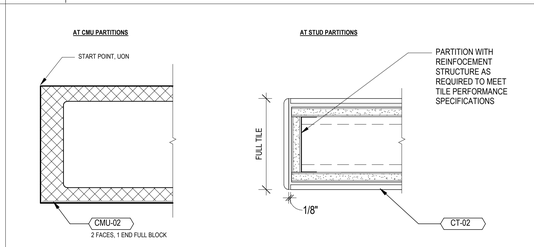
3 RECESSED TOWER DISP. / WASTE TYP.

SCALE: 1 1/2" = 1'-0"



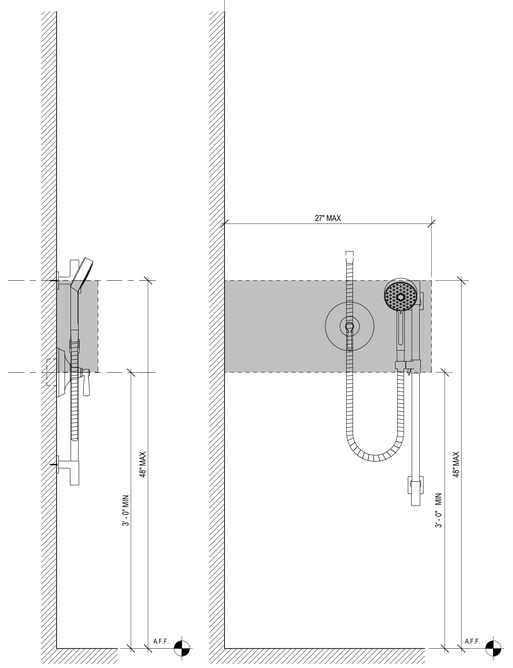
5 HAND DRYER DETAIL TYP.

SCALE: 1 1/2" = 1'-0"



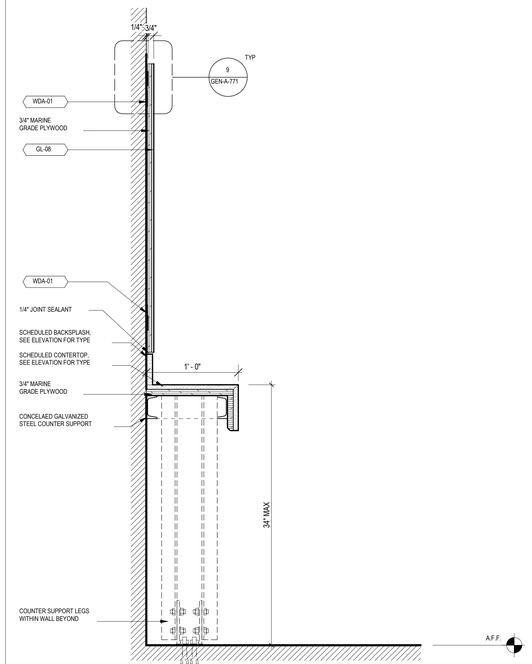
2 PLAN DETAIL AT VANITY END WALL

SCALE: 3" = 1'-0"



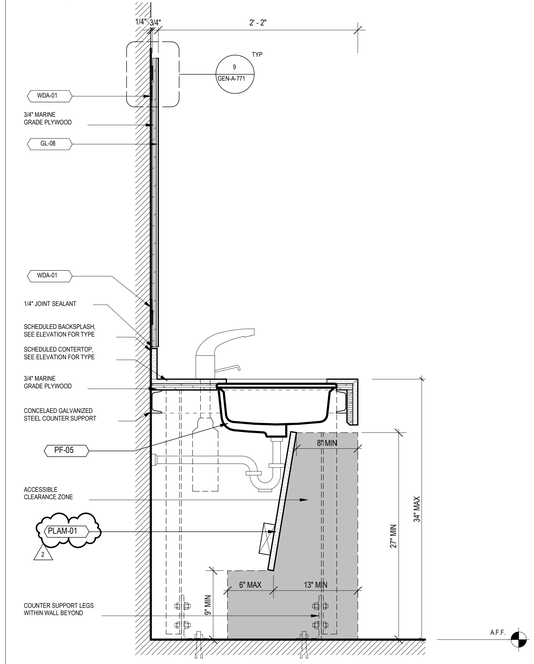
7 SHOWER HEAD / CONTROL DETAILS AT ADA

SCALE: 1 1/2" = 1'-0"



4 GROOMING AREA TYP.

SCALE: 1 1/2" = 1'-0"



1 RESTROOM VANITY TYP.

SCALE: 1 1/2" = 1'-0"

KEYNOTES

CMU-02	042000 CONCRETE MASONRY UNIT, 8" X 24" X 8" GROUND FACE
CT-02	093000 3" X 6" CERAMIC TILE WHITE
GL-08	088000 MIRROR GLASS
PF-05	224000 PUBLIC BATHROOMS SINK
PLAM-01	064000 PLASTIC LAMINATE, WHITE
TA-02	102813 RECESSED COMBINATION PAPER TOWEL DISPENSER / WASTE RECEPTACLE
TA-02A	102813 SEMI-RECESSED COMBINATION PAPER TOWEL DISPENSER / WASTE RECEPTACLE
TA-15	102813 HAND DRYER

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0 1

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POOL DESIGN

AQUA Design International
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KEYPLAN

NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
2	14 JULY 2023	ADDENDUM 32			
1	19 MAY 2023	ISSUED FOR BID			

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SIGNATURE DATE

ARCHITECT

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 5

Pennsylvania State Police Academy
Core Buildings, BESO & Sitework

PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

RESTROOM DETAILS

SHEET No.
GEN-A-771

DRAWN BY	CHECKED BY	DATE	SCALE
ML	TNB	SEPT 2022	AS NOTED

VOLUME 2A

HVAC CONSTRUCTION CONTRACTOR .2

DRAWING NO.	DRAWING NAME	ISSUED FOR BID 5/19/23
G-SERIES	**GENERAL**	
GEN-G-001.2	COVER SHEET VOLUME 2	X
GEN-G-003.1	DRAWING INDEX VOLUME 2	X
GEN-G-003.2	DRAWING INDEX VOLUME 2	X
M-SERIES	**MECHANICAL DRAWINGS**	
GEN-M-001	SYMBOL LIST AND GENERAL NOTES - MECHANICAL	X
GEN-M-002	SHEET LIST - MECHANICAL	X
STE-M-100	SITE PLAN - MECHANICAL	X
STE-M-700	WATERSIDE DETAILS	X
M-SERIES-MAQ	**MECHANICAL DRAWINGS-MAQ**	
MAQ-M-000	OVERALL FLOOR PLAN - UNDERGROUND - MECHANICAL	X
MAQ-M-001	OVERALL FLOOR PLAN - LEVEL 0 - MECHANICAL	X
MAQ-M-002	OVERALL FLOOR PLAN - LEVEL 1 - MECHANICAL	X
MAQ-M-003	OVERALL FLOOR PLAN - LEVEL 2 - MECHANICAL	X
MAQ-M-004	OVERALL FLOOR PLAN - LEVEL 3 - MECHANICAL	X
MAQ-M-005	OVERALL FLOOR PLAN - LEVEL 4 - MECHANICAL	X
MAQ-M-006	OVERALL FLOOR PLAN - ROOF - MECHANICAL	X
MAQ-M-102	FLOOR PLAN PART B - LEVEL UNDERGROUND - MECHANICAL	X
MAQ-M-103	FLOOR PLAN PART C - LEVEL UNDERGROUND - MECHANICAL	X
MAQ-M-105	FLOOR PLAN PART G - LEVEL UNDERGROUND - MECHANICAL	X
MAQ-M-110	FLOOR PART PLAN A- LEVEL 0 - MECHANICAL	X
MAQ-M-111	FLOOR PART PLAN B - LEVEL 0 - MECHANICAL	X
MAQ-M-112	FLOOR PART PLAN C - LEVEL 0 - MECHANICAL	X
MAQ-M-113	FLOOR PART PLAN D - LEVEL 0 - MECHANICAL	X
MAQ-M-114	FLOOR PART PLAN G - LEVEL 0 - MECHANICAL	X
MAQ-M-120	FLOOR PART PLAN A - LEVEL 1 - MECHANICAL	X
MAQ-M-121	FLOOR PART PLAN B - LEVEL 1 - MECHANICAL	X
MAQ-M-122	FLOOR PART PLAN C - LEVEL 1 - MECHANICAL	X
MAQ-M-123	FLOOR PART PLAN D - LEVEL 1 - MECHANICAL	X
MAQ-M-124	FLOOR PART PLAN E - LEVEL 1 - MECHANICAL	X
MAQ-M-130	FLOOR PART PLAN A - LEVEL 2 - MECHANICAL	X
MAQ-M-131	FLOOR PART PLAN B - LEVEL 2 - MECHANICAL	X
MAQ-M-132	FLOOR PART PLAN C - LEVEL 2 - MECHANICAL	X
MAQ-M-133	FLOOR PART PLAN D - LEVEL 2 - MECHANICAL	X
MAQ-M-140	FLOOR PART PLAN A - LEVEL 3 - MECHANICAL	X
MAQ-M-141	FLOOR PART PLAN B - LEVEL 3 - MECHANICAL	X
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MAQ-M-143	FLOOR PART PLAN D - LEVEL 3 - MECHANICAL	X
MAQ-M-150	FLOOR PART PLAN A - LEVEL 4 - MECHANICAL	X
MAQ-M-151	FLOOR PART PLAN B - LEVEL 4 - MECHANICAL	X
MAQ-M-152	FLOOR PART PLAN C - LEVEL 4 - MECHANICAL	X
MAQ-M-153	FLOOR PART PLAN D - LEVEL 4 - MECHANICAL	X
MAQ-M-160	FLOOR PART PLAN A - ROOF - MECHANICAL	X
MAQ-M-161	FLOOR PART PLAN B - ROOF - MECHANICAL	X
MAQ-M-162	FLOOR PART PLAN C - ROOF - MECHANICAL	X
MAQ-M-163	FLOOR PART PLAN D - ROOF - MECHANICAL	X
MAQ-M-200	OVERALL FLOOR PLAN - LEVEL UNDERGROUD - MECHANICAL PIPING	X
MAQ-M-201	OVERALL FLOOR PLAN - LEVEL 0 - MECHANICAL PIPING	X
MAQ-M-202	OVERALL FLOOR PLAN - LEVEL 1 - MECHANICAL PIPING	X
MAQ-M-203	OVERALL FLOOR PLAN - LEVEL 2 - MECHANICAL PIPING	X
MAQ-M-204	OVERALL FLOOR PLAN - LEVEL 3 - MECHANICAL PIPING	X
MAQ-M-205	OVERALL FLOOR PLAN - LEVEL 4 - MECHANICAL PIPING	X
MAQ-M-206	FLOOR PLAN G - LEVEL UNDERGROUND - MECHANICAL PIPING	X
MAQ-M-210	FLOOR PART PLAN A - LEVEL 0 - MECHANICAL PIPING	X
MAQ-M-211	FLOOR PART PLAN B - LEVEL 0 - MECHANICAL PIPING	X
MAQ-M-212	FLOOR PART PLAN C - LEVEL 0 - MECHANICAL PIPING	X
MAQ-M-213	FLOOR PART PLAN D - LEVEL 0 - MECHANICAL PIPING	X
MAQ-M-214	FLOOR PART PLAN G - LEVEL 0- MECHANICAL PIPING	X
MAQ-M-220	FLOOR PART PLAN A - LEVEL 1 - MECHANICAL PIPING	X
MAQ-M-221	FLOOR PART PLAN B - LEVEL 1 - MECHANICAL PIPING	X
MAQ-M-222	FLOOR PART PLAN C - LEVEL 1 - MECHANICAL PIPING	X
MAQ-M-223	FLOOR PART PLAN D - LEVEL 1 - MECHANICAL PIPING	X
MAQ-M-224	FLOOR PART PLAN G - LEVEL 1 - MECHANICAL PIPING	X
MAQ-M-230	FLOOR PART PLAN A - LEVEL 2 - MECHANICAL PIPING	X
MAQ-M-231	FLOOR PART PLAN B - LEVEL 2 - MECHANICAL PIPING	X
MAQ-M-232	FLOOR PART PLAN C - LEVEL 2 - MECHANICAL PIPING	X
MAQ-M-233	FLOOR PART PLAN D - LEVEL 2 - MECHANICAL PIPING	X
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MAQ-M-242	FLOOR PART PLAN C - LEVEL 3 - MECHANICAL PIPING	X
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MAQ-M-302	ENLARGED PLANS - MECHANICAL	X
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MAQ-M-304	ENLARGED PLANS - MECHANICAL	X
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MAQ-M-307	ENLARGED PLANS - MECHANICAL	X
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MAQ-M-401	AIR RISER - MECHANICAL	X
MAQ-M-402	AIR RISER - MECHANICAL	X
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MAQ-M-404	WATER RISER - MECHANICAL	X
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MAQ-M-701	AIRSIDE DETAILS	X
MAQ-M-702	AIRSIDE DETAILS	X
MAQ-M-703	WATERSIDE DETAILS	X
MAQ-M-704	WATERSIDE DETAILS	X
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MAQ-M-801	CONTROLS - MECHANICAL	X
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MAQ-M-803	CONTROLS - MECHANICAL	X
MAQ-M-804	CONTROLS - MECHANICAL	X
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MAQ-M-808	CONTROLS - MECHANICAL	X
MAQ-M-809	CONTROLS - MECHANICAL	X
M-SERIES-GYM	**MECHANICAL DRAWINGS-GYM**	
GYM-M-101	OVERALL FLOOR PLAN - LEVEL 1 - MECHANICAL	X
GYM-M-102	OVERALL FLOOR PLAN - MEZZANINE - MECHANICAL	X
GYM-M-103	ROOF PLAN - MECHANICAL	X
GYM-M-111	FLOOR PART PLAN A - LEVEL 1 - MECHANICAL	X
GYM-M-112	FLOOR PART PLAN B - LEVEL 1 - MECHANICAL	X
GYM-M-121	FLOOR PART PLAN A - MEZZANINE - MECHANICAL	X
GYM-M-122	FLOOR PART PLAN B - MEZZANINE - MECHANICAL	X
GYM-M-201	OVERALL FLOOR PLAN - LEVEL 1 - MECHANICAL PIPING	X
GYM-M-202	OVERALL FLOOR PLAN - MEZZANINE - MECHANICAL PIPING	X
GYM-M-211	FLOOR PART PLAN A - LEVEL 1 - MECHANICAL PIPING	X
GYM-M-212	FLOOR PART PLAN B - LEVEL 1 - MECHANICAL PIPING	X
GYM-M-221	FLOOR PART PLAN A - MEZZANINE - MECHANICAL PIPING	X
GYM-M-222	FLOOR PART PLAN B - MEZZANINE - MECHANICAL PIPING	X
GYM-M-300	ENLARGED PLANS - MECHANICAL	X
GYM-M-301	ENLARGED PLANS - MECHANICAL	X
GYM-M-400	SCHEDULES- MECHANICAL	X
GYM-M-401	SCHEDULES- MECHANICAL	X
GYM-M-402	VENTILATION SCHEDULES- MECHANICAL	X
GYM-M-700	AIRSIDE DETAILS	X
GYM-M-701	AIRSIDE DETAILS	X
GYM-M-702	WATERSIDE DETAILS	X
GYM-M-800	CONTROLS - MECHANICAL	X
GYM-M-801	CONTROLS - MECHANICAL	X
GYM-M-802	CONTROLS - MECHANICAL	X
M-SERIES-FTU	**MECHANICAL DRAWINGS-FTU**	
FTU-M-101	FLOOR PLAN - LEVEL 1 - MECHANICAL	X
FTU-M-102	FLOOR PLAN - ROOF - MECHANICAL	X
FTU-M-201	FLOOR PLAN - LEVEL 1 - MECHANICAL PIPING	X
FTU-M-301	ENLARGED PLANS - MECHANICAL	X
FTU-M-302	ENLARGED PLANS - MECHANICAL	X
FTU-M-401	SCHEDULES- MECHANICAL	X
FTU-M-402	SCHEDULES- MECHANICAL	X
FTU-M-403	SCHEDULES- MECHANICAL	X
FTU-M-700	AIRSIDE DETIALS	X
FTU-M-701	AIRSIDE DETIALS	X
FTU-M-703	WATERSIDE DETAILS	X
FTU-M-800	CONTROLS - MECHANICAL	X
FTU-M-801	CONTROLS - MECHANICAL	X
FTU-M-802	CONTROLS - MECHANICAL	X
FTU-M-803	CONTROLS - MECHANICAL	X
FTU-M-804	CONTROLS - MECHANICAL	X

HVAC CONSTRUCTION CONTRACTOR .2 (CONT)

DRAWING NO.	DRAWING NAME	ISSUED FOR BID 5/19/23
M-SERIES-BSO	**MECHANICAL DRAWINGS-BSO**	
BSO-M-101	OVERALL FLOOR PLAN - LEVEL 1 - MECHANCIAL	X
BSO-M-102	OVERALL FLOOR PLAN - LEVEL 2 - MECHANCIAL	X
BSO-M-110	FLOOR PART PLAN A - LEVEL 1 - MECHANICAL	X
BSO-M-111	FLOOR PART PLAN B - LEVEL 1 - MECHANICAL	X
BSO-M-120	FLOOR PART PLAN A - LEVEL 2 - MECHANICAL	X
BSO-M-121	FLOOR PART PLAN B - LEVEL 2 - MECHANICAL	X
BSO-M-301	ENLARGED PLANS - MECHANICAL	X
BSO-M-401	SCHEDULES- MECHANICAL	X
BSO-M-402	SCHEDULES- MECHANICAL	X
BSO-M-403	SCHEDULES- MECHANICAL	X
BSO-M-700	AIRSIDE DETAILS	X
BSO-M-701	AIRSIDE DETAILS	X
BSO-M-800	CONTROLS - MECHANICAL	X
BSO-M-801	CONTROLS - MECHANICAL	X
BSO-M-802	CONTROLS - MECHANICAL	X
M-SERIES-OTV	**MECHANICAL DRAWINGS-OTV**	
OTV-M-100	OVERALL SITE PLAN - MECHANICAL	X
OTV-M-210	FLOOR PLANS - PH - MECHANICAL	X
OTV-M-401	SCHEDULES - MECHANICAL	X

PLUMBING CONSTRUCTION CONTRACTOR .3

DRAWING NO.	DRAWING NAME	ISSUED FOR BID 5/19/23
P-SERIES	**PLUMBING DRAWINGS - GEN & SITE**	
GEN-P-001	MARQUEE - GENERAL NOTES, SYMBOLS, LEGEND AND ABBREVIATIONS -...	X
GEN-P-501	STANDARD DETAILS 1 OF 4	X
GEN-P-502	STANDARD DETAILS 2 OF 4	X
GEN-P-503	STANDARD DETAILS 3 OF 4	X
GEN-P-504	STANDARD DETAILS 4 OF 4	X
STE-P-020	SITE PLAN	X
P-SERIES-MAQ	**PLUMBING DRAWINGS - MAQ**	
MAQ-P-100	MARQUEE - OVERALL FLOOR PLAN - LEVEL 0 - PLUMBING	X
MAQ-P-101.1	MARQUEE - OVERHEAD FLOOR PART PLAN A - SAN & VENT - LEVEL 0 - PLUMBING	X
MAQ-P-101.2	MARQUEE - BELOWSLAB FLOOR PART PLAN A - SAN & VENT - LEVEL 0 - PLUMBING	X
MAQ-P-102.1	MARQUEE - OVERHEAD FLOOR PART PLAN B - SAN & VENT - LEVEL 0 - PLUMBING	X
MAQ-P-102.2	MARQUEE - BELOWSLAB FLOOR PART PLAN B - SAN & VENT - LEVEL 0 - PLUMBING	X
MAQ-P-103.1	MARQUEE - OVERHEAD FLOOR PART PLAN C - SAN & VENT - LEVEL 0 - PLUMBING	X
MAQ-P-103.2	MARQUEE - BELOWSLAB FLOOR PART PLAN C - SAN & VENT - LEVEL 0 - PLUMBING	X
MAQ-P-104.1	MARQUEE - OVERHEAD FLOOR PART PLAN D - SAN & VENT - LEVEL 0 - PLUMBING	X
MAQ-P-104.2	MARQUEE - BELOWSLAB FLOOR PART PLAN D - SAN & VENT - LEVEL 0 - PLUMBING	X
MAQ-P-104.3	MARQUEE - OVERHEAD FLOOR PART PLAN G - SAN & VENT - LEVEL 0 - PLUMBING	X
MAQ-P-104.4	MARQUEE - BELOWSLAB FLOOR PART PLAN G - SAN & VENT - LEVEL 0 - PLUMBING	X
MAQ-P-105	MARQUEE - FLOOR PART PLAN A - DOMESTIC WATER SUPPLY - LEVEL 0 -...	X
MAQ-P-106	MARQUEE - FLOOR PART PLAN B - DOMESTIC WATER SUPPLY - LEVEL 0 -...	X
MAQ-P-107	MARQUEE - FLOOR PART PLAN C - DOMESTIC WATER SUPPLY - LEVEL 0 -...	X
MAQ-P-108	MARQUEE - FLOOR PART PLAN D - DOMESTIC WATER SUPPLY - LEVEL 0 -...	X
MAQ-P-110	MARQUEE - OVERALL FLOOR PLAN - LEVEL 1 - PLUMBING	X
MAQ-P-111.1	MARQUEE - OVERHEAD FLOOR PART PLAN A - SAN & VENT - LEVEL 1 - PLUMBING	X
MAQ-P-111.2	MARQUEE - BELOWSLAB FLOOR PART PLAN A - SAN & VENT - LEVEL 1 - PLUMBING	X
MAQ-P-112.1	MARQUEE - OVERHEAD FLOOR PART PLAN B - SAN & VENT - LEVEL 1 - PLUMBING	X
MAQ-P-112.2	MARQUEE - BELOWSLAB FLOOR PART PLAN B - SAN & VENT - LEVEL 1 - PLUMBING	X
MAQ-P-113.1	MARQUEE - OVERHEAD FLOOR PART PLAN C - SAN & VENT - LEVEL 1 - PLUMBING	X
MAQ-P-113.2	MARQUEE - BELOWSLAB FLOOR PART PLAN C - SAN & VENT - LEVEL 1 - PLUMBING	X
MAQ-P-114.1	MARQUEE - OVERHEAD FLOOR PART PLAN D - SAN & VENT - LEVEL 1 - PLUMBING	X
MAQ-P-114.2	MARQUEE - BELOWSLAB FLOOR PART PLAN D - SAN & VENT - LEVEL 1 - PLUMBING	X
MAQ-P-115	MARQUEE -OVERHEAD FLOOR PART PLAN F -SAN & VENT -LEVEL 1 -PLUMBING	X
MAQ-P-115.1	MARQUEE - BELOW SLAB FLOOR PART PLAN F - SAN & VENT - LEVEL 1 - PLUMBING	X
MAQ-P-116	MARQUEE - FLOOR PART PLAN A - DOMESTIC WATER SUPPLY - LEVEL 1 -...	X
MAQ-P-117	MARQUEE - FLOOR PART PLAN B - DOMESTIC WATER SUPPLY - LEVEL 1 -...	X
MAQ-P-118	MARQUEE - FLOOR PART PLAN C - DOMESTIC WATER SUPPLY - LEVEL 1 -...	X
MAQ-P-119	MARQUEE - FLOOR PART PLAN D - DOMESTIC WATER SUPPLY - LEVEL 1 -...	X
MAQ-P-120	MARQUEE - OVERALL FLOOR PLAN - LEVEL 2 - PLUMBING	X
MAQ-P-121	MARQUEE - FLOOR PART PLAN A - SAN & VENT - LEVEL 2 - PLUMBING	X
MAQ-P-122	MARQUEE - FLOOR PART PLAN B - SAN & VENT - LEVEL 2 - PLUMBING	X
MAQ-P-123	MARQUEE - FLOOR PART PLAN C - SAN & VENT - LEVEL 2 - PLUMBING	X
MAQ-P-124	MARQUEE - FLOOR PART PLAN D - SAN & VENT - LEVEL 2 - PLUMBING	X
MAQ-P-125	MARQUEE - FLOOR PART PLAN F - SAN & VENT - LEVEL 2 - PLUMBING	X
MAQ-P-126	MARQUEE - FLOOR PART PLAN A - DOMESTIC WATER SUPPLY - LEVEL 2 -...	X
MAQ-P-127	MARQUEE - FLOOR PART PLAN B - DOMESTIC WATER SUPPLY - LEVEL 2 -...	X
MAQ-P-128	MARQUEE - FLOOR PART PLAN C - DOMESTIC WATER SUPPLY - LEVEL 2 -...	X
MAQ-P-129	MARQUEE - FLOOR PART PLAN D - DOMESTIC WATER SUPPLY - LEVEL 2 -...	X
MAQ-P-130	MARQUEE - OVERALL FLOOR PLAN - LEVEL 3 - PLUMBING MARQUEE - OVERALL	X
MAQ-P-131	MARQUEE - FLOOR PART PLAN A - SAN & VENT - LEVEL 3 - PLUMBING	X
MAQ-P-132	MARQUEE - FLOOR PART PLAN B - SAN & VENT - LEVEL 3 - PLUMBING	X
MAQ-P-133	MARQUEE - FLOOR PART PLAN C - SAN & VENT - LEVEL 3 - PLUMBING	X
MAQ-P-134	MARQUEE - FLOOR PART PLAN D - SAN & VENT - LEVEL 3 - PLUMBING	X
MAQ-P-135	MARQUEE - FLOOR PART PLAN E - SAN & VENT - LEVEL 3 - PLUMBING	X
MAQ-P-136	MARQUEE - FLOOR PART PLAN A - DOMESTIC WATER SUPPLY - LEVEL 3 -...	X
MAQ-P-137	MARQUEE - FLOOR PART PLAN B - DOMESTIC WATER SUPPLY - LEVEL 3 -...	X
MAQ-P-138	MARQUEE - FLOOR PART PLAN C - DOMESTIC WATER SUPPLY - LEVEL 3 -...	X
MAQ-P-139	MARQUEE - FLOOR PART PLAN D - DOMESTIC WATER SUPPLY - LEVEL 3 -...	X
MAQ-P-140	MARQUEE - OVERALL FLOOR PLAN - LEVEL 4 - PLUMBING	X
MAQ-P-141	MARQUEE - FLOOR PART PLAN A - SAN & VENT - LEVEL 4 - PLUMBING	X
MAQ-P-142	MARQUEE - FLOOR PART PLAN B - SAN & VENT - LEVEL 4 - PLUMBING	X
MAQ-P-143	MARQUEE - FLOOR PART PLAN C - SAN & VENT - LEVEL 4 - PLUMBING	X
MAQ-P-144	MARQUEE - FLOOR PART PLAN D - SAN & VENT - LEVEL 4 - PLUMBING	X
MAQ-P-145	MARQUEE - FLOOR PART PLAN A - DOMESTIC WATER SUPPLY - LEVEL 4 -...	X
MAQ-P-146	MARQUEE - FLOOR PART PLAN B - DOMESTIC WATER SUPPLY - LEVEL 4 -...	X
MAQ-P-147	MARQUEE - FLOOR PART PLAN C - DOMESTIC WATER SUPPLY - LEVEL 4 -...	X
MAQ-P-148	MARQUEE - FLOOR PART PLAN D - DOMESTIC WATER SUPPLY - LEVEL 4 -...	X
MAQ-P-150	MARQUEE - OVERALL FLOOR PLAN - ROOF - PLUMBING	X
MAQ-P-151	MARQUEE - FLOOR PART PLAN A - ROOF- PLUMBING	X
MAQ-P-152	MARQUEE - FLOOR PART PLAN B - ROOF - PLUMBING	X
MAQ-P-153	MARQUEE - FLOOR PART PLAN C - ROOF - PLUMBING	X
MAQ-P-154	MARQUEE - FLOOR PART PLAN D - ROOF - PLUMBING	X
MAQ-P-201	MARQUEE - ENLARGED PLANS 1 OF 6- PLUMBING	X
MAQ-P-202	MARQUEE - ENLARGED PLANS 2 OF 6- PLUMBING	X
MAQ-P-203	MARQUEE - ENLARGED PLANS 3 OF 6- PLUMBING	X
MAQ-P-204	MARQUEE - ENLARGED PLANS 4 OF 6- PLUMBING	X
MAQ-P-205	MARQUEE - ENLARGED PLANS 5 OF 6- PLUMBING	X
MAQ-P-206	MARQUEE - ENLARGED PLANS 6 OF 6 - PLUMBING	X
MAQ-P-301	MARQUEE - DOMESTIC WATER SUPPLY RISER 1 OF 8 - PLUMBING	X
MAQ-P-302	MARQUEE - DOMESTIC WATER SUPPLY RISER 2 OF 8 - PLUMBING	X
MAQ-P-303	MARQUEE - DOMESTIC WATER SUPPLY RISER 3 OF 8 - PLUMBING	X
MAQ-P-304	MARQUEE - DOMESTIC WATER SUPPLY RISER 4 OF 8 - PLUMBING	X
MAQ-P-305	MARQUEE - DOMESTIC WATER SUPPLY RISER 5 OF 8 - PLUMBING	X
MAQ-P-306	MARQUEE - DOMESTIC WATER SUPPLY RISER 6 OF 8 - PLUMBING	X
MAQ-P-307	MARQUEE - DOMESTIC WATER SUPPLY RISER 7 OF 8 - PLUMBING	X
MAQ-P-308	MARQUEE - DOMESTIC WATER SUPPLY RISER 8 OF 8 - PLUMBING	X
MAQ-P-309	MARQUEE - SANITARY AND VENT RISER 1 OF 11 - PLUMBING	X
MAQ-P-310	MARQUEE - SANITARY AND VENT RISER 2 OF 11 - PLUMBING	X
MAQ-P-311	MARQUEE - SANITARY AND VENT RISER 3 OF 11 - PLUMBING	X
MAQ-P-312	MARQUEE - SANITARY AND VENT RISER 4 OF 11 - PLUMBING	X
MAQ-P-313	MARQUEE - SANITARY AND VENT RISER 5 OF 11 - PLUMBING	X
MAQ-P-314	MARQUEE - SANITARY AND VENT RISER 6 OF 11 - PLUMBING	X
MAQ-P-315	MARQUEE - SANITARY AND VENT RISER 7 OF 11 - PLUMBING	X
MAQ-P-316	MARQUEE - SANITARY AND VENT RISER 8 OF 11 - PLUMBING	X
MAQ-P-317	MARQUEE - SANITARY AND VENT RISER 9 OF 11 - PLUMBING	X
MAQ-P-318	MARQUEE - SANITARY AND VENT RISER 10 OF 11 - PLUMBING	X
MAQ-P-319	MARQUEE - SANITARY AND VENT RISER 11 OF 11 - PLUMBING	X
MAQ-P-320	MARQUEE - GAS RISER - PLUMBING	X
MAQ-P-321	MARQUEE - STORM WATER RISER - PLUMBING	X
MAQ-P-401	MARQUEE - SCHEDULES 1 OF 2- PLUMBING	X
MAQ-P-402	MARQUEE - SCHEDULES 2 OF 2- PLUMBING	X
P-SERIES-GYM	**PLUMBING DRAWINGS - GYM**	
GYM-P-110	GYMNASIUM - OVERALL FLOOR PLAN - LEVEL1 - PLUMBING	X
GYM-P-111	GYMNASIUM - FLOOR PART PLAN A - SAN & VENT- LEVEL 1 - PLUMBING	X
GYM-P-112	GYMNASIUM - FLOOR PART PLAN B - SAN & VENT - LEVEL 1 - PLUMBING	X
GYM-P-113	GYMNASIUM - FLOOR PART PLAN A - DOMESTIC WATER SUPPLY - LEVEL 1 -...	X
GYM-P-114	GYMNASIUM - FLOOR PART PLAN B - DOMESTIC WATER SUPPLY - LEVEL 1 -...	X
GYM-P-120	GYMNASIUM - OVERLALL FLOOR PLAN - LEVEL 2 - PLUMBING	X
GYM-P-121	GYMNASIUM - FLOOR PART PLAN A - SAN & VENT - LEVEL 2 - PLUMBING	X
GYM-P-122	GYMNASIUM - FLOOR PART PLAN B - SAN & VENT - LEVEL 2 - PLUMBING	X
GYM-P-123	GYMNASIUM - FLOOR PART PLAN A - DOMESTIC WATER SUPPLY - LEVEL 2 -...	X
GYM-P-124	GYMNASIUM - FLOOR PART PLAN B - DOMESTIC WATER SUPPLY - LEVEL 2 -...	X
GYM-P-130	GYMNASIUM - OVERALL FLOOR PLAN - ROOF - PLUMBING	X
GYM-P-301	GYMNASIUM - DOMESTIC WATER SUPPLY RISER - PLUMBING	X
GYM-P-302	GYMNASIUM - SANITARY AND VENT RISER - PLUMBING	X
GYM-P-303	GYMNASIUM - STORM WATER RISER - PLUMBING	X
GYM-P-304	GYMNASIUM - GAS RISER - PLUMBING	X
GYM-P-401	GYMNASIUM - SCHEDULES - PLUMBING	X
P-SERIES-FTU	**PLUMBING DRAWINGS - FIREARMS UNIT**	
FTU-P-110	FIREARMS UNIT - OVERALL FLOOR PLAN - LEVEL 1 - PLUMBING	X
FTU-P-111	FIREARMS UNITS - FLOOR PART PLAN A - SAN & VENT - LEVEL 1 - PLUMBING	X
FTU-P-112	FIREARMS UNITS - FLOOR PART PLAN B - SAN & VENT - LEVEL 1 - PLUMBING	X
FTU-P-113	FIREARMS UNITS - FLOOR PART PLAN A - DOMESTIC WATER SUPPLY - LEVEL 1 -...	X
FTU-P-114	FIREARMS UNITS - FLOOR PART PLAN B - DOMESTIC WATER SUPPLY - LEVEL 1 -...	X
FTU-P-120	FIREARMS UNIT - OVERALL FLOOR PLAN - ROOF - PLUMBING	X
FTU-P-121	FIREARMS UNIT - FLOOR PART PLAN A - ROOF - PLUMBING	X
FTU-P-122	FIREARMS UNIT - FLOOR PART PLAN B - ROOF - PLUMBING	X
FTU-P-301	FIREARMS UNIT - DOMESTIC WATER SUPPLY RISER - PLUMBING	X
FTU-P-302	FIREARMS UNIT - SANITARY AND VENT RISER - PLUMBING	X
FTU-P-303	FIREARMS UNIT - STORM WATER RISER - PLUMBING	X
FTU-P-401	FIREARMS UNIT - SCHEDULES - PLUMBING	X

PLUMBING CONSTRUCTION CONTRACT .3 (CONT)

DRAWING NO.	DRAWING NAME	ISSUED FOR BID 5/19/23
P-SERIES-BSO	**PLUMBING DRAWINGS - BESO**	
BSO-P-110	BESO - OVERALL FLOOR PLAN - LEVEL 1 - PLUMBING	X
BSO-P-111	BESO - FLOOR PART PLAN A - SAN & VENT - LEVEL 1 - PLUMBING	X
BSO-P-112	BESO - FLOOR PART PLAN B - SAN & VENT - LEVEL 1 - PLUMBING	X
BSO-P-113	BESO - FLOOR PART PLAN A - DOMESTIC WATER SUPPLY - LEVEL 1 - PLUMBING	X
BSO-P-114	BESO - FLOOR PART PLAN B - DOMESTIC WATER SUPPLY - LEVEL 1 - PLUMBING	X
BSO-P-120	BESO - OVERALL FLOOR PLAN - LEVEL 2 - PLUMBING	X
BSO-P-121	BESO - FLOOR PART PLAN A - SAN & VENT - LEVEL 2 - PLUMBING	X
BSO-P-122	BESO - FLOOR PART PLAN B - SAN & VENT - LEVEL 2 - PLUMBING	X
BSO-P-123	BESO - FLOOR PART PLAN B - DOMESTIC WATER SUPPLY - LEVEL 2 - PLUMBING	X
BSO-P-130	BESO - OVERALL FLOOR PLAN - ROOF - PLUMBING	X
BSO-P-301	BESO - DOMESTIC WATER SUPPLY RISER - PLUMBING	X
BSO-P-302	BESO - SANITARY AND VENT RISER - PLUMBING	X
BSO-P-303	BESO - GAS RISER - PLUMBING	X
BSO-P-401	BESO - SCHEDULES - PLUMBING	X
FP-SERIES	**FIRE PROTECTION DRAWINGS**	
GEN-F-001	MARQUEE - GENERAL NOTES, SYMBOLS, LEGEND AND ABBREVIATIONS - FIRE...	X
GEN-F-501	STANDARD DETAILS 1 OF 3 - FIRE PROTECTION	X
GEN-F-502	STANDARD DETAILS 2 OF 3 - FIRE PROTECTION	X
GEN-F-503	STANDARD DETAILS 3 OF 3 - FIRE PROTECTION	X
FP-SERIES-MAQ	**FIRE PROTECTION DRAWINGS - MAQ**	
MAQ-F-100	MARQUEE - OVERALL FLOOR PLAN - LEVEL 0 - FIRE PROECTION	X
MAQ-F-101	MARQUEE - FLOOR PART PLAN A - LEVEL 0 - FIRE PROTECTION	X
MAQ-F-102	MARQUEE - FLOOR PART PLAN B - LEVEL 0 - FIRE PROTECTION	X
MAQ-F-103	MARQUEE - FLOOR PART PLAN C - LEVEL 0 - FIRE PROTECTION	X
MAQ-F-104	MARQUEE - FLOOR PART PLAN D - LEVEL 0 - FIRE PROTECTION	X
MAQ-F-105	MARQUEE - FLOOR PART PLAN G - LEVEL 0 - FIRE PROTECTION	X
MAQ-F-110	MARQUEE - OVERALL FLOOR PLAN - LEVEL 1 - FIRE PROTECTION	X
MAQ-F-111	MARQUEE - FLOOR PART PLAN A - LEVEL 1 - FIRE PROTECTION	X
MAQ-F-112	MARQUEE - FLOOR PART PLAN B - LEVEL 1 - FIRE PROTECTION	X
MAQ-F-113	MARQUEE - FLOOR PART PLAN C - LEVEL 1 - FIRE PROTECTION	X
MAQ-F-114	MARQUEE - FLOOR PART PLAN D - LEVEL 1 - FIRE PROTECTION	X
MAQ-F-115	MARQUEE - FLOOR PART PLAN E - LEVEL 1 - FIRE PROTECTION	X
MAQ-F-116	MARQUEE - FLOOR PART PLAN F - LEVEL 1 - FIRE PROTECTION	X
MAQ-F-120	MARQUEE - OVERALL FLOOR PLAN - LEVEL 2 - FIRE PROTECTION	X
MAQ-F-121	MARQUEE - FLOOR PART PLAN A - LEVEL 2 - FIRE PROTECTION	X
MAQ-F-122	MARQUEE - FLOOR PART PLAN B - LEVEL 2 - FIRE PROTECTION	X
MAQ-F-123	MARQUEE - FLOOR PART PLAN C - LEVEL 2 - FIRE PROTECTION	X
MAQ-F-124	MARQUEE - FLOOR PART PLAN D - LEVEL 2 - FIRE PROTECTION	X
MAQ-F-130	MARQUEE - OVERALL FLOOR PLAN - LEVEL 3 - FIRE PROTECTION	X
MAQ-F-131	MARQUEE - FLOOR PART PLAN A - LEVEL 3 - FIRE PROTECTION	X
MAQ-F-132	MARQUEE - FLOOR PART PLAN B - LEVEL 3 - FIRE PROTECTION	X
MAQ-F-133	MARQUEE - FLOOR PART PLAN C - LEVEL 3 - FIRE PROTECTION	X
MAQ-F-134	MARQUEE - FLOOR PART PLAN D - LEVEL 3 - FIRE PROTECTION	X
MAQ-F-140	MARQUEE - OVERALL FLOOR PLAN - LEVEL 4 - FIRE PROTECTION	X
MAQ-F-141	MARQUEE - FLOOR PART PLAN A - LEVEL 4 - FIRE PROTECTION	X
MAQ-F-142	MARQUEE - FLOOR PART PLAN B - LEVEL 4 - FIRE PROTECTION	X
MAQ-F-143	MARQUEE - FLOOR PART PLAN C - LEVEL 4 - FIRE PROTECTION	X
MAQ-F-144	MARQUEE - FLOOR PART PLAN D - LEVEL 4 - FIRE PROTECTION	X
MAQ-F-301	MARQUEE - SPRINKLER AND STANDPIPE RISE - FIRE PROTECTION	X
MAQ-F-401	MARQUEE - SCHEDULES - FIRE PROTECTION	X
FP-SERIES-GYM	**FIRE PROTECTION DRAWINGS - GYM**	
GYM-F-110	GYMNASIUM - OVERALL FLOOR PLAN - LEVEL 1 - FIRE PROTECTION	X
GYM-F-111	GYMNASIUM - FLOOR PART PLAN A - LEVEL 1 - FIRE PROTECTION	X
GYM-F-112	GYMNASIUM - FLOOR PART PLAN B - LEVEL 1 - FIRE PROTECTION	X
GYM-F-120	GYMNASIUM - OVERALL FLOOR PLAN - LEVEL 2 - FIRE PROTECTION	X
GYM-F-121	GYMNASIUM - FLOOR PART PLAN A - LEVEL 2 - FIRE PROTECTION	X
GYM-F-122	GYMNASIUM - FLOOR PART PLAN B - LEVEL 2 - FIRE PROTECTION	X
GYM-F-301	GYMNASIUM - SPRINKLER AND STANDPIPE RISER - FIRE PROTECTION	X
GYM-F-401	GYMNASIUM - SCHEDULES - FIRE PROTECTION	X
FP-SERIES-FTU	**FIRE PROTECTION DRAWINGS - FIREARMS UNIT**	
FTU-F-110	FIREARMS UNIT - OVERALL FLOOR PLAN - LEVEL 1 - FIRE PROTECTION	X
FTU-F-111	FIREARMS UNIT - FLOOR PART PLAN A - LEVEL 1 - FIRE PROTECTION	X
FTU-F-112	FIREARMS UNIT - FLOOR PART PLAN B - LEVEL 1 - FIRE PROTECTION	X
FTU-F-113	FIREARMS UNIT - FLOOR PART - LEVEL 1 - ABOVE BAFFLES - FIRE PROTECTION	X
FTU-F-301	FIREARMS UNIT - SPRINKLER AND STANDPIPE RISER - FIRE PROTECTION	X
FTU-F-401	FIREARMS UNIT - SCHEDULES - FIRE PROTECTION	X
FP-SERIES-BSO	**FIRE PROTECTION DRAWINGS - BESO**	
BSO-F-110	BESO - OVERALL FLOOR PLAN - LEVEL 1 - FIRE PROTECTION	X
BSO-F-111	BESO - FLOOR PART PLAN A - LEVEL 1 - FIRE PROTECTION	X
BSO-F-112	BESO - FLOOR PART PLAN B - LEVEL 1 - FIRE PROTECTION	X
BSO-F-120	BESO - OVERALL FLOOR PLAN - LEVEL 2 - FIRE PROTECTION	X
BSO-F-121	BESO - FLOOR PART PLAN A - LEVEL 2 - FIRE PROTECTION	X
BSO-F-122	BESO - FLOOR PART PLAN B - LEVEL 2 - FIRE PROTECTION	X
BSO-F-301	BESO - SPRINKLER AND STANDPIPE RISER - FIRE PROTECTION	X
BSO-F-401	BESO - SCHEDULES - FIRE PROTECTION	X
FP-SERIES-OTV	**FIRE PROTECTION DRAWINGS - OTV**	
OTV-F-101	FLOOR PLANS - PH - FIRE PROTECTION	X
OTV-F-401	SCHEDULES - FIRE PROTECTION	X

PLUMBING CONSTRUCTION CONTRACT .4

DRAWING NO.	DRAWING NAME	ISSUED FOR BID 5/19/23
E-SERIES-STE	**ELECTRICAL DRAWINGS - GEN & SITE**	
GEN-E-001	ELECTRICAL SYMBOLS,& LEGENDS ABBREVIATIONS, AND NOTES	X
GEN-E-701	ELECTRICAL TYPICAL DETAILS - 1	X
GEN-E-702	ELECTRICAL TYPICAL DETAILS - 2	X
GEN-E-703	ELECTRICAL TYPICAL DETAILS - 3	X
GEN-E-704	ELECTRICAL TYPICAL DETAILS - 4	X
STE-E-100	SITE PLAN - ELECTRICAL SYSTEMS	X
STE-E-101	SITE PLAN - FIRE ALARM SYSTEMS	X
STE-E-102	LANDSCAPE LIGHTING PLAN -OVERALL	X
STE-E-103	LANDSCAPE LIGHTING -PLAN A	X
STE-E-104	LANDSCAPE LIGHTING -PLAN B	X
STE-E-105	LANDSCAPE LIGHTING -PLAN C	X
STE-E-106	LANDSCAPE LIGHTING -PLAN D	X
STE-E-107	LANDSCAPE LIGHTING -PLAN E	X
STE-E-108	LANDSCAPE LIGHTING -PLAN F	X
STE-E-109	SITE LIGHT CONTROL WIRING DIAGRAM AND LCP SCHEDULES	X
STE-E-113	COMS CHECK	X
E-SERIES-MAQ	**ELECTRICAL DRAWINGS - MARQUEE**	
MAQ-E-101	OVERALL FLOOR PLAN - LEVEL 0 - ELECTRICAL SYSTEMS	X
MAQ-E-102	OVERALL FLOOR PLAN - LEVEL 1 - ELECTRICAL SYSTEMS	X
MAQ-E-103	OVERALL FLOOR PLAN - LEVEL 2 - ELECTRICAL SYSTEMS	X
MAQ-E-104	OVERALL FLOOR PLAN - LEVEL 3 - ELECTRICAL SYSTEMS	X
MAQ-E-105	OVERALL FLOOR PLAN - LEVEL 4 - ELECTRICAL SYSTEMS	X
MAQ-E-106	OVERALL FLOOR PLAN - ROOF - ELECTRICAL SYSTEMS	X
MAQ-E-107	OVERALL FLOOR PART PLAN - LEVEL 0 - GROUNDING	X
MAQ-E-108	OVERALL FLOOR PART PLAN - LEVEL 1 - GROUNDING	X
MAQ-E-109	OVERALL FLOOR PART PLAN - LEVEL ROOF - LIGHTNING PROTECTION	X
MAQ-E-110	FLOOR PART PLAN A - LEVEL 0 - ELECTRICAL SYSTEMS	X
MAQ-E-111	FLOOR PART PLAN B - LEVEL 0 - ELECTRICAL SYSTEMS	X
MAQ-E-112	FLOOR PART PLAN C - LEVEL 0 - ELECTRICAL SYSTEMS	X
MAQ-E-113	FLOOR PART PLAN D - LEVEL 0 - ELECTRICAL SYSTEMS	X
MAQ-E-114	FLOOR PART PLAN G - LEVEL 0 - ELECTRICAL SYSTEMS	X
MAQ-E-120	FLOOR PART PLAN A - LEVEL 1 - ELECTRICAL SYSTEMS	X
MAQ-E-121	FLOOR PART PLAN B - LEVEL 1 - ELECTRICAL SYSTEMS	X
MAQ-E-122	FLOOR PART PLAN C - LEVEL 1 - ELECTRICAL SYSTEMS	X
MAQ-E-123	FLOOR PART PLAN D - LEVEL 1 - ELECTRICAL SYSTEMS	X
MAQ-E-124	FLOOR PART PLAN E - LEVEL 1 - ELECTRICAL SYSTEMS	X
MAQ-E-125	FLOOR PART PLAN F - LEVEL 1 - ELECTRICAL SYSTEMS	X
MAQ-E-126	FLOOR PART PLAN G - LEVEL 1 - ELECTRICAL SYSTEMS	X
MAQ-E-130	FLOOR PART PLAN A - LEVEL 2 - ELECTRICAL SYSTEMS	X
MAQ-E-131	FLOOR PART PLAN B - LEVEL 2 - ELECTRICAL SYSTEMS	X
MAQ-E-132	FLOOR PART PLAN C - LEVEL 2 - ELECTRICAL SYSTEMS	X
MAQ-E-133	FLOOR PART PLAN D - LEVEL 2 - ELECTRICAL SYSTEMS	X
MAQ-E-140	FLOOR PART PLAN A - LEVEL 3 - ELECTRICAL SYSTEMS	X
MAQ-E-141	FLOOR PART PLAN B - LEVEL 3 - ELECTRICAL SYSTEMS	X
MAQ-E-142	FLOOR PART PLAN C - LEVEL 3 - ELECTRICAL SYSTEMS	X
MAQ-E-143	FLOOR PART PLAN D - LEVEL 3 - ELECTRICAL SYSTEMS	X
MAQ-E-150	FLOOR PART PLAN A - LEVEL 4 - ELECTRICAL SYSTEMS	X
MAQ-E-151	FLOOR PART PLAN B - LEVEL 4 - ELECTRICAL SYSTEMS	X
MAQ-E-152	FLOOR PART PLAN C - LEVEL 4 - ELECTRICAL SYSTEMS	X
MAQ-E-153	FLOOR PART PLAN D - LEVEL 4 - ELECTRICAL SYSTEMS	X
MAQ-E-154	FLOOR PART PLAN A - LEVEL ROOF - ELECTRICAL SYSTEMS	X
MAQ-E-155	FLOOR PART PLAN B - LEVEL ROOF - ELECTRICAL SYSTEMS	X
MAQ-E-156	FLOOR PART PLAN C - LEVEL ROOF - ELECTRICAL SYSTEMS	X
MAQ-E-157	FLOOR PART PLAN D - LEVEL ROOF - ELECTRICAL SYSTEMS	X
MAQ-E-210	FLOOR PART PLAN A - LEVEL 0 - LIGHTING SYSTEMS	X
MAQ-E-211	FLOOR PART PLAN B - LEVEL 0 - LIGHTING SYSTEMS	X
MAQ-E-212	FLOOR PART PLAN C - LEVEL 0 - LIGHTING SYSTEMS	X
MAQ-E-213	FLOOR PART PLAN D - LEVEL 0 - LIGHTING SYSTEMS	X
MAQ-E-214	FLOOR PART PLAN G - LEVEL 0 - LIGHTING SYSTEMS	X
MAQ-E-220	FLOOR PART PLAN A - LEVEL 1 - LIGHTING SYSTEMS	X
MAQ-E-221	FLOOR PART PLAN B - LEVEL 1 - LIGHTING SYSTEMS	X
MAQ-E-222	FLOOR PART PLAN C - LEVEL 1 - LIGHTING SYSTEMS	X
MAQ-E-223	FLOOR PART PLAN D - LEVEL 1 - LIGHTING SYSTEMS	X
MAQ-E-224	FLOOR PART PLAN E - LEVEL 1 - LIGHTING SYSTEMS	X
MAQ-E-225	FLOOR PART PLAN F - LEVEL 1 - LIGHTING SYSTEMS	X
MAQ-E-230	FLOOR PART PLAN A - LEVEL 2 - LIGHTING SYSTEMS	X
MAQ-E-231	FLOOR PART PLAN B - LEVEL 2 - LIGHTING SYSTEMS	X
MAQ-E-232	FLOOR PART PLAN C - LEVEL 2 - LIGHTING SYSTEMS	X
MAQ-E-233	FLOOR PART PLAN D - LEVEL 2 - LIGHTING SYSTEMS	X
MAQ-E-240	FLOOR PART PLAN A - LEVEL 3 - LIGHTING SYSTEMS	X
MAQ-E-241	FLOOR PART PLAN B - LEVEL 3 - LIGHTING SYSTEMS	X
MAQ-E-242	FLOOR PART PLAN C - LEVEL 3 - LIGHTING SYSTEMS	X
MAQ-E-243	FLOOR PART PLAN D - LEVEL 3 - LIGHTING SYSTEMS	X
MAQ-E-250	FLOOR PART PLAN A - LEVEL 4 - LIGHTING SYSTEMS	X
MAQ-E-251	FLOOR PART PLAN B - LEVEL 4 - LIGHTING SYSTEMS	X
MAQ-E-252	FLOOR PART PLAN C - LEVEL 4 - LIGHTING SYSTEMS	X
MAQ-E-253	FLOOR PART PLAN D - LEVEL 4 - LIGHTING SYSTEMS	X

ELECTRICAL CONSTRUCTION CONTRACT .4 (CONT)

DRAWING NO.	DRAWING NAME	ISSUED FOR BID 5/19/23
MAQ-E-301	FLOOR PART PLAN A - LEVEL 0 - FIRE ALARM SYSTEMS	X
MAQ-E-302	FLOOR PART PLAN B - LEVEL 0 - FIRE ALARM SYSTEMS	X
MAQ-E-303	FLOOR PART PLAN C - LEVEL 0 - FIRE ALARM SYSTEMS	X
MAQ-E-304	FLOOR PART PLAN D - LEVEL 0 - FIRE ALARM SYSTEMS	X
MAQ-E-305	FLOOR PART PLAN G - LEVEL 0 - FIRE ALARM SYSTEMS	X
MAQ-E-306	FLOOR PART PLAN A - LEVEL 1 - FIRE ALARM SYSTEMS	X
MAQ-E-307	FLOOR PART PLAN B - LEVEL 1 - FIRE ALARM SYSTEMS	X
MAQ-E-308	FLOOR PART PLAN C - LEVEL 1 - FIRE ALARM SYSTEMS	X
MAQ-E-309	FLOOR PART PLAN D - LEVEL 1 - FIRE ALARM SYSTEMS	X
MAQ-E-310	FLOOR PART PLAN E - LEVEL 1 - FIRE ALARM SYSTEMS	X
MAQ-E-311	FLOOR PART PLAN F - LEVEL 1 - FIRE ALARM SYSTEMS	X
MAQ-E-312	FLOOR PART PLAN G - LEVEL 1 - FIRE ALARM SYSTEMS	X
MAQ-E-313	FLOOR PART PLAN A - LEVEL 2 - FIRE ALARM SYSTEMS	X
MAQ-E-314	FLOOR PART PLAN B - LEVEL 2 - FIRE ALARM SYSTEMS	X
MAQ-E-315	FLOOR PART PLAN C - LEVEL 2 - FIRE ALARM SYSTEMS	X
MAQ-E-316	FLOOR PART PLAN D - LEVEL 2 - FIRE ALARM SYSTEMS	X
MAQ-E-317	FLOOR PART PLAN A - LEVEL 3 - FIRE ALARM SYSTEMS	X
MAQ-E-318	FLOOR PART PLAN B - LEVEL 3 - FIRE ALARM SYSTEMS	X
MAQ-E-319	FLOOR PART PLAN C - LEVEL 3 - FIRE ALARM SYSTEMS	X
MAQ-E-320	FLOOR PART PLAN D - LEVEL 3 - FIRE ALARM SYSTEMS	X
MAQ-E-321	FLOOR PART PLAN A - LEVEL 4 - FIRE ALARM SYSTEMS	X
MAQ-E-322	FLOOR PART PLAN B - LEVEL 4 - FIRE ALARM SYSTEMS	X
MAQ-E-323	FLOOR PART PLAN C - LEVEL 4 - FIRE ALARM SYSTEMS	X
MAQ-E-324	FLOOR PART PLAN D - LEVEL 4 - FIRE ALARM SYSTEMS	X
MAQ-E-325	FLOOR PART PLAN B - LEVEL ROOF - FIRE ALARM SYSTEMS	X
MAQ-E-326	FLOOR PART PLAN D - LEVEL ROOF - FIRE ALARM SYSTEMS	X
MAQ-E-401	ENLARGED PART PLANS - 1	X
MAQ-E-402	ENLARGED PART PLAN - KITCHEN	X
MAQ-E-403	ENLARGED PART PLAN - BEVERAGE STATIONS AND SALAD ISLANDS	X
MAQ-E-404	ENLARGED PART PLAN - PUMP HOUSE	X
MAQ-E-405	ENLARGED PART PLAN - PUMPING STATION	X
MAQ-E-501	NORMAL POWER RISER DIAGRAM - WEST	X
MAQ-E-502	NORMAL POWER RISER DIAGRAM - EAST	X
MAQ-E-503	EMERGENCY SINGLE LINE DIAGRAM	X
MAQ-E-504	FIRE ALARM RISER DIAGRAM AND SEQUENCE OF OPERATION	X
MAQ-E-505	LIGHTING CONTROL DIAGRAM	X
MAQ-E-506	GENERATOR DETAILS - 1	X
~~MAQ-E-507~~	~~GENERATOR DETAILS - 2~~	X
~~MAQ-E-508~~	~~GENERATOR DETAILS - 3~~	X
MAQ-E-601	EMERGENCY PANEL SCHEDULES	X
MAQ-E-602	EMERGENCY_LEGALLY REQUIRED PANEL SCHEDULES	X
MAQ-E-603	LEGALLY REQUIRED PANEL SCHEDULES	X
MAQ-E-604	LEGALLY REQUIRED PANEL SCHEDULES	X
MAQ-E-605	LEGALLY REQUIRED PANEL SCHEDULES	X
MAQ-E-606	LEGALLY REQUIRED AND OPTIONAL STANDBY PANEL SCHEDULES	X
MAQ-E-607	OPTIONAL STANDBY PANEL SCHEDULES	X
MAQ-E-608	OPTIONAL STANDBY PANEL SCHEDULES	X
MAQ-E-609	OPTIONAL STANDBY PANEL SCHEDULES	X
MAQ-E-610	OPTIONAL STANDBY PANEL SCHEDULES	X
~~MAQ-E-611~~	~~OPTIONAL STANDBY PANEL SCHEDULES~~	X
~~MAQ-E-612~~	~~OPTIONAL STANDBY PANEL SCHEDULES~~	X
~~MAQ-E-613~~	~~OPTIONAL STANDBY PANEL SCHEDULES~~	X
MAQ-E-614	FTU AND GYM PANEL SCHEDULES	X
MAQ-E-615	LIGHTING FIXTURE SCHEDULE	X
E-SERIES-GYM	**ELECTRICAL DRAWINGS - GYMNASIUM**	
GYM-E-001	LIGHTNING PROTECTION	X
GYM-E-002	GROUNDING SYSTEM	X
GYM-E-101	OVERALL FLOOR PLAN - LEVEL 1 - ELECTRICAL SYSTEMS	X
GYM-E-102	OVERALL FLOOR PLAN - LEVEL 2 - ELECTRICAL SYSTEMS	X
GYM-E-111	LEVEL 1 - PART A - ELECTRICAL SYSTEMS	X
GYM-E-112	LEVEL 1 - PART B - ELECTRICAL SYSTEMS	X
GYM-E-121	LEVEL 2 - PART A - ELECTRICAL SYSTEMS	X
GYM-E-122	LEVEL 2 - PART B - ELECTRICAL SYSTEMS	X
GYM-E-132	B.O. STEEL - PART B - ELECTRICAL SYSTEMS	X
GYM-E-211	LEVEL 1 - PART A - LIGHTING SYSTEMS	X
GYM-E-212	LEVEL 1 - PART B - LIGHTING SYSTEMS	X
GYM-E-221	LEVEL 2 - PART A - LIGHTING SYSTEMS	X
GYM-E-222	LEVEL 2 - PART B - LIGHTING SYSTEMS	X
GYM-E-301	LEVEL 1 - FIRE ALARM SYSTEMS	X
GYM-E-302	LEVEL 2 - FIRE ALARM SYSTEMS	X
GYM-E-401	ENLARGED PLANS AND SINGLE LINE DIAGRAM	X
GYM-E-402	FIRE ALARM RISER DIAGRAM AND SEQUENCE OF OPERATION	X
GYM-E-601	SCHEDULES	X
GYM-E-602	LIGHTING SCHEDULES	X
E-SERIES-FTU	**ELECTRICAL DRAWINGS - FIREARMS UNIT**	
FTU-E-001	LIGHTNING PROTECTION	X
FTU-E-002	GROUNDING SYSTEM	X
FTU-E-101	OVERALL PLAN - LEVEL 1 - ELECTRICAL SYSTEMS	X
FTU-E-111	LEVEL 1 - ELECTRICAL SYSTEMS - PART A	X
FTU-E-112	LEVEL 1 - ELECTRICAL SYSTEMS - PART B	X
FTU-E-211	LEVEL 1 - LIGHTING SYSTEMS - PART A	X
FTU-E-212	LEVEL 1 - LIGHTING SYSTEMS - PART B	X
FTU-E-301	LEVEL 1 - FIRE ALARM SYSTEMS	X
FTU-E-401	ENLARGED PLANS AND SINGLE LINE DIAGRAM	X
FTU-E-402	FIRE ALARM RISER DIAGRAM AND SEQUENCE OF OPERATION	X
FTU-E-601	HIGH VOLTAGE PANEL SCHEDULES	X
FTU-E-602	LOW VOLTAGE PANEL SCHEDULES	X
FTU-E-603	SCHEDULES	X
E-SERIES-BSO	**ELECTRICAL DRAWINGS - BESO**	
BSO-E-100	OVERALL LEVEL 1 - CONDUIT LAYOUT	X
BSO-E-101	LEVEL 1 - ELECTRICAL SYSTEMS	X
BSO-E-102	LEVEL 2 - ELECTRICAL SYSTEMS	X
BSO-E-103	LIGHTNING PROTECTION PLAN	X
BSO-E-111	LEVEL 1 - ELECTRICAL SYSTEMS - PART A	X
BSO-E-112	LEVEL 1 - ELECTRICAL SYSTEMS - PART B	X
BSO-E-121	LEVEL 2 - ELECTRICAL SYSTEMS - PART A	X
BSO-E-122	LEVEL 2 - ELECTRICAL SYSTEMS - PART B	X
BSO-E-211	LEVEL 1 - LIGHTING SYSTEMS - PART A	X
BSO-E-212	LEVEL 1 - LIGHTING SYSTEMS - PART B	X
BSO-E-221	LEVEL 2 - LIGHTING SYSTEMS - PART B	X
BSO-E-222	LEVEL 2 - LIGHTING SYSTEMS - PART B	X
BSO-E-301	LEVEL 1 - FIRE ALARM SYSTEMS	X
BSO-E-302	LEVEL 2 - FIRE ALARM SYSTEMS	X
BSO-E-401	ENLARGED PLANS	X
BSO-E-402	SINGLE LINE DIAGRAM	X
BSO-E-403	FIRE ALARM RISER DIAGRAM AND SEQUENCE OF OPERATION	X
BSO-E-601	HIGH VOLTAGE PANEL SCHEDULES	X
BSO-E-602	LOW VOLTAGE PANEL SCHEDULES	X
BSO-E-603	SCHEDULES	X
E-SERIES-GRG	**ELECTRICAL DRAWINGS - GRG**	
GRG-E-100	MUSEUM GARAGE - ELECTRICAL SYTEMS	X
TC-SERIES-GEN	**TELECOMMUNICATIONS DRAWINGS - GEN & SITE**	
GEN-TC-001	SYMBOL LIST AND GENERAL NOTES - TELECOMMUNICATIONS	X
STE-TC-010	SITE PLAN - TELECOMMUNICATIONS	X
TC-SERIES-MAQ	**TELECOMMUNICATIONS DRAWINGS - MAQ**	
MAQ-TC-100	SYMBOL LIST AND GENERAL NOTES - TECHNOLOGY	X
MAQ-TC-100	OVERALL FLOOR PLAN - LEVEL 0 - TELECOMMUNICATIONS	
MAQ-TC-101	OVERALL FLOOR PLAN - LEVEL 1 - TELECOMMUNICATIONS	X
MAQ-TC-102	OVERALL FLOOR PLAN - LEVEL 2 - TELECOMMUNICATIONS	X
MAQ-TC-103	OVERALL FLOOR PLAN - LEVEL 3 - TELECOMMUNICATIONS	X
MAQ-TC-104	OVERALL FLOOR PLAN - LEVEL 4 - TELECOMMUNICATIONS	X
MAQ-TC-110	FLOOR PART PLAN A - LEVEL 0 - TELECOMMUNICATIONS	X
MAQ-TC-111	FLOOR PART PLAN B - LEVEL 0 - TELECOMMUNICATIONS	X
MAQ-TC-112	FLOOR PART PLAN C - LEVEL 0 - TELECOMMUNICATIONS	X
MAQ-TC-113	FLOOR PART PLAN D - LEVEL 0 - TELECOMMUNICATIONS	X
MAQ-TC-114	FLOOR PART PLAN G - LEVEL 0 - TELECOMMUNICATIONS	X
MAQ-TC-120	FLOOR PART PLAN A - LEVEL 1 - TELECOMMUNICATIONS	X
MAQ-TC-121	FLOOR PART PLAN B - LEVEL 1 - TELECOMMUNICATIONS	X
MAQ-TC-122	FLOOR PART PLAN C - LEVEL 1 - TELECOMMUNICATIONS	X
MAQ-TC-123	FLOOR PART PLAN D - LEVEL 1 - TELECOMMUNICATIONS	X
MAQ-TC-130	FLOOR PART PLAN A - LEVEL 2 - TELECOMMUNICATIONS	X
MAQ-TC-131	FLOOR PART PLAN B - LEVEL 2 - TELECOMMUNICATIONS	X
MAQ-TC-132	FLOOR PART PLAN C - LEVEL 2 - TELECOMMUNICATIONS	X
MAQ-TC-133	FLOOR PART PLAN D - LEVEL 2 - TELECOMMUNICATIONS	X
MAQ-TC-140	FLOOR PART PLAN A - LEVEL 3 - TELECOMMUNICATIONS	X
MAQ-TC-141	FLOOR PART PLAN B - LEVEL 3 - TELECOMMUNICATIONS	X
MAQ-TC-142	FLOOR PART PLAN C - LEVEL 3 - TELECOMMUNICATIONS	X
MAQ-TC-143	FLOOR PART PLAN D - LEVEL 3 - TELECOMMUNICATIONS	X
MAQ-TC-150	FLOOR PART PLAN A - LEVEL 4 - TELECOMMUNICATIONS	X
MAQ-TC-151	FLOOR PART PLAN B - LEVEL 4 - TELECOMMUNICATIONS	X
MAQ-TC-152	FLOOR PART PLAN C - LEVEL 4 - TELECOMMUNICATIONS	X
MAQ-TC-153	FLOOR PART PLAN D - LEVEL 4 - TELECOMMUNICATIONS	X
MAQ-TC-300	ENLARGED PLANS - TELECOMMUNICATIONS	X
MAQ-TC-301	ENLARGED PLANS - TELECOMMUNICATIONS	X
MAQ-TC-302	ENLARGED PLANS - TELECOMMUNICATIONS	X
MAQ-TC-303	ENLARGED PLANS - TELECOMMUNICATIONS	X
MAQ-TC-304	ENLARGED PLANS - TELECOMMUNICATIONS	X
MAQ-TC-305	ENLARGED PLANS - TELECOMMUNICATIONS	X
MAQ-TC-306	ENLARGED PLANS - TELECOMMUNICATIONS	X
MAQ-TC-307	ENLARGED PLANS - TELECOMMUNICATIONS	X
MAQ-TC-401	SINGLE LINE DIAGRAM - TELECOMMUNICATIONS	X
MAQ-TC-402	SINGLE LINE DIAGRAM - TELECOMMUNICATIONS	X
MAQ-TC-403	SINGLE LINE DIAGRAM - TELECOMMUNICATIONS	X

2 (Addendum revision marks)

VERIFY SCALE

BAR IS ONE (1) INCH LONG ON ORIGINAL DRAWING:

0 ▬ 1

IF BAR IS NOT ONE (1) INCH LONG, ADJUST SCALE ACCORDINGLY

CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS. VARIANCE FROM CONTRACT DOCUMENTS NOT PERMITTED WITHOUT PROFESSIONAL & BUREAU OF CONSTRUCTION APPROVAL.

TACTICAL TRAINING DESIGN

Tactical Design North, Inc.

231 E. Buffalo St #502, Milwaukee, WI 53202

LOCAL ARCHITECT

Jacobs Wyper Architects

1232 Chancellor St, Philadelphia, PA 19107

STRUCTURAL ENGINEER

Skidmore, Owings & Merrill LLP

250 Greenwich St, New York, NY 10007

ELECTRICAL, PLUMBING, FIRE PROTECTION, FIRE ALARM ENGINEER

A & J Consulting Engineering Services, P.C.

164 Brighton Rd, Clifton, NJ 07012

MECHANICAL, AV/IT ENGINEER

Interface Engineering, Inc.

2000 M Street NW, Suite 270, Washington, DC 20036

ACOUSTICAL ENGINEER

Cerami

1001 Ave of the Americas, 4th Floor, New York, NY 10018

CODE CONSULTING

CCI

215 W 40th St, 10th Floor, New York, NY 10018

CIVIL ENGINEER

Langan

1818 Market St #3300, Philadelphia, PA 19103

VERTICAL TRANSPORT

Michael Blades & Associates Ltd.

5409 Rapidan Ct, Lothian, MD 20711

SIGNAGE CONSULTANT

Patricia Hord Graphik Design

119 S. St. Asaph St, Alexandria, VA 22314

LANDSCAPE

Lee and Associates, Inc.

638 I Street NW, Washington, DC 20001

LIGHTING

MCLA

1000 Patomic St NW, Suite 121, Washington, DC 20007

FOOD SERVICE

Hopkins Foodservice Specialists, Inc.

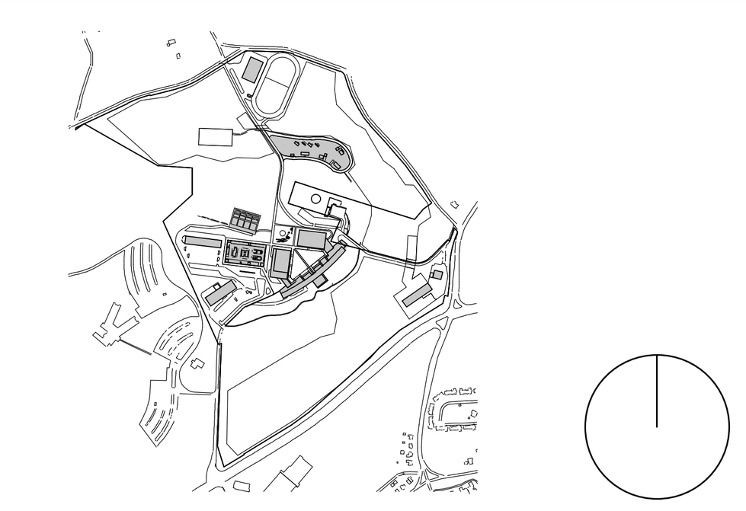
7906 MacArthur Blvd, Suite 100, Cabin John, MD 20818

POOL DESIGN

AQUA Design International

7536 N. La Cholla Blvd, Tucson, AZ 85741

KEYPLAN



NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
2	14 JULY 2023	ADDENDUM 3			
1	19 MAY 2023	ISSUED FOR BID			

RECORD REVISIONS

SEAL

SIGNATURE DATE

ARCHITECT

SOM

Skidmore, Owings & Merrill LLP

250 Greenwich St, New York, 10007

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES

HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.

C-0211-0005 PHASE 5

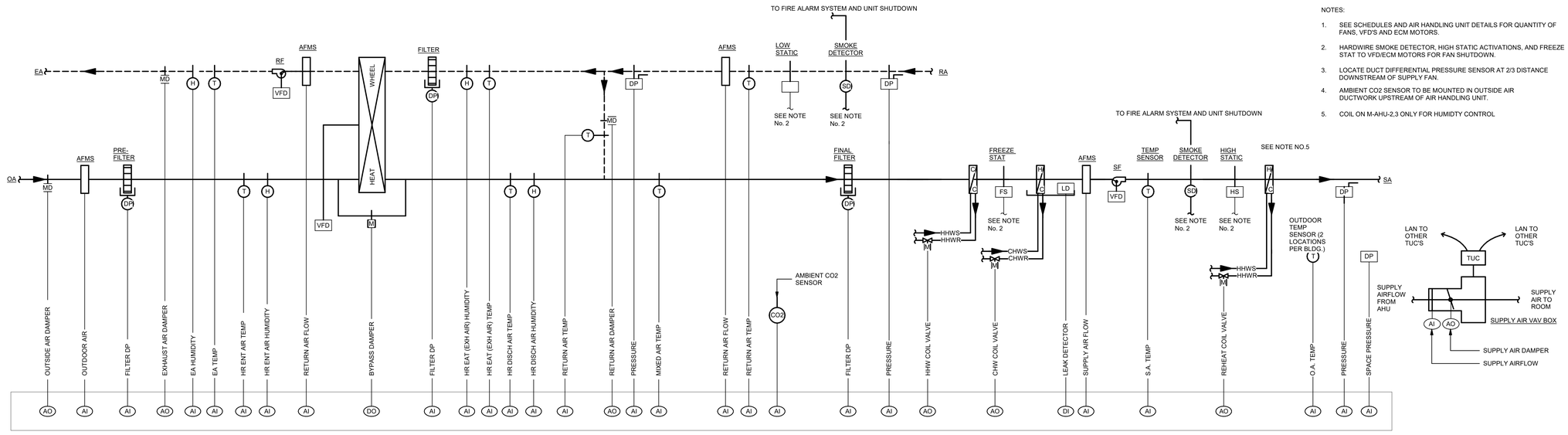
Pennsylvania State Police Academy
Core Buildings, BESO & Sitework

PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

DRAWING INDEX VOLUME 2

SHEET No. GEN-G-003.1

DRAWN BY	CHECKED BY	DATE	SCALE
Author	Checker	SEP 2022	AS NOTED



NOTES:

1. SEE SCHEDULES AND AIR HANDLING UNIT DETAILS FOR QUANTITY OF FANS, VFD'S AND ECM MOTORS.
2. HARDWIRE SMOKE DETECTOR, HIGH STATIC ACTIVATIONS, AND FREEZE STAT TO VFD/ECM MOTORS FOR FAN SHUTDOWN.
3. LOCATE DUCT DIFFERENTIAL PRESSURE SENSOR AT 2/3 DISTANCE DOWNSTREAM OF SUPPLY FAN.
4. AMBIENT CO2 SENSOR TO BE MOUNTED IN OUTSIDE AIR DUCTWORK UPSTREAM OF AIR HANDLING UNIT.
5. COIL ON M-AHU-2,3 ONLY FOR HUMIDTY CONTROL

GENERAL RUN CONDITIONS:

1. AHU SHALL BE AUTOMATICALLY OR MANUALLY ENABLED TO RUN IN OCCUPIED MODE AS FOLLOWS:
   1. AUTOMATIC OPERATION
   2. MANUALLY SELECTED BY USER FROM GRAPHIC INTERFACE
   3. OPTIMAL START/STOP
2. AHU SHALL BE STOPPED:
   A. AUTOMATICALLY IN UNOCCUPIED MODE
   B. MANUALLY
   C. FROM SAFETY SHUTDOWNS
      1. OPEN FIRE AND SMOKE DAMPERS IN DISTRIBUTION DUCTWORK. AFTER 60 SECOND DELAY STARTS THE FANS TO ALLOW FIRE AND SMOKE DAMPERS TO OPEN WITHOUT CAUSING DUCT DAMAGE.
4. START SUPPLY FAN(S).
5. FANS SHALL RUN CONTINUOUSLY AND AS DESCRIBED HEREIN AFTER.
6. OPEN NORMALLY CLOSED OUTDOOR AIR DAMPER OR MINIMUM OUTDOOR AIR DAMPER POSITION AND RESET MINIMUM OUTDOOR AIR QUANTITY TO MINIMUM DEMAND CONTROL VENTILATION (DCV) AIR QUANTITY POSITION WHERE A DCV VALUE IS SHOWN ON SCHEDULES.
7. AUTOMATIC OPERATION:
   A. AUTOMATIC OPERATION IN OCCUPIED/UNOCCUPIED MODE SHALL BE DETERMINED THROUGH A USER-ADJUSTABLE, GRAPHICAL, SEVEN-DAY ZONE OCCUPANCY SCHEDULE WITH A HOLIDAY SCHEDULE. ZONE OCCUPANCY SCHEDULE SHALL AUTOMATICALLY SELECT THE UNOCCUPIED OR OCCUPIED MODE OF THE AHU. COORDINATE SCHEDULES WITH OWNER.
   B. AT THE SCHEDULED OCCUPANCY TIME, THE UNIT SHALL START IF NOT ALREADY STARTED BY THE OPTIMAL START ROUTINE, AND THE UNIT SHALL BE SWITCHED TO THE OCCUPIED MODE.
   C. SCHEDULED STOP: WHEN THE TIME SCHEDULE ENTERS THE UNOCCUPIED TIME PERIOD, THE BAS SHALL STOP THE AIR HANDLING UNIT.
   D. UNOCCUPIED START/STOP: IN THE UNOCCUPIED MODE, THE BAS SHALL START THE UNIT AND OPERATE THE SYSTEM IN THE UNOCCUPIED COOLING MODE IF ANY SPACE TEMPERATURE RISES ABOVE 90°F (ADJ). OR IF THE SPACE RELATIVELY HUMIDITY RISES ABOVE 65% RH. THE UNIT SHALL OPERATE UNTIL EITHER ALL SPACE TEMPERATURES HAVE DROPPED BELOW 85°F (ADJ) AND/OR THE SPACE RELATIVE HUMIDITY HAS DROPPED BELOW 55% (WORST CASE SCENARIO). THE FANS SHALL OPERATE FOR A MINIMUM OF 30MIN OR UNTIL THERE ARE NO ZONE HEATING/COOLING REQUESTS AS DEFINED AT THE VAV CONTROL LEVEL.
8. SHUTDOWN MODE
   A. SHUT DOWN UNIT ACCORDING TO BAS SCHEDULE OR IF REQUIRED DUE TO SAFETIES, AND:
      a. DISABLE FANS.
      b. CLOSE OUTDOOR AND RELIEF AIR DAMPERS.
      c. OPEN RETURN AIR DAMPER.
      d. CLOSE CHILLED WATER CONTROL VALVE.
      e. 60 SECONDS (ADJ) AFTER FAN SHUTDOWN CLOSE FIRE AND SMOKE DAMPERS IN DISTRIBUTION DUCTWORK
9. MORNING PRE-COOLING:
   A. MORNING COOL-DOWN DOES NOT APPLY TO 100 PERCENT OUTDOOR AIR UNITS WITHOUT A RETURN AIR CONNECTION.
   B. INITIATE MORNING COOL-DOWN MODE USING AN 'OPTIMAL' START ALGORITHM THAT USES AN ADAPTIVE LEARNING FEATURE THAT AUTOMATICALLY ADJUSTS THE MORNING COOL-DOWN START TIME SO THAT THE AVERAGE ZONE TEMPERATURE IN THE EXTERIOR ZONES IS 78 DEGREES F (ADJ) AT THE SCHEDULED OCCUPIED START TIME.
   C. DURING MORNING COOL-DOWN OPERATION:
      a. UNIT AND APPLICABLE FANS OPERATE.
      b. OPERATE UNIT IN MORNING COOL-DOWN OR SETBACK MODE, AS AVAILABLE.
10. MORNING-WARM UP:
   A. MORNING WARM-UP DOES NOT APPLY TO 100 PERCENT OUTDOOR AIR UNITS WITHOUT A RETURN AIR CONNECTION.
   B. INITIATE MORNING WARM-UP MODE USING AN 'OPTIMAL' START ALGORITHM THAT USES AN ADAPTIVE LEARNING FEATURE THAT AUTOMATICALLY ADJUSTS THE MORNING COOL-DOWN START TIME SO THAT THE AVERAGE ZONE TEMPERATURE IN THE EXTERIOR ZONES IS 78 DEGREES F (ADJ) AT THE SCHEDULED OCCUPIED START TIME.
   C. DURING MORNING COOL-DOWN OPERATION:
      a. UNIT AND APPLICABLE FANS OPERATE.
      b. OPERATE UNIT IN MORNING WARM-UP OR SETBACK MODE, AS AVAILABLE.

SUPPLY FAN CONTROL:

1. SUPPLY FAN HAND-OFF-AUTO (HOA) OPERATION:
   A. HOA SETTINGS SHALL BE PROVIDED AS PART OF THE VARIABLE FREQUENCY DRIVE THROUGH THE DRIVE'S KEYPAD FOR THE SUPPLY FAN. WHEN IN THE HAND MODE, THE FAN SHALL BE STARTED. IN THE OFF MODE, THE FAN SHALL BE OFF. IN THE AUTO MODE, THE FAN SHALL BE STARTED AND STOPPED THROUGH THE BAS. PROVIDE AN ADJUSTABLE DELAY-ON-MAKE RELAY, WIRED IN BOTH THE HAND AND AUTO MODES, TO STAGGER THE RESTART OF EACH UNIT AFTER A POWER FAILURE TO PREVENT CREATING A SPIKE IN THE FACILITY ELECTRICAL DEMAND. UPON ACTIVATION, SAFETIES SHALL STOP THE SUPPLY FAN IN THE HAND AND AUTO MODES.
2. SUPPLY FAN AUTOMATIC SPEED CONTROL:
   A. WHEN THE SUPPLY FAN(S) ARRAY IS ON, THE BAS SHALL CONTROL THE SPEED OF THE FAN ARRAY IN UNISON TO MAINTAIN THE SUPPLY DUCT STATIC PRESSURE AS SENSED BY STATIC PRESSURE SENSOR. LOCATE STATIC PRESSURE SENSORS IN A POSITION THAT THE CONTROLLER SETPOINT IS NO GREATER THAN ONE THIRD OF THE TOTAL DESIGN FAN STATIC PRESSURE. IF THIS RESULTS IN THE SENSOR BEING LOCATED DOWNSTREAM OF MAJOR DUCT SPLITS, MULTIPLE SENSORS SHALL BE INSTALLED IN EACH MAJOR BRANCH TO ENSURE THAT STATIC PRESSURE CAN BE MAINTAINED IN EACH, PER ASHRAE 90.1. SECTION 6.5.3.2.2. WHEN THE SUPPLY DUCT STATIC PRESSURE IS BELOW THE SET POINT AT THE STATIC PRESSURE SENSOR(S), THE SPEED SHALL INCREASE AND WHEN THE SUPPLY DUCT STATIC PRESSURE IS ABOVE THE SET POINT AT ALL OF THE STATIC PRESSURE SENSORS, THE SPEED SHALL DECREASE. WHEN THE FAN IS OFF, THE VFDS SHALL BE COMMANDED BY THE BAS TO THE UNLOADED POSITION (0%). THE FINAL DUCT STATIC PRESSURE SETPOINT SHALL BE DETERMINED IN CONSULTATION WITH THE BALANCING CONTRACTOR. CONDUCT STATIC PRESSURE MEASUREMENTS TO DOCUMENT COMPLIANCE. SUBMIT DOCUMENTATION FOR REVIEW AND APPROVAL PRIOR TO INSTALLING SENSORS. THE SUPPLY FAN SPEED SHALL NOT DROP BELOW 20% (ADJ) TO PROVIDE ADEQUATE MOTOR COOLING AND PREVENT FAN STALLING PHENOMENA.
   B. FOR UNITS WITH MULTIPLE VFDS, WITHOUT A STANDBY VFD, VARY THE SPEED OF VFDS IN UNISON. SHUT DOWN LAG VFD WHEN THE SPEED OF VFDS IS AT MINIMUM AND TURN ON THE LAG VFD(S) WHEN THE SPEED OF OPERATING VFD(S) IS AT 85 PERCENT OF PEAK SPEED OR AT FAILURE OF LEAD FAN(S) OR LEAD VFD. ON FAILURE OF LEAD FAN(S) OR LEAD VFD SHUT DOWN LEAD VFD AND START LAG VFD THROUGH HARDWIRE CONNECTION BETWEEN VFDS.
   C. AN AIRFLOW MONITORING STATION SHALL CONTINUOUSLY MONITOR THE TOTAL SUPPLY AIR FAN VOLUME IN CFM AND SEND AN OUTPUT TO THE BAS.
3. ZONE VAV AIR TERMINAL UNIT INTERFACE:
   A. ALL VARIABLE AIR VOLUME TERMINAL UNITS SERVED BY AN AHU SHALL BE LINKED WITH THE VAV AHU CONTROLLER OR BAS TO PERFORM THE FOLLOWING FUNCTIONS:
      a. DUCT STATIC PRESSURE SETPOINT RESET AS DESCRIBED IN THE SUPPLY DUCT STATIC PRESSURE RESET SECTION BELOW
      b. SUPPLY AIR TEMPERATURE SETPOINT RESET AS DESCRIBED IN THE PERTINENT SECTION BELOW
      c. DEMAND BASED CONTROLLED VENTILATION

SUPPLY DUCT STATIC PRESSURE SETPOINT RESET:

1. THE BAS SHALL MONITOR THE VAV TERMINAL UNIT ASSOCIATED DAMPER POSITION. THE CONTROLLER SHALL BE COMMUNICATING WITH ALL VAV TERMINAL UNITS TO OBTAIN ZONE PRESSURE REQUESTS. A ZONE PRESSURE REQUEST IS GENERATED WHEN THE DAMPER IS GREATER THAN 90% OPEN AND UNTIL IT DROPS TO 80% OPEN. THE STATIC PRESSURE SETPOINT SHALL BE RESET BASED ON ZONE PRESSURE REQUESTS, DERIVED FROM DAMPER POSITIONS AND MEETING THE OUTSIDE AIRFLOW REQUIREMENTS, USING THE TRIM AND RESPOND LOGIC DESCRIBED HEREINAFTER.
2. RESET SUPPLY AIR DUCT STATIC PRESSURE SETPOINT BETWEEN 0.15-INCH (ADJ) AND SCHEDULED MAXIMUM UNIT ESP (ADJ) AT A MAXIMUM RATE OF 0.1- INCH (ADJ) EVERY 5 MINUTES (ADJ), UNTIL THERE ARE ZERO (ADJ) ZONE PRESSURE REQUESTS. WHEN THERE ARE ZERO ZONE PRESSURE REQUESTS, GRADUALLY REDUCE (TRIM) THE STATIC PRESSURE SETPOINT AT A MAXIMUM RATE OF 0.1 IN WG (ADJ) EVERY 5 MINUTES. WHEN ZONE PRESSURE REQUESTS INCREASE, THE REVERSE SHALL OCCUR AND THE STATIC PRESSURE SETPOINT SHALL BE GRADUALLY INCREASED AS DESCRIBED ABOVE.
3. WHEN UNIT IS ENABLED IN ANY MODE, SET INITIAL SUPPLY AIR STATIC PRESSURE SETPOINT AT 0.5-INCH (ADJ).
4. IN THE EVENT OF LOSS OF COMMUNICATION WITH ONE OR MORE VAV TERMINAL UNIT CONTROLLERS THE SYSTEM SHALL REVERT TO MODULATING THE FAN SPEED TO MAINTAIN THE DUCT STATIC PRESSURE SETPOINT OF NEGATIVE .5 IN WG (ADJ.) AND/OR TO MAINTAIN OUTSIDE AIRFLOW REQUIREMENTS.

SUPPLY AIR TEMPERATURE SETPOINT RESET:

A. THE BAS SHALL MONITOR THE VAV TERMINAL UNIT DAMPER POSITION. EACH AHU CONTROLLER SHALL BE COMMUNICATING WITH ALL ASSOCIATED VAV TERMINAL UNITS TO OBTAIN ZONE COOLING REQUESTS. A ZONE COOLING REQUEST IS GENERATED BY A VAV TERMINAL UNIT WHEN THE VAV DAMPER IS GREATER THAN 95% (ADJ) OPEN AND UNTIL IT DROPS TO 85% (ADJ) OPEN.
B. THE BAS SHALL MONITOR THE AHU DISCHARGE AIR TEMPERATURE AND SHALL RESET THE DISCHARGE AIR TEMPERATURE SETPOINT BASED ON DAMPER POSITIONS AND SATISFACTION OF ALL ZONE COOLING REQUIREMENTS.
C. THE SETPOINT SHALL BE RESET USING THE TRIM AND RESPOND LOGIC DESCRIBED HEREINAFTER. THE INITIAL SETPOINT SHALL BE 55°F (ADJ). DURING OCCUPIED MODE, THE SETPOINT SHALL BE RESET FROM 55°F (ADJ) UP TO A TMAX OF 65°F. WHEN FAN IS OFF, TMAX SHALL BE EQUAL TO THE MINIMUM VALUE OF 55°F. WHEN FAN IS PROVEN ON, IF THERE ARE TWO OR LESS ZONE COOLING REQUESTS INCREASE THE SETPOINT BY 0.3°F (ADJ), EVERY 2 MIN (ADJ). IF THERE ARE MORE THAN TWO ZONE COOLING REQUESTS AND AHU STATIC PRESSURE SETPOINT IS AT THE MAX VALUE (1.5 IN WG), DECREASE THE SETPOINT BY 0.3°F (ADJ), EVERY 2 MIN (ADJ)

DEHUMIDIFICATION MODE:

A. A MIXED AIR RELATIVE HUMIDITY SENSOR SHALL OVERRIDE THE SUPPLY AIR TEMPERATURE RESET STRATEGY DESCRIBED ABOVE TO MAINTAIN A MAXIMUM OF 60% RH (ADJ) FOR THE AREA SERVED BY THE AHU. IF MIXED AIR RH IS GREATER THAN MAXIMUM SETPOINT AND AHU DISCHARGE AIR TEMPERATURE IS ABOVE INITIAL SETPOINT OF 55°F (ADJ), THEN RESET DISCHARGE AIR TEMPERATURE SETPOINT (TO 55°F). IF AFTER 30MIN (ADJ) RELATIVE HUMIDITY IS LOWER THAN MAXIMUM SETPOINT, RE-ENABLE SUPPLY AIR TEMPERATURE SETPOINT

RESET STRATEGY COORDINATION:

A. THE SUPPLY AIR TEMPERATURE SETPOINT RESET STRATEGY AND SUPPLY DUCT STATIC PRESSURE SETPOINT RESET STRATEGY SHALL BE IMPLEMENTED IN COORDINATION WITH EACH OTHER SUCH THAT THEY DO NOT OVERLAP. BAS CONTRACTOR SHALL IDENTIFY STRATEGY INTERACTIONS, DETECT POSSIBLE OPERATIONAL ISSUES FOR EACH SYSTEM THROUGH TREND ANALYSIS AND SHALL OPTIMIZE OPERATIONS.

BUILDING STATIC PRESSURE CONTROL WITH RELIEF FAN

A. MODULATE FAN SPEED TO MAINTAIN BUILDING STATIC PRESSURE OF 0.03-INCH POSITIVE (ADJ) RELATIVE TO OUTDOORS.
B. FULLY OPEN RELIEF AIR DAMPER WHEN FAN OPERATES. PROVIDE 15-SECOND DELAY IN FAN START/STOP TO ALLOW DAMPER TO OPEN/CLOSE WITHOUT CAUSING DUCT DAMAGE.
C. IF FAN IS AT MINIMUM SPEED, TURN FAN OFF AND MODULATE RELIEF DAMPER TO MAINTAIN BUILDING STATIC PRESSURE SETPOINT

MINIMUM OUTDOOR AIR CONTROL:

A. WHEN THE UNIT IS OFF OR THE UNIT IS STARTED IN THE UNOCCUPIED AND COOL DOWN MODES, THE MINIMUM OUTDOOR AIR DAMPER SHALL BE CLOSED. EXCEPTION: A SYSTEM MAY REQUIRE ABSOLUTE MINIMUM OUTSIDE AIR FOR MAINTAINING TRANSFER AIR OR EXHAUST AIR PRESSURE RELATIONSHIPS DURING SCHEDULED UNOCCUPIED PERIODS. THIS SHALL BE COORDINATED DURING COMMISSIONING.
B. WHEN THE UNIT IS STARTED IN THE OCCUPIED MODE THE OUTSIDE AIR DAMPER SHALL BE OPENED TO THE MINIMUM POSITION. THE MINIMUM OUTSIDE AIR SHALL BE MEASURED AND THE OUTSIDE AIR DAMPER DAMPER SHALL BE MODULATED AND CONTROLLED TO MAINTAIN VENTILATION AND PRESSURIZATION REQUIREMENTS.
C. THE OUTSIDE AIR AIRFLOW MEASURING STATION SHALL MONITOR THE MINIMUM OUTSIDE AIR VOLUME IN CFM AND SEND OUTPUT TO THE BAS TO MAINTAIN OA CFM SETPOINT AS SYSTEM FANS MODULATE. MODULATE MINIMUM OA DAMPER AT 100% OPEN IN AN ATTEMPT TO ACHIEVE MEASURED OUTSIDE AIRFLOW SETPOINT.
D. OA CFM INPUT, OUTPUT AND DAMPER POSITION SHALL BE MONITORED AND GRAPHICALLY DISPLAYED IN THE BAS.

DEMAND CONTROL VENTILATION:

A. DURING OCCUPIED MODE, DEMAND VENTILATION CONTROLS SHALL MONITOR SPACES WITH CO2 SENSORS. PROVIDE AN ENABLE/DISABLE FUNCTION FOR DEMAND CONTROL VENTILATION FUNCTION. IN THE DISABLE MODE, WHEN THE UNIT IS ON, THE OUTSIDE AIRFLOW DAMPER SHALL MODULATE TO MAINTAIN THE SCHEDULED OUTSIDE AIR FLOW VALUE. IN THE ENABLE MODE, THE BAS SHALL MONITOR SPACES WITH CO2 SENSORS. AS CO2 SIGNAL FROM THE ZONES SERVED BY THE SYSTEM RISES ABOVE SETPOINT, THE BAS SHALL FIRST INCREASE CRITICAL ZONE MINIMUM AIRFLOW TO SATISFY VENTILATION REQUIREMENTS, AND THEN INCREASE THE OUTDOOR RATE AT THE AIR HANDLER AS DESCRIBED HEREINAFTER.
   1. ZONE LEVEL: UPON A RISE IN ZONE CO2 CONCENTRATION ABOVE SETPOINT, THE MINIMUM OCCUPIED AIRFLOW SETPOINT AT THE ZONE VAV TERMINAL SHALL FIRST BE RESET FROM THE DESIGN MINIMUM UP TO THE MAXIMUM VALUE (ADJ). CO2 SETPOINT=AMBIENT CO2 CONCENTRATION + 600PPM (ADJ)
   2. AHU LEVEL: UPON CONTINUED CALL FOR VENTILATION BASED IN CONTINUED RISE OF CO2 CONCENTRATION IN CO2 MONITORED ZONES, THE MINIMUM OUTDOOR AIR SETPOINT SHALL BE RESET, BASED ON THE HIGHEST ZONE CO2 LOOP SIGNAL FROM ABSOLUTE MINIMUM TO THE DESIGN MINIMUM. REFERENCE AHU CO2 RESET SCHEDULE TO OBTAIN ABSOLUTE MINIMUM AND DESIGN MINIMUM AIRFLOW RATES. ABSOLUTE MINIMUM IS THE UNOCCUPIED DESIGN MINIMUM OUTSIDE AIR QUANTITY AND DESIGN MINIMUM IS THE OCCUPIED DESIGN OUTSIDE AIR QUANTITY.

SPACE TEMPERATURE SET POINT CONTROL:

A. THE BAS SHALL MAINTAIN THE SPACE TEMPERATURE SET POINT ACCORDING TO THE FOLLOWING. SPACE TEMPERATURE CONTROL SHALL BE RESTRICTED SUCH THAT THE SUPPLY AIR TEMPERATURE SHALL NEVER FALL BELOW 55 °F (ADJ) OR RISE ABOVE 85°F (ADJ)
   a. OCCUPIED COOLING SET POINT - 75°F

CHILLED WATER VALVE CONTROL:

A. WHEN THE UNIT STATUS IS OFF, THE CHILLED WATER VALVE SHALL BE CLOSED. WHEN THE UNIT STATUS IS ON, THE CHILLED WATER VALVE SHALL BE CONTROLLED AS DESCRIBED BELOW.
   a. UNOCCUPIED COOLING AND COOL DOWN MODES: WHEN THE UNIT IS ON IN THE UNOCCUPIED COOLING AND COOL DOWN MODES, THE BAS SHALL MODULATE THE CHILLED WATER VALVE TO MAINTAIN A SUPPLY AIR TEMPERATURE OF 55°F.
   b. OCCUPIED MODE: IN THE OCCUPIED MODE, THE BAS SHALL MODULATE THE CHILLED WATER VALVE LAST IN SEQUENCE TO MAINTAIN AHU DISCHARGE AIR LEAVING TEMPERATURE COOLING SETPOINT, NORMALLY LIMITED TO 55°F (ADJ).THIS COOLING SETPOINT SHALL BE RESET BASED ON THE DISCHARGE AIR SETPOINT RESET STRATEGY DESCRIBED IN THE PERTINENT SECTION ABOVE.

HOT WATER VALVE CONTROL:

A. WHEN THE UNIT STATUS IS OFF, THE HOT WATER VALVE SHALL BE CLOSED. WHEN THE UNIT STATUS IS ON, THE HOT WATER VALVE SHALL BE CONTROLLED AS DESCRIBED BELOW.
   a. UNOCCUPIED COOLING AND WARM UP MODES: WHEN THE UNIT IS ON IN THE UNOCCUPIED HEATING AND WARM UP MODES, THE BAS SHALL MODULATE THE HOT WATER VALVE TO MAINTAIN A SUPPLY AIR TEMPERATURE OF 55°F.
   b. OCCUPIED MODE: IN THE OCCUPIED MODE, THE BAS SHALL MODULATE THE HOT WATER VALVE LAST IN SEQUENCE TO MAINTAIN AHU DISCHARGE AIR LEAVING TEMPERATURE HEATING SETPOINT, NORMALLY LIMITED TO 55°F (ADJ).THIS HEATING SETPOINT SHALL BE RESET BASED ON THE DISCHARGE AIR SETPOINT RESET STRATEGY DESCRIBED IN THE PERTINENT SECTION ABOVE.

SAFETY SHUTDOWNS AND ALARMS:

A. FIRE ALARM SHUTDOWN CONTROL:
   a. THE SUPPLY AND EXHAUST FANS SHALL BE INTERLOCKED WITH THE FIRE ALARM SYSTEM THROUGH A CONTROL MODULE (CM). THE CONTROL MODULE SHALL BE HARD WIRE INTERLOCKED TO CONTROL THE SUPPLY FAN IN THE HAND AND AUTO OPERATING MODES. EXHAUST FAN SHUTDOWN WILL OCCUR THROUGH THE HARDWIRE INTERLOCK WITH THE SUPPLY FAN.
   b. SMOKE DAMPERS INSTALLED IN THE SUPPLY AND EXHAUST DUCT MAINS AT THE AHU SHALL BE INTERLOCKED WITH THE FIRE ALARM SYSTEM THROUGH A CONTROL MODULE (CM). THE CONTROL MODULE SHALL BE HARD WIRE INTERLOCKED TO CONTROL THE SMOKE DAMPER. CONTRACTOR SHALL COORDINATE WITH PLANS AND PROVIDE CONTROL POINTS, SEQUENCES AND GRAPHICS AS REQUIRED.
   c. THE DUCT SMOKE DETECTOR LOCATED IN THE SUPPLY/RETURN AIR OF THE UNIT WILL BE MONITORED BY THE FIRE ALARM SYSTEM. THE FIRE ALARM SYSTEM SHALL BE PROGRAMMED TO ACTIVATE THE CONTROL MODULE AND THE SYSTEM SHALL OPERATE AS FOLLOWS:
      A. WHEN PRODUCTS OF COMBUSTION ARE SENSED BY THE SUPPLY/RETURN AIR DUCT SMOKE DETECTOR, THE CONTROL MODULES SHALL STOP THE FANS IN THE HAND AND AUTO OPERATING MODES AND CLOSE THE ASSOCIATED SMOKE DAMPERS.
      B. WHEN THE PRODUCTS OF COMBUSTION ARE CLEARED AND THE FIRE ALARM SYSTEM IS RESET, THE CONTROL MODULE SHALL RESTORE NORMAL CONTROL TO THE FANS.
      C. REMOTE SMOKE DAMPERS OR COMBINATION FIRE/SMOKE DAMPERS INSTALLED IN THE SUPPLY AND RETURN DUCT SYSTEM ASSOCIATED WITH THE AHU SHALL BE INTERLOCKED WITH THE FIRE ALARM SYSTEM THROUGH A CONTROL MODULE (CM). THE CONTROL MODULE SHALL BE HARD WIRE INTERLOCKED TO CONTROL THE SMOKE DAMPER. CONTRACTOR SHALL COORDINATE WITH PLANS AND PROVIDE CONTROL POINTS, SEQUENCES AND GRAPHICS AS REQUIRED.

B. HIGH PRESSURE SWITCH:
   a. WHEN THE HIGH PRESSURE SWITCH TRIPS, THE UNIT SHALL BE STOPPED THROUGH A HARD WIRE INTERLOCK. AN ALARM SHALL BE GENERATED IN THE BAS AND DISPLAYED AT THE OWS. THE HIGH PRESSURE SWITCH SHALL BE SET TO TRIP AT 4" WC. (MANUALLY ADJUSTABLE) AND MUST BE MANUALLY RESET AT THE HIGH PRESSURE SWITCH.

C. LOW PRESSURE SWITCH:
   a. PRESSURE SWITCH SHALL DISABLE RETURN FAN IF FIRE/SMOKE DAMPER IN RETURN DUCT CLOSES. WHEN THE LOW PRESSURE SWITCH TRIPS, THE UNIT SHALL BE STOPPED THROUGH A HARD WIRE INTERLOCK. AN ALARM SHALL BE GENERATED IN THE BAS. THE LOW PRESSURE SWITCH SHALL BE SET TO TRIP AT -3" WC. (MANUALLY ADJUSTABLE) AND MUST BE MANUALLY RESET AT THE LOW PRESSURE SWITCH.

D. DIRTY FILTER ALARM:
   a. DIFFERENTIAL PRESSURE SWITCHES SHALL MONITOR THE PRESSURE DROP AT THE FILTERS. WHEN THE PRESSURE EXCEEDS AN ADJUSTABLE LIMIT, AN ALARM SIGNAL WILL BE SENT. PRESSURE DIFFERENCE INDICATORS, LOCATED AT THE FILTERS, SHALL INDICATE THE DIFFERENTIAL PRESSURE ACROSS THE FILTERS. EACH FILTER SHALL BE PROVIDED WITH INDIVIDUAL DIRTY PRESSURE SETPOINTS, FILTERS MAY NOT BE COMBINED FOR A SINGLE DIRTY PRESSURE DIFFERENTIAL.

F. OUTSIDE AIRFLOW ALARM:
   a. WHENEVER THE OUTSIDE AIRFLOW, AS MEASURED BY THE UNIT'S OA AFMS, VARIES FROM THE SETPOINT BY MORE THAN 15% FOR MORE THAN 15MIN(ADJ.) AN ALARM SHALL BE RAISED TO THE BAS.

G. FAN STATUS:
   1). THE CURRENT RELAYS SHALL BE USED TO MONITOR THE STATUS OF THE UNIT SUPPLY AND EXHAUST FANS. IF THE STATUS INDICATED DOES NOT MATCH THE COMMANDED OUTPUT FOR A FAN, AN ALARM SHALL BE GENERATED.

G. TEMPERATURE AND HUMIDITY ALARM:
   1). AN ALARM SHALL BE GENERATED AT THE BAS IF THE SUPPLY AIR DISCHARGE TEMPERATURE IS ABOVE OR BELOW SETPOINT BY +/-5°F
   2). AN ALARM SHALL BE GENERATED AT THE BAS IF THE SUPPLY AIR DISCHARGE HUMIDITY IS ABOVE SETPOINT BY + 10%

H. FREEZE STAT:
   a. WHEN THE FREEZE STAT TRIPS THE UNIT SHALL BE STOPPED THROUGH A HARD WIRED INTERLOCK. AND ALARM SHALL BE GENERATED IN THE BAS AND DISPLAY AT THE OWS. THE FREEZE STAT SHALL BE SET TO TRIP AT 38F (ADJ) AND MUST BE MANUALLY RESET.

1 VAV AIR HANDLING UNIT SYSTEM CONTROL DIAGRAM W/ ERV (G-DOAS-1 & G-DHU-1)

NO SCALE

TACTICAL TRAINING DESIGN

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LOCAL ARCHITECT

Jacobs Wyper Architects
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STRUCTURAL ENGINEER

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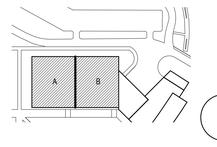
7906 MacArthur Blvd, Suite 100, Cabin John, MD 20818

POOL DESIGN

AQUA Design International
7536 N. La Cholla Blvd, Tucson, AZ 85741

KEYPLAN



NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
4	14 JUL 2023	ADDENDUM 32			
3	29 JUN 2023	ADDENDUM 29			
2	19 MAY 2023	ISSUED FOR BID			

RECORD REVISIONS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ANDREW J. FLANAGAN ENGINEER PE088450 PENNSYLVANIA

07/14/2023

SIGNATURE DATE

ARCHITECT

SOM

Skidmore, Owings & Merrill LLP
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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 5

Pennsylvania State Police Academy
Core Buildings, BESO & Sitework

PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

VERIFY SCALE

BAR IS ONE (1) INCH LONG
ON ORIGINAL DRAWING:
0 1

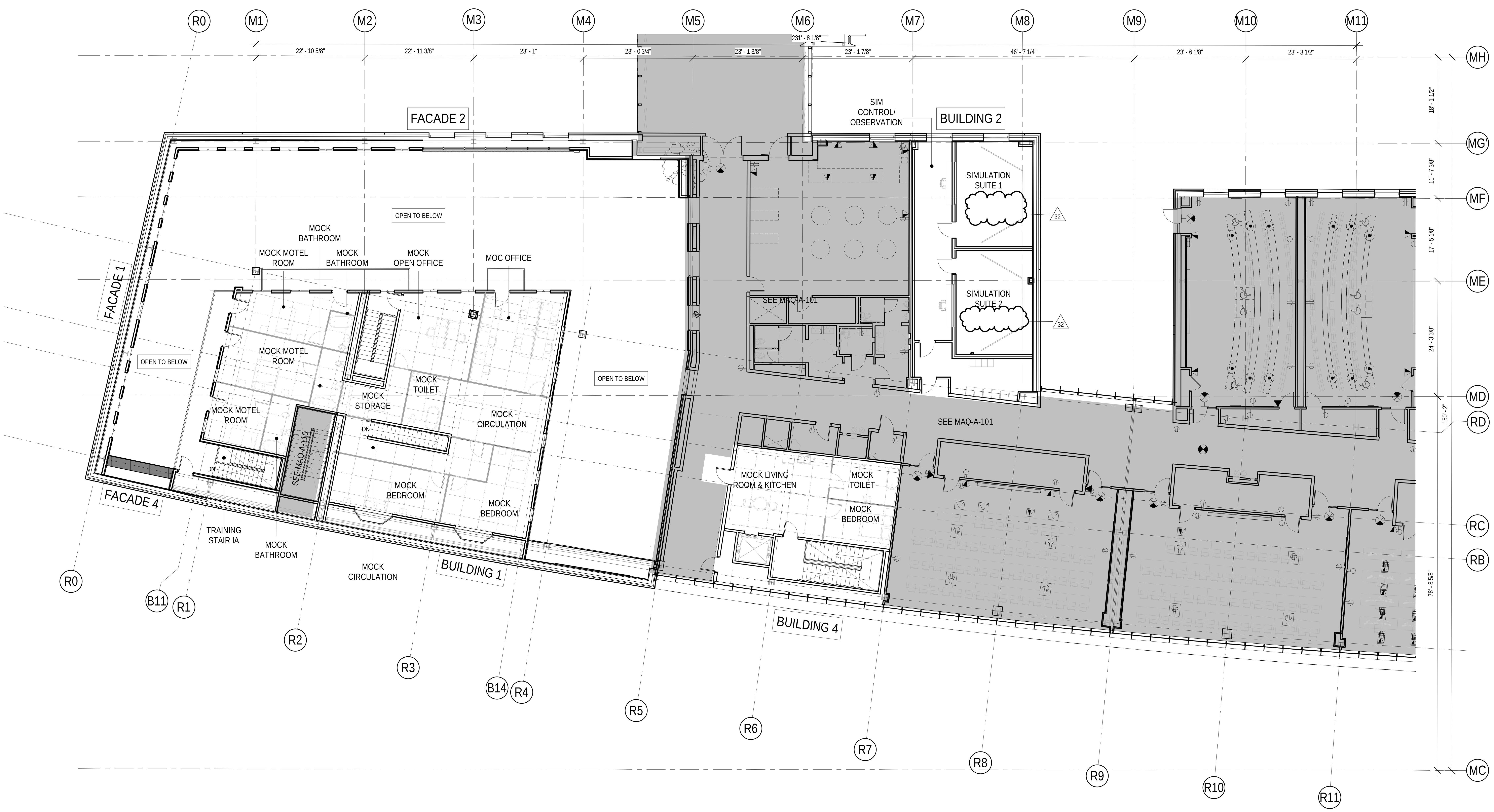
IF BAR IS NOT ONE (1) INCH LONG, ADJUST SCALE ACCORDINGLY

CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS. VARIANCE FROM CONTRACT DOCUMENTS NOT PERMITTED WITHOUT PROFESSIONAL & BUREAU OF CONSTRUCTION APPROVAL.

CONTROLS – MECHANICAL

SHEET No. GYM-M-800

DRAWN BY	CHECKED BY	DATE	SCALE
Author	Checker	FEB, 2022	AS NOTED



1 OVERALL TRAINING FURNITURE PLAN - LEVEL 1

SCALE: 3/32" = 1'-0"   0 5'-4" 10'-8" 21'-4" 42'-8"

KEYNOTES

TACTICAL TRAINING DESIGN
Tactical Design North, Inc.
231 E. Buffalo St #502, Milwaukee, WI 53202

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KEYPLAN

NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
32	14 JUL 2023	ADDENDUM #32			
1	19 MAY 2023	ISSUED FOR BID			

RECORD REVISIONS

SIGNATURE DATE

ARCHITECT
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250 Greenwich St, New York, 10007

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 5

Pennsylvania State Police Academy
Core Buildings, BESO & Sitework
PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

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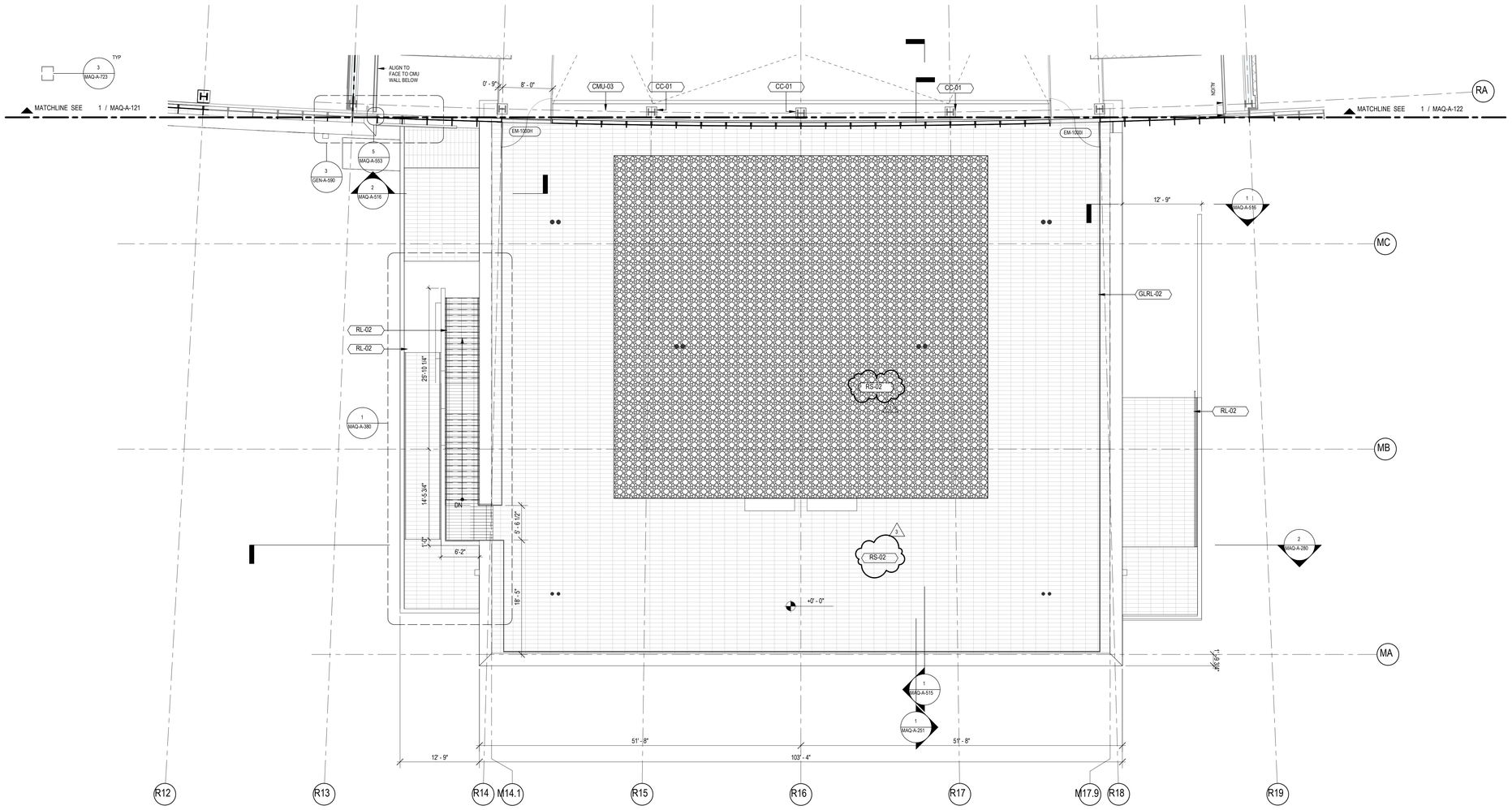
OVERALL TRAINING FURNITURE PLAN - LEVEL 1

SHEET No.
ITV-A-331

DRAWN BY	CHECKED BY	DATE	SCALE
TDN	TDN	MAY 2023	AS NOTED



1 FLOOR PART PLAN - LEVEL 1G

SCALE: 1/8" = 1'-0"

0 4'-0" 8'-0" 16'-0" 32'-0"

LEGEND

FIRE RATINGS

- 1/2 HOUR FIRE RATING
- 1 HOUR FIRE RATING
- 2 HOUR FIRE RATING
- 3 HOUR FIRE RATING
- SCOPE REFERENCE HATCH
- MILLWORK
- B.P. BUILDING BASE POINT
- W.P. WORK POINT
- XX DRAWING NOTE
- XX PARTITION TYPE
- INDICATES COLD-FORMED METAL FRAMING

GENERAL NOTES

1. ALL BUILDING ELEVATIONS ARE REFERENCED TO THE BUILDING REFERENCE DATUM, ELEVATION 0'-0". REFER TO GEN-G-100 FOR NAVD 88 DATUMS FOR EACH BUILDING.
2. REFER TO GEN-G-100 FOR GENERAL NOTES
3. REFER TO GEN-G-101 FOR ACCESSIBILITY AND ADAPTABILITY GENERAL NOTES AND REQUIREMENTS
4. REFER TO GEN-G-102 FOR SYMBOLS, ABBREVIATIONS AND LEGENDS
5. REFER TO GEN-G-103 MOUNTING HEIGHTS.
6. REFER TO GEN-G-104 FOR MATERIAL LISTS AND EQUIPMENT LISTS.
7. REFER TO LS SERIES FOR CODE ANALYSIS AND REQUIRED WALL FIRE RATINGS.
8. REFER TO SITE DRAWINGS FOR SITE ORIGIN AND BUILDING ORIGIN POINTS.
9. REFER TO GEN-G-500 FOR EXTERIOR WALL ASSEMBLIES
10. REFER TO GEN-G-730 FOR WINDOW SCHEDULES
11. REFER TO GEN-G-710 - 712 FOR PARTITION SCHEDULES
12. REFER TO GEN-G-715 - 719 FOR TYPICAL PARTITION DETAILS
13. ALL SLAB PENETRATIONS FOR PIPES, CONDUITS, ETC OUTSIDE OF RATED SHAFTS ARE TO BE FIRESAFED TO MATCH THE RATING OF THE SLAB.
14. ALL PENETRATIONS THROUGH RATED WALL ASSEMBLIES ARE TO HAVE A FIRESTOP ASSEMBLY SYSTEM TO MATCH THE RATING OF THE WALL.
15. THE PRECISE NUMBER, SIZE AND LOCATION OF ALL HOUSEKEEPING PADS REQUIRED TO SUPPORT OR MAINTAIN MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION EQUIPMENT SHALL BE CONFIRMED WITH THE EQUIPMENT SUPPLIER
16. ALL STRUCTURAL MEMBERS SHALL BE FIRE-PROOFED IN ACCORDANCE WITH THE NOTES ON GEN-G-100
17. PARTITIONS AT PERIMETER OF ALL TOILET ROOMS/JANITOR'S CLOSETS ADJACENT TO MECHANICAL SHAFTS AND AT ALL LAUNDRY ROOMS/MECHANICAL ROOMS WITH WATER SHALL HAVE A CURB. AT GYPSUM PARTITIONS PROVIDE A 6" X 6" CURB. WHERE AT MASONRY WALLS, PROVIDE 6" TALL CURBS WITH WIDTH TO MATCH MASONRY ASSEMBLY.
18. ALL DOORS TO BE INSTALLED 4" ON HINGE SIDE FROM PERPENDICULAR PARTITIONS U.O.N.
19. FLOOR PLANS ARE CUT 4'-0" AFF TYPICAL.
20. INTERIOR LAYOUT DIMENSIONS ARE SHOWN TO FINISHED FACE OF GWB U.O.N
21. PROVIDE SUPPLEMENTAL FRAMING, BLOCKING AND BRACING WHERE REQUIRED FOR WALL MOUNTED FIXTURES AND EQUIPMENT AT GWB WALL.

HATCHES

- PAVERS
- RIVER ROCK

DRAWING NOTES

KEYNOTES

CC-01	057000 RECTANGULAR METAL COLUMN COVER
CMU-03	042000 CONCRETE MASONRY UNIT, 8" X 24" X 4" GROUND FACE
GLRL-02	057000 EXTERIOR METAL & GLASS GUARDRAIL
RS-02	075556 PMR WITH PAVER

VERIFY SCALE

BAR IS ONE (1) INCH LONG ON ORIGINAL DRAWING:

0 1

IF BAR IS NOT ONE (1) INCH LONG, ADJUST SCALE ACCORDINGLY

CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS. VARIANCE FROM CONTRACT DOCUMENTS NOT PERMITTED WITHOUT PROFESSIONAL & BUREAU OF CONSTRUCTION APPROVAL.

TACTICAL TRAINING DESIGN

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LOCAL ARCHITECT

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LANDSCAPE

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638 I Street NW, Washington, DC 20001

LIGHTING

MCLA
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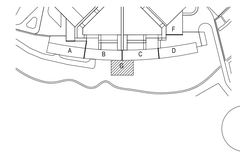
POOL DESIGN

Aqua Design International
7536 N. La Cholla Blvd Tucson, AZ 85741

KEYPLAN



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DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 5

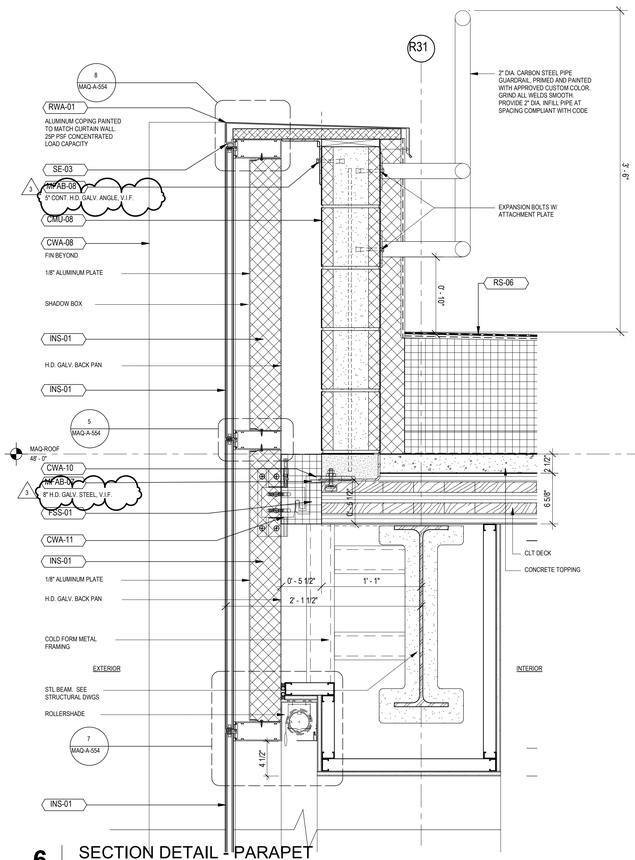
Pennsylvania State Police Academy
Core Buildings, BESO & Sitework

PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

FLOOR PART PLAN G - LEVEL 1

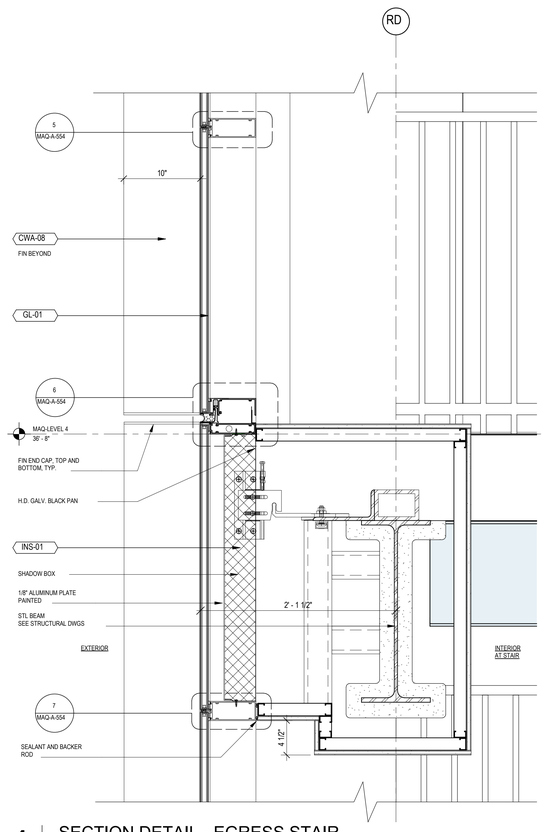
SHEET No.
MAQ-A-126

DRAWN BY	CHECKED BY	DATE	SCALE
LS	TNB	SEPT 2022	AS NOTED



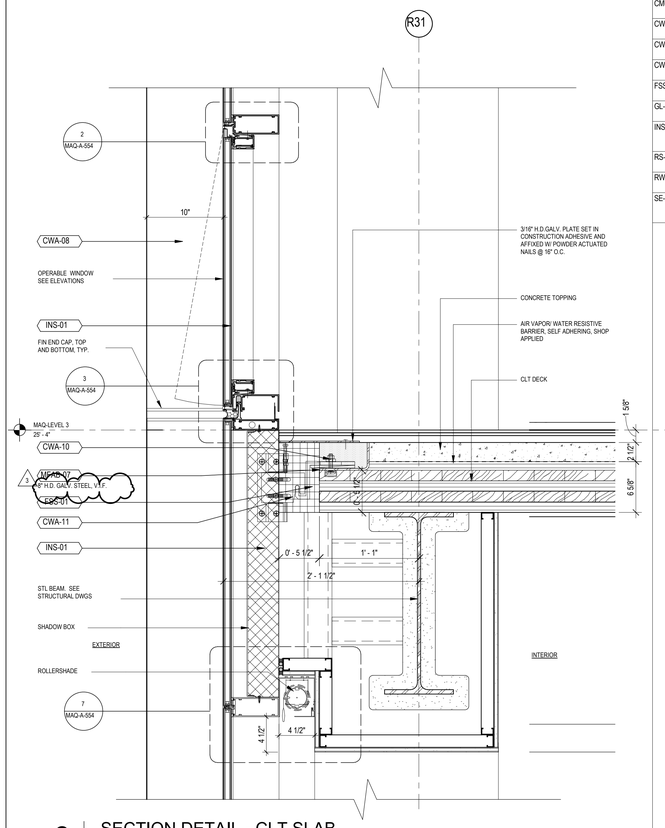
6 SECTION DETAIL - PARAPET

SCALE: 1 1/2" = 1'-0"



4 SECTION DETAIL - EGRESS STAIR

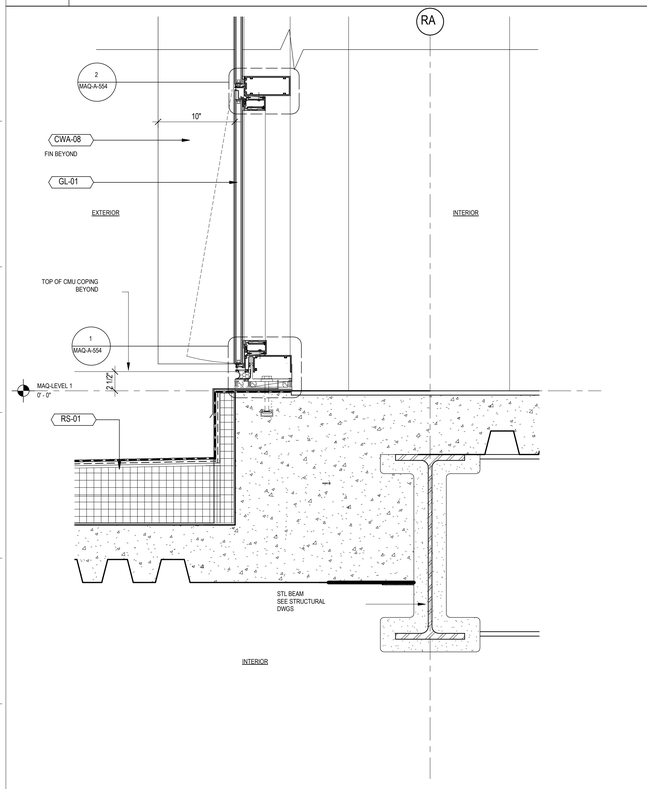
SCALE: 1 1/2" = 1'-0"



2 SECTION DETAIL - CLT SLAB

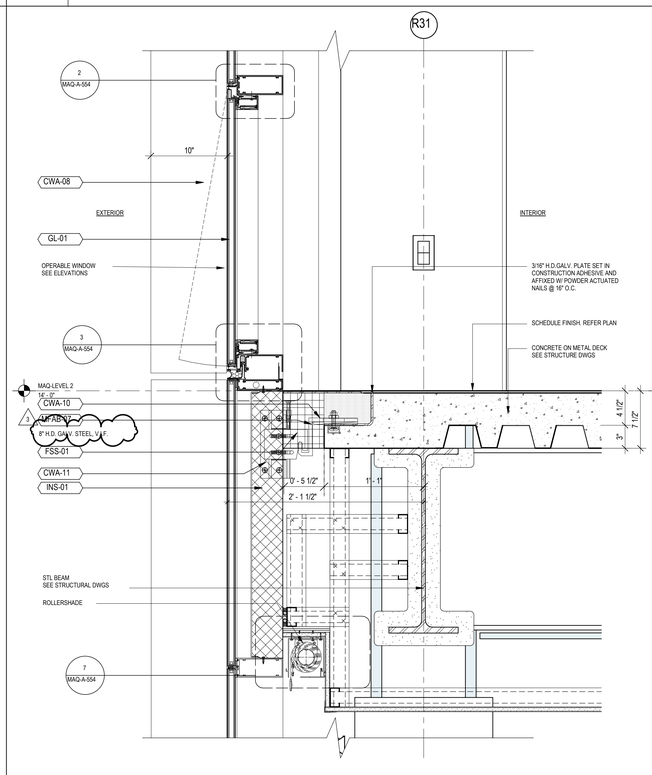
SCALE: 1 1/2" = 1'-0"

KEYNOTES	
CMU-08	042000 CONCRETE MASONRY UNIT, 8" X 16" X 8"
CWA-08	084400 FIELD INSTALLED VERTICAL FIN
CWA-10	084400 J-HOOK AND EMBED
CWA-11	084400 3-WAY ADJUSTABLE ANCHOR
FSS-01	079400 FIRESTOPPING
GL-01	088000 TYPICAL EXTERIOR IGU
INS-01	072100 SEMI-RIGID MINERAL WOOL BOARD INSULATION
RS-01	075200 SBS MEMBRANE ROOF ON CONCRETE
RWA-01	077000 METAL COPING CW-01
SE-03	079200 SILICONE WEATHER SEAL SEALANT, BLACK.DOW



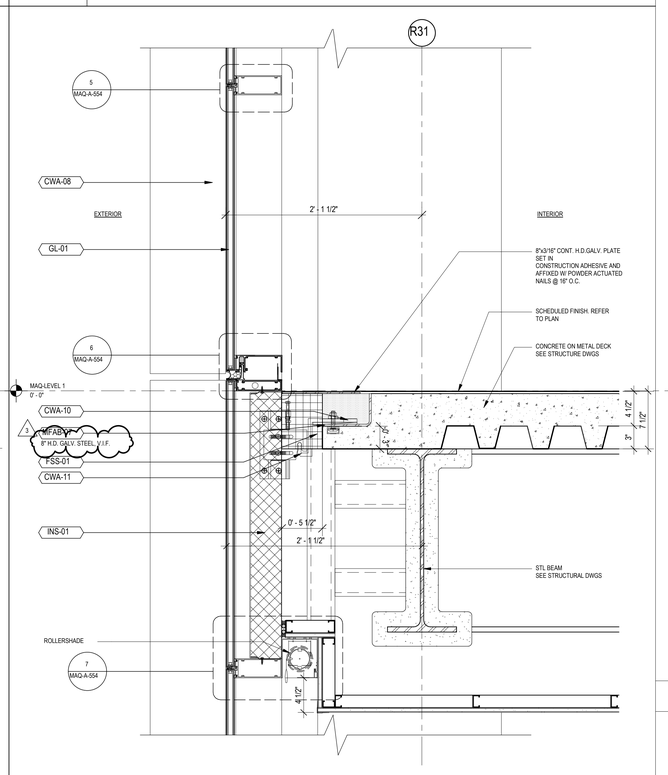
5 SECTION DETAIL - CW @ LOW ROOF

SCALE: 1 1/2" = 1'-0"



3 SECTION DETAIL - MD SLAB OPERABLE

SCALE: 1 1/2" = 1'-0"



1 SECTION DETAIL - MD SLAB

SCALE: 1 1/2" = 1'-0"

0 4" 8" 1'-4" 2'-8"

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0 1

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POOL DESIGN

Aqua Design International
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KEYPLAN

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DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 5

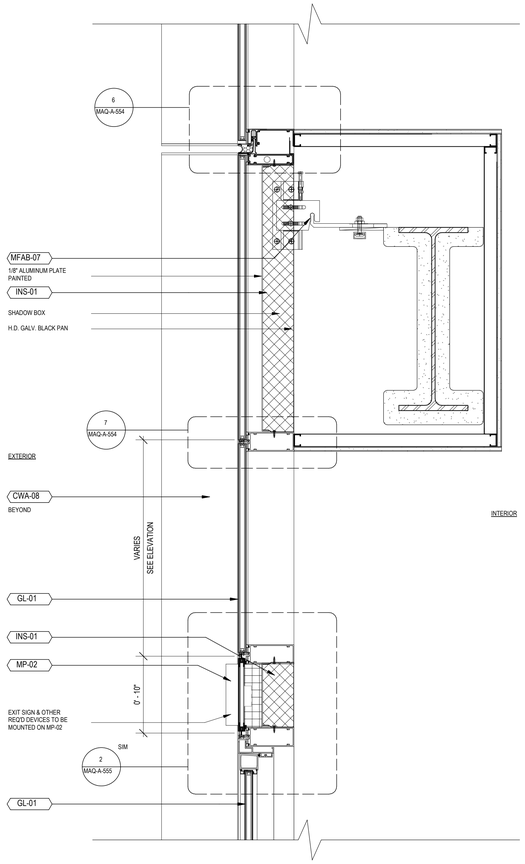
Pennsylvania State Police Academy
Core Buildings, BESO & Sitework

PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

ENCLOSURE SECTION DETAILS - CW-01

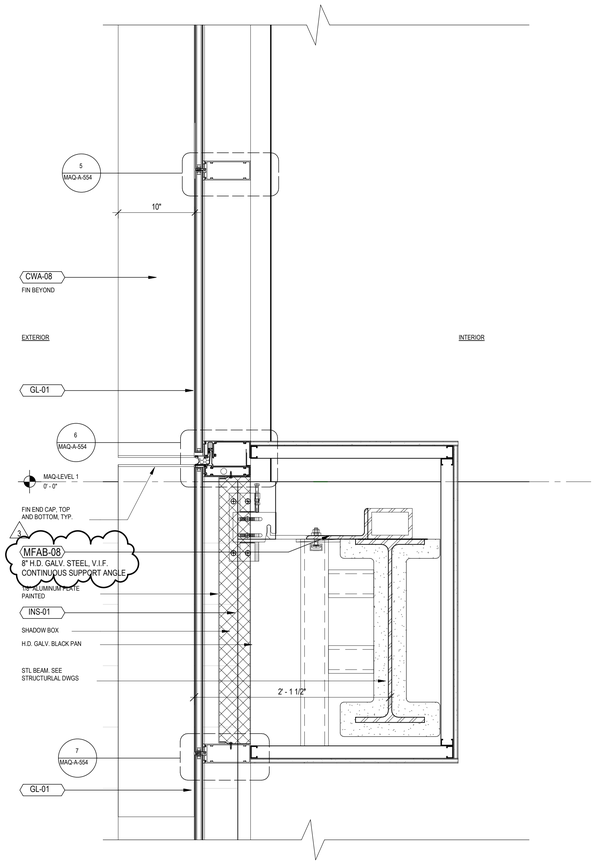
SHEET No.
MAQ-A-551

DRAWN BY	CHECKED BY	DATE	SCALE
Author	Checker	SEPT 2022	AS NOTED



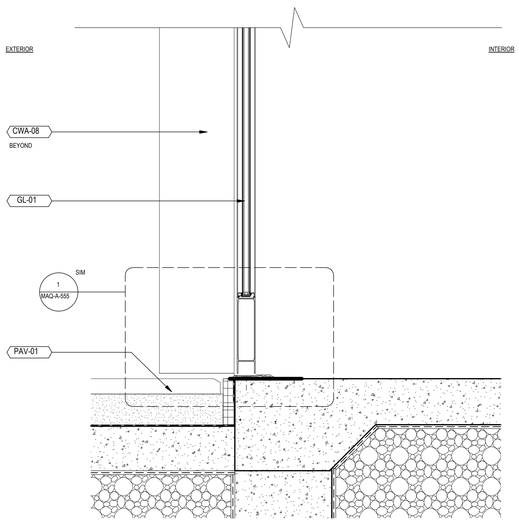
4 SECTION DETAIL - EGRESS DOOR HEAD

SCALE: 1 1/2" = 1'-0"



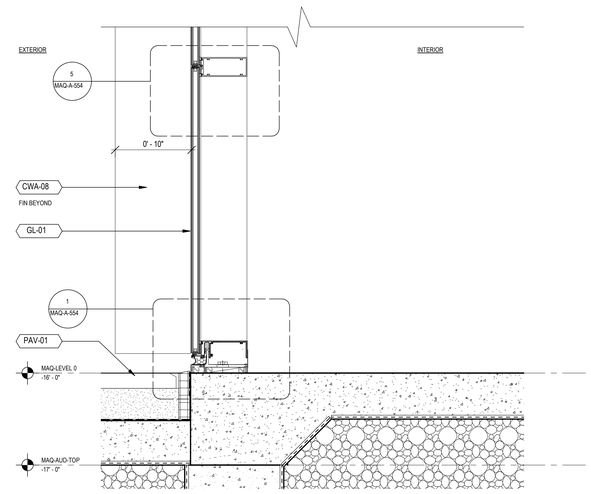
2 SECTION DETAIL - EGRESS STAIR LOWER

SCALE: 1 1/2" = 1'-0"



3 SECTION DETAIL - EGRESS DOOR SILL

SCALE: 1 1/2" = 1'-0"



1 SECTION DETAIL - CW PLATFORM AT GRADE

SCALE: 1 1/2" = 1'-0"

0 4" 8" 1'-4" 2'-8"

CWA-08	084400 FIELD INSTALLED VERTICAL FIN
GL-01	088000 TYPICAL EXTERIOR IGU
INS-01	072100 SEMI-RIGID MINERAL WOOL BOARD INSULATION
MP-02	074213 METAL PANEL SYSTEM
PAV-01	075556 PAVERS

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0 1

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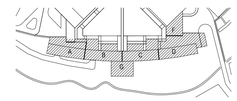
KEYPLAN



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DEPARTMENT OF GENERAL SERVICES

HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.

C-0211-0005 PHASE 5

Pennsylvania State Police Academy
Core Buildings, BESO & Sitework

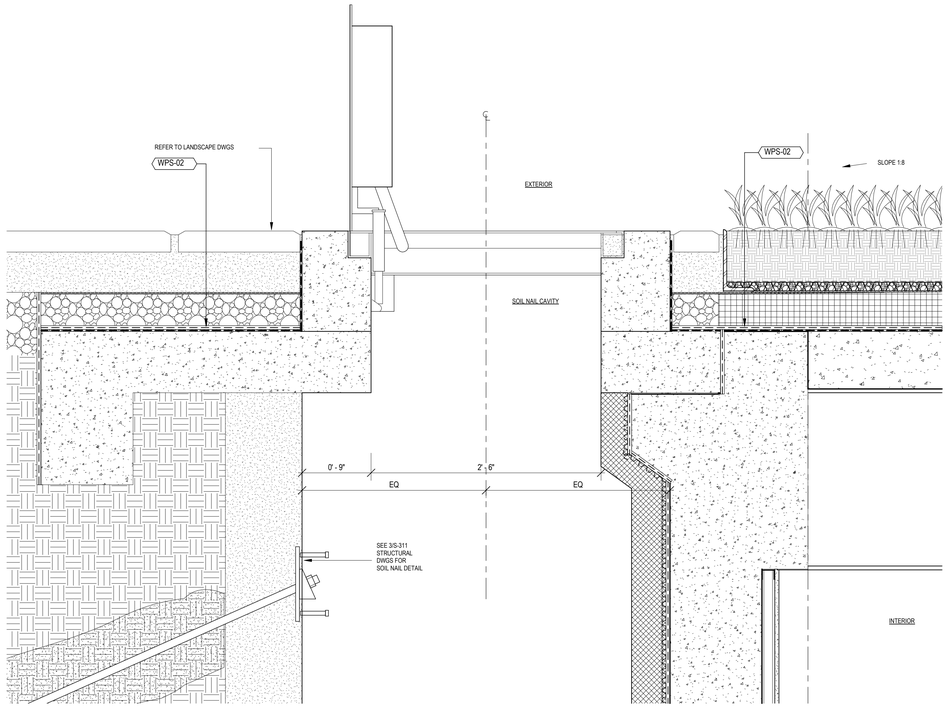
PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

ENCLOSURE SECTION DETAILS - CW-01

SHEET No.

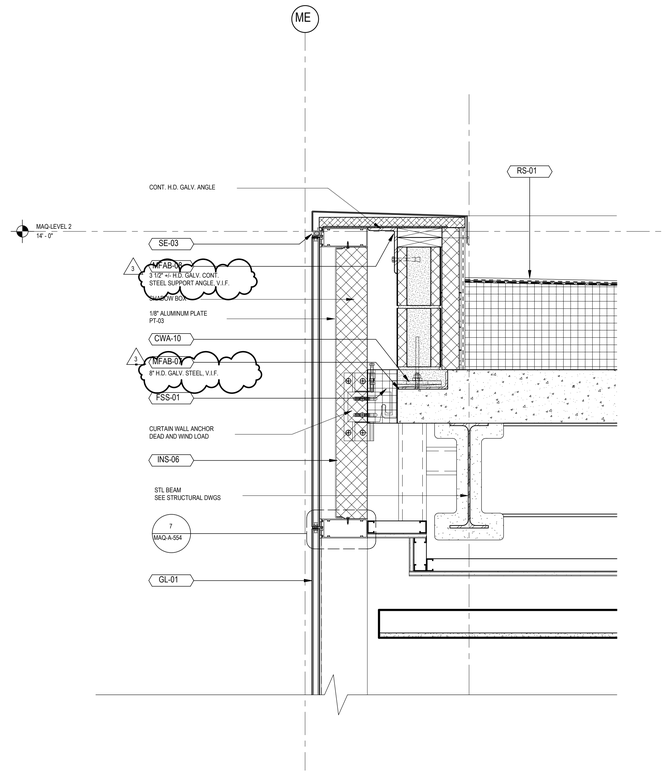
MAQ-A-552

DRAWN BY	CHECKED BY	DATE	SCALE
Author	Checker	SEPT 2022	AS NOTED



5 WALL SECTION - SOIL NAIL WALL ACCESS

SCALE: 1 1/2" = 1'-0"



2 SECTION DETAIL - CW-02 PARAPET

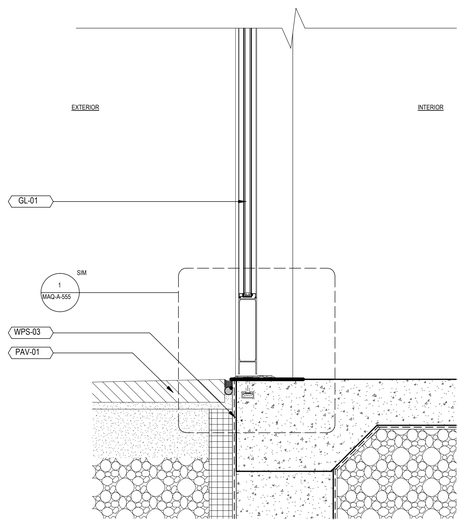
SCALE: 1 1/2" = 1'-0"

KEYNOTES

CWA-10	084400 J-HOOK AND EMBED
FSS-01	078400 FIRESTOPPING
GL-01	088000 TYPICAL EXTERIOR IGU
PAV-01	075556 PAVERS
RS-01	075200 SBS MEMBRANE ROOF ON CONCRETE
SE-02	079200 STRUCTURAL SILICONE SEALANT, BLACK DOW
SE-03	079200 SILICONE WEATHER SEAL SEALANT, BLACK DOW
WPS-01	071300 UNDERSLAB SHEET WATERPROOFING
WPS-02	071300 FOUNDATION WALL SHEET WATERPROOFING
WPS-03	075556 HOT FLUID APPLIED WATERPROOFING

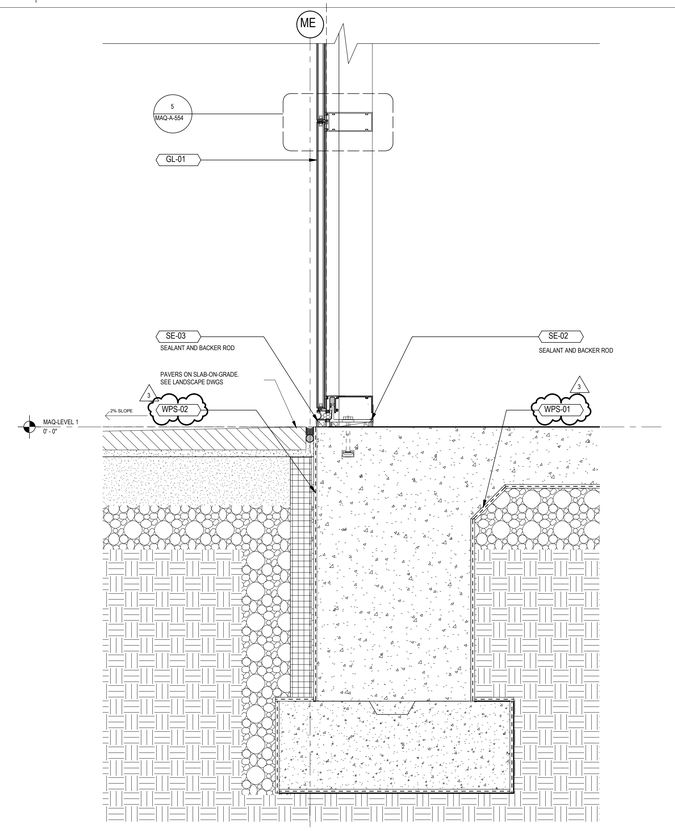
4 SECTION DETAIL - CW-02 DOOR HEAD

SCALE: 1 1/2" = 1'-0"



3 SECTION DETAIL - CW-02 DOOR SILL

SCALE: 1 1/2" = 1'-0"



1 SECTION DETAIL - CW-02 SILL

SCALE: 1 1/2" = 1'-0"

0 4" 8" 1'-4" 2'-8"

VERIFY SCALE

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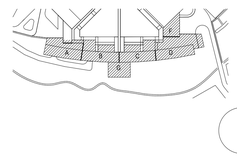

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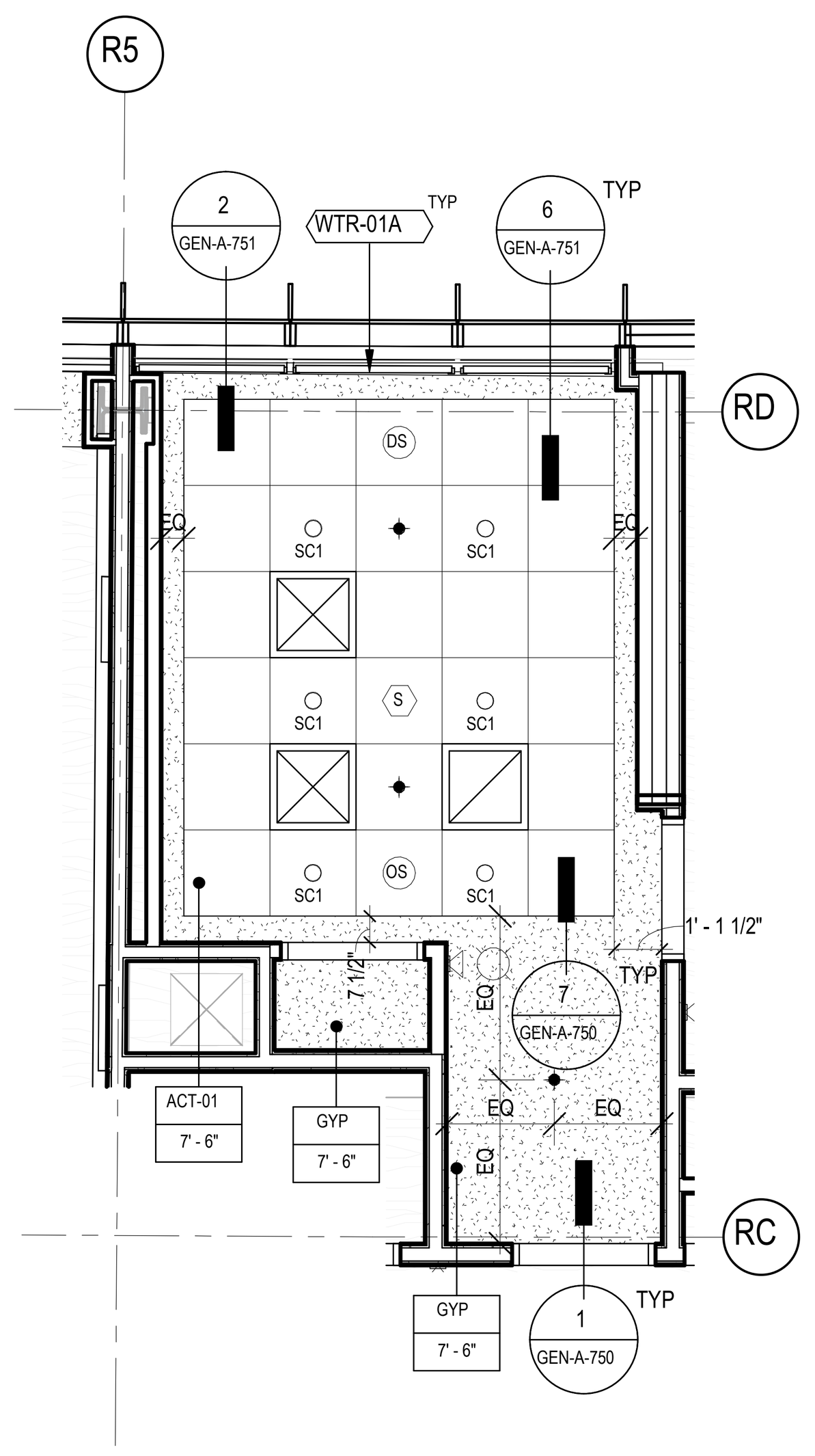
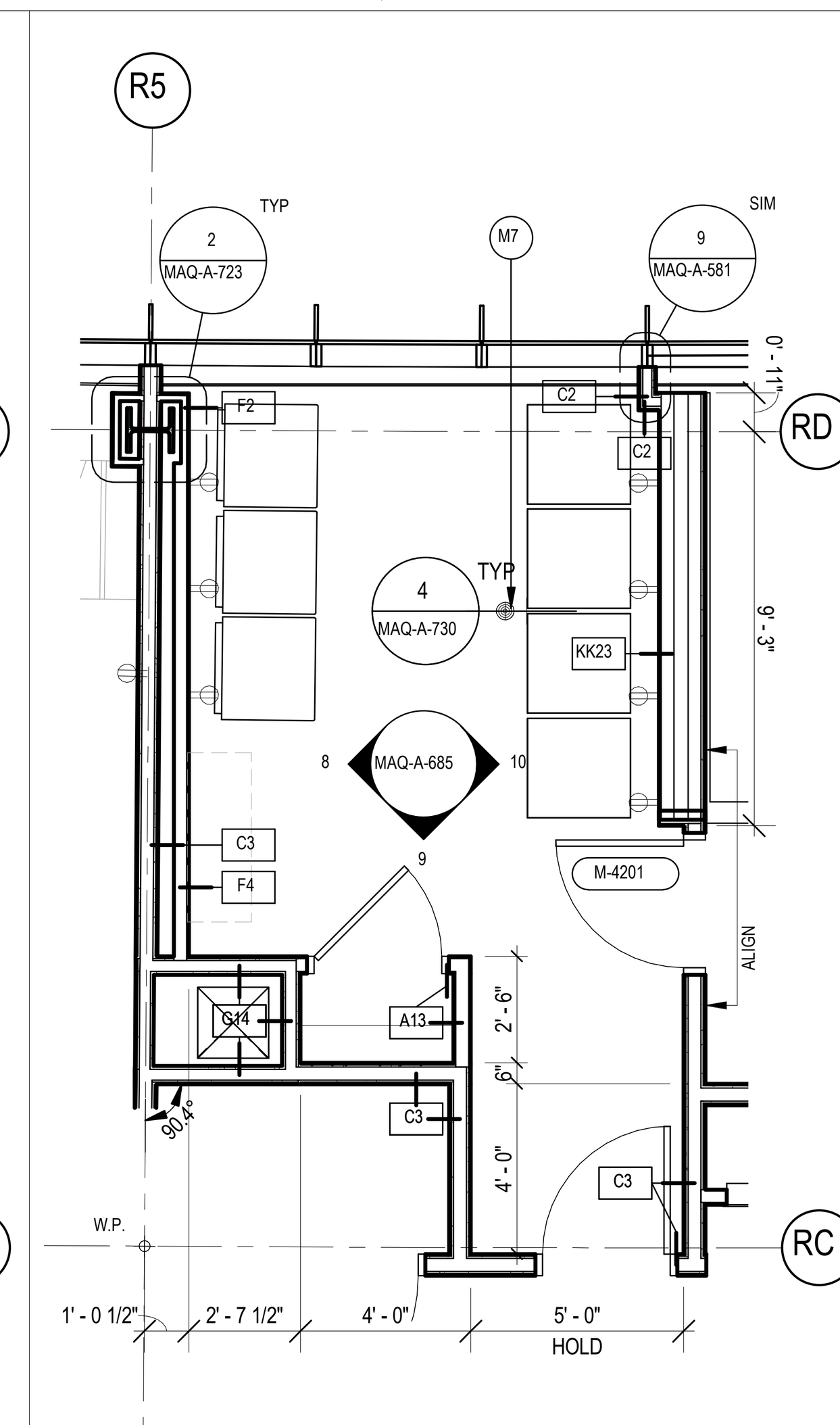
ENCLOSURE ENLARGED SECTION DETAIL CW-02

SHEET No.
MAQ-A-558

DRAWN BY	CHECKED BY	DATE	SCALE
Author	Checker	SEPT 2022	AS NOTED



4 RCP - LVL 4 LAUND.
SCALE: 1/4" = 1'-0"



3 PLAN - LVL 4 LAUND.
SCALE: 1/4" = 1'-0"

KEYNOTES

PLAM-01	064000 PLASTIC LAMINATE, WHITE
PT-01	099100 PAINT FINISH, WHITE
RB-02	096500 RUBBER BASE - 2.5" - GRAY
REQ-01	113000 WASHER
REQ-02	113000 DRYER
WTR-01A	122100 MECHANICAL WINDOW SHADE, LIGHT GRAY

LEGEND

FIRE RATINGS

- 1/2 HOUR FIRE RATING
- 1 HOUR FIRE RATING
- 2 HOUR FIRE RATING
- 3 HOUR FIRE RATING
- DRAWING NOTE

1	SWITCH	SINGLE 1A	DOUBLE 1B	QUAD 1C	CONTROL PANEL 1D
2	ELECTRICAL OUTLET	SINGLE 2A	DUPLEX 2B	QUAD 2C	
3	DATA OUTLET	2 PORT 3A	6 PORT 3B	AV 3C	
4	FIRE ALRAM STROBE	4			
5	THERMOSTAT	5			
6	WALL CLOCK	6			
7	PULL STATION	7			
8	SECURITY CAMERA	8			
9	CARD READER	9			
10	ADA PUSH BOTTON	10			
11	FLOOR BOX	11A	TELE FLOOR MOUNTED 11B	D&T FLOOR MOUNTED 11C	DATA FLOOR MOUNTED 11D
12	WAP	12			

RCP LEGEND

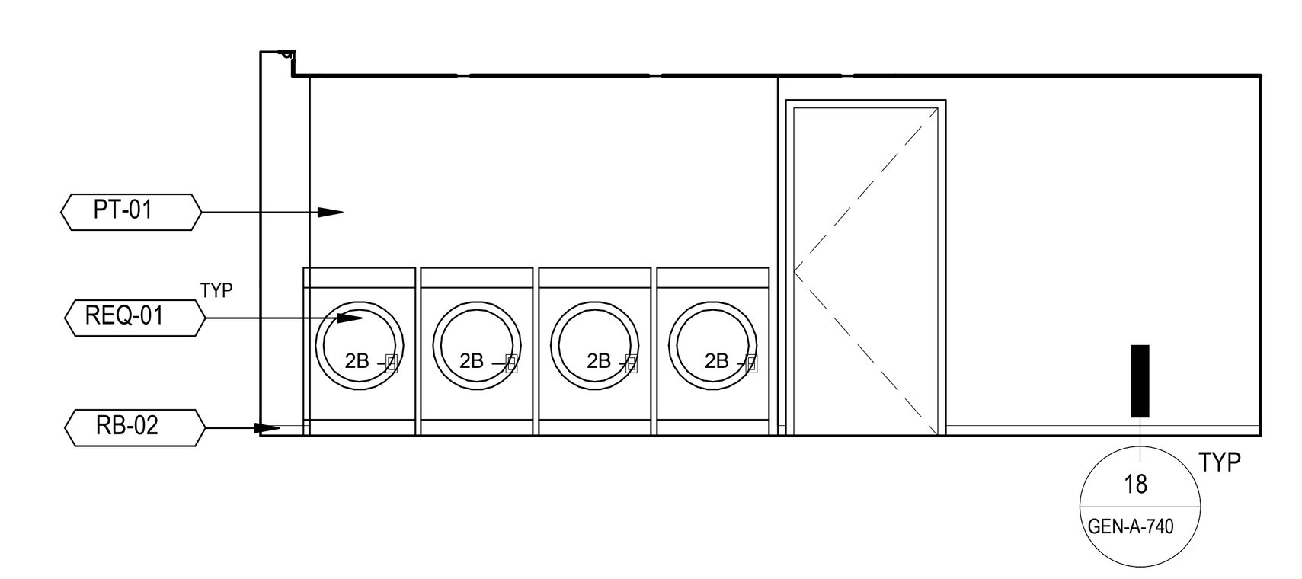
- CONCEAL PENDANT SPRINKLER
- PENDANT SPRINKLER
- UPRIGHT SPRINKLER
- SIDE WALL SPRINKLER
- LINEAR DIFFUSER
- DIFFUSER
- EXHAUST
- ACCESS PANEL
- LIGHT FIXTURE
- LIGHT FIXTURE
- PROJECTOR
- PROJECTOR SCREEN
- EXIT SIGN
- SPEAKER
- PAGING SPEAKER
- MICROPHONE
- SMOKE DETECTOR
- FIRE ALARM SPEAKER/STROBE
- FIRE ALARM STROBE
- OCCUPANCY SENSOR
- VACANCY
- DAYLIGHT SENSOR
- SECURITY CAMERA
- WAP ABOVE CEILING
- WAP BELOW CEILING
- WOOD BAFFLE
- WALL CLOCK

GENERAL NOTES

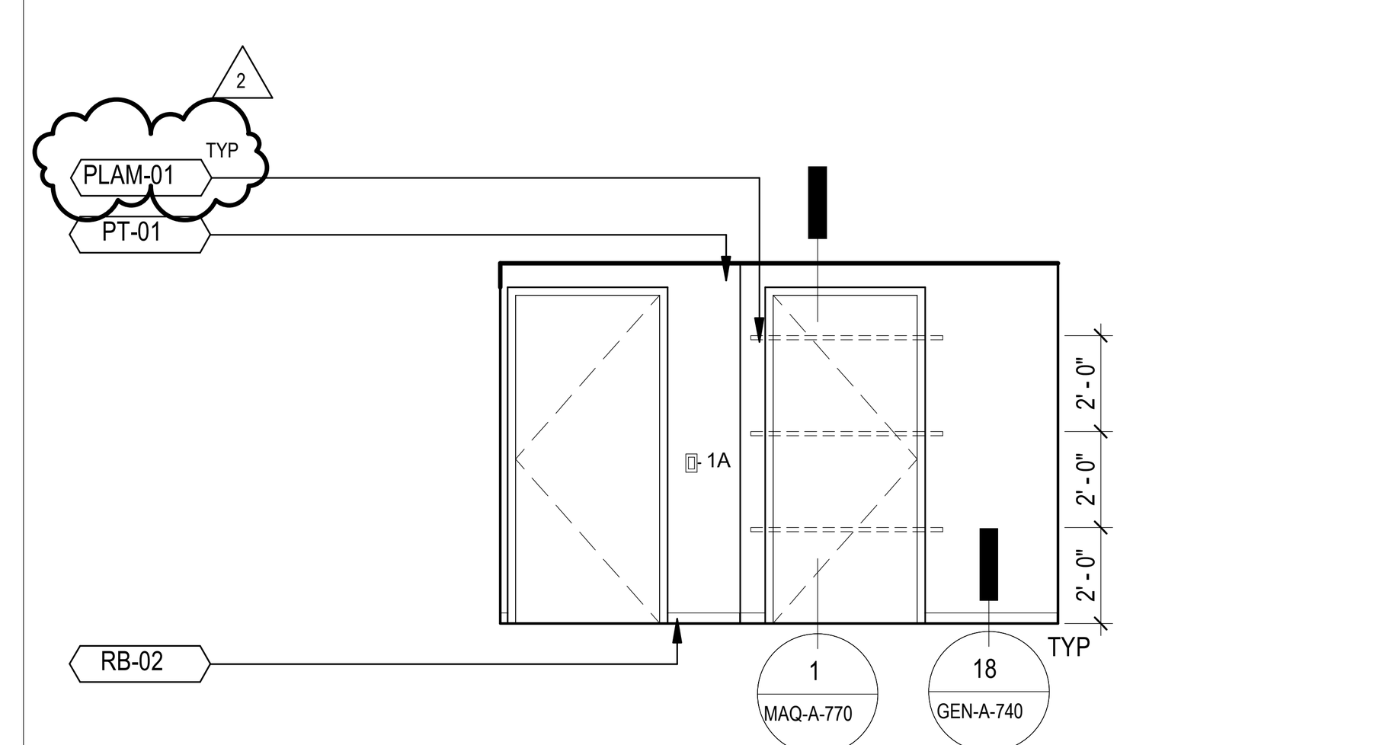
1. ALL DIFFUSERS, REGISTERS AND GRILLES ARE BY THE .2 HVAC CONTRACTOR AND ARE SHOWN FOR LOCATION AND COORDINATION ONLY, UNO.
2. ALL PLUMBING FIXTURES, SPRINKLERS, FHCS, AND STANDPIPES AND RELATED EQUIPMENT ARE BY THE .4 PLUMBING CONTRACTOR AND ARE SHOWN FOR LOCATION AND COORDINATION ONLY, UNO.
3. ALL RECEPTACLES, LIGHTS SWITCHES, TELE/ DATA RECEPTACLES, TELECOM EQUIPMENT AND AV EQUIPMENT ARE BY THE .4 ELECTRICAL CONTRACTOR AND ARE SHOWN FOR LOCATION AND COORDINATION ONLY, UNO.
4. REFERENCE GEN-G-103 FOR STANDARD MOUNTING HEIGHTS AND DETAILS
5. REFERENCE ALSO POWER, COMMUNICATIONS AND FINISH PLANS AND GEN-G-103 FOR STANDARD DEVICE MOUNTING ARRANGEMENTS, ALIGNMENTS AND DIMENSIONAL INFORMATION.
6. ALIGN WALL TILE JOINTS TO FLOOR TILE JOIN LINES.
7. CONFIRM FINIAL TILE JOINT LAYOUT WITH PROFESSIONAL PRIOR TO INSTALLATION.

DRAWING NOTES

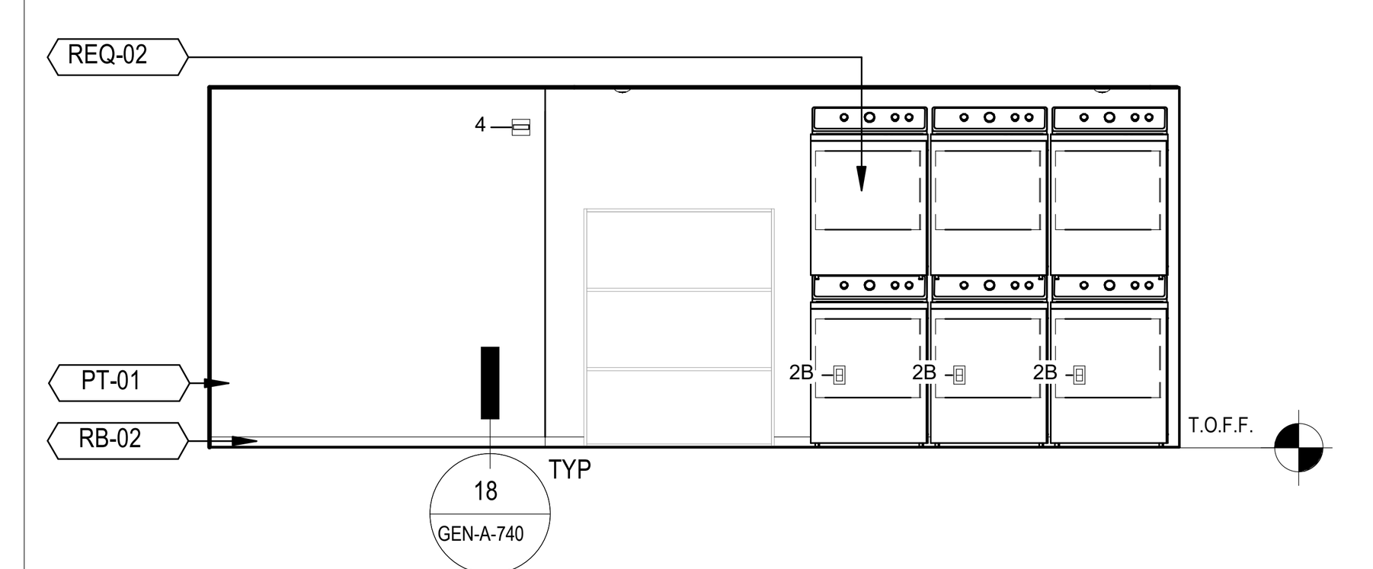
M7	FLOOR DRAIN, REFER TO PLUMBING DRAWINGS



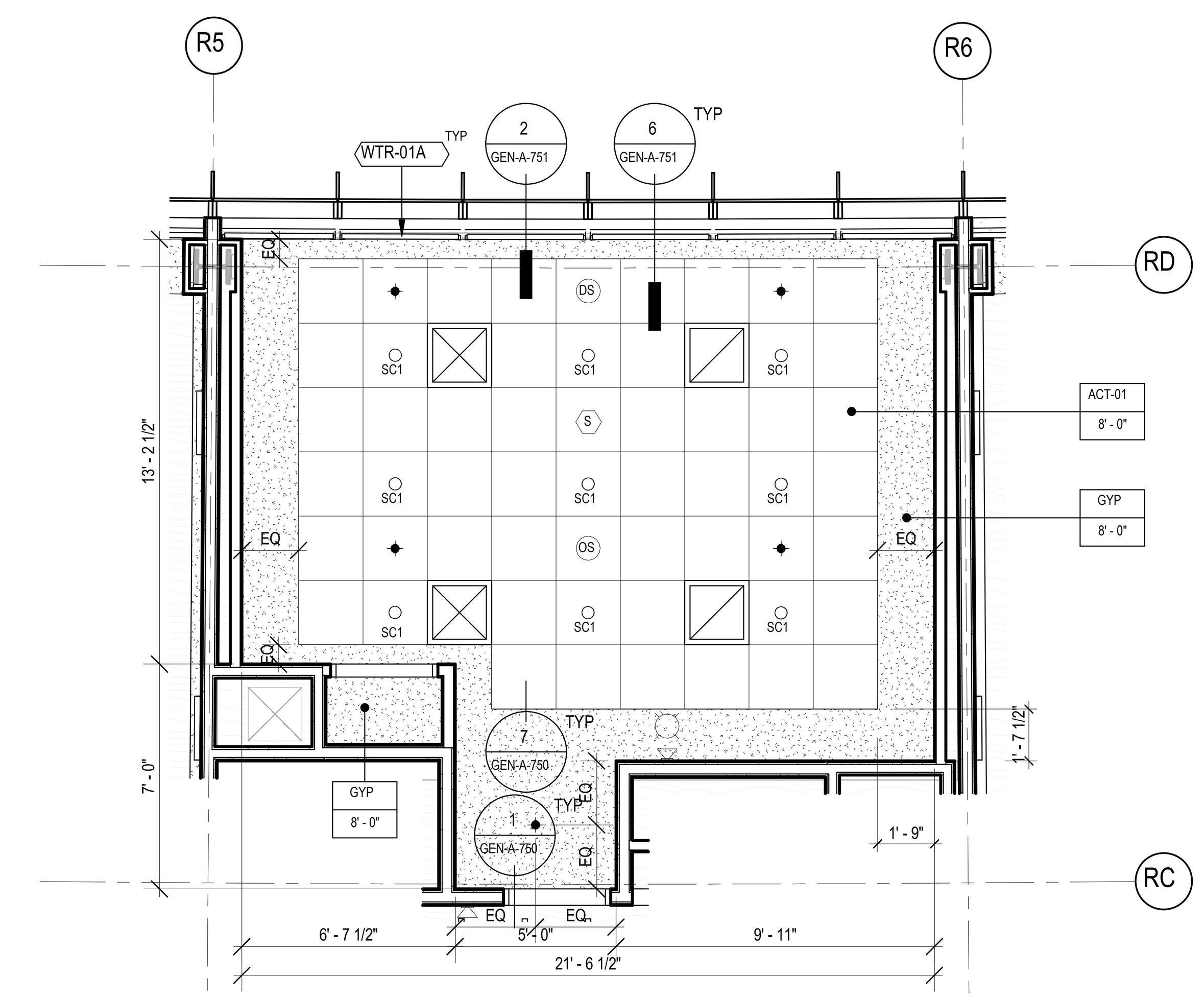
10 LAUNDRY AT LEVEL 4 - EAST
SCALE: 1/4" = 1'-0"



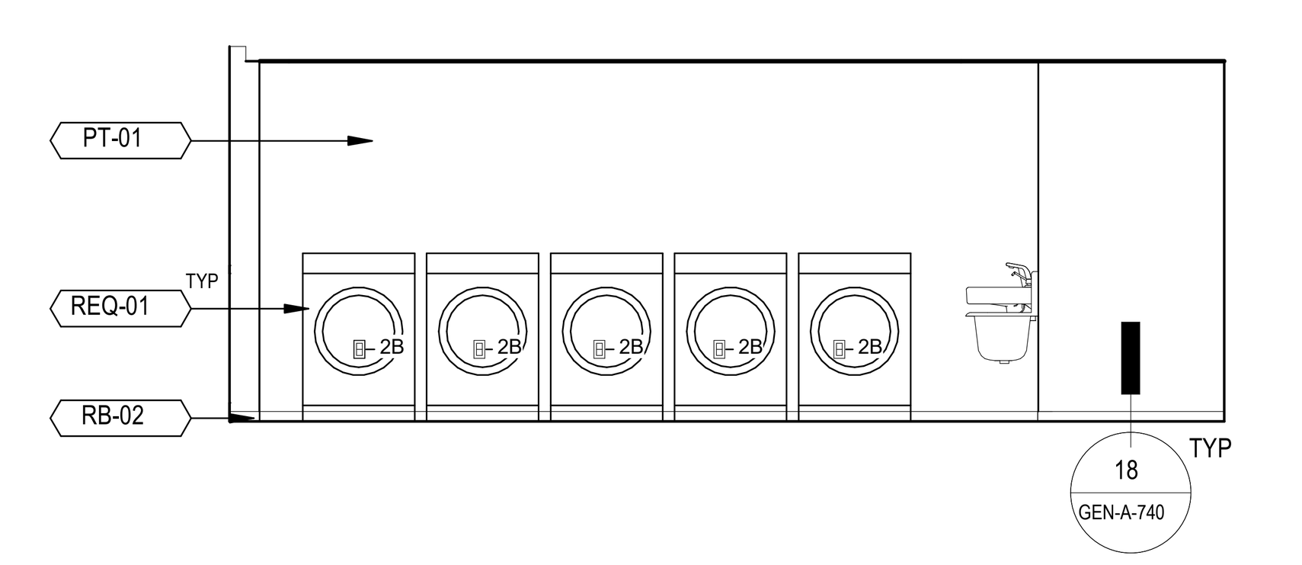
9 LAUNDRY AT LEVEL 4 - SOUTH
SCALE: 1/4" = 1'-0"



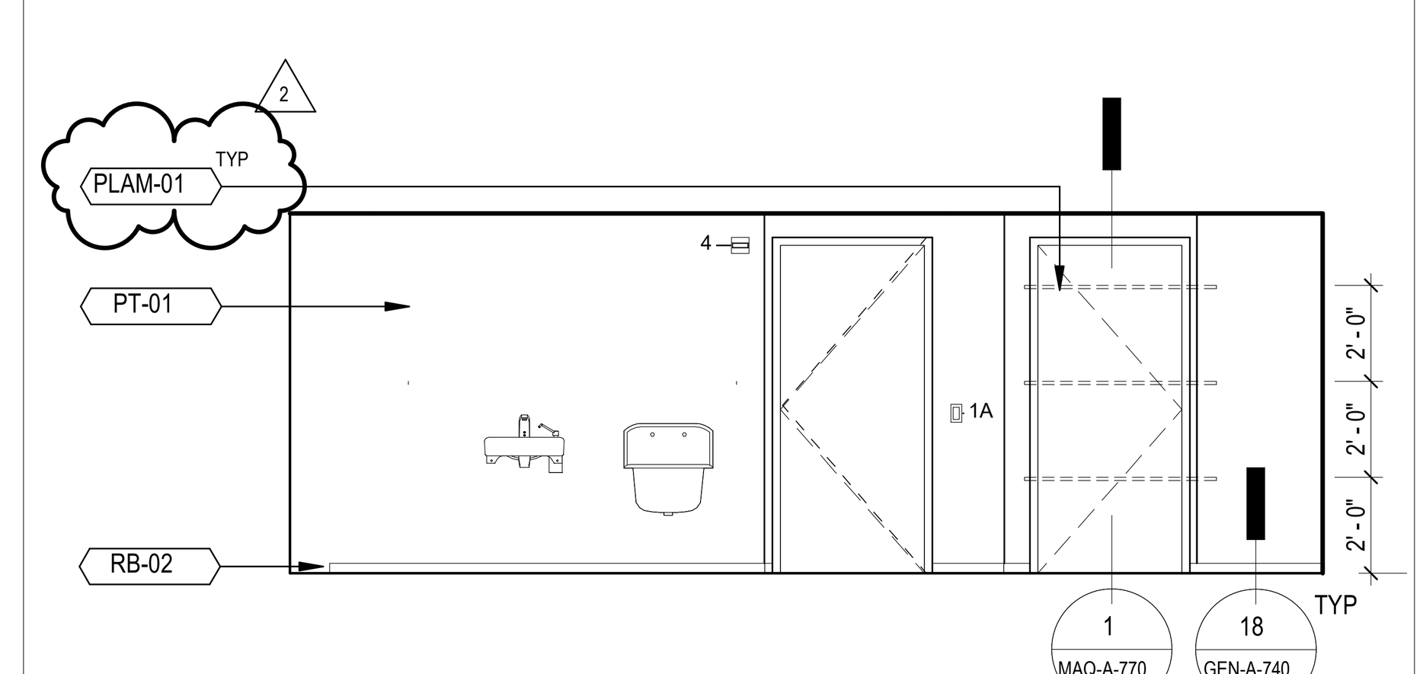
8 LAUNDRY AT LEVEL 4 - WEST
SCALE: 1/4" = 1'-0"



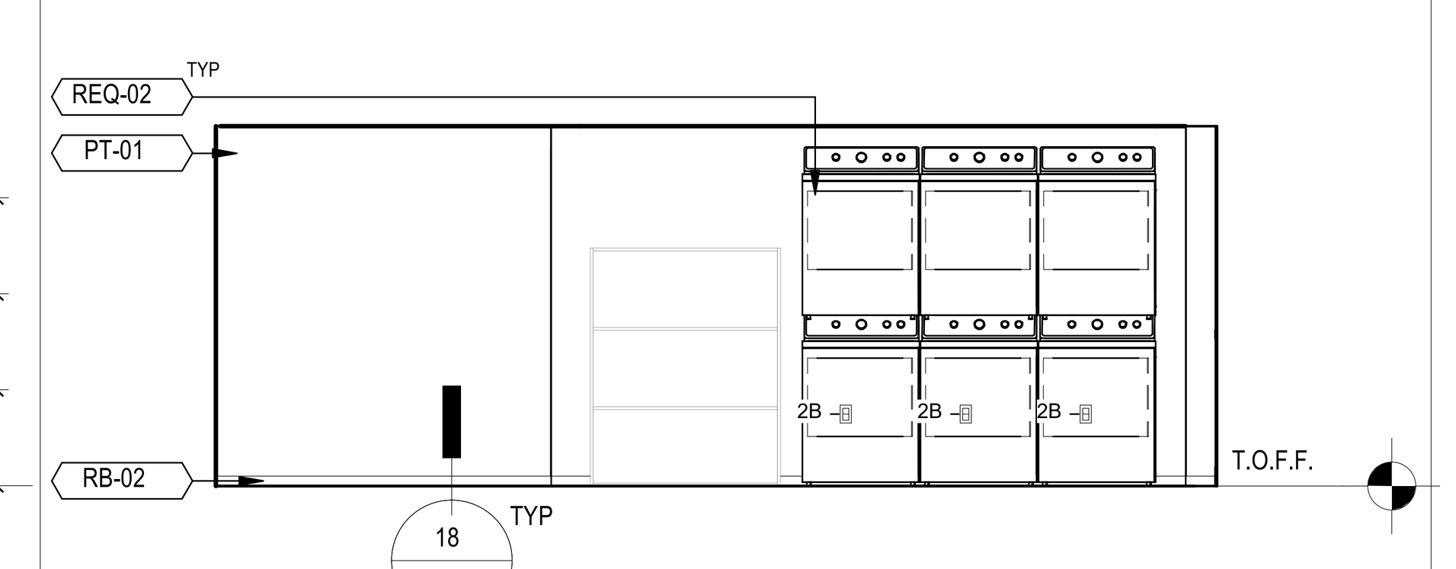
2 RCP - LEVEL 2-3 LAUNDRY TYP.
SCALE: 1/4" = 1'-0"



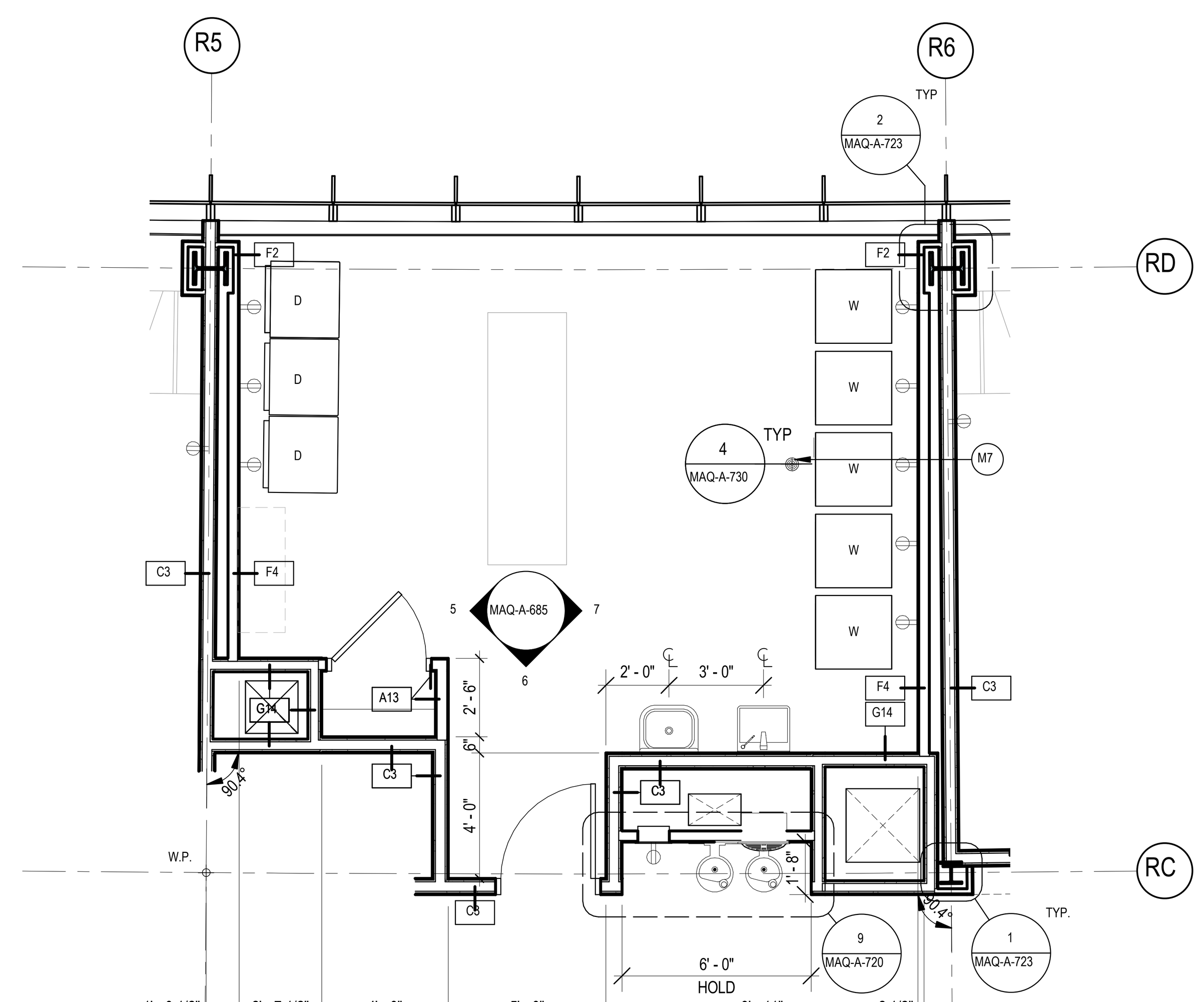
7 LAUNDRY AT LEVEL 2-3 - EAST
SCALE: 1/4" = 1'-0"



6 LAUNDRY AT LEVEL 2-3 - SOUTH
SCALE: 1/4" = 1'-0"



5 LAUNDRY AT LEVEL 2-3 - WEST
SCALE: 1/4" = 1'-0"



1 PLAN - LEVEL 2-3 LAUNDRY TYP.
SCALE: 1/4" = 1'-0"

0 2'-0" 4'-0" 8'-0" 16'-0"

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POOL DESIGN
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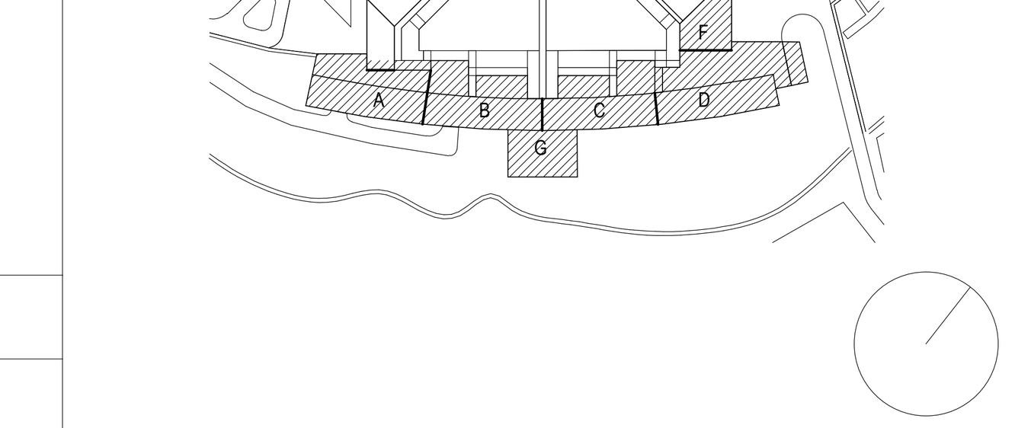
KEYPLAN



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2	14 JULY 2023	ADDENDUM 32			
1	19 MAY 2023	ISSUED FOR BID			

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SIGNATURE DATE

ARCHITECT
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DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 5

Pennsylvania State Police Academy
Core Buildings, BESO & Sitework
PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

VERIFY SCALE

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ENLARGED PLANS/ RCP AND ELEVATIONS - LAUNDRY AT LEVEL 2-3 TYP.

SHEET No.			
MAQ-A-685			
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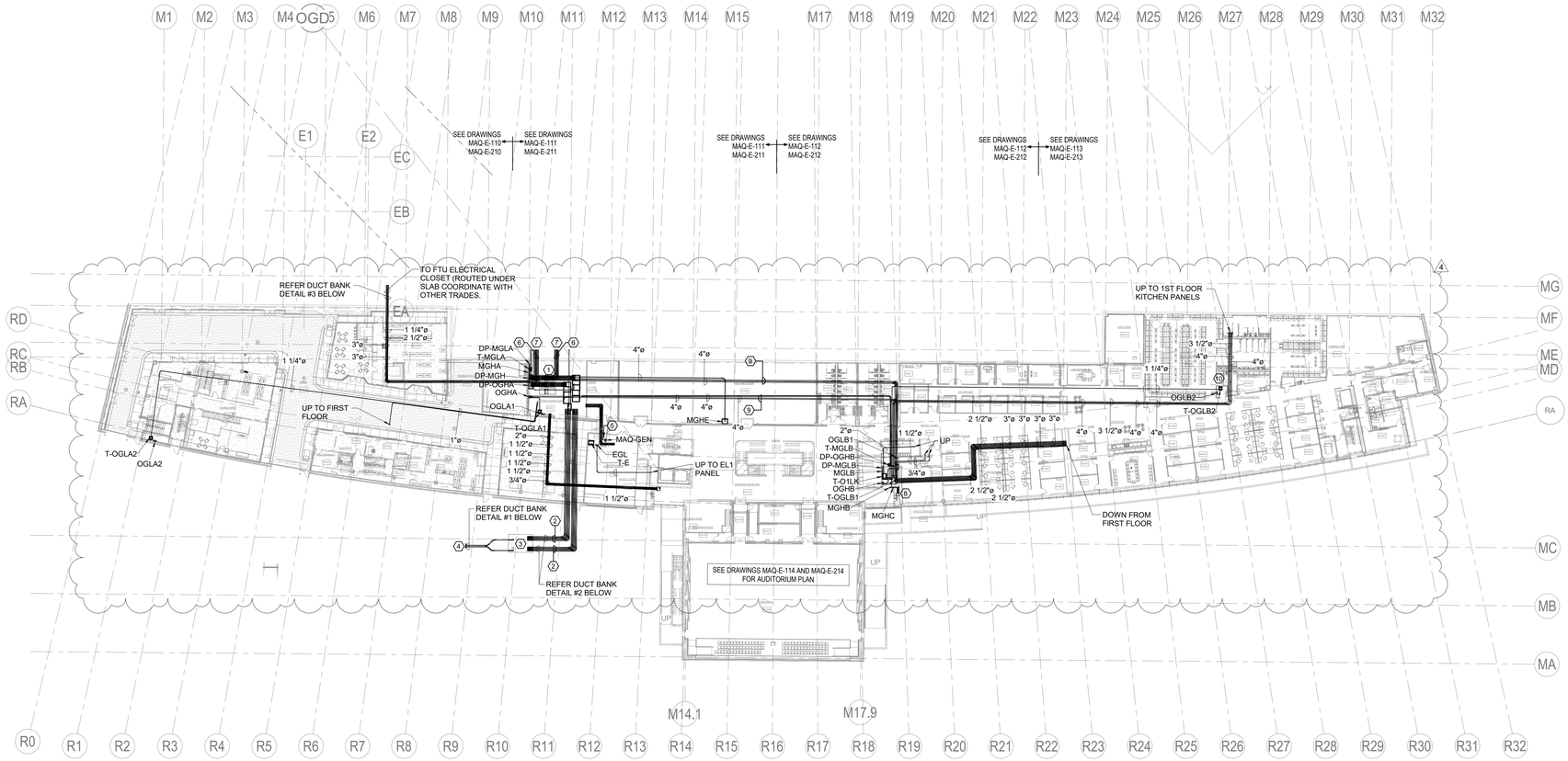
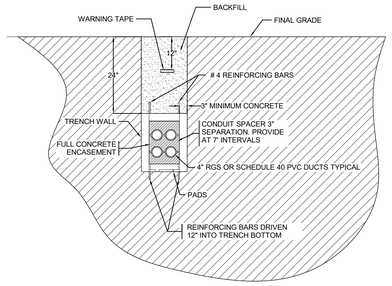
SS	TNB	SEPT 2022	AS NOTED



1 OVERALL FLOOR PLAN - LEVEL 0 - ELECTRICAL SYSTEMS

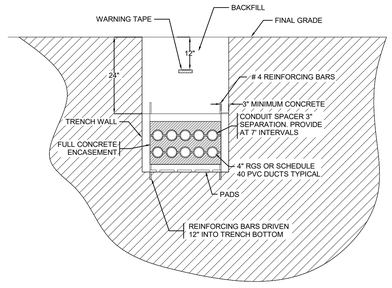
SCALE: 1/32" = 1'-0"

0 4'-0" 8'-0" 16'-0" 32'-0"



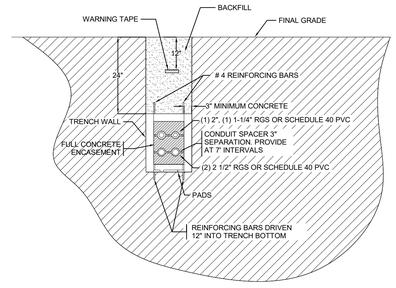
2 SERVICE DUCT BANK DETAIL #1

SCALE: N.T.S.



3 SERVICE DUCT BANK DETAIL #2

SCALE: N.T.S.



4 SERVICE DUCT BANK DETAIL #3

SCALE: N.T.S.

GENERAL NOTES

1. REFER TO GEN-E-001 FOR SYMBOLS, ABBREVIATIONS AND NOTES.
2. REFER TO MAQ-E-401 FOR ENLARGED PLANS.
3. REFER TO GEN-E-701 FOR DETAILS.
4. CONDUIT ROUTING AND TRANSFORMER PAD AND UTILITY POLE LOCATIONS ON SITE ARE FOR REFERENCE ONLY. REFER TO SITE/CIVIL PLANS FOR EXACT LOCATION AND ROUTING.

SHEET NOTES

1. MAIN SERVICE SWITCHBOARD IN MAIN ELECTRICAL ROOM. THE EQUIPMENT ARRANGEMENT MAY CHANGE AS PER THE FINAL DECISION ON MAIN SERVICE FROM PPL. CONTRACTOR SHALL CONSIDER A SECOND SERVICE TO THIS ROOM IF PPL DICTATES.
2. UNDERGROUND ELECTRIC SERVICE FEEDERS.
3. TRANSFORMERS BY UTILITY, PAD TO BE BY GENERAL CONTRACTOR, COORDINATE WITH PPL.
4. INCOMING ELECTRIC SERVICE FEEDERS FROM UTILITY - (4) 4" CONDUITS, COORDINATE WITH PPL.
5. ATS ROOM
6. UNDERGROUND EMERGENCY ELECTRIC SERVICE FEEDERS.
7. INCOMING EMERGENCY SERVICE FEEDERS FROM EMERGENCY GENERATOR
8. ELECTRICAL DISTRIBUTION ROOM FOR THE EAST SIDE OF THE BUILDING
9. UNDERGROUND ELECTRICAL DISTRIBUTION FEEDERS FROM MAIN ELECTRICAL ROOM TO ELECTRICAL DISTRIBUTION ROOM
10. ELECTRICAL CLOSETS.

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KEYPLAN

NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
4	14 JUL 2023	ADDENDUM 32			
1	19 MAY 2023	ISSUED FOR BID			

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 5

Pennsylvania State Police Academy Core buildings, BESO & Sitework
PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

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OVERALL FLOOR PLAN - LEVEL 0 - ELECTRICAL SYSTEMS

SHEET No.
MAQ-E-101

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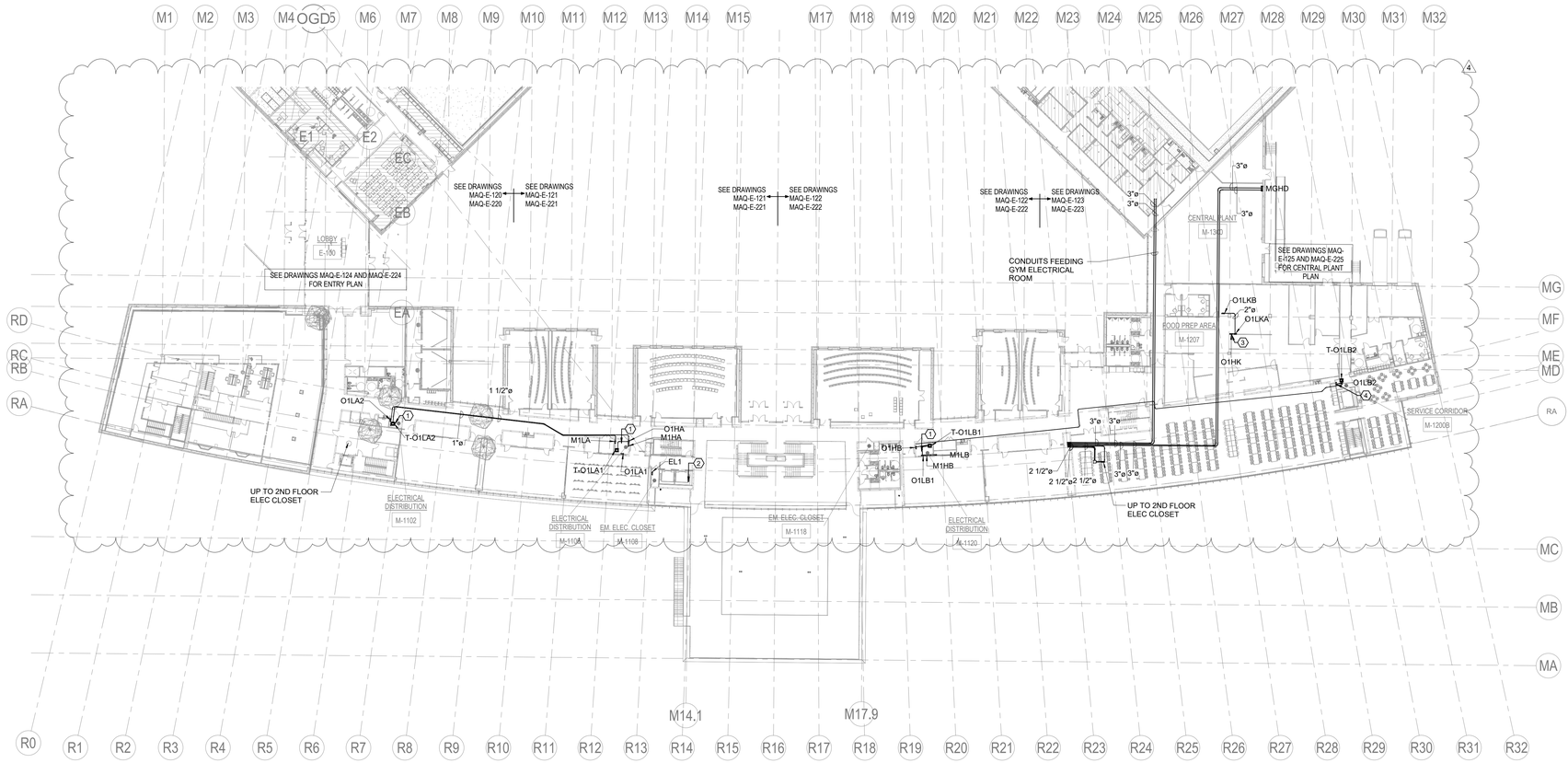

1 OVERALL FLOOR PLAN - LEVEL 1 - ELECTRICAL SYSTEMS

SCALE: 1/32" = 1'-0"

0 16'-0" 32'-0" 64'-0" 128'-0"

GENERAL NOTES

1. REFER TO GEN-E-001 FOR SYMBOLS, ABBREVIATIONS AND NOTES.
2. REFER TO MAQ-E-401 FOR ENLARGED PLANS.
3. REFER TO GEN-E-701 FOR DETAILS.

SHEET NOTES

1. ELECTRICAL CLOSETS
2. EMERGENCY ELECTRICAL CLOSETS
3. SEE ENLARGED PLANS MAQ-E-402 AND MAQ-E-403 FOR KITCHEN ENLARGED PLANS.
4. PROVIDE AND COORDINATE 2#3+1#3G IN 1" CONDUIT FROM PANEL 'OL1E2' TO GEOTHERMAL VAULT. CONTRACTOR TO ASSUME 300'-0" OF WIRE LENGTH FROM VAULT TO PANEL 'OL1E2'. CONTRACTOR SHALL CONSIDER ALL PENETRATIONS THRU WALLS AND UNDERGROUND CONDUIT ROUTING. REFER TO MAQ-E-611 FOR PANEL SCHEDULE. THIS IS DELEGATED DESIGN FOR GEOTHERMAL SYSTEM. CONTRACTOR SHALL COORINATE WITH OTHER TRADES TO AVOID ANY CONFLICTS AT SITE.

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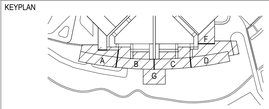
KEYPLAN



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DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 5

Pennsylvania State Police Academy Core buildings, BESO & Sitework
PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

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OVERALL FLOOR PLAN - LEVEL 1 - ELECTRICAL SYSTEMS

SHEET No. MAQ-E-102

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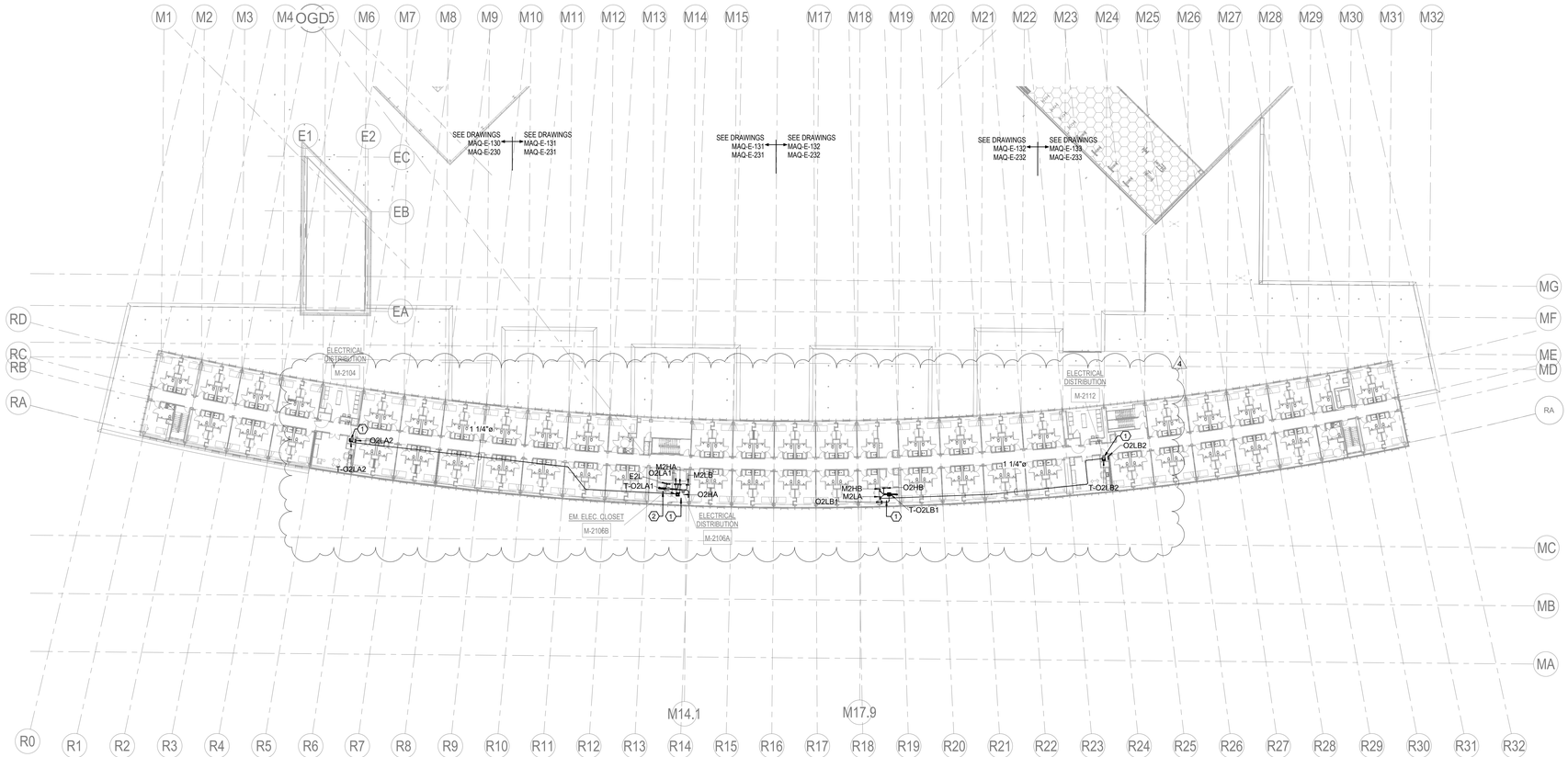

1 OVERALL FLOOR PLAN - LEVEL 2 - ELECTRICAL SYSTEMS

SCALE: 1/32" = 1'-0"

0 4'-0" 8'-0" 16'-0" 32'-0"

GENERAL NOTES

1. REFER TO GEN-E-001 FOR SYMBOLS, ABBREVIATIONS AND NOTES.
2. REFER TO MAQ-E-401 FOR ENLARGED PLANS.
3. REFER TO GEN-E-701 FOR DETAILS.

SHEET NOTES

1. ELECTRICAL CLOSETS
2. EMERGENCY ELECTRICAL CLOSETS

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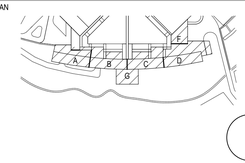

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OVERALL FLOOR PLAN - LEVEL 2 - ELECTRICAL SYSTEMS

SHEET No. MAQ-E-103

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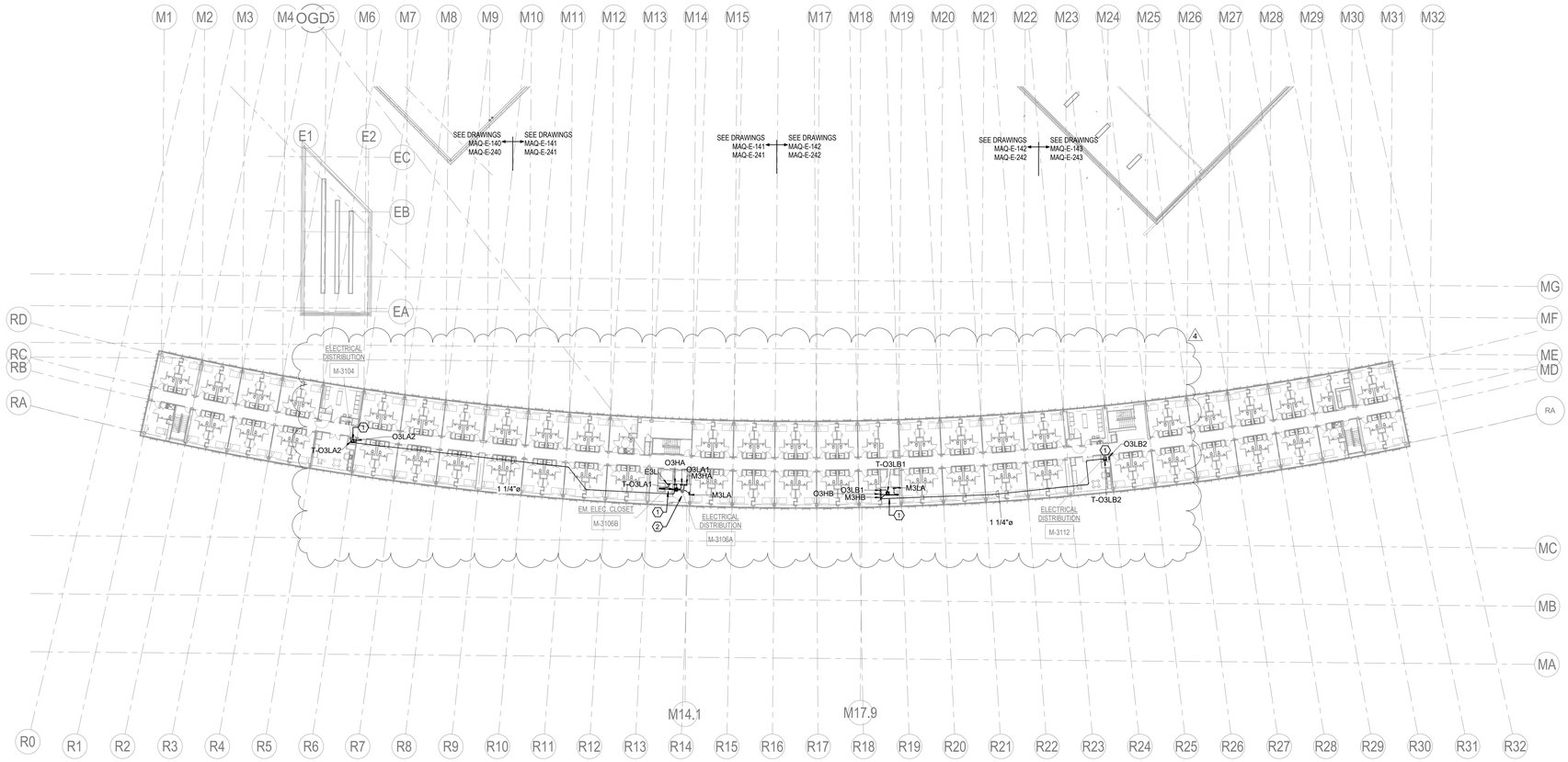

1 OVERALL FLOOR PLAN - LEVEL 3 - ELECTRICAL SYSTEMS

SCALE: 1/32" = 1'-0"

0 4'-0" 8'-0" 16'-0" 32'-0"

GENERAL NOTES

1. REFER TO GEN-E-001 FOR SYMBOLS, ABBREVIATIONS AND NOTES.
2. REFER TO MAQ-E-401 FOR ENLARGED PLANS.
3. REFER TO GEN-E-701 FOR DETAILS.

SHEET NOTES

1. ELECTRICAL CLOSETS
2. EMERGENCY ELECTRICAL CLOSETS

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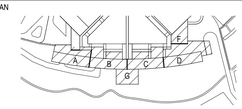
KEYPLAN



NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
4	14 JUL 2023	ADDENDUM 32			
1	19 MAY 2023	ISSUED FOR BID			

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ARCHITECT
SOM
Skidmore, Owings & Merrill LLP
250 Greenwich St, New York, 10007

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 5

Pennsylvania State Police Academy Core buildings, BESO & Sitework
PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

VERIFY SCALE

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OVERALL FLOOR PLAN - LEVEL 3 - ELECTRICAL SYSTEMS

SHEET No. MAQ-E-104

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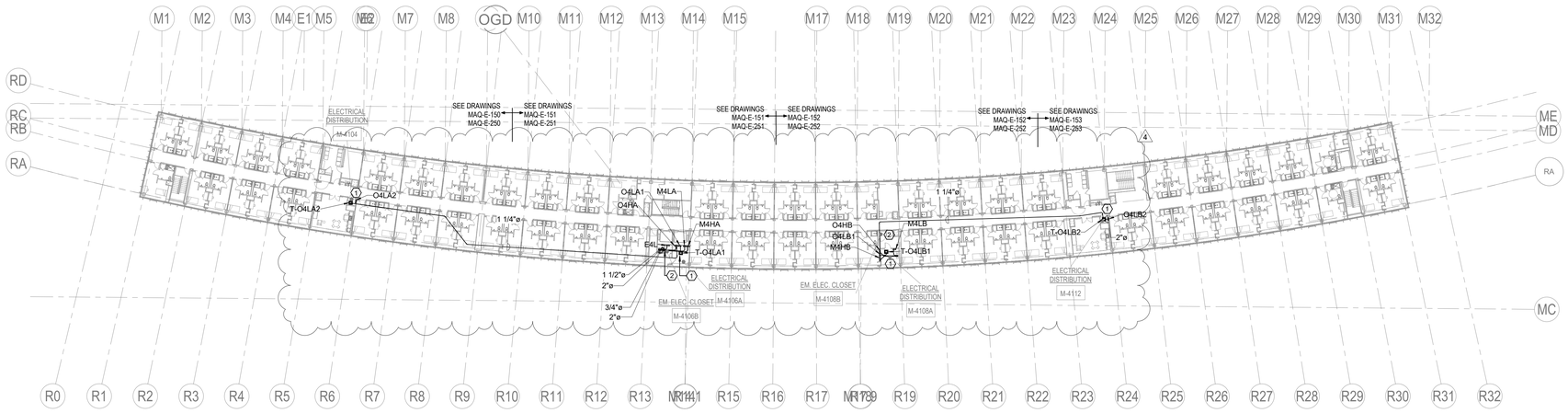

1 OVERALL FLOOR PLAN - LEVEL 4 - ELECTRICAL SYSTEMS

SCALE: 1/32" = 1'-0"

0 4'-0" 8'-0" 16'-0" 32'-0"

GENERAL NOTES

1. REFER TO GEN-E-001 FOR SYMBOLS, ABBREVIATIONS AND NOTES.
2. REFER TO MAQ-E-401 FOR ENLARGED PLANS.
3. REFER TO GEN-E-701 FOR DETAILS.

SHEET NOTES

1. ELECTRICAL CLOSETS
2. EMERGENCY ELECTRICAL CLOSETS

TACTICAL TRAINING DESIGN

Tactical Design North, Inc.
231 E. Buffalo St #502, Milwaukee, WI 53202

LOCAL ARCHITECT

Jacobs Wyper Architects
1232 Chancellor St, Philadelphia, PA 19107

STRUCTURAL ENGINEER

Skidmore, Owings & Merrill LLP
250 Greenwich St, New York, NY 10007

ELECTRICAL, PLUMBING, FIRE PROTECTION, FIRE ALARM ENGINEER

A & J Consulting Engineering Services, P.C.
164 Brighton Rd, Clifton, NJ 07012

MECHANICAL, AVIT ENGINEER

Interface Engineering, Inc.
2000 M Street NW, Suite 270, Washington, DC 20036

ACOUSTICAL ENGINEER

Cerami
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CODE CONSULTING

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CIVIL ENGINEER

Langan
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VERTICAL TRANSPORT

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5409 Rapidan Ct, Lothian, MD 20711

SIGNAGE CONSULTANT

Patricia Hord Graphik Design
119 S. St. Asaph St, Alexandria, VA 22314

LANDSCAPE

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638 I Street NW, Washington, DC 20001

LIGHTING

MCLA
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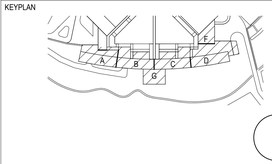
7906 MacArthur Blvd, Suite 100, Cabin John, MD 20818

POOL DESIGN

Aqua Design International
7536 N. La Cholla Blvd Tucson, AZ 85741

KEYPLAN



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D.G.S. PROJECT No.
C-0211-0005 PHASE 5

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PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

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OVERALL FLOOR PLAN - LEVEL 4 - ELECTRICAL SYSTEMS

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SHEET No. MAQ-E-105

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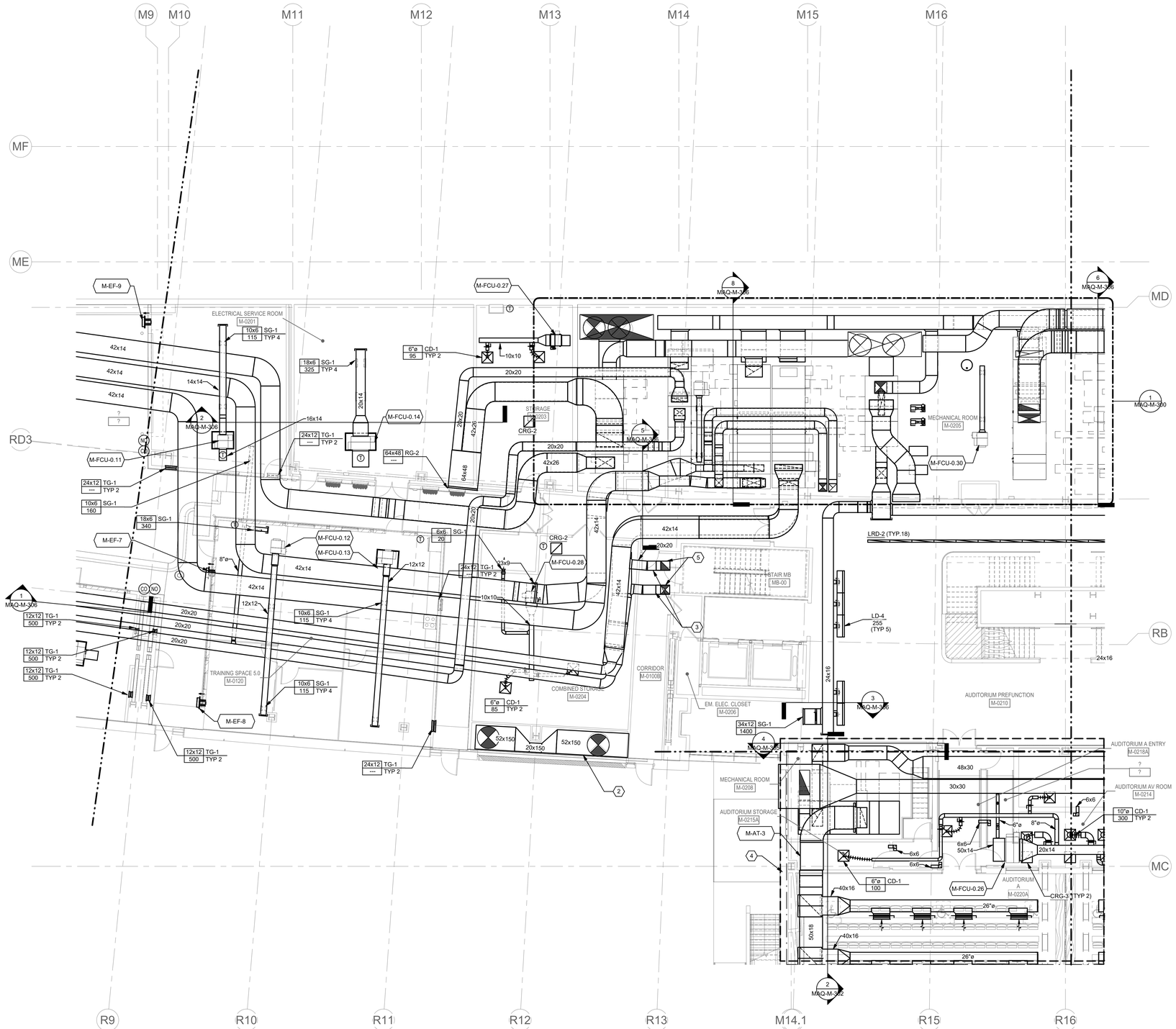
GENERAL SHEET NOTES

A. PROVIDE ACOUSTIC LINING ON FIRST 20' OF SUPPLY AND EXHAUST/RETURN DUCT DOWNSTREAM OF ANY DOAS AND AHU.
B. PROVIDE ACOUSTIC LINING ON FIRST 10' OF DUCT DOWNSTREAM OF ANY FCU.

SHEET KEYNOTES

1. OUTSIDE AIR AND RETURN AIR UP TO LEVEL 1. SEE MAQ-M-121 FOR CONTINUATION. FIRE DAMPER W SLAB.
2. 9' X 27' OUTSIDE AIR LOUVER WITH 50% FREE AREA. DUCT DOWN TO UNDERGROUND DUCT. SEE MAQ-M-102 FOR CONTINUATION.
3. PROVIDE 2-HOUR RATED ENCLOSURE FOR DUCTWORK PASSING THROUGH EGRESS PATHWAY.
4. REFER TO MAQ-M-114 FOR MORE INFORMATION.
5. DUCTS UP.



1 FLOOR PART PLAN B - LEVEL 0 – MECHANICAL

0' 4' 8' 16'
1/8" = 1'-0"

TACTICAL TRAINING DESIGN
Tactical Design North, Inc.
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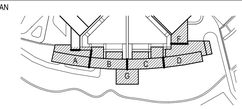

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6	14 JUL 23	ADDENDUM 32			
2	19 MAY 2023	ISSUED FOR BID			
1	18 FEB 2022	ISSUED TO L&I			

RECORD REVISIONS

COMMONWEALTH OF PENNSYLVANIA
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ANDREW J. FLANAGAN
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PE088450
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07/14/2023
SIGNATURE DATE

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 6

Pennsylvania State Police Academy
Outbuildings, Tactical Villages & Sitework
PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

INTERFACE ENGINEERING
PROJECT 2021-0159
CONTACT Keith Pasma
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TEL: 202.370.9555
www.interfaceengineering.com

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FLOOR PART PLAN B - LEVEL 0 – MECHANICAL

SHEET No. MAQ-M-111

DRAWN BY	CHECKED BY	DATE	SCALE
Author	Checker		AS NOTED

1 MARQUEE - FLOOR PART PLAN A - DOMESTIC WATER SUPPLY - LEVEL 4 - PLUMBING

SCALE: 1/8" = 1'-0"

0 4'-0" 8'-0" 16'-0" 32'-0"

GENERAL NOTES:

1. ALL PIPING SHALL BE INSTALLED IN SUCH A MANNER AS TO AVOID FREEZING. ALL WATER PIPING SHALL BE INSTALLED BELOW ATTIC/ROOF INSULATION AND NO PIPING SHALL BE INSTALLED WITHIN EXTERIOR WALLS.

2. THE INSTALLATION OF PLUMBING SYSTEMS SHALL IN NO WAY CRUSH OR COMPROMISE BUILDING INSULATION AND ALL BELOW GRADE WATER PIPING SHALL BE INSTALLED NO LESS THAN 6" BELOW FROST DEPTH.

3. ALL PIPING SHALL BE INSTALLED PARALLEL OR PERPENDICULAR TO BUILDING LINES. THEY SHALL BE SUPPORTED AND ANCHORED AS REQUIRED TO FACILITATE EXPANSION AND CONTRACTION.

4. ALL PIPING SHALL BE CONCEALED EXCEPT IN UNFINISHED SPACES OR OPEN CEILING SPACES.

5. INSULATION AND VAPOR BARRIER SHALL BE PROVIDED ON ALL PIPING AND/OR EQUIPMENT SUBJECT TO HEAT LOSS, CONDENSATION OR CONSTITUTING A POTENTIAL BURN HAZARD.

6. ACCESS DOORS AND/OR PANELS SHALL BE PROVIDED AT ALL MAINTENANCE AND SERVICE LOCATIONS FOR CONCEALED CONTROL DEVICES, VALVES AND PLUMBING EQUIPMENT/DEVICES. UNLESS SIZE OF ACCESS DOOR IS SPECIFICALLY NOTED, PANELS SHALL BE SIZED 18" X 18" MINIMUM AND SHALL BE PAINTED WITH SAME COLOR AS SURROUNDING PAINT COLOR.

7. ALL PIPING SHALL BE SUPPORTED DIRECTLY FROM STRUCTURAL ELEMENTS. NO OTHER COMPONENTS SHALL BE SUPPORTED FROM PLUMBING PIPING.

8. PROVIDE LOCAL TEMPERING VALVES FOR ALL LAVATORIES, SHOWERS AND HAND SINKS. TEMPERING VALVES SHALL CONFORM WITH ASSE 1070.

9. PROVIDE WATER HAMMER ARRESTORS AT ALL QUICK CLOSING VALVES WITH ISOLATION VALVE AND WITH ACCESS OR ACCESS PANELS.

10. ALL THREADED HOSE CONNECTIONS TO DOMESTIC WATER SYSTEM SHALL HAVE AN APPROVED VACUUM BREAKER I.E. HOSE BIBBS, WALL HYDRANTS, SYSTEM DRAINS, EQUIPMENT DRAINS, ETC.

11. PROVIDE INDIVIDUAL SHUT-OFF VALVES FOR EACH PLUMBING FIXTURE, INCLUDING DRINKING FOUNTAINS.

12. ALL PIPING, FITTINGS, VALVES SHALL COMPLY TO LEAD-FREE ACT.

13. CONTRACTOR SHALL PROVIDE TAGS TO EACH VALVES AND PLUMBING EQUIPMENT. CONTRACTOR SHALL PROVIDE VALVE TAG SCHEDULE TO OWNER AT THE END OF JOB.

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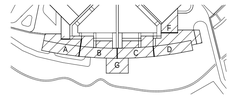
KEYPLAN



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	19 MAY 2023	ISSUED FOR BID			

RECORD REVISIONS

COMMONWEALTH OF PENNSYLVANIA
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JITENDRA K AGARWAL
ENGINEER
PE033176E
PENNSYLVANIA

2023-07-14
SIGNATURE DATE

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Skidmore, Owings & Merrill LLP
250 Greenwich St, New York, 10007

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 5

Pennsylvania State Police Academy
Core Buildings, BESO & Sitework
PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

MARQUEE - FLOOR PART PLAN A - DOMESTIC WATER SUPPLY - LEVEL 4 - PLUMBING

SHEET No. MAQ-P-145

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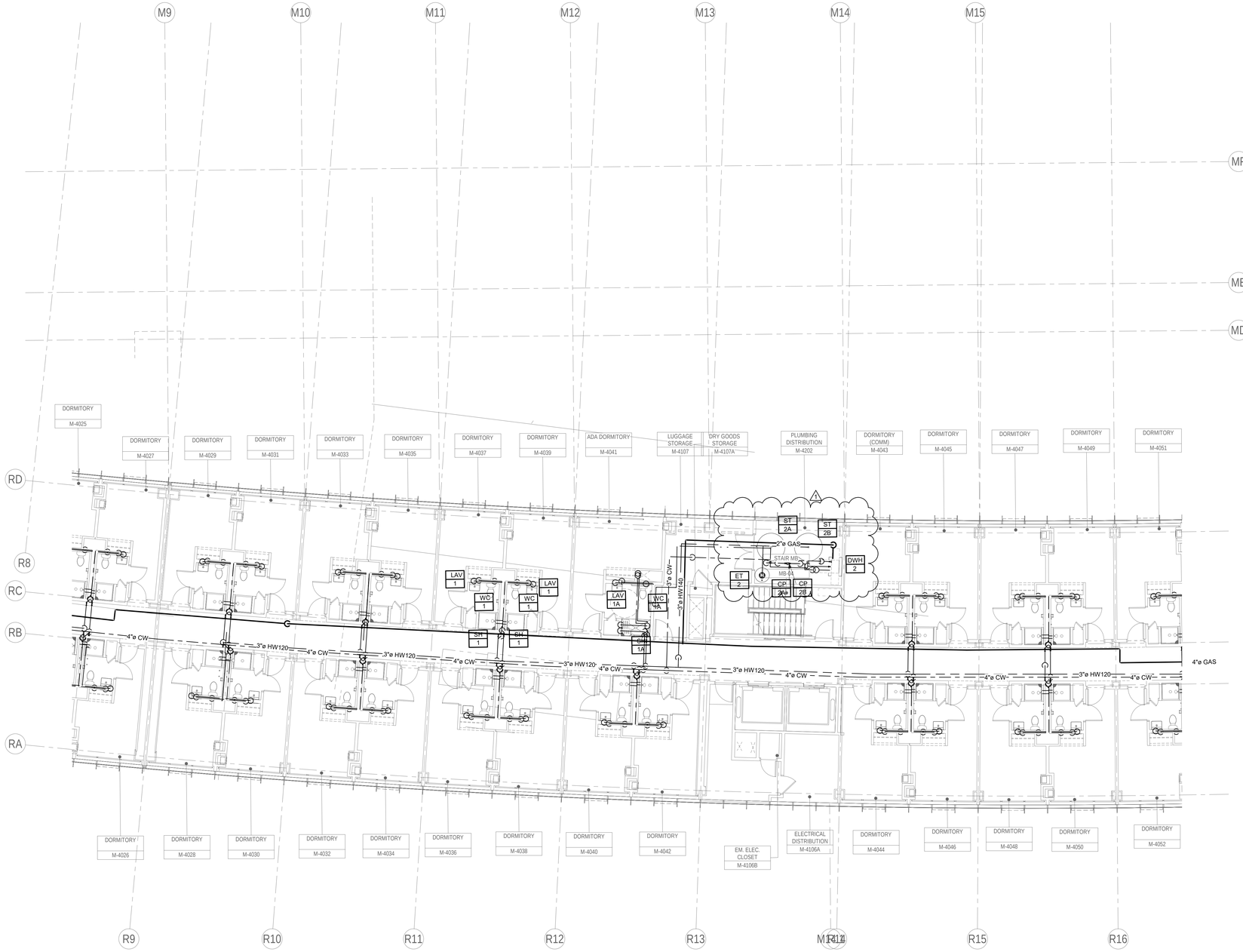

1 MARQUEE - FLOOR PART PLAN B - DOMESTIC WATER SUPPLY - LEVEL 4 - PLUMBING

SCALE: 1/8" = 1'-0"

0 4'-0" 8'-0" 16'-0" 32'-0"

GENERAL NOTES:

1. ALL PIPING SHALL BE INSTALLED IN SUCH A MANNER AS TO AVOID FREEZING. ALL WATER PIPING SHALL BE INSTALLED BELOW ATTIC/ROOF INSULATION AND NO PIPING SHALL BE INSTALLED WITHIN EXTREIOR WALLS.

2. THE INSTALLATION OF PLUMBING SYSTEMS SHALL IN NO WAY CRUSH OR COMPROMISE BUILDING INSULATION AND ALL BELOW GRADE WATER PIPING SHALL BE INSTALLED NO LESS THAN 6" BELOW FROST DEPTH.

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11. PROVIDE INDIVIDUAL SHUT-OFF VALVES FOR EACH PLUMBING FIXTURE, INCLUDING DRINKING FOUNTAINS.

12. ALL PIPING, FITTINGS, VALVES SHALL COMPLY TO LEAD-FREE ACT.

13. CONTRACTOR SHALL PROVIDE TAGS TO EACH VALVES AND PLUMBING EQUIPMENT. CONTRACTOR SHALL PROVIDE VALVE TAG SCHEDULE TO OWNER AT THE END OF JOB.

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RECORD REVISIONS

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JITENDRA K AGARWAL
ENGINEER
PE033176E
PENNSYLVANIA

2023-07-14
SIGNATURE DATE

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 5

Pennsylvania State Police Academy
Core Buildings, BESO & Sitework
PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

MARQUEE - FLOOR PART PLAN B - DOMESTIC WATER SUPPLY - LEVEL 4 - PLUMBING

SHEET No. MAQ-P-146

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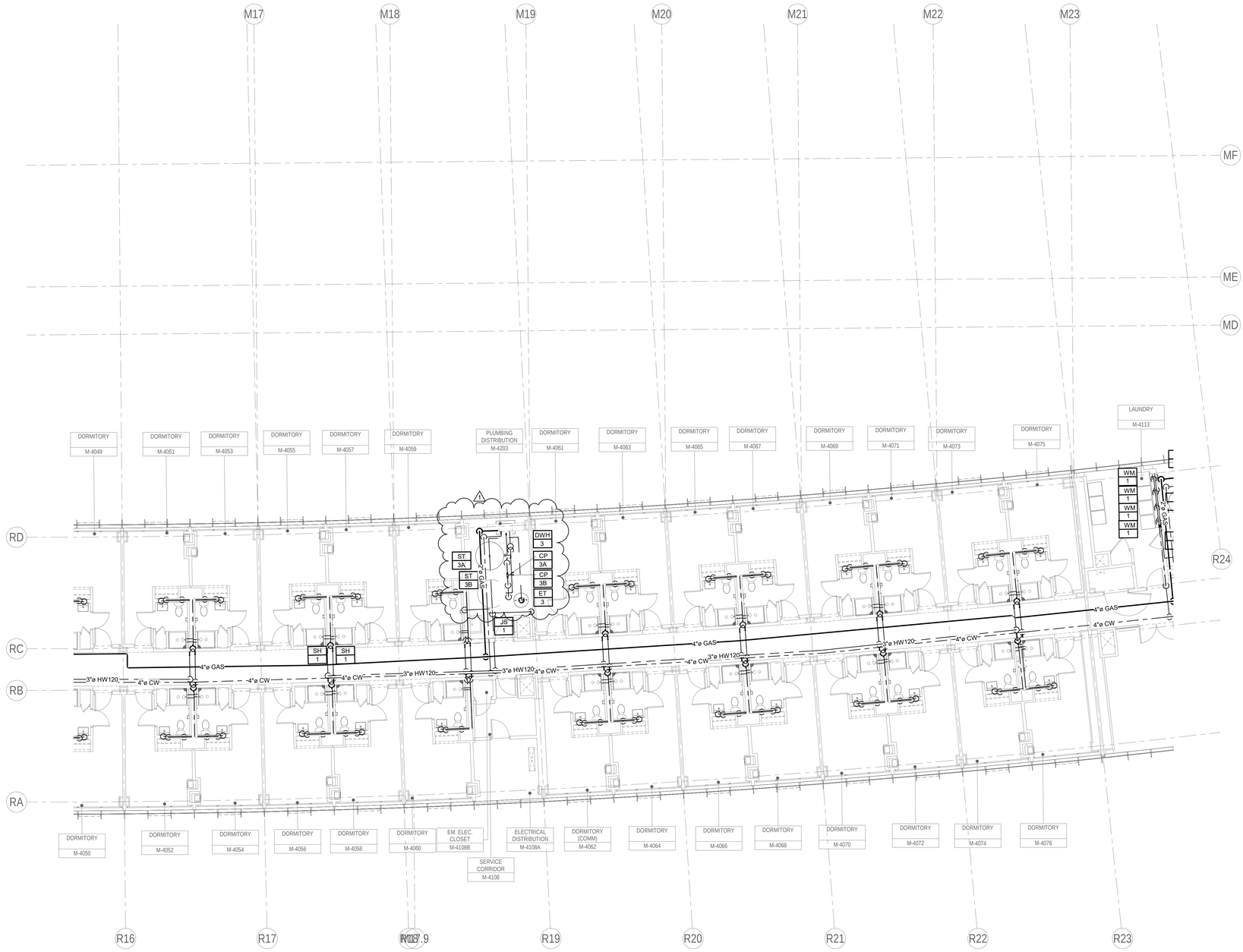

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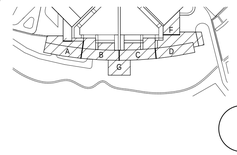
KEYPLAN



NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
1	14 JULY 2023	ADDENDUM 32			
	19 MAY 2023	ISSUED FOR BID			

RECORD REVISIONS

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JITENDRA K AGARWAL
ENGINEER
PE033176E
PENNSYLVANIA

2023-07-14
SIGNATURE DATE

ARCHITECT

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250 Greenwich St, New York, 10007

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 5

Pennsylvania State Police Academy
Core Buildings, BESO & Sitework
PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

VERIFY SCALE

BAR IS ONE (1) INCH LONG
ON ORIGINAL DRAWING:
0 1

IF BAR IS NOT ONE (1) INCH LONG, ADJUST SCALE ACCORDINGLY

CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS. VARIANCE FROM CONTRACT DOCUMENTS NOT PERMITTED WITHOUT PROFESSIONAL & BUREAU OF CONSTRUCTION APPROVAL.

MARQUEE - FLOOR PART PLAN C - DOMESTIC WATER SUPPLY - LEVEL 4 - PLUMBING

SHEET No.
MAQ-P-147

DRAWN BY	CHECKED BY	DATE	SCALE
NV/KT	HS/JKA		AS NOTED

1 MARQUEE - FLOOR PART PLAN D - DOMESTIC WATER SUPPLY - LEVEL 4 - PLUMBING

SCALE: 1/8" = 1'-0"

0 4'-0" 8'-0" 16'-0" 32'-0"

GENERAL NOTES:

1. ALL PIPING SHALL BE INSTALLED IN SUCH A MANNER AS TO AVOID FREEZING. ALL WATER PIPING SHALL BE INSTALLED BELOW ATTIC/ROOF INSULATION AND NO PIPING SHALL BE INSTALLED WITHIN EXTREIOR WALLS.

2. THE INSTALLATION OF PLUMBING SYSTEMS SHALL IN NO WAY CRUSH OR COMPROMISE BUILDING INSULATION AND ALL BELOW GRADE WATER PIPING SHALL BE INSTALLED NO LESS THAN 6" BELOW FROST DEPTH.

3. ALL PIPING SHALL BE INSTALLED PARALLEL OR PERPENDICULAR TO BUILDING LINES. THEY SHALL BE SUPPORTED AND ANCHORED AS REQUIRED TO FACILITATE EXPANSION AND CONTRACTION.

4. ALL PIPING SHALL BE CONCEALED EXCEPT IN UNFINISHED SPACES OR OPEN CEILING SPACES.

5. INSULATION AND VAPOR BARRIER SHALL BE PROVIDED ON ALL PIPING AND/OR EQUIPMENT SUBJECT TO HEAT LOSS, CONDENSATION OR CONSTITUTING A POTENTIAL BURN HAZARD.

6. ACCESS DOORS AND/OR PANELS SHALL BE PROVIDED AT ALL MAINTENANCE AND SERVICE LOCATIONS FOR CONCEALED CONTROL DEVICES, VALVES AND PLUMBING EQUIPMENT/DEVICES. UNLESS SIZE OF ACCESS DOOR IS SPECIFICALLY NOTED, PANELS SHALL BE SIZED 18" X 18" MINIMUM AND SHALL BE PAINTED WITH SAME COLOR AS SURROUNDING PAINT COLOR.

7. ALL PIPING SHALL BE SUPPORTED DIRECTLY FROM STRUCTURAL ELEMENTS. NO OTHER COMPONENTS SHALL BE SUPPORTED FROM PLUMBING PIPING.

8. PROVIDE LOCAL TEMPERING VALVES FOR ALL LAVATORIES, SHOWERS AND HAND SINKS. TEMPERING VALVES SHALL CONFORM WITH ASSE 1070.

9. PROVIDE WATER HAMMER ARRESTORS AT ALL QUICK CLOSING VALVES WITH ISOLATION VALVE AND WITH ACCESS OR ACCESS PANELS.

10. ALL THREADED HOSE CONNECTIONS TO DOMESTIC WATER SYSTEM SHALL HAVE AN APPROVED VACUUM BREAKER I.E. HOSE BIBBS, WALL HYDRANTS, SYSTEM DRAINS, EQUIPMENT DRAINS, ETC.

11. PROVIDE INDIVIDUAL SHUT-OFF VALVES FOR EACH PLUMBING FIXTURE, INCLUDING DRINKING FOUNTAINS.

12. ALL PIPING, FITTINGS, VALVES SHALL COMPLY TO LEAD-FREE ACT.

13. CONTRACTOR SHALL PROVIDE TAGS TO EACH VALVES AND PLUMBING EQUIPMENT. CONTRACTOR SHALL PROVIDE VALVE TAG SCHEDULE TO OWNER AT THE END OF JOB.

VERIFY SCALE

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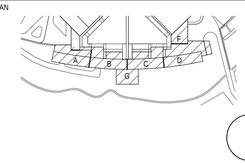

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Core Buildings, BESO & Sitework
PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

MARQUEE - FLOOR PART PLAN D - DOMESTIC WATER SUPPLY - LEVEL 4 - PLUMBING

SHEET No.
MAQ-P-148

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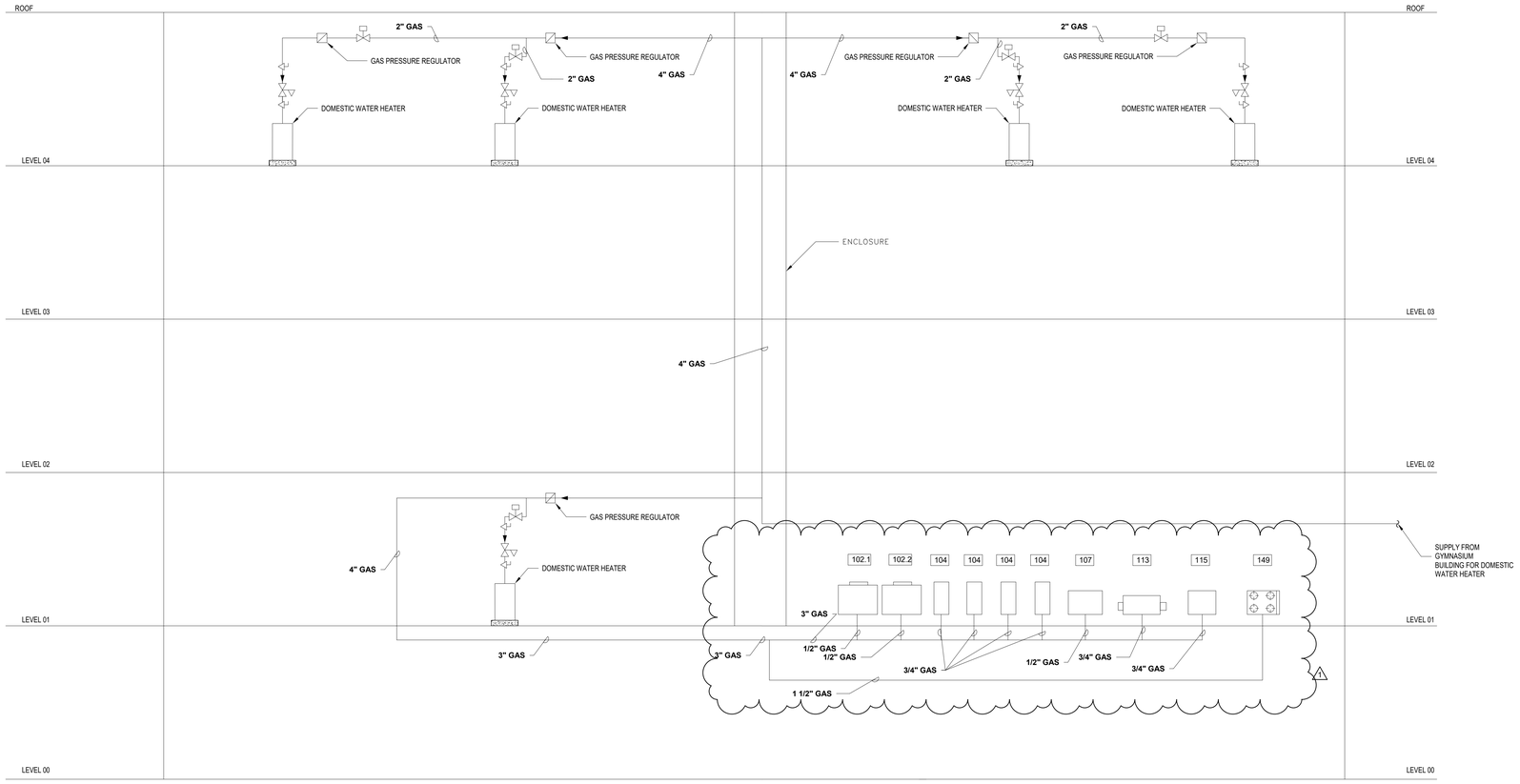

1 MARQUEE - GAS RISER - PLUMBING

SCALE: N.T.S

0 4'-0" 8'-0" 16'-0" 32'-0"

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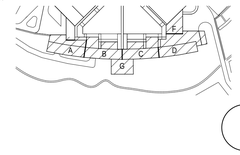
KEYPLAN



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JITENDRA K AGARWAL
ENGINEER PE033176E

2023-07-14
SIGNATURE DATE

ARCHITECT

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 5

Pennsylvania State Police Academy
Core Buildings, BESO & Sitework
PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

VERIFY SCALE

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MARQUEE - GAS RISER - PLUMBING

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SHEET No. MAQ-P-320

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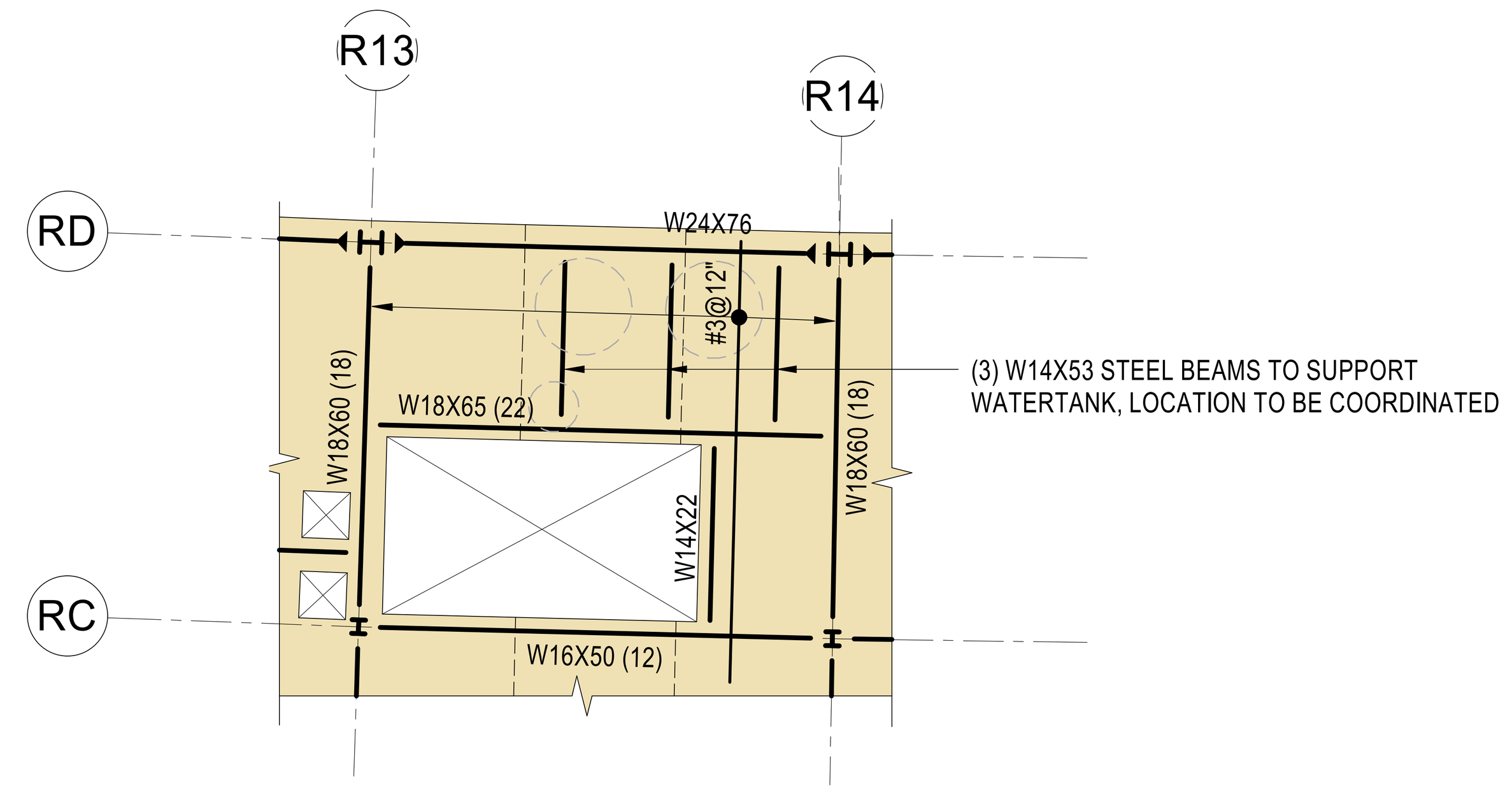
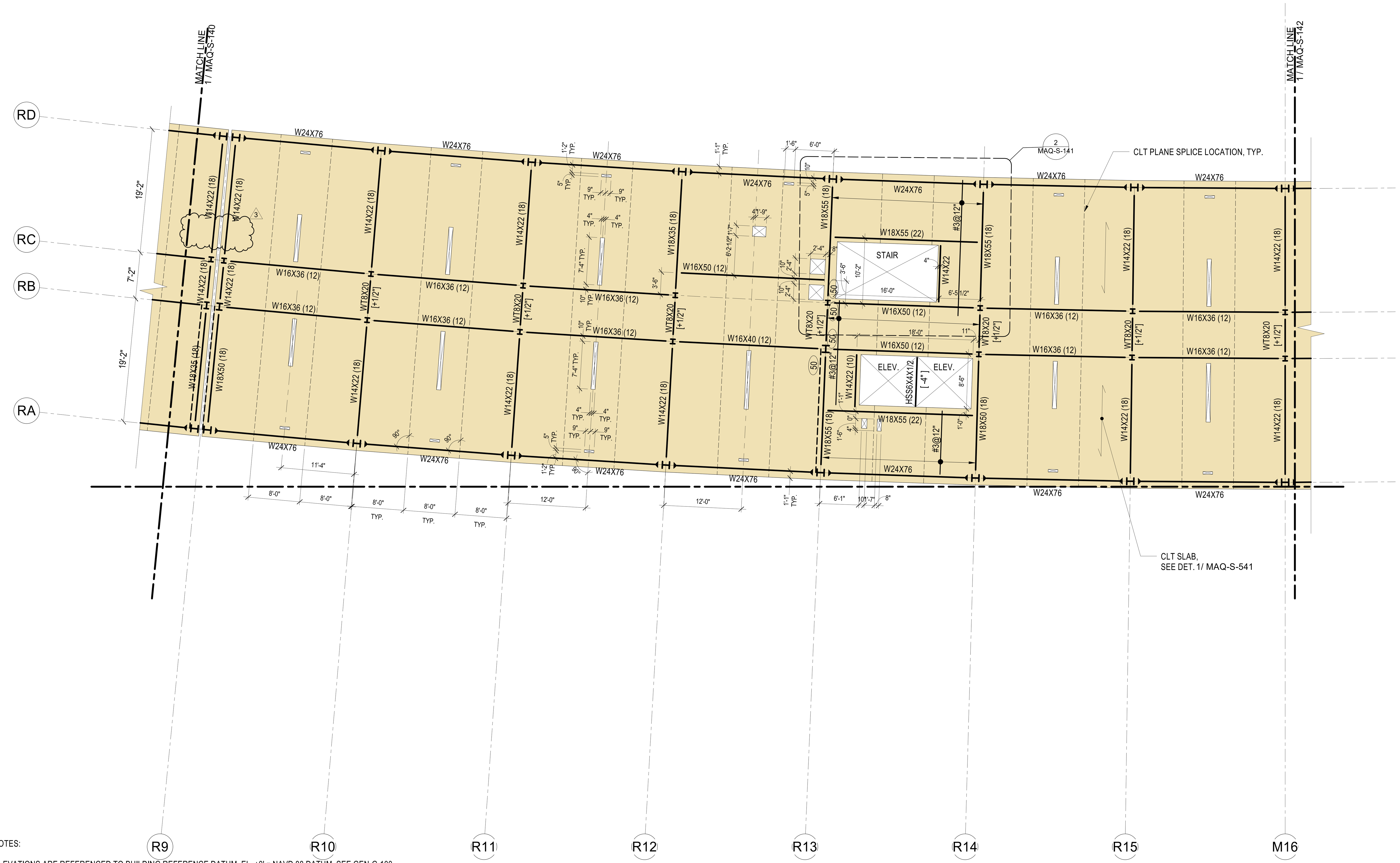


2 LEVEL 04 FRAMING PART PLAN

1/8" = 1'-0"
MAQ-S-141 1



1 LEVEL 3 & 4 FRAMING PART PLAN B

SCALE: 1/8" = 1'-0" 0 4'-0" 8'-0" 16'-0"

GENERAL SHEET NOTES:

1. ALL BUILDING ELEVATIONS ARE REFERENCED TO BUILDING REFERENCE DATUM, EL. +0' = NAVD 88 DATUM, SEE GEN-G-100
2. TOP OF SLAB ELEVATION IS EL. SEE SCHEDULE
3. TOP OF STEEL ELEVATION IS EL. SEE SCHEDULE , THUS [+/-X'-X"] DENOTES VERTICAL OFFSET
4. COMPOSITE BEAM SHEAR STUD SHALL BE 3/4" DIAMETER AT 12" O.C., U.N.O., THUS (XX)
5. SEE ARCHITECTURAL AND MEP DRAWINGS FOR ADDITIONAL OPENING NOT SHOWN ON PLANS.
6. SEE ARCHITECTURAL AND MEP DRAWINGS FOR CURBS, PADS, AND FILLS SIZE AND LOCATIONS.
7. SEE GEN-S-002 FOR STRUCTURAL SYMBOLS AND ABBREVIATIONS
8. SEE GEN-S-004 FOR CONCRETE NTOES
9. SEE GEN-S-005 FOR STRUCTURAL STEEL AND METAL DECK NOTES
10. SEE GEN-S-006 FOR MASS TIMBER NOTES
10. SEE MAQ-S-501 TO 503 FOR STEEL COLUMN SCHEDULE AND DETAILS
11. SEE MAQ-S-511 FOR TYIPCAL STRUCTURAL STEEL DETAILS
12. SEE MAQ-S-531 TO 532 FOR METAL DECK SLAB DETAILS
13. SEE MAQ-S-541 FOR CLT DECK SLAB DETAILS

MAQ LEVEL SCHEDULE	
LEVEL	ELEVATION
T/SLAB LEVEL 3	25' - 2"
T/SLAB LEVEL 4	36' - 6"
T/STEEL L3	24' - 4 5/8"
T/STEEL L4	35' - 8 5/8"
ENTRY ROOF	24' - 10"

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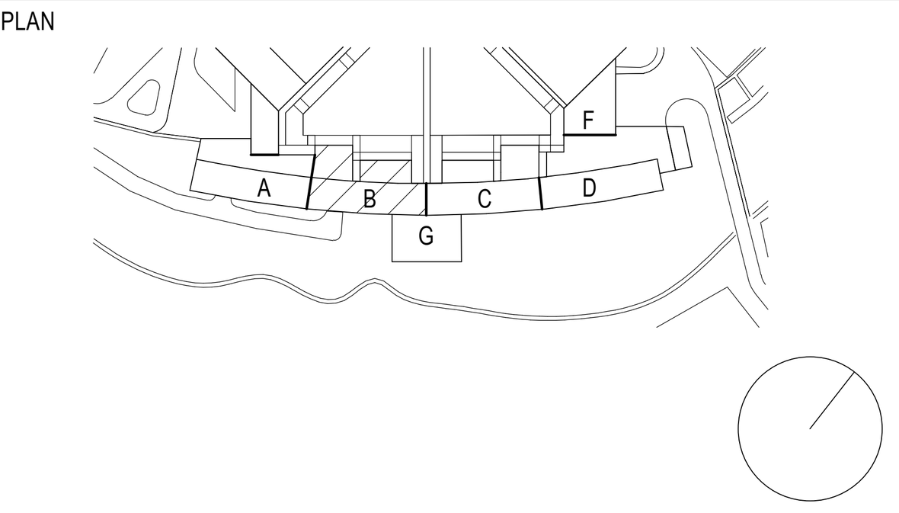

NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
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2	19 MAY 2023	ISSUED FOR BID			
1	18 FEB 2022	ISSUED TO L&I			

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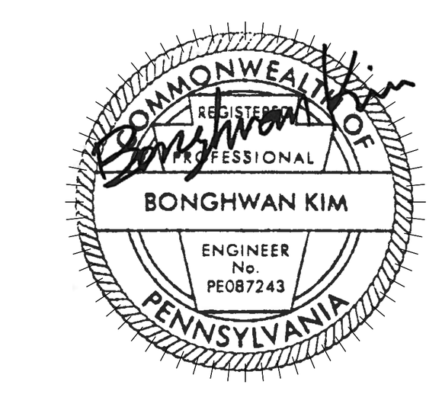

SIGNATURE DATE

ARCHITECT
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250 Greenwich St, New York, 10007

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 5

PA State Police Academy - New Construction of Three Core Buildings and BESO
PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

VERIFY SCALE

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0 1
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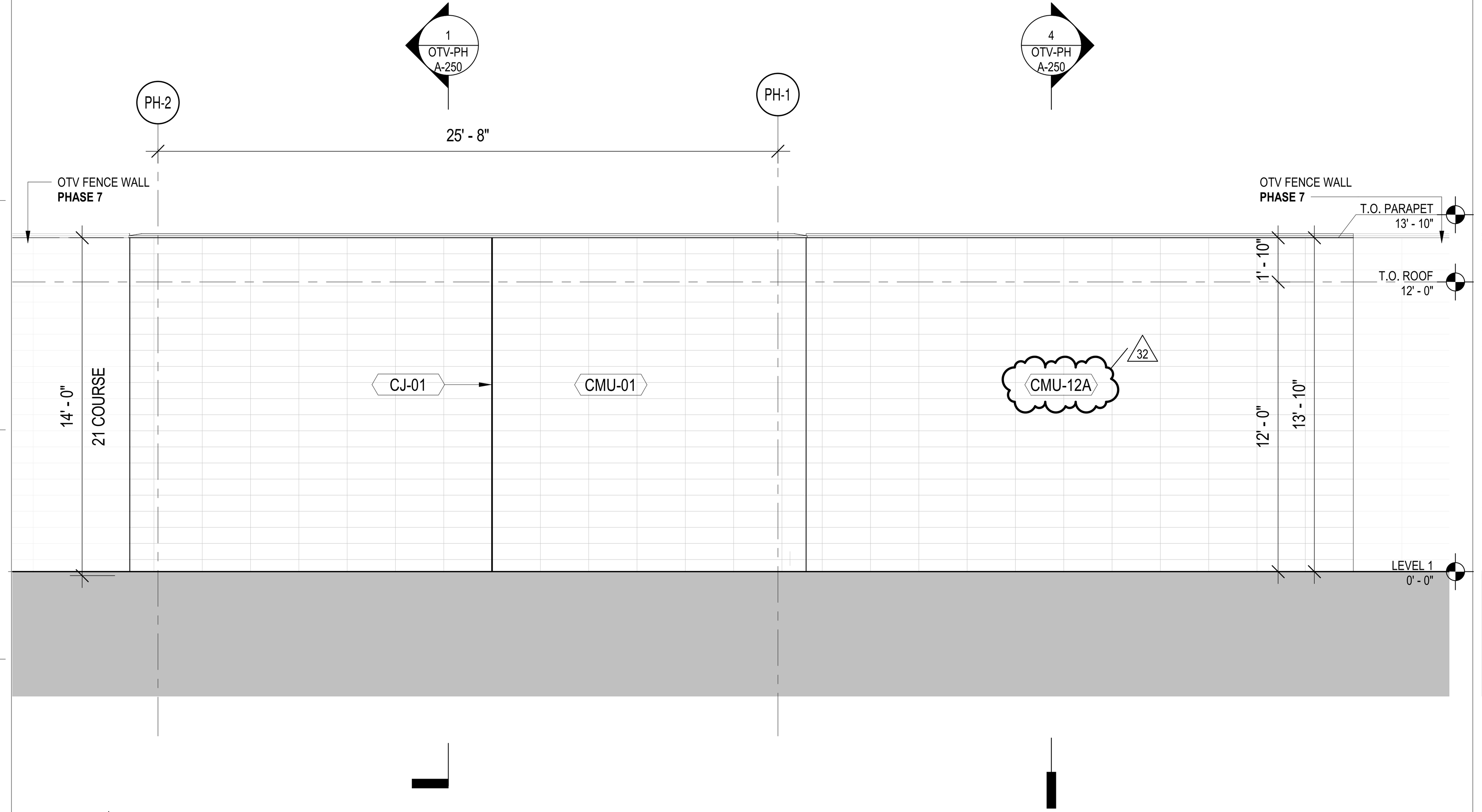
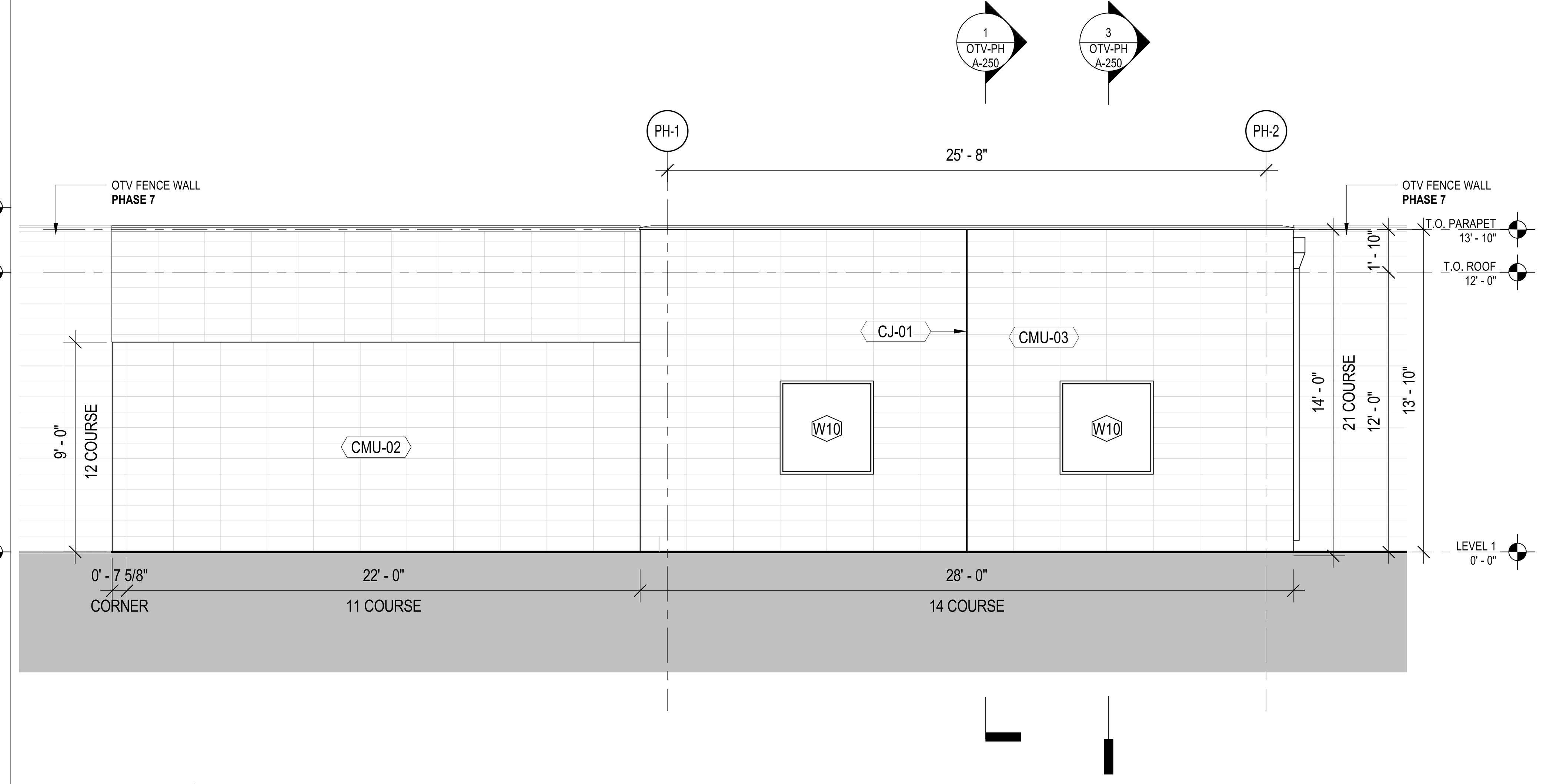
FRAMING PART PLAN B - LEVEL 3 & 4

SHEET No. MAQ-S-141

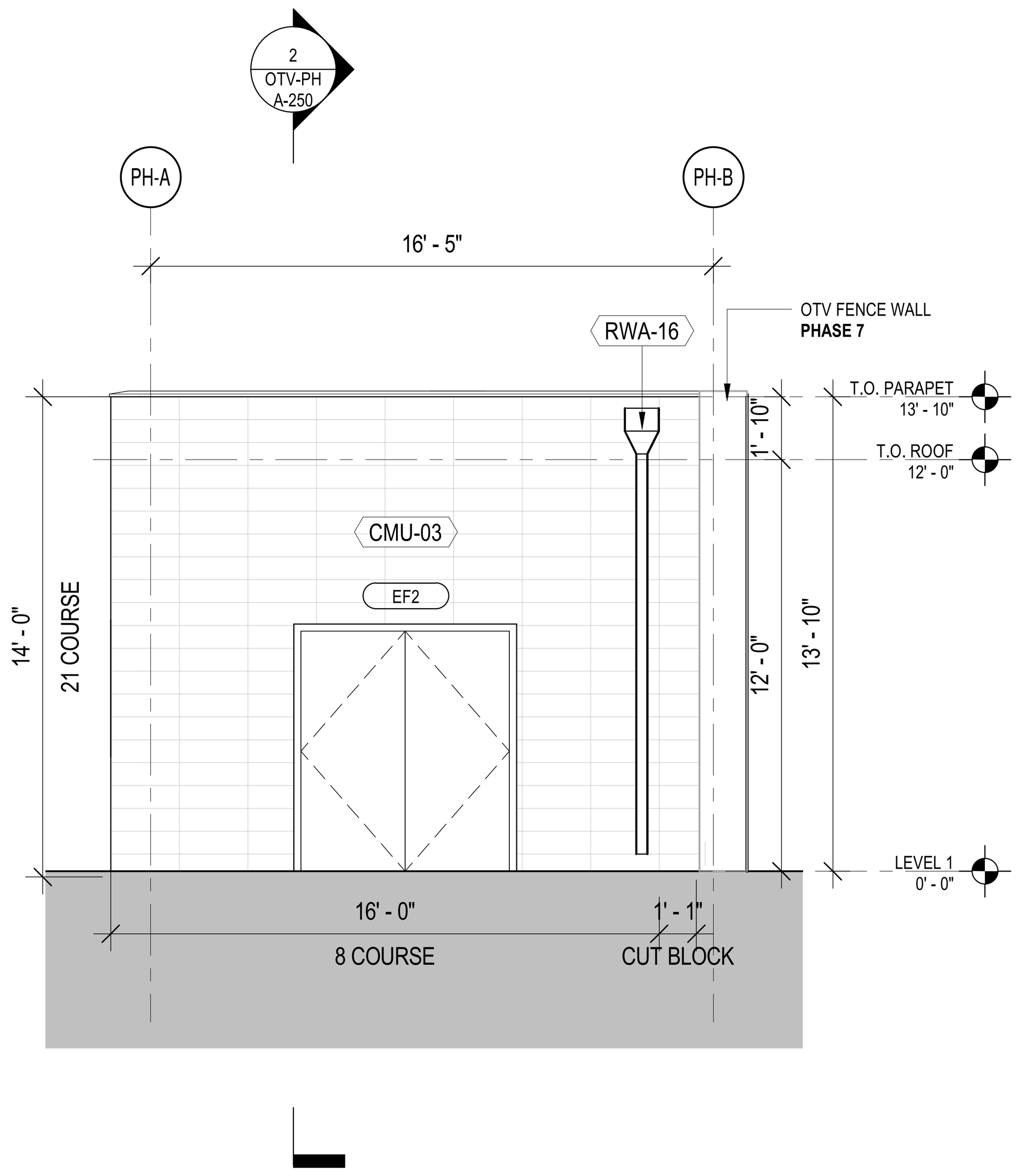
DRAWN BY	CHECKED BY	DATE	SCALE
Author	Checker		AS NOTED



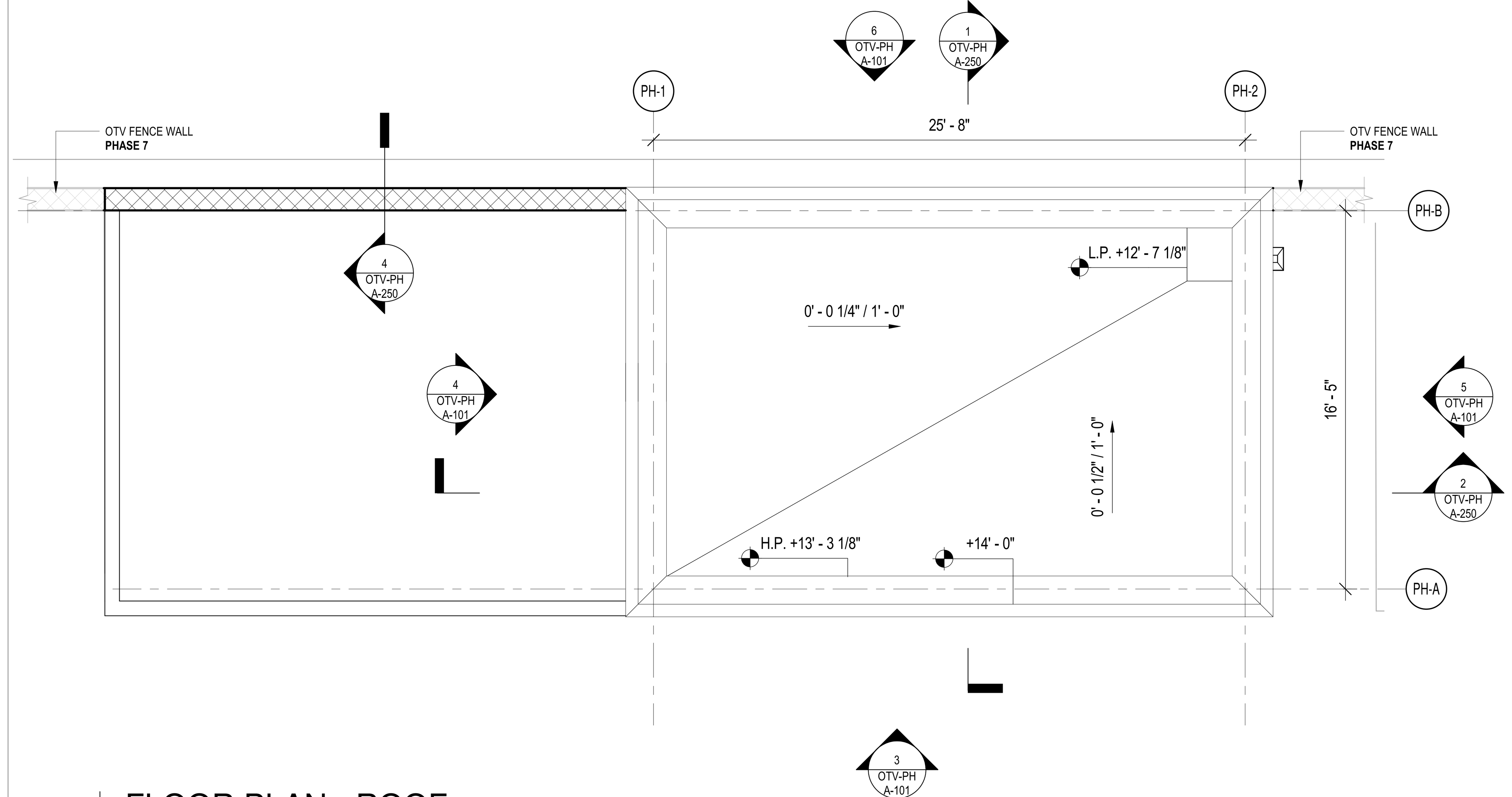
6 NORTH ELEVATION
SCALE: 1/4" = 1'-0"



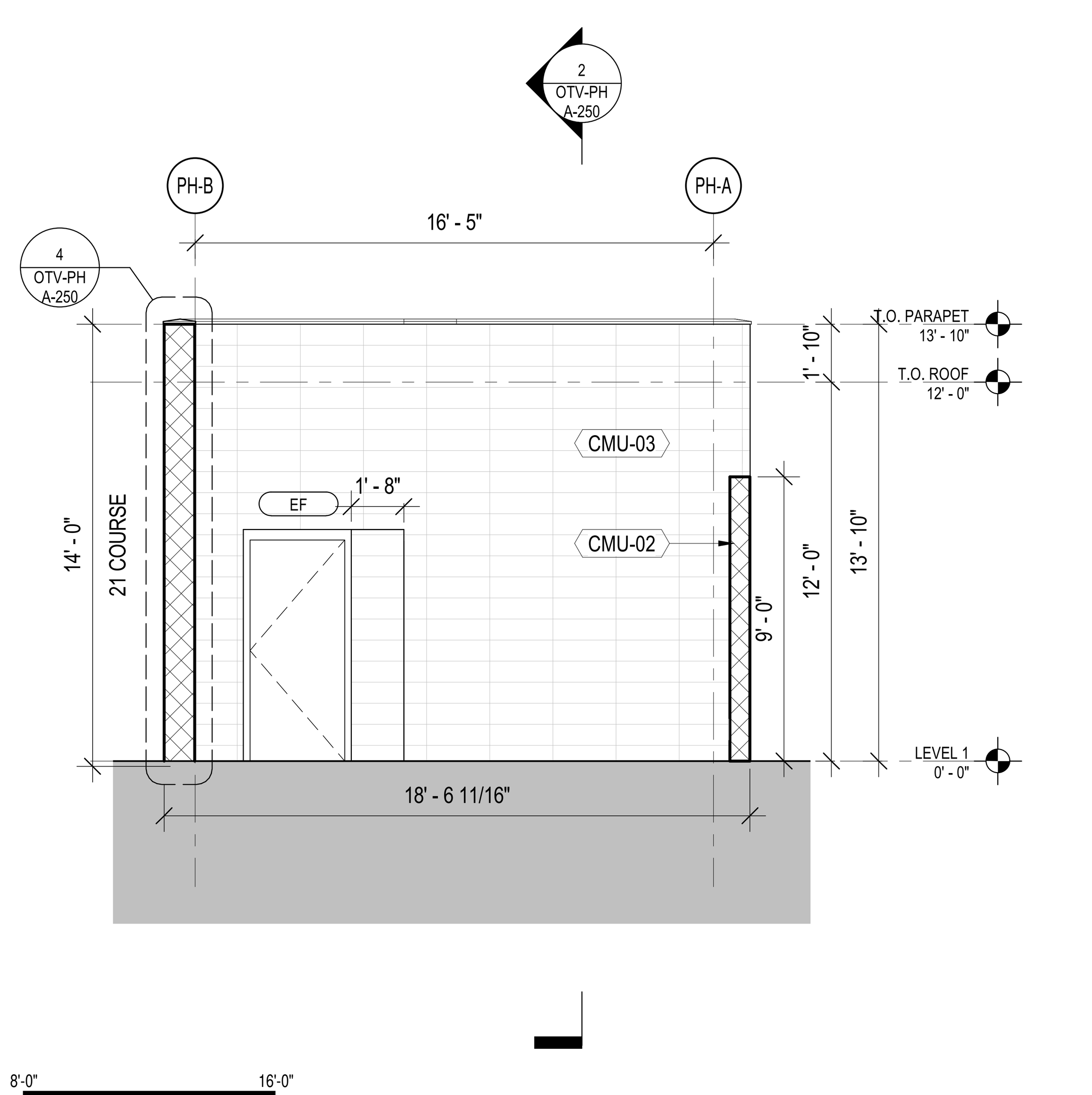
3 SOUTH ELEVATION
SCALE: 1/4" = 1'-0"



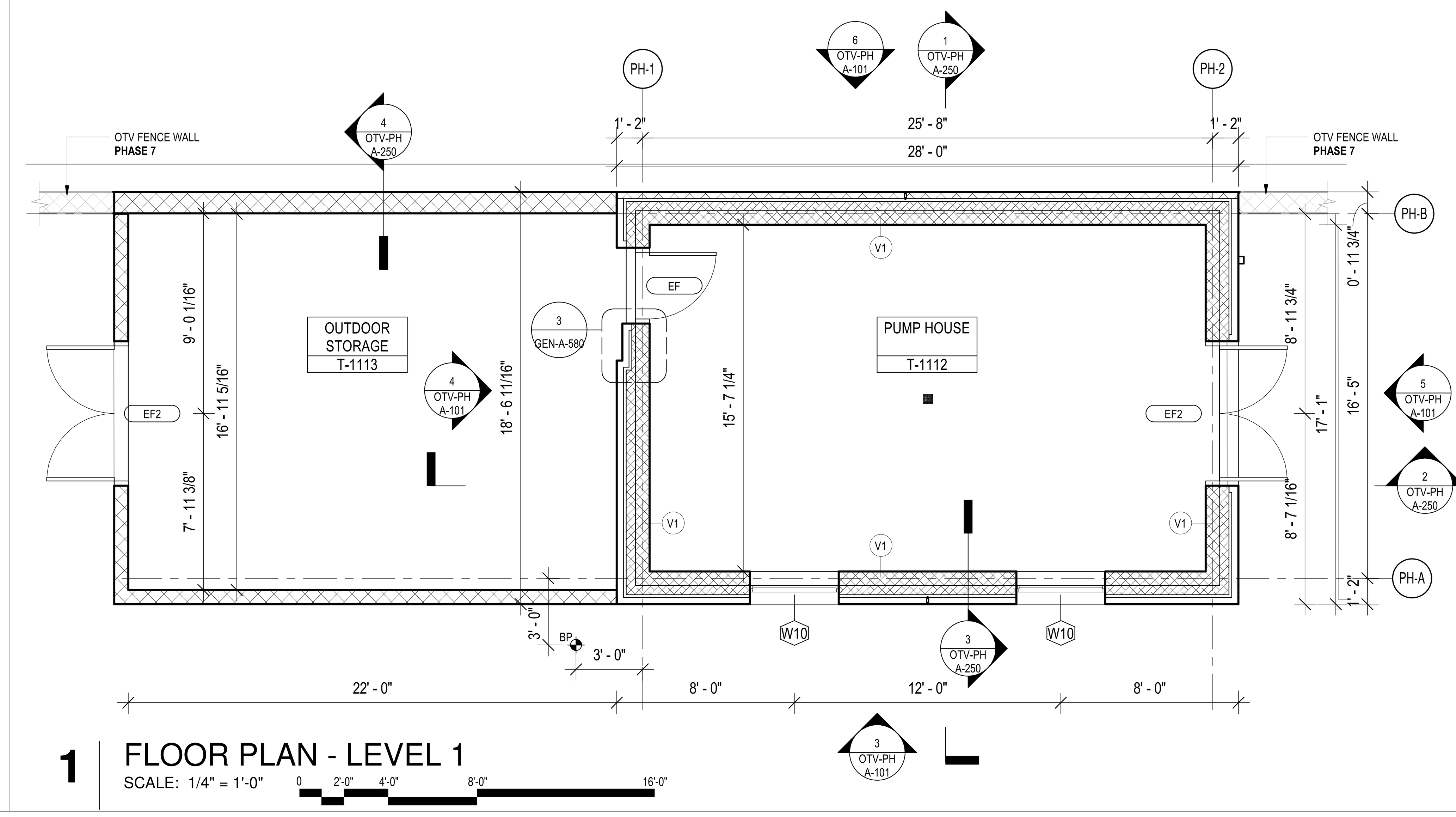
5 EAST ELEVATION
SCALE: 1/4" = 1'-0"



2 FLOOR PLAN - ROOF
SCALE: 1/4" = 1'-0"



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



1 FLOOR PLAN - LEVEL 1
SCALE: 1/4" = 1'-0"

LEGEND

FIRE RATINGS

- 1/2 HOUR FIRE RATING
- 1 HOUR FIRE RATING
- 2 HOUR FIRE RATING
- 3 HOUR FIRE RATING

SCOPE REFERENCE HATCH
MILLWORK
B.P. BUILDING BASE POINT
W.P. WORK POINT
XX DRAWING NOTE
PARTITION TYPE
XX C INDICATES COLD-FORMED METAL FRAMING

GENERAL NOTES

1. ALL BUILDING ELEVATIONS ARE REFERENCED TO THE BUILDING REFERENCE DATUM, ELEVATION 0'-0". REFER TO GEN-G-100 FOR NAVD 88 DATUMS FOR EACH BUILDING.
2. REFER TO GEN-G-100 FOR GENERAL NOTES
3. REFER TO GEN-G-101 FOR ACCESSIBILITY AND ADAPTABILITY GENERAL NOTES AND REQUIREMENTS
4. REFER TO GEN-G-102 FOR SYMBOLS, ABBREVIATIONS AND LEGENDS
5. REFER TO GEN-G-103 MOUNTING HEIGHTS.
6. REFER TO GEN-G-104 FOR MATERIAL LISTS AND EQUIPMENT LISTS.
7. REFER TO LS SERIES FOR CODE ANALYSIS AND REQUIRED WALL FIRE RATINGS
8. REFER TO SITE DRAWINGS FOR SITE ORIGIN AND BUILDING ORIGIN POINTS.
9. REFER TO GEN-G-500 FOR EXTERIOR WALL ASSEMBLIES
10. REFER TO GEN-G-730 FOR WINDOW SCHEDULES
11. REFER TO GEN-G-710 - 712 FOR PARTITION SCHEDULES
12. REFER TO GEN-G-715 - 719 FOR TYPICAL PARTITION DETAILS
13. ALL SLAB PENETRATIONS FOR PIPES, CONDUITS, ETC OUTSIDE OF RATED SHAFTS ARE TO BE FIRESAFED TO MATCH THE RATING OF THE SLAB.
14. ALL PENETRATIONS THROUGH RATED WALL ASSEMBLIES ARE TO HAVE A FIRESTOP ASSEMBLY SYSTEM TO MATCH THE RATING OF THE WALL.
15. THE PRECISE NUMBER, SIZE AND LOCATION OF ALL HOUSEKEEPING PADS REQUIRED TO SUPPORT OR MAINTAIN MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION EQUIPMENT SHALL BE CONFIRMED WITH THE EQUIPMENT SUPPLIER
16. ALL STRUCTURAL MEMBERS SHALL BE FIRE-PROOFED IN ACCORDANCE WITH THE NOTES ON GEN-G-100
17. PARTITIONS AT PERIMETER OF ALL TOILET ROOMS/JANITOR'S CLOSETS ADJACENT TO MECHANICAL SHAFTS AND AT ALL LAUNDRY ROOMS/MECHANICAL ROOMS WITH WATER SHALL HAVE A CURB. AT GYPSUM PARTITIONS PROVIDE A 6" X 6" CURB. WHERE AT MASONRY WALLS, PROVIDE 6" TALL CURBS WITH WIDTH TO MATCH MASONRY ASSEMBLY.
18. ALL DOORS TO BE INSTALLED 4" ON HINGE SIDE FROM PERPENDICULAR PARTITIONS U.O.N.
19. FLOOR PLANS ARE CUT 4'-0" AFF TYPICAL.
20. INTERIOR LAYOUT DIMENSIONS ARE SHOWN TO FINISHED FACE OF GWB U.O.N
21. PROVIDE SUPPLEMENTAL FRAMING, BLOCKING AND BRACING WHERE REQUIRED FOR WALL MOUNTED FIXTURES AND EQUIPMENT AT GWB WALL.

DRAWING NOTES

V1	LOAD BEARING CMU WALL - SEE STRUCTURAL

KEYNOTES

CJ-01	042000 3/8" CMU CONTROL JOINT
CMU-01	042000 CONCRETE MASONRY UNIT, 8" X 24" X 4" SPLIT FACE
CMU-02	042000 CONCRETE MASONRY UNIT, 8" X 24" X 8" GROUND FACE
CMU-03	042000 CONCRETE MASONRY UNIT, 8" X 24" X 4" GROUND FACE
CMU-12A	042000 CONCRETE MASONRY UNIT, 8" X 16" X 12" SPLIT FACE
RWA-16	077000 COLLECTOR BOX

WALL HATCHES

NON-LOAD BEARING CMU WALL
LOAD BEARING CMU WALL

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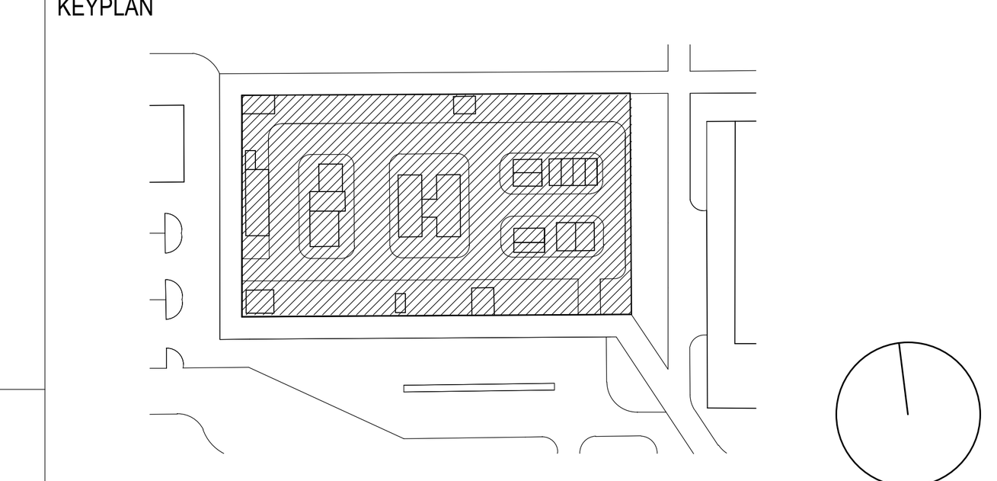

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RECORD REVISIONS

REGISTERED ARCHITECT PENNSYLVANIA SEAL MICHAEL ENZ No. RA409078

SIGNATURE DATE

ARCHITECT
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250 Greenwich St, New York, 10007

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HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 5

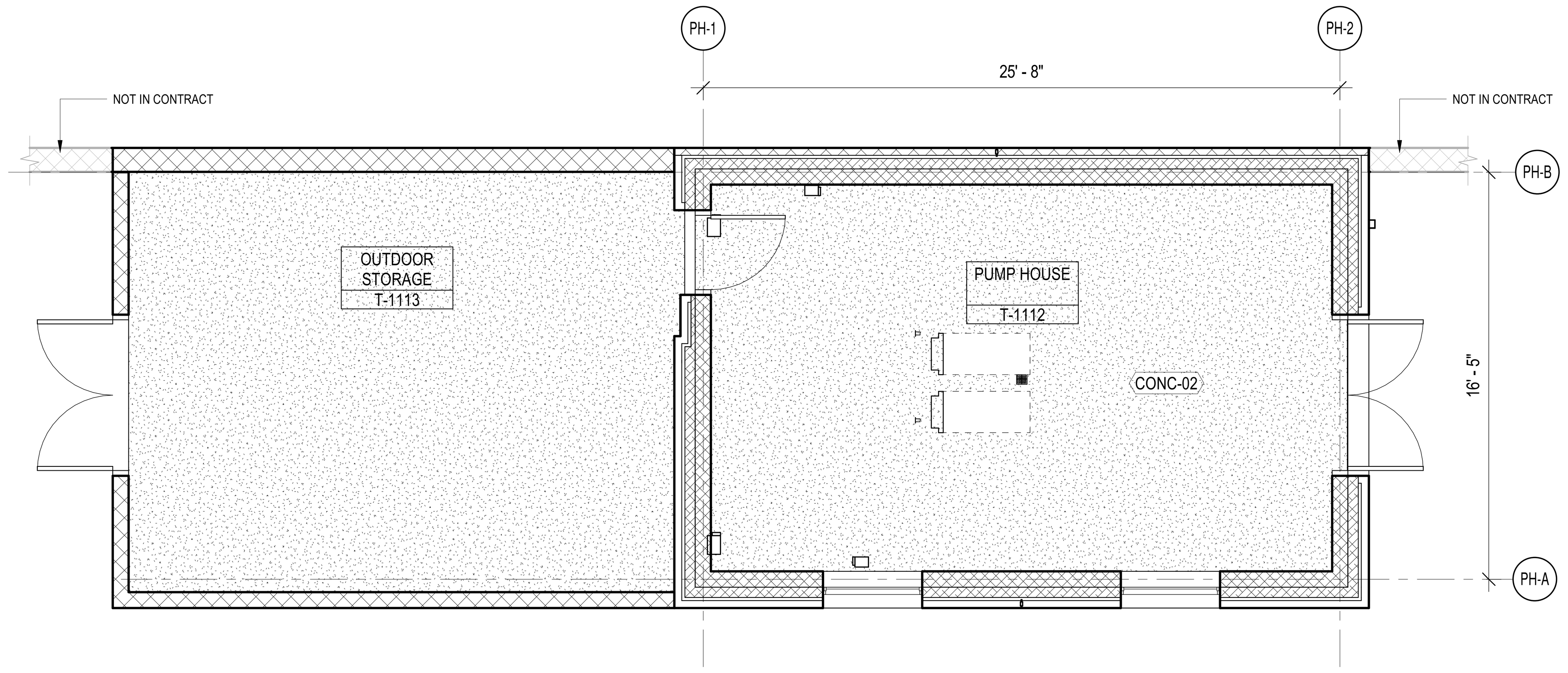
Pennsylvania State Police Academy
Core Buildings, BESO & Sitework
PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

FLOOR & ROOF PLANS / BUILDING ELEVATIONS

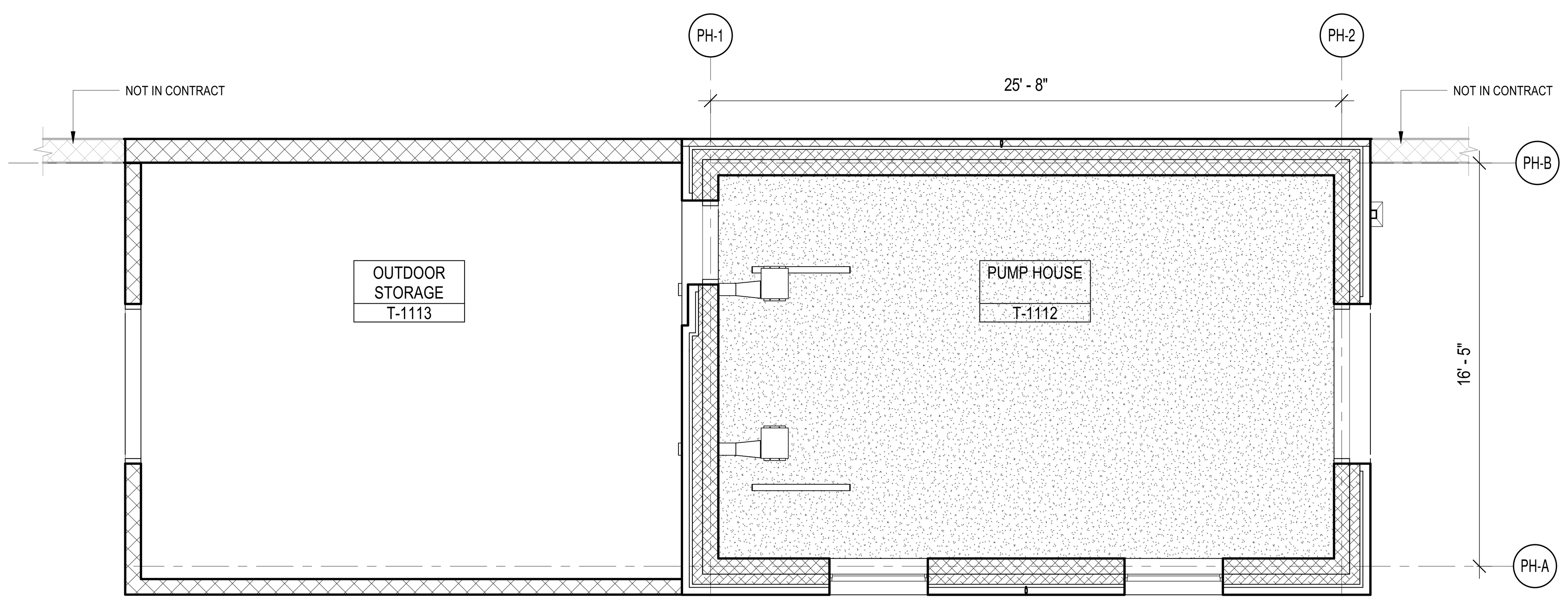
SHEET No.	OTV-PH A-101		
DRAWN BY	CHECKED BY	DATE	SCALE
TDN	TDN	MAY 2023	AS NOTED

FINISH SCHEDULE

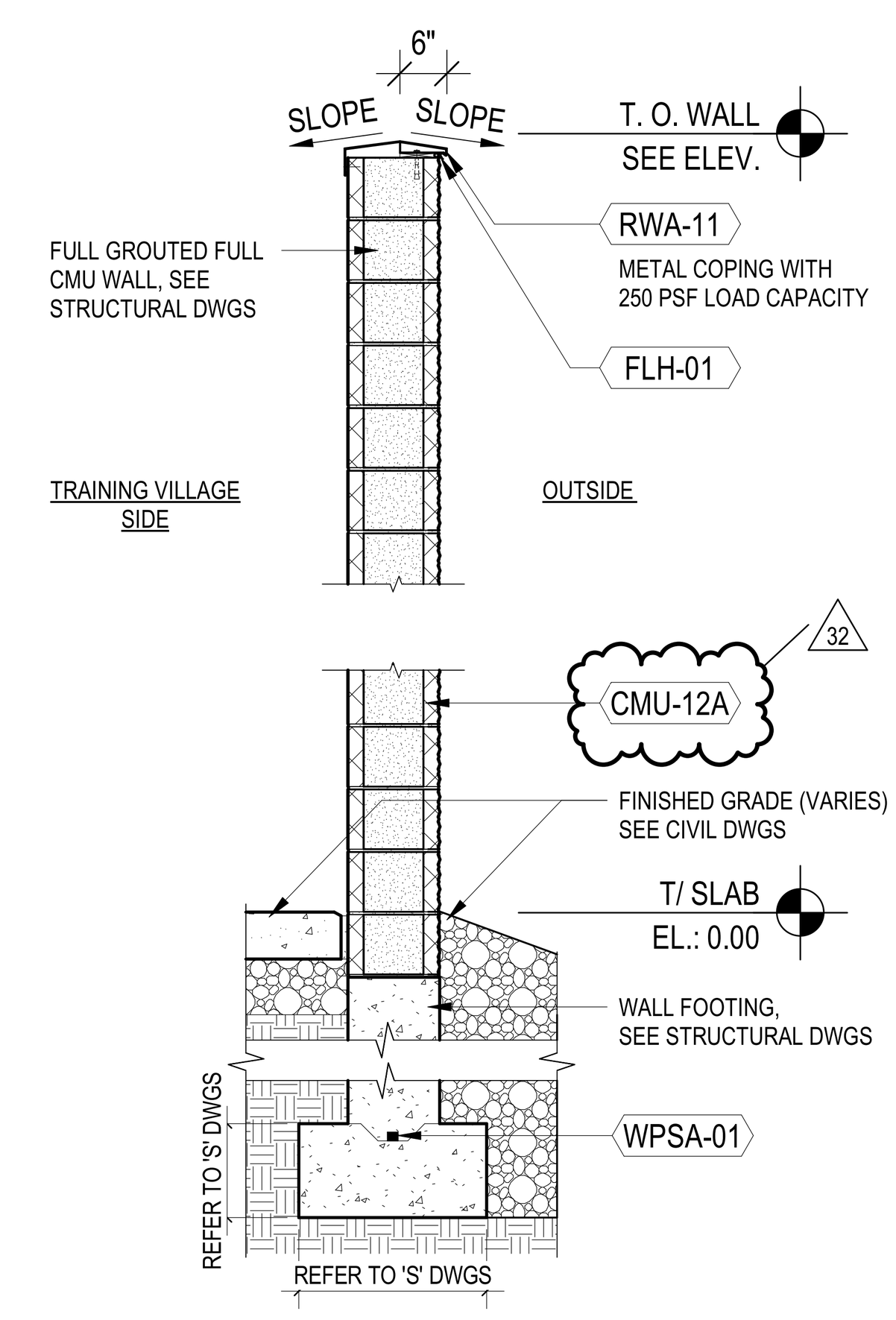
NUMBER	NAME	FLOOR FINISH	BASE FINISH	WALL FINISH	CEILING FINISH
LEVEL 1					
T-1112	PUMP HOUSE	CONC-02	RB-02	PT-02	EXPOSED
T-1113	OUTDOOR STORAGE	CONC-02	NONE	NONE	NONE



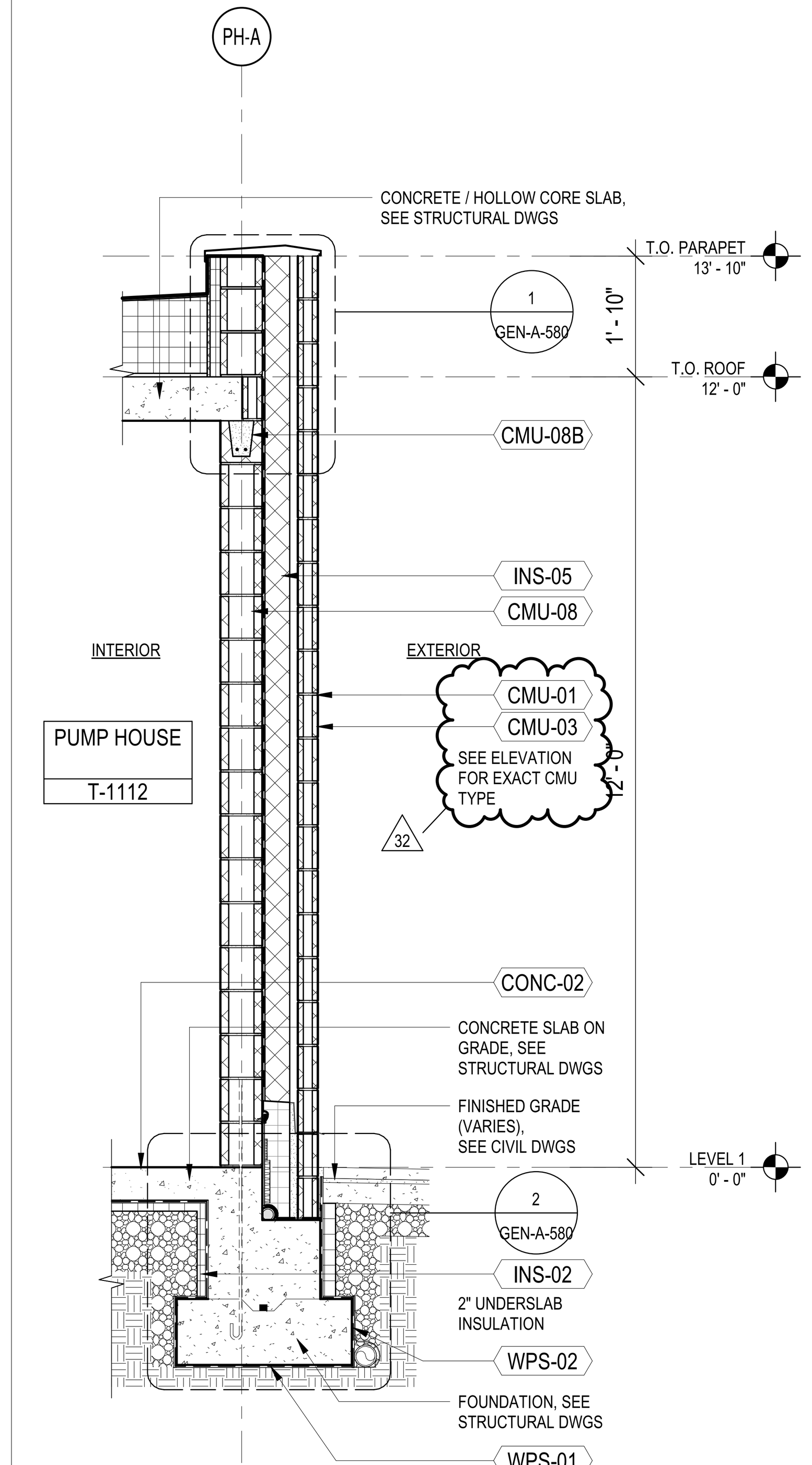
6 POWER/COMMUNICATION & FINISH PLAN - LEVEL 1
SCALE: 1/4" = 1'-0"



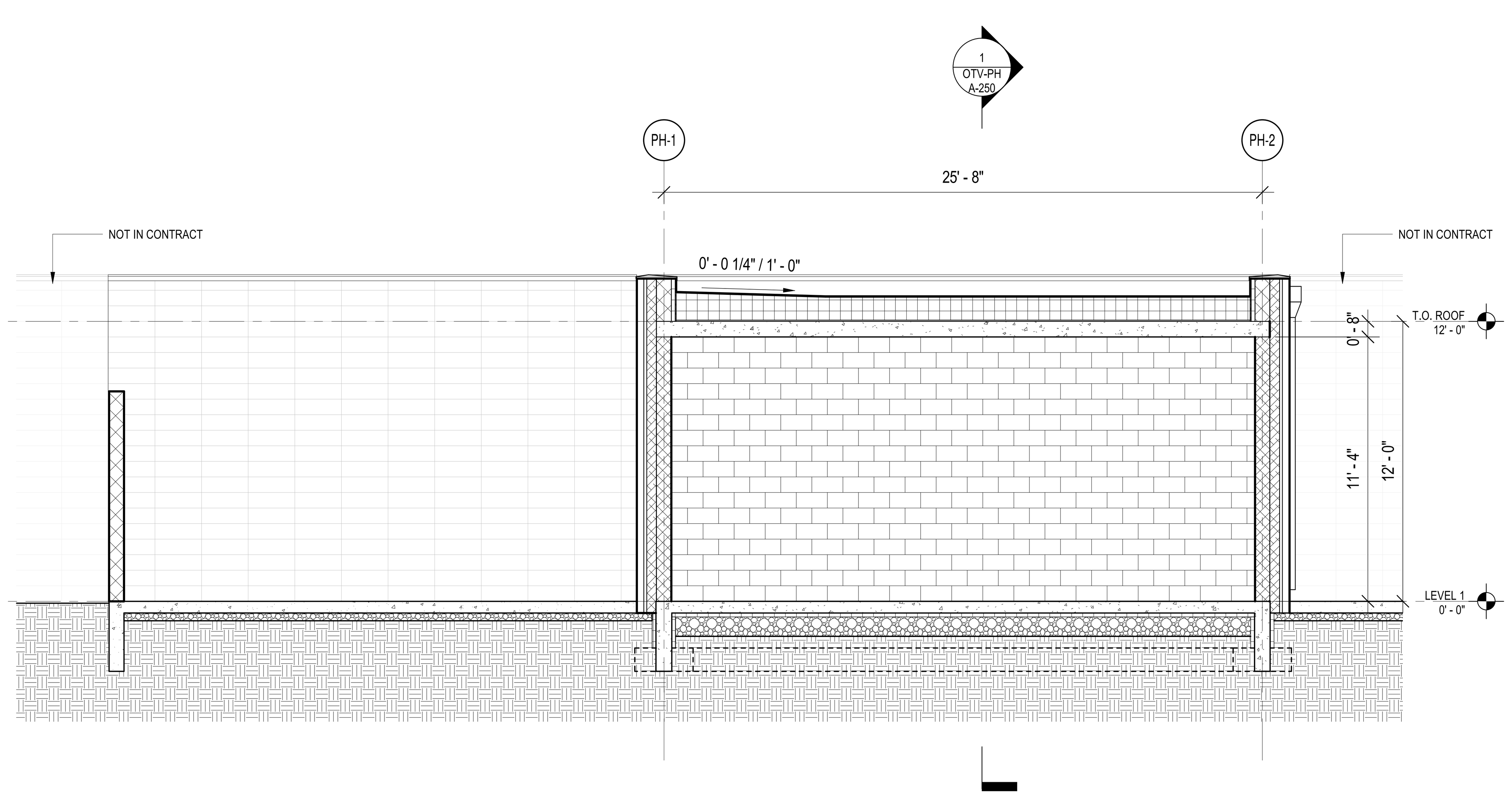
5 REFLECTED CEILING PLAN - LEVEL 1
SCALE: 1/4" = 1'-0"



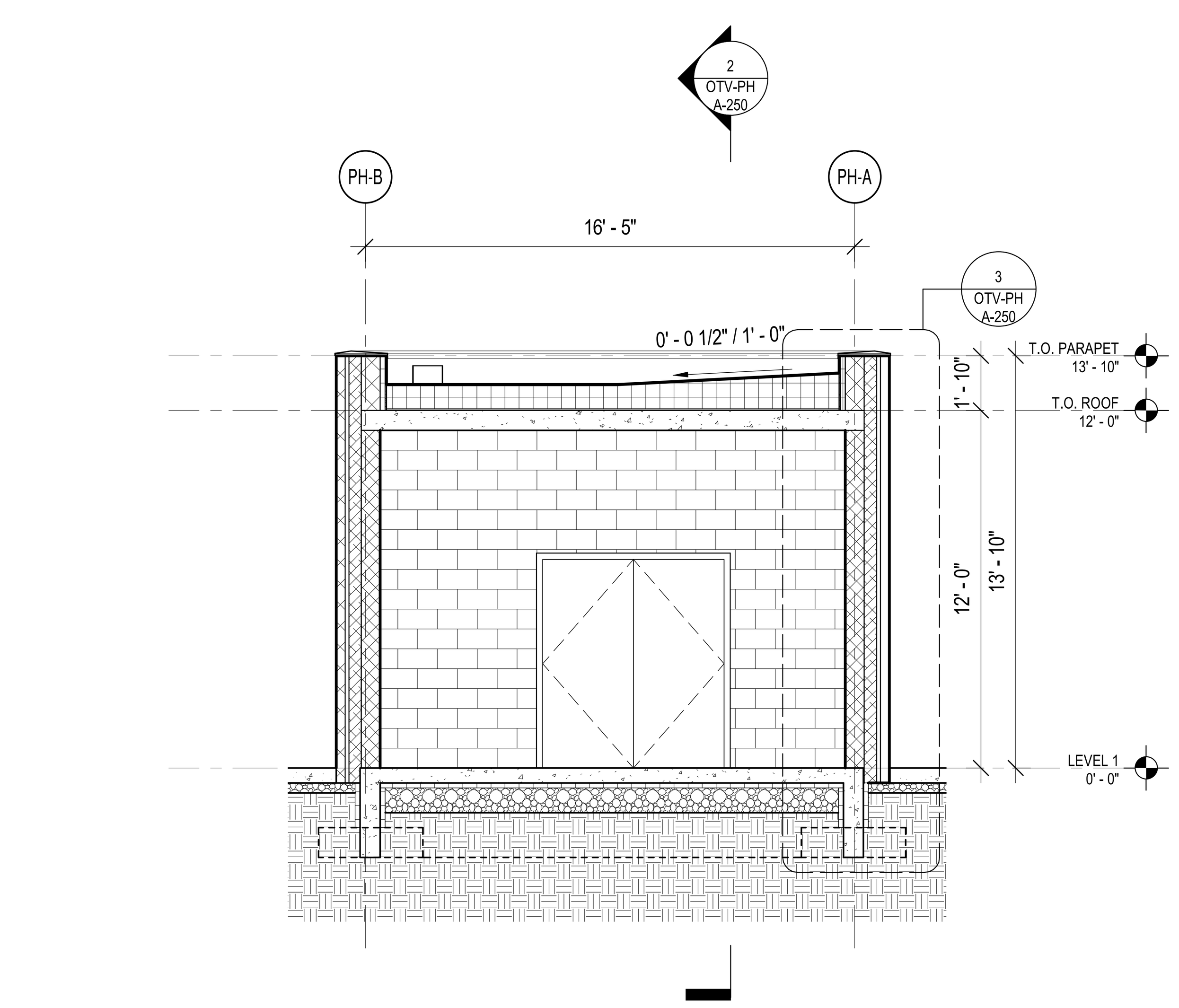
4 WALL SECTION - FENCE
SCALE: 1/2" = 1'-0"



3 WALL SECTION - CMU-03
SCALE: 1/2" = 1'-0"



2 BUILDING SECTION
SCALE: 1/4" = 1'-0"



1 BUILDING SECTION
SCALE: 1/4" = 1'-0"

LEGEND RCP

- SCOPE REFERENCE HATCH
- CEILING MOUNTED DEVICES
- WALL MOUNTED DEVICES
- CONCEAL PENDANT SPRINKLER
- PENDANT SPRINKLER
- UPRIGHT SPRINKLER
- SIDE WALL SPRINKLER
- LINEAR DIFFUSER
- DIFFUSER
- EXHAUST
- ACCESS PANEL
- XX1 LIGHT FIXTURE
- XX1 LIGHT FIXTURE
- PROJECTOR
- PROJECTOR SCREEN
- EXIT SIGN
- SPEAKER
- PAGING SPEAKER
- MICROPHONE
- SMOKE DETECTOR
- FIRE ALARM SPEAKER/STROBE
- FIRE ALARM STROBE
- OCCUPANCY SENSOR
- VACANCY
- DAYLIGHT SENSOR
- SECURITY CAMERA
- WAP ABOVE CEILING
- WAP BELOW CEILING
- WOOD BAFFLE
- WALL CLOCK

GENERAL NOTES

1. REFER TO SHEET GEN-G-104 FOR MATERIAL CODES LIST & SPEC SECTION REFERENCES
2. REFER TO LS SERIES CODE ANALYSIS PLANS FOR REQUIRED WALL FIRE RATINGS
3. REFER TO 500 SERIES FOR EXTERIOR ENCLOSURE INFORMATION
4. RCPS ARE CUT 6'-0" AFF TYP.
5. ALL CEILING HEIGHTS ARE AS INDICATED ON RCP
6. ALL DIFFUSERS, REGISTERS AND GRILLES ARE BY THE .2 HVAC CONTRACTOR AND ARE SHOWN FOR LOCATION AND COORDINATION ONLY.
7. ALL PLUMBING FIXTURES, SPRINKLERS, FHCS, AND STANDPIPES AND RELATED EQUIPMENT ARE BY THE .3 PLUMBING CONTRACTOR AND ARE SHOWN FOR LOCATION AND COORDINATION ONLY.
8. ALL LIGHTS, LIGHTING CONTROL DEVICES, FIRE ALARM DEVICES, AV/IT AND SECURITY DEVICES ARE BY THE .4 ELECTRICAL CONTRACTOR AND ARE SHOWN FOR LOCATION AND COORDINATION ONLY.
9. REFER TO ELECTRICAL, IT DRAWINGS AND LIGHTING FIXTURE SCHEDULE FOR LIGHTING INFORMATION
10. REFER TO ELECTRICAL, AV, IT, AND SECURITY DOCUMENTS FOR FURTHER INFORMATION ABOUT CEILING MOUNTED DEVICES.
11. ALL FIXTURES LOCATED WITHIN ACT TILE TO BE CENTERED WITHIN TILE.
12. REFER TO MECHANICAL DRAWINGS FOR HVAC DIFFUSER INFORMATION.
13. ALL EXPOSED AFS INDICATED ON THE RCPs IS TO BE 1.5" THICK ON UNDERSIDE OF METAL DECKING AND EXPOSED BEAMS, UNLESS NOTED OTHERWISE.
14. ALL EXPOSED CEILINGS IN BOH AND MEP SPACES TO BE PAINTED ONLY.
15. SOME TYPICAL ENLARGEMENTS IN 600 SERIES APPLY TO MULTIPLE SIMILAR ROOMS.

GENERAL NOTES ON EXPOSED CEILINGS

1. ALL NON CLT EXPOSED CEILINGS AND/OR ACOUSTICAL FINISHES TO BE PAINTED TO MATCH PT-05 U.O.N.
2. ADJACENT SURFACES SHOULD BE PROTECTED DURING THE APPLICATION OF SPRAY-ON FIRE PROOFING, PAINT AND/OR ACOUSTICAL FINISH.
3. ALL PAINT, FINISH APPLICATIONS AND TOUCH UP SHOULD BE CONSISTENT THROUGHOUT, AND REVIEWED BY THE ARCHITECT AND OWNER.
4. IT AND MEP SYSTEM LAYOUTS, SEAM LOCATIONS, HANGER DETAILS AND LOCATIONS SHOULD TO BE COORDINATED ON SHOP DRAWINGS FOR REVIEW AND APPROVAL BY THE ARCHITECT.
5. ALL DUCTWORKS AND CONDUITS IN EXPOSED CEILINGS SHOULD BE FREE OF MARKINGS, TAGS, STICKERS AND IMPERFECTIONS, AND PROVIDED WITH A FINISH TO BE COMPATIBLE WITH A FINAL PAINT COATING ON SITE.
6. EXPOSED HOT WATER PIPING AND INSULATION IN EXPOSED CEILINGS SHOULD BE JACKETED WITH STAINLESS STEEL SHEET METAL, PVC, OR APPROVED EQUAL.
7. DUCTWORKS IN EXPOSED CEILINGS SHOULD HAVE INTERNAL ACOUSTICAL AND THERMAL LINING AND NO EXTERNAL INSULATION.
8. ALL MEP ELEMENTS AND ACCESSORIES SHOULD HAVE A FINAL PAINT COAT ON SITE.

CEILING HATCHES

- EXPOSED CEILING U.O.N.
- GYPSUM CEILING (092116)
- ACOUSTIC CEILING TILES (095100)
- WOOD CEILING (064000)
- SPRAY ACOUSTICAL TREATMENT (092100)

LEGEND POWER/COMM & FINISH

FIRE RATINGS

- 1/2 HOUR FIRE RATING
- 1 HOUR FIRE RATING
- 2 HOUR FIRE RATING
- 3 HOUR FIRE RATING
- SCOPE REFERENCE HATCH
- XX DRAWING NOTES

FLOOR FINISHES

PCFS-01	CONC-01
PCFS-02	CONC-02
CPT-01	CONC-03
CPT-02	CONC-04
CPT-03	RMX-01
RFL-01	RMX-02
RFL-02	QT-01
RFL-03	CT-01
RFL-04	BEQ-14

POWER & DATA DEVICES

1	ELECTRICAL OUTLET	SINGLE / DUPLEX / QUAD DUPLEX / DEDICATED DUPLEX / DEDICATED QUAD
2	TELE/DATA RECEPTACLE	DATA RECEPT. / DATA & TELE RECEPT. / TELEPHONE RECEPT.
3	THERMOSTAT	
4	USB POWER	
5	WIRELESS ACCESS POINT	AP
6	ELECTRICAL SWITCH	SINGLE POLE / TWO POLE / THREE POLE
7	JUNCTION BOX	J
8	FURNITURE DUPLEX	
9	FLOOR BOX	TELE FLOOR MOUNTED / D&T FLOOR MOUNTED / DATA FLOOR MOUNTED

GENERAL NOTES

1. ALL DIFFUSERS, REGISTERS AND GRILLES ARE BY THE .2 HVAC CONTRACTOR AND ARE SHOWN FOR LOCATION AND COORDINATION ONLY. REFER TO MECHANICAL DRAWINGS FOR QUANTITY/TYPE.
2. ALL PLUMBING FIXTURES, SPRINKLERS, FHCS, AND STANDPIPES AND RELATED EQUIPMENT ARE BY THE .3 PLUMBING CONTRACTOR AND ARE SHOWN FOR LOCATION AND COORDINATION ONLY. REFER TO MECHANICAL DRAWINGS FOR QUANTITY/TYPE.
3. ALL RECEPTACLES, LIGHTS SWITCHES, TELE/ DATA RECEPTACLES, TELECOM EQUIPMENT AND AV EQUIPMENT ARE BY THE .4 ELECTRICAL CONTRACTOR AND ARE SHOWN FOR LOCATION AND COORDINATION ONLY. REFER TO MECHANICAL DRAWINGS FOR QUANTITY/TYPE.
4. REFERENCE GEN-G-103 FOR STANDARD MOUNTING HEIGHTS AND DETAILS.
5. REFERENCE GEN-G-103 FOR STANDARD DEVICE MOUNTING ARRANGEMENTS AND ALIGNMENTS
6. CHANGE OF FLOOR MATERIAL LINE IS FOR REFERENCE ONLY. REFER TO 700 SERIES DRAWINGS FOR FLOOR FINISH TRANSITION DETAILS.
7. CONTRACTOR TO COORDINATE CONTROL JOINT LOCATIONS IN CONCRETE SLAB TO BE APPROVED BY PROFESSIONAL.
8. REFER TO GEN-G-104 FOR ALL MATERIAL DESIGNATIONS.
9. IF DEVICE IS NOT DIMENSIONED IN PLAN, REFER TO ASSOCIATED ENLARGED ELEVATION FOR LOCATION.

KEYNOTES

CMU-01	042000 CONCRETE MASONRY UNIT, 8" X 24" X 4" SPLIT FACE
CMU-03	042000 CONCRETE MASONRY UNIT, 8" X 24" X 4" GROUND FACE
CMU-08	042000 CONCRETE MASONRY UNIT, 8" X 16" X 8"
CMU-08B	042000 CONCRETE MASONRY UNIT BOND BEAM, 8" X 16" X 8"
CMU-12A	042000 CONCRETE MASONRY UNIT, 8" X 16" X 12" SPLIT FACE
CONC-02	033000 FINE HAIR BROOMED FINISH
FLH-01	076200 SS FLASHING
INS-02	072100 XPS BOARD INSULATION 25 PSI
INS-05	072100 SEMI RIGID MINERAL FIBER INSULATION
RWA-11	077000 METAL COPING CMU
WPS-01	071300 UNDERSLAB SHEET WATERPROOFING
WPS-02	071300 FOUNDATION WALL SHEET WATERPROOFING
WPSA-01	071300 WATERSTOP

VERIFY SCALE

BAR IS ONE (1) INCH LONG ON ORIGINAL DRAWING:
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TACTICAL TRAINING DESIGN
Tactical Design North
231 E. Buffalo St #502, Milwaukee, WI 53202

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Jacobs Wyper Architects
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250 Greenwich St, New York, NY 10007

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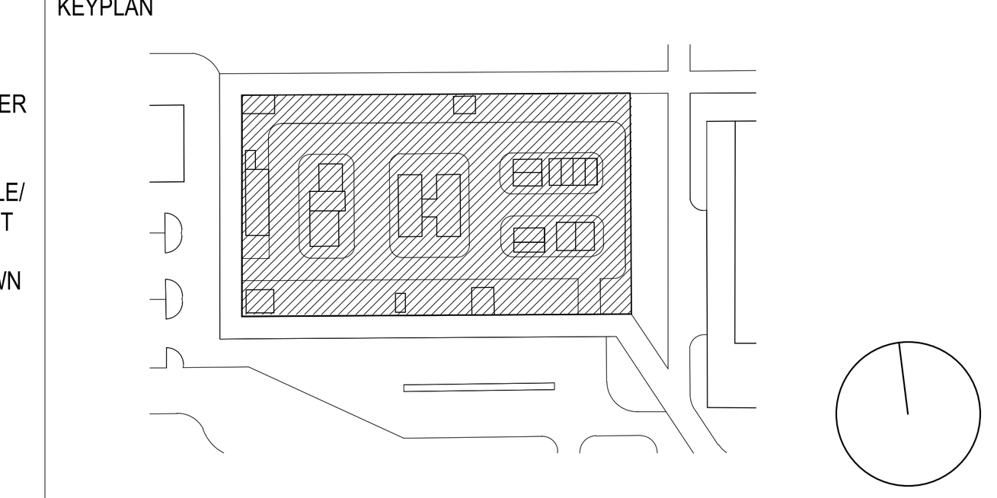
COST ESTIMATING
AECOM
1700 Market St, Suite 1600, Philadelphia, PA 19103

KEYPLAN



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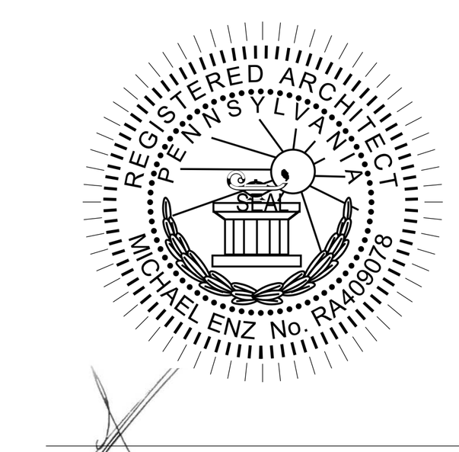
32	14 JUL 2023	ADDENDUM #32			
1	19 MAY 2023	ISSUED FOR BID			

RECORD REVISIONS



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DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 5

Pennsylvania State Police Academy
Core Buildings, BESO & Sitework
PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

BUILDING SECTIONS / EXTERIOR WALL SECTION / REFLECTED CEILING PLAN / POWER/COMMUNICATION PLAN

SHEET No. OTV-PH A-250

DRAWN BY	CHECKED BY	DATE	SCALE
TDN	TDN	MAY 2023	AS NOTED

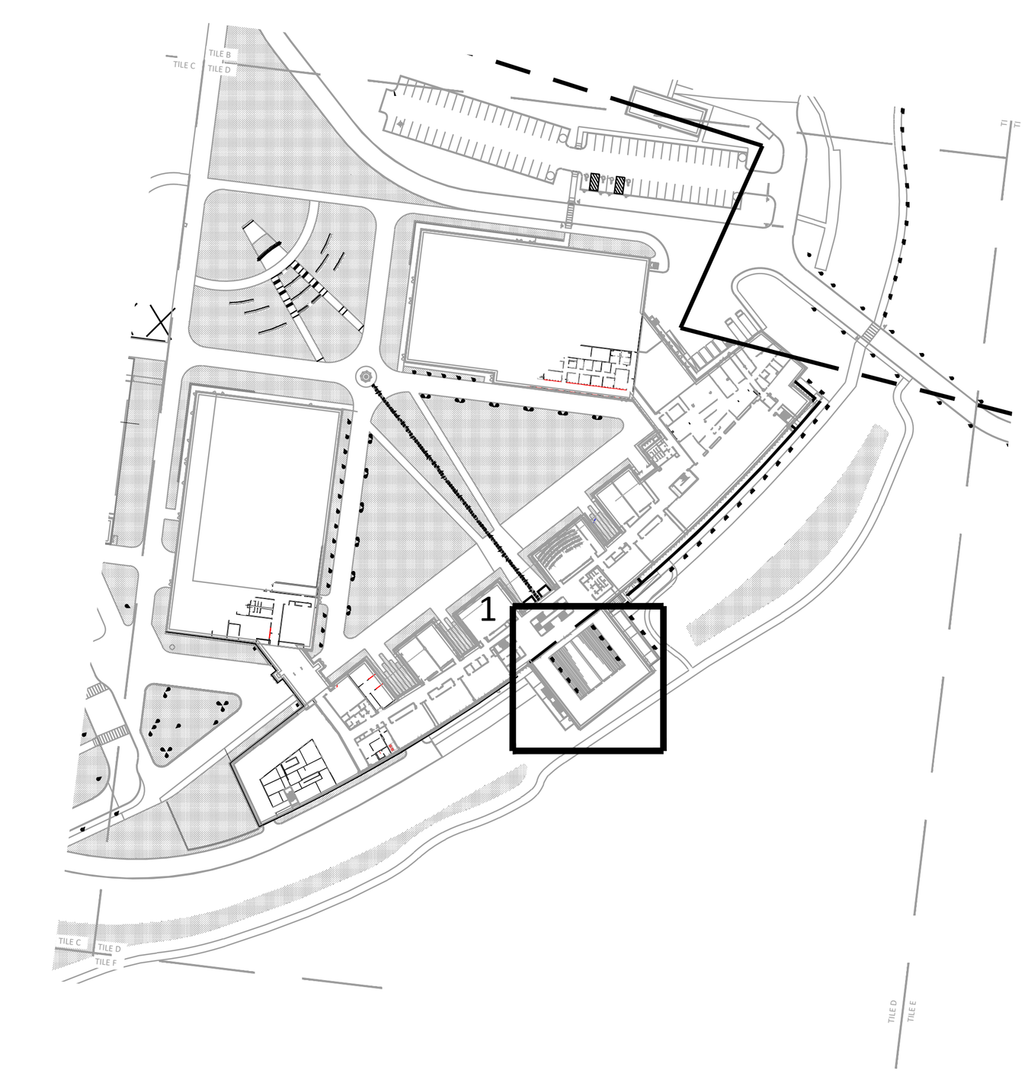
LEGEND

PROPERTY LINE

MATCH LINE

SEE SITE-L-500 SERIES FOR PLANTING LAYOUTS

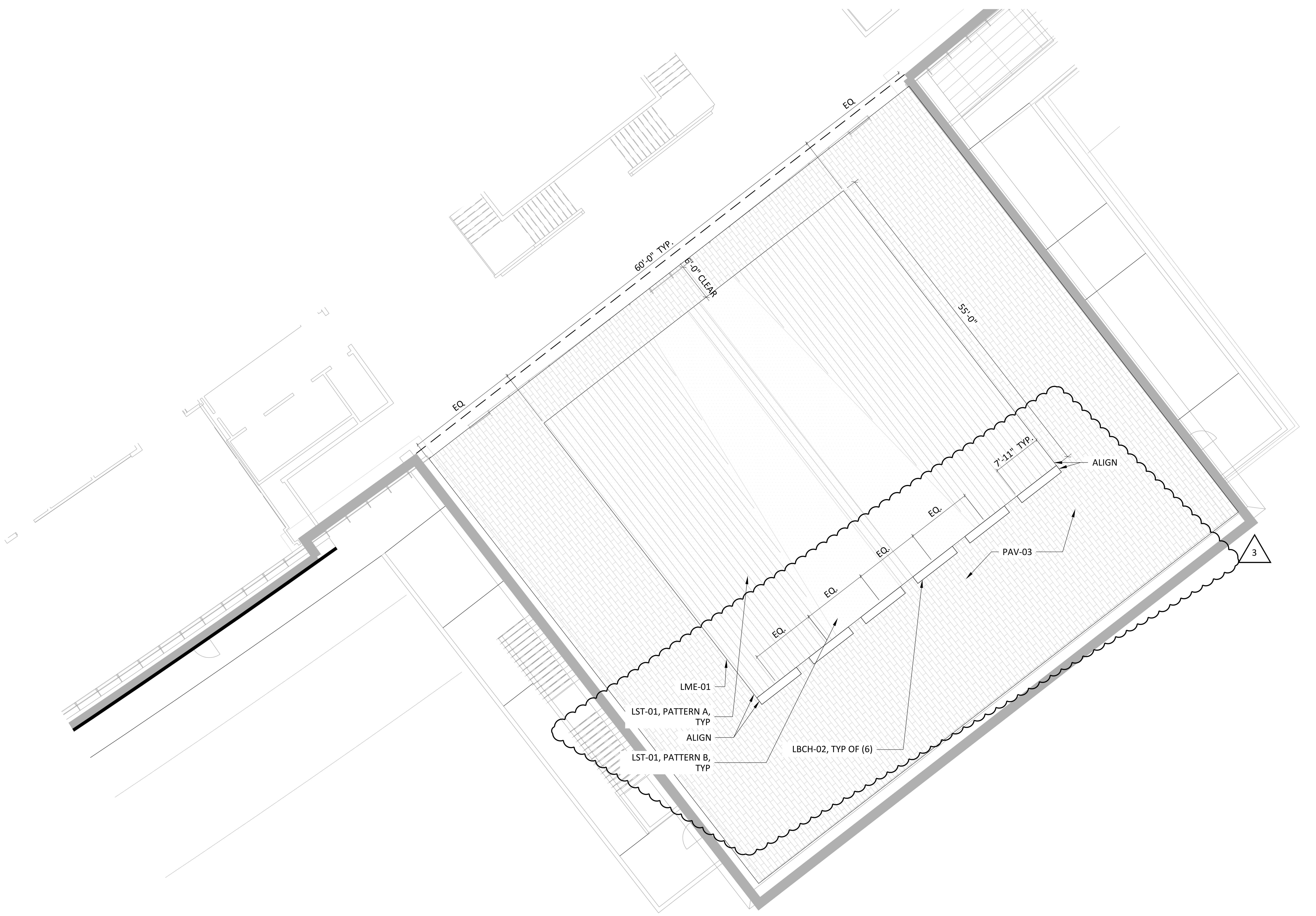
NOTES
SEE STE-L-600 SERIES FOR LIGHTING LAYOUTS



TILE D - KEY MAP

LST-01 - PATTERN A PRECEDENT

LST-01 - PATTERN B PRECEDENT



1 ENLARGED SITE MATERIALS PLAN - TILE D
SCALE: 1/8" = 1' - 0"

N

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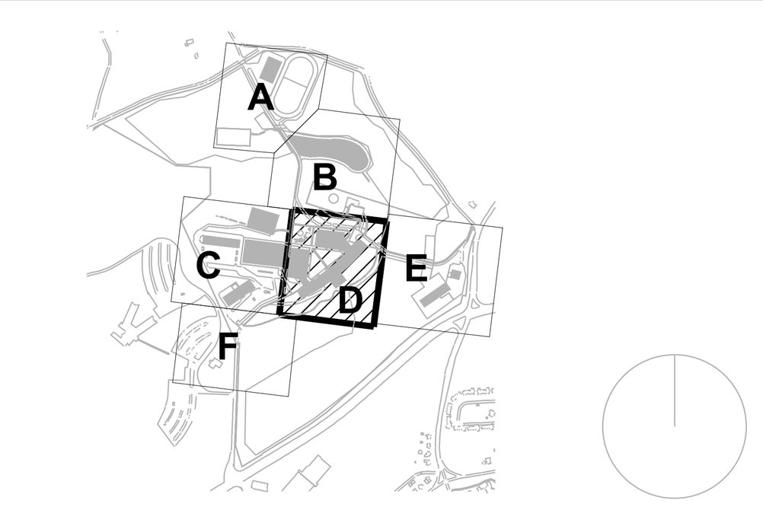
7906 MacArthur Blvd, Suite 100, Cabin John, MD 20818

POOL DESIGN
AQUA Design International
7536 N. La Cholla Blvd, Tucson, AZ 85741

KEYPLAN



NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
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2	19 MAY 2023	ISSUED FOR BID			
1	18 FEB 2022	ISSUED TO L&I			

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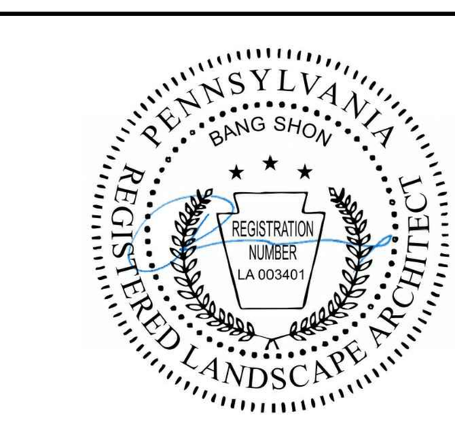

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HARRISBURG, PENNSYLVANIA

D.G.S. PROJECT No.
C-0211-0005 PHASE 5

Pennsylvania State Police Academy
Core Buildings, BESO & Sitework
PENNSYLVANIA STATE POLICE
HERSHEY, DAUPHIN COUNTY, PA

VERIFY SCALE

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ENLARGED SITE MATERIALS PLAN - TILE D

SHEET No.
STE-L-104_F

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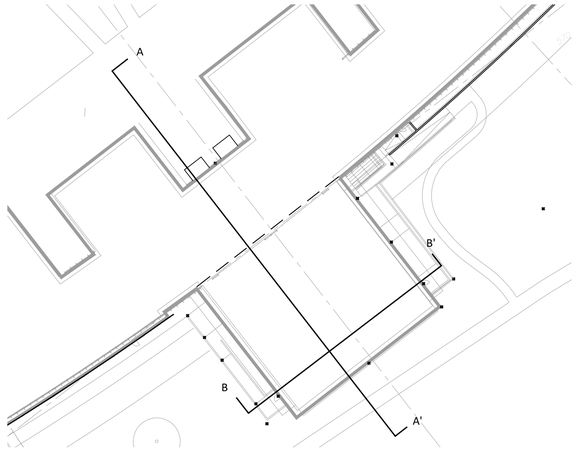
PAGE NUMBER



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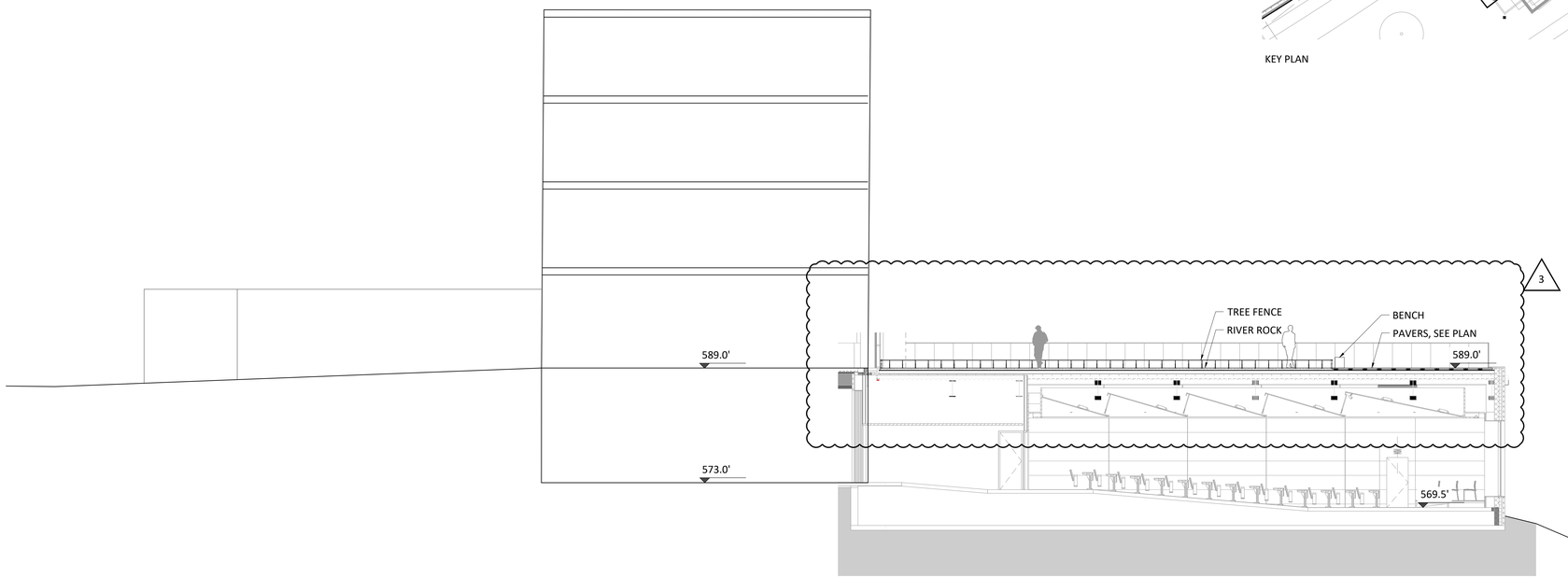
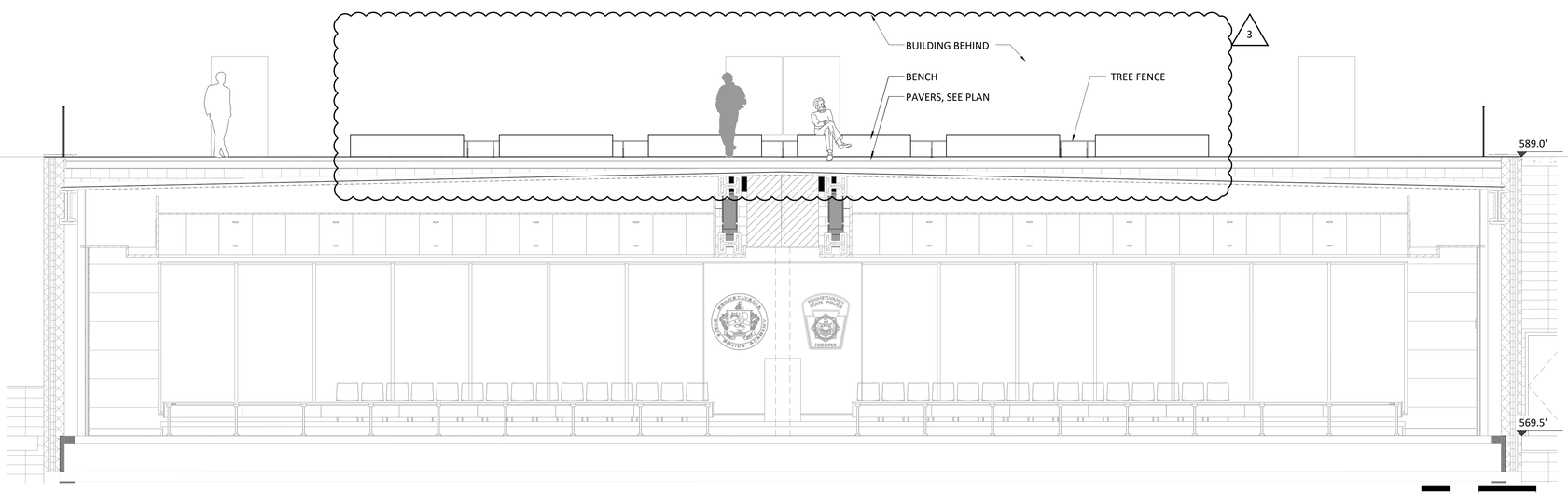


1 AUTOMATIUM ROOF SECTION A-A'

1/8"=1'-0"



2 AUDITORIUM ROOF SECTION B-B'

1/4"=1'-0"

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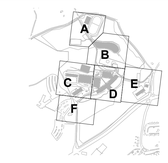

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1	16 FEB 2022	ISSUED TO I&I			

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REGISTERED LANDSCAPE ARCHITECT — COMMONWEALTH OF PENNSYLVANIA — BRAD SWAN — REGISTRATION NUMBER LA 003401

SIGNATURE DATE

ARCHITECT

SOM

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250 Greenwich St, New York, 10007

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DEPARTMENT OF GENERAL SERVICES

HARRISBURG, PENNSYLVANIA

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SECTION - AUDITORIUM ROOF

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