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Addendum No. 01

Project: New Police Station
City of Lacey
222 College Street SE
Lacey, WA 98503
City Project No. PW 2022-13

KMB Job No.: 22022

Issue Date: October 16, 2023

Bid Date: November 2, 2023

To: All Plan Holders

From: Bryan Beley, AIA – KMB architects

The following modifications to the Project Manual, Specifications, and/or Drawings are to be incorporated into bid proposals that may be offered, and the subsequent construction. Bidders shall assess and include the full impact of the revision(s) on any and all related systems and work. Receipt and incorporation of this Addendum in the bid proposal shall be indicated on the Bid Proposal form in the space provided.

General:

Item Description

1. **PRE-BID CONFERENCE ATTENDANCE LIST:**
   The Pre-Bid Conference was held on Friday, October 6 at 10:30AM in the City of Lacey City Hall Chambers. A copy of the sign-in sheet of attendees is attached to this Addendum.

2. **QUESTIONS AND ANSWERS:**
   The following questions and answers do not modify the Project Manual, Specifications, and/or Drawings unless another separate Addendum item herein is specifically referenced. Disregard any answer causing further conflicts and notify the Architect immediately.

   1) Question: Devices are listed on the drawings, but please confirm specifications and scope of work related to the Access Control Systems and Closed Circuit Television System (CCTV).
      a) Specifications and further information on Access Control and CCTV Systems is included in this Addendum, see items below.

   2) Question: Please provide civil CAD files so I can run Earthwork calculations for this project.
      a) Civil CAD files are available to all contractors upon request with the submission of a completed Document 005433 Digital Electronic Data Protocol Exhibit found in the specifications. Please submit inquiries to Bryan Beley (bryanbeley@kmb-architects.com).

   3) Question: On Plan sheet C-201, the HMA Trench Restoration is shown approximately 5'-0" wide, but it references Detail 7-14.1 on C-704. That detail shows a minimum 11'-0" wide grind and overlay. Will the trench patch be limited to the 5'-0" width or will the 11'-0" wide grind and overlay be required?
      a) The trench restoration in the asphalt parking lot is intended to be the width of the trench disturbance or a minimum of the 5-ft wide neat, straight width as shown on sheet C-201. The additional grind and overlay outside the trench limits is not required as this is not a public street.

4) Question: Please confirm the air handling system at the Firing Range.
   a) To clarify, the air handling system at the Firing Range has air recirculation and is not a purge system (100% outside air). Per design meeting notes, the system was designed to have 25% outside air with the remaining airflow being recirculated from the range.
5) Question: Please verify who is responsible for carrying Builder's Risk – Owner or Contractor – as verbiage throughout section is vague.
   a) Builder's Risk Insurance is to be purchased and maintained by the Contractor. Addendum item herein provides further clarification.
6) Question: Can pricing for alternates be bid one hour later? With the size of Alternate 1, it will be difficult to close on two separate large buildings at the same time since Mechanical and Electrical numbers come in at the last minute.
   a) No – please submit bids per the specifications.

Project Manual:

Item Description

3. SECTION A – INSTRUCTIONS TO BIDDERS

A. Replace entire section with INSTRUCTIONS TO BIDDERS attached to this Addendum. Changes and additions are indicated in RED.

4. SECTION 000110 TABLE OF CONTENTS

A. Revise 007203 GENERAL CONDITIONS to 007200 matching corresponding section (replaced via Addendum item herein).
B. Revise 237320 GUN RANGE AIR HANDLING UNIT to 237302 matching the corresponding section.
C. Revise 238143 AIR COOLED SPLIT SYSTEM HEAT PUMP to 238145 matching the corresponding section.

5. SECTION 007203 GENERAL CONDITIONS OF THE CONTRACT

A. Article 11. Insurance and Bonds, add the following paragraphs proceeding 11.1.3:

"11.1.4 Contractor shall purchase and maintain Builder's Risk insurance covering interests of the Owner, the Contractor, and subcontractors of every tier, as Named Insureds, in the Work. An Installation Floater instead of Builders Risk is acceptable for renovation projects. Builder's Risk insurance shall be on a special form policy, and shall insure against the perils of fire and extended coverage and physical loss or damage, theft, vandalism, malicious mischief and collapse; and flood and earthquake when shown below. The Builder's Risk insurance shall include coverage for temporary buildings, debris removal, and damage to materials in transit or stored off-site. Such insurance shall cover resulting "soft costs" including but not limited to design costs, licensing fees, Engineer's and Architect's fees, and costs due to delay in completion.

11.1.5 Builder's Risk insurance shall be written in the amount of the completed value of the project, with no coinsurance provisions. Such policy must provide coverage and deductibles that comply with the following:

Coverage:
Total Cost of Project to be Insured: Contract Value
Soft Costs: 5% of the Contract Value
Flood: 10% of the Contract Value
Earthquake: 10% of the Contract Value

Deductibles not to exceed:
Flood: 2% of the Value at Time of Loss, subject to a $250,000 Minimum
Earthquake: 5% of the Value at Time of Loss, subject to a $250,000 Minimum
Earth Movement: 5% of the Value at Time of Loss, subject to a $250,000 Minimum
All Other Perils: $50,000
Soft Costs: $50,000, with no more than 7-day waiting period

11.1.6 The Builder's Risk insurance covering the work shall have maximum deductibles as listed above for each occurrence. The deductible(s) shall be the responsibility of the Contractor.

11.1.7 The Contractor shall provide the Owner with a full and certified copy of the insurance policy when the Contractor delivers the signed Contract for the work. Failure of the Owner to demand such verification of coverage with these insurance requirements or failure of the Owner to identify a deficiency from the insurance documentation provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

11.1.8 The Builder's Risk insurance shall be maintained until final acceptance of the Work by the Owner.

11.1.9 The Contractor and the Owner waive all rights against each other and any of their subcontractors of every tier, agents, and employees, officers, and officials, for damages caused by fire or other perils to the extent covered by Builder's Risk insurance or other property insurance applicable to the work. The policies shall provide such waivers by endorsement. "

6. SECTION 011000 SUMMARY OF WORK

A. Page 3, Part 1, paragraph 1.6 A., add article:

"2. The Contractor is responsible for procuring and installing CFCI (Contractor-Furnished, Contractor-Installed) items and provide full and complete installation of OFCI items included within the OFCI, OFOI, and OFCI schedule attached, following this section."

7. SECTION 012500 SUBSITUTION PROCEDURES

A. Page 2, Part 1, paragraph 1.6 A., add article:

"3. Substitution requests offering advantages solely to the Contractor will not be considered."
4. Substitution requests are to be reviewed in the order they are received and pending the available time of the Architect and design team Every effort will be made to address substitution requests received but are not guaranteed.
5. Acceptance will be acknowledged through Addendum only, and to include review time. Rejected requests will not be noted."

8. SECTION 015639 TEMPORARY TREE AND PLANT PROTECTION

A. Page 1, Part 1.1.A.7, delete the article.

9. SECTION 051200 STRUCTURAL STEEL FRAMING

A. Page 3, Part 1, paragraph 1.6 B., replace entire paragraph with:

"B. Installer Qualifications: A qualified installer, with a minimum of 5 years documented experience with commercial quality work comparable in scope to this Project, who maintains an internal Quality Assurance program similar in scope to the AISC Quality Certification Program and is designated as an AISC Certified Erector.
1. The AISC Certified Erector requirement may be waived for qualified installers who have completed a minimum of five (5) projects similar in size, scope, and complexity to this project within the past 10 years.
2. Installer shall provide substantiating information for completed projects as an informational submittal. "

10. SECTION 057313.13 STRUCTURAL GLASS RAILINGS

A. Page 4, Part 2, paragraph 2.8, add the following paragraph:

"G. Provide ceramic frit on glass as shown on A-202 elevations of police station. Architect to select from manufacturer's standard patterns and colors based on coverage percentage." Related revisions to these elevations can be found on 8.5x11 sheet A-202-A1 attached to this Addendum.

11. SECTION 072100 THERMAL INSULATION

A. Page 4, Part 2 paragraph 2.5 A. 1. b., replace "VersaBoard" with "RainBarrier 45 Dark".

12. SECTION 095426 SUSPENDED WOOD CEILINGS

A. Replace entire section with Section 095426 SUSPENDED WOOD CEILINGS attached to this Addendum. Includes addition of Vertical Wood Slat ceilings (Additive Alternate No. 1D) – "WSC-2".

13. SECTION 230900 ENERGY MANAGEMENT & CONTROLS (DDC)

A. Page 1, Part 1.2, paragraph C. 1., add the following:

"g. Honeywell by Sunset"

14. SECTION 233700 AIR TERMINALS

A. Page 2, Part 2.2, paragraph C. 4., add the following:

"g. Architectural Louvers"

15. SECTION 237302 GUN RANGE AIR HANDLING UNIT

A. Page 2, Part 2.2, paragraph. A, add the following:

"B. Scott Springfield"

"C. Energy Labs Inc."

16. SECTION 274116.29 LARGE CONFERENCE ROOM AUDIO-VISUAL SYSTEMS

A. Add new specification section attached to this Addendum.

17. SECTION 274116.51 TRAINING ROOM AUDIO-VISUAL SYSTEM

A. Replace entire specification section attached to this Addendum.

18. SECTION 274116.52 FIRING RANGE AUDIO SYSTEM

A. Add new specification section attached to this Addendum.

19. SECTION 274116.62 COMMUNITY ROOM & EOC ROOM AUDIO-VISUAL SYSTEM

A. Replace entire specification section attached to this Addendum.

20. SECTION 281300 ACCESS CONTROL SYSTEM-LENEL ONGUARD

A. Add new specification section attached to this Addendum.

21. SECTION 282300 CCTV SYSTEM_AXIS & OCULARIS

Add new specification section attached to this Addendum.

Civil Drawings:

Item Description

22. SHEET C-205

A. CURB PLAN

1) Replace entire sheet with full-size sheet C-205 attached to this Addendum including but not limited to changes noted below.
2) Add Legend with curb type detail references.
3) Add "Curb Notes"
   "1. 6" vertical curb shown on interface of sidewalk and roadway shall be monolithic curb and sidewalk per detail no. 1 on sheet C-202."
4) Add plan callout to south access road near bottom of sheet.
   "No curb at edge of pavement from this point south to Abbey Way. Both sides. See Paving Plan."

23. SHEET C-300

A. GRADING PLAN NORTH

1) Replace entire sheet with full-size sheet C-300 attached to this Addendum including but not limited to changes noted below.
2) Add additional grading callouts for asphalt and concrete pavement areas.
3) Revise "Earthwork Quantities" Table
4) Revise earthwork note to read the following:
   "Estimated quantities are not provided for bidding. Bidders to confirm all quantities. Quantities reflect existing surface to proposed surface comparison. Quantities do not include striping, pavement depth, building foundations, excavation for utilities, or underground storm infiltration facility."

24. SHEET C-302

A. GRADING DETAIL - WEST

1) Replace entire sheet with full-size sheet C-302 attached to this Addendum including but not limited to changes noted below.
2) Extend plan view south for further information coverage.
3) Revise Legend to include cut slope catch line linetype.
4) Add additional spot grades for proposed curb and gutter.
5) Revise top and bottom of wall callouts for site retaining walls.

25. SHEET C-303

A. GRADING DETAIL - EAST

1) Replace entire sheet with full-size sheet C-303 attached to this Addendum including but not limited to changes noted below.
2) Revise Legend to include cut slope catch line linetype.
3) Add additional spot grades for proposed curb, gutter, and concrete ramp.
4) Revise top and bottom of wall callouts for site retaining walls.

26. SHEET C-304

A. SITE GRADING SECTIONS

1) Replace Grading Section "A" with grading section on 11x17 sheet C-304-A1 attached to this Addendum including but not limited to changes noted below.
2) Update separation location between upper and lower floor of main building for clarification.
3) Add additional dimensions and slope callouts to area between eastern most curb and property line.

27. SHEET C-305 (Reorganize sheet in main set to follow C-304)
- **A.** SITE GRADING SECTIONS
  1) Replace entire sheet with full-size sheet C-305 attached to this Addendum replacing Grading Sections "C" and "D" including but not limited to changes noted below.
  2) Update separation location between upper and lower floor of main building for clarification
  3) Add additional dimensions and slope callouts to area between eastern most curb and property line.

28. SHEET C-400
- **A.** OVERALL UTILITY PLAN NORTH
  1) Replace entire sheet with full-size sheet C-400 attached to this Addendum including but not limited to changes noted below.
  2) Revise Legend to identify proposed roof drain.
  3) Add detail references for storm catch basins on Legend.
  4) Add sanitary sewer manhole at intersection of Oil/Water Separator discharge line and gravity sanitary sewer main.
  5) Revise layout of 3" domestic service line, 6" fire line, and 4" FDC line to main building.

29. SHEET C-500
- **A.** STORM DRAINAGE PLAN NORTH
  1) Replace entire sheet with full-size sheet C-500 attached to this Addendum including but not limited to changes noted below.
  2) Move dispersion trench information from sheet C-501 to this plan sheet for clarity.
  3) Revise storm main alignments to route runoff from south side of main building to the dispersion trench rather than to the infiltration gallery. The storm system branch alignment is modified and catch basins have been renumbered for clarity.
  4) Update storm drainage structure information in structure tables.

30. SHEET C-502
- **A.** STORM DRAINAGE PROFILES
  1) Replace entire sheet with full-size sheet C-502 attached to this Addendum including but not limited to changes noted below.
  2) Revise storm drainage profiles to reflect updated storm drainage alignment design.

31. SHEET C-503
- **A.** STORM DRAINAGE PROFILES CONT.
  1) Replace entire sheet with full-size sheet C-503 attached to this Addendum including but not limited to changes noted below.
  2) Revise storm drainage profiles to reflect updated storm drainage alignment design.

32. SHEET C-600
- **A.** WATER PLAN NORTH
  1) Revise layout of 3" domestic service line, 6" fire line, and 4" FDC line to main building per partial water plan on 8.5x11 sheet C-600-A1 attached to this Addendum.

33. SHEET C-601
- **A.** WATER PLAN SOUTH
  1) Replace proposed 12" 90-degree water main bend fitting with a 12" tee (FLxFL), two 12" gate valves (FLxMJ), and a 12" blind flange per partial water plan on 8.5x11 sheet C-601-A1 attached to this Addendum.

34. SHEET C-603

A. Delete City of Lacey Drawing No. 6-4.3 "Reduced Pressure Backflow Assembly for 2" or Smaller (Outdoor Application)" Detail.

35. SHEET C-700

A. SEWER PLAN NORTH

1) Replace "Service Wye" / "#70, Null Structure" on gravity sanitary sewer main with "SSMH #3, Type 1-48" " per partial sewer plan on 8.5x11 sheet C-700-A1 attached to this Addendum.

36. SHEET C-702

A. SEWER PROFILES

1) Replace entire sheet with full-size sheet C-702 attached to this Addendum including but not limited to changes noted below.
2) Revise sewer alignment station numbering to avoid duplication with other utility alignments.
3) Combine profile view from sheet C-703 onto sheet C-702 for clarity.

37. SHEET C-703

A. SEWER PROFILES CONT.

1) Move the section of sewer profile to sheet C-702

B. Re-number "Sewer Details" sheet to C-703

38. SHEET C-704

A. Replace entire sheet with full-size sheet C-704 attached to this Addendum including but not limited to changes noted below.
B. Move Sewer Details to Sheet C-703
C. Add "Lift Station Notes" and "Onelift Pump Station" detail.

Landscape Drawings:

Item Description

39. SHEET L-001

A. TREE PROTECTION, SALVAGE, AND DEMO PLAN

1) Keyed Notes: delete Keyed Note #6, #7, #19, #20, #21.
2) Keyed Notes: replace Keyed Note #19 to read:
"Contractor shall consider the value of trees requiring demolition as part of the base bid."

Structural Drawings:

Item Description

40. SHEET S-001

A. STRUCTURAL GENERAL NOTES

1) Add notes section for Cold Formed Metal Framing per 8.5x11 sheet S-001-A1 attached to this Addendum.

41. SHEET S-111

A. LOWER LEVEL PLAN – WEST

1) Revise column schedule to eliminate C10 and C14W per 8.5x11 sheet S-001-A1 attached to this Addendum.
2) Update column size at grid E6 to mark C8 per 8.5x11 sheet S-111-A1 attached to this Addendum.
3) Update column size at grid E7 to mark C8 per 8.5x11 sheet S-111-A1 attached to this Addendum.

42. SHEET S-112

A. LOWER LEVEL PLAN – EAST

1) Revise column schedule to eliminate C10 and C14W per 8.5x11 sheet S-001-A1 attached to this Addendum.
2) Update column size at grid E7 to mark C8.
3) Add column tag (mark C10W) at grid F11 per 8.5x11 sheet S-112-A1 attached to this Addendum.

43. SHEET S-113

A. UPPER LEVEL FLOOR FRAMING PLAN - WEST

1) Revise column schedule to eliminate C10 and C14W per 8.5x11 sheet S-001-A1 attached to this Addendum.
2) Remove erroneous footing linework and tags at grids E3 and F2 per 8.5x11 sheet S-113-A1 attached to this Addendum.
3) Remove column marks at grids E6 and E7 per 8.5x11 sheet S-113-A1 attached to this Addendum.
4) Update column sizes at braced frame (referenced by elevation 4/S-210) to mark C10W per 8.5x11 sheet S-113-A1 attached to this Addendum.

44. SHEET S-114

A. UPPER LEVEL FLOOR FRAMING PLAN – EAST

1) Revise column schedule to eliminate C10 and C14W per 8.5x11 sheet S-001-A1 attached to this Addendum.
2) Remove column marks at grid E7.

45. SHEET S-115

A. ROOF FRAMING PLAN - WEST

1) Revise beam sizes adjacent to grid G (between grids 1 and 3) to W12x14 per 11x17 sheet S-115-A1 attached to this Addendum.
2) Eliminate wide flange beam cantilevers at grids 5, 6, and 7 and gridline E per 11x17 sheet S-115-A1 attached to this Addendum.
3) Eliminate W18x35 beam line adjacent to grid 7 between grids C and F per 11x17 sheet S-115-A1 attached to this Addendum.

46. SHEET S-116

A. ROOF FRAMING PLAN - EAST

1) Eliminate wide flange beam cantilevers at grids 7, 8, 9, 10, and 12 and gridline E per 8.5x11 sheet S-116-A1 attached to this Addendum.
2) Revise roof overhang extents adjacent to grid 9 per 8.5x11 sheet S-116-A1 attached to this Addendum.

47. SHEET S-118

A. CLT PANEL LAYOUT PLAN - EAST

1) Revise roof overhang extents adjacent to grid 9 per 8.5x11 sheet S-118-A1 attached to this Addendum.

48. SHEET S-119

A. ENLARGED PLANS

1) Revise column schedule to eliminate C10 and C14W per 8.5x11 sheet S-001-A1 attached to this Addendum.
2) Remove erroneous footing linework and tags at grids E3 and F2.

49. SHEET S-701

A. LIGHT GAUGE STEEL DETAILS

1) Replace entire sheet with full-size sheet S-701 attached to this Addendum including but not limited to changes noted below.
2) Add detail 4, "TYP STUD WALL TO CLT".
3) Add detail 6, "SOFFIT TO CMU WALL".
4) Add detail 7, "SOFFIT CORNER FRAMING".
5) Add detail 8, "STUD TO DECK EDGE".
6) Add detail 9, "SECTION – SOFFIT OVERHANG".
7) Add detail 10, "SOFFIT BRACE".
8) Add detail 12, "TYP LIGHT GAUGE WALL FRAMING".
9) Add detail 13, "TYP LIGHT GAUGE WALL ATTACHMENT".
10) Add detail 14, "TYP LIGHT GAUGE WALL BRIDGING".

Architectural Drawings:

Item Description

50. SHEET A-112

A. LOWER LEVEL – ENLARGED FLOOR & SYMBOL PLAN - EAST

1) Room 040 Less-Than-Lethal Storage: revise wall type of west wall to "S1B" and north wall to "S3B" per 8.5x11 sheet A-112-A1 attached to this Addendum.
2) Room 060 Sally Port: revise wall type of exterior southeast wall to "E8M1" per 8.5x11 sheet A-112-A1 attached to this Addendum.

51. SHEET A-113

A. UPPER LEVEL – ENLARGED FLOOR & SYMBOL PLAN - WEST

1) Room 105C EOC Storage: revise wall type of west wall to "S9B" per 8.5x11 sheet A-113-A1 attached to this Addendum.
2) Room 105C EOC Storage: add wall type symbols "S9A" north and south of EOC Storage wall to clarify change in wall type per 8.5x11 sheet A-113-A1 attached to this Addendum.
3) Room 143 Storage Room: revise wall type of south wall to "S1B" per 8.5x11 sheet A-113-A1 attached to this Addendum.

52. SHEET A-114

A. UPPER LEVEL – ENLARGED FLOOR & SYMBOL PLAN - EAST

1) Room 178A Copier / Supplies: revise floor plan wall layout and wall types per 8.5x11 sheet A-114-A1 attached to this Addendum. Make modifications relative to all finishes and disciplines associated with this floor plan change.

53. SHEET A-154

A. UPPER LEVEL – REFLECTED CEILING PLAN – EAST

1) Room 178A Copier / Supplies: revise reflected ceiling plan wall layout per 8.5x11 sheet A-154-A1 attached to this Addendum. Make modifications relative to all finishes and disciplines associated with this reflected ceiling plan change.
2) Room 183 Mobile Outreach Team: replace ceiling type "ACT-1" with "ACT-3" per 8.5x11 sheet A-154-A1 attached to this Addendum.

54. SHEET A-202

A. EXTERIOR ELEVATIONS

1) Detail views 9 and 11: add graphic hatch to glass railing and indicate ceramic frit coverage percentages per

8.5x11 sheet A-202-A1 attached to this Addendum.

2) Detail views 9 and 11: add notes to graphic hatch per 8.5x11 sheet A-202-A1 attached to this Addendum: "Glass railing [and door] with ceramic frit pattern (20%, 30%, 40%, 50%, 60%)"

55. SHEET A-251

A. INTERIOR ELEVATIONS

1) Replace entire sheet with full-sheet A-251 attached to this Addendum including but not limited to changes noted below.
2) Detail view 1, Community Room 105 - E: relocate equipment E-01 and associated wall mount to a height so as to not conflict with the signage G-24 mounting height.
3) Detail view 5, Community Room 105 - W: relocate visible power receptacles off glazing in association with electrical power plans.
4) Add new Detail view 22, Hallway 102 - West.
5) Detail view 6, Soft Interview - N: delete note "Cut panels to size, paint ends to match"
6) Detail view 11, Interview Typ. - N: add material keynote "AP-1" to lightly hatched panels.

56. SHEET A-252

A. INTERIOR ELEVATIONS

1) Replace entire sheet with full-sheet A-252 attached to this Addendum including but not limited to changes noted below.
2) Detail view 1, Corridor 112 - N - West End: revise locations of gyp. expansion joints along wall as shown.
3) Detail view 1, Corridor 112 - N - West End: delete WP-2 and RB-2 along light shaft opening as shown.
4) Detail view 2, Corridor 112 - N - East End: delete WP-2 and RB-2 along light shaft opening as shown.
5) Detail view 3, Operations Circulation 023 - S - West End: delete erroneous hatch and linework on wall along stair opening.

57. SHEET A-253

A. INTERIOR ELEVATIONS

1) Detail view 6, Fitness Room 020 - W: add equipment E-01 with associated monitor wall mount per 11x17 sheet A-253-A1 attached to this Addendum.

58. SHEET A-323

A. ELEVATOR – PLANS / SECTIONS

1) Plan view 3, Floor Plan - Elevator Pit: relocate sump pump 3 inches from north and west walls per 8.5x11 sheet A-323-A1 attached to this Addendum.

59. SHEET A-401

A. ENLARGED ENTRY & RECEPTION – PLANS / ELEVATIONS

1) Replace entire sheet with full-sheet A-401 attached to this Addendum including but not limited to changes noted below.
2) Detail views 1 through 6: delete OFOI furniture and equipment from view.
3) Detail view 4: add "WD-2" hatch above opening.
4) Detail view 5: add "WD-2" hatch and notes to entire wall.
5) Detail view 6: revise locations of ballistic glazing pass through as shown.

60. SHEET A-407

A. ENLARGED VIDEO WALL – PLANS / ELEVATIONS / DETAILS

1) Detail view 3: add note to video wall per 11x17 sheet A-407-A1 attached to this Addendum:
"55" television monitors with ultra-thin bezel (OFCI) mounted on video wall flat brackets (CFCI); Confirm bracket weight capacity is compatible with weight of monitors."

61. SHEET A-408

A. ENLARGED CASEWORK – PLANS / ELEVATIONS

1) Replace entire sheet with full-sheet A-408 attached to this Addendum including but not limited to changes noted below.
2) Detail view 2: revise with finish notes "STC-1".
3) Detail view 4: revise with finish notes "STC-1".
4) Detail view 5: revise portion of wall with finish notes "CT-1".
5) Detail view 7: revise layout of mail slots.
6) Detail view 11: update view title text to read "Command Coffee Alcove 114A - E"
7) Detail view 16: add graphic and note for "Patch, laser cut metal"
8) Add Detail view 22, "Breakroom 154 Island - S" as shown.
9) Detail view 20: revise layout of mail slots.
10) Detail view 21: revise layout of mail slots.

62. SHEET A-583

A. CASEWORK & INTERIOR DETAILS

1) Detail view 10: revise dimension of stainless steel countertop to 1'-6" per 11x17 sheet A-583-A1 attached to this Addendum.
2) Add detail 11 per 11x17 sheet A-583-A1 attached to this Addendum.
3) Add detail 12 per 11x17 sheet A-583-A1 attached to this Addendum.
4) Add detail 13 per 11x17 sheet A-583-A1 attached to this Addendum.

63. SHEET A-621

A. FINISH SCHEDULE

1) Replace entire sheet with full-sheet A-621 attached to this Addendum.

64. SHEET A-622

A. LOWER LEVEL FINISH FLOOR PLAN

1) Replace entire sheet with full-sheet A-401 attached to this Addendum including but not limited to changes noted below.
2) Revise Legend to correct graphic hatches and include special coatings.
3) Add room labels throughout.
4) Revise Coffee Alcove 027 floor finish.
5) Revise Vestibule 005 floor finish.
6) Revise Evidence Supply Storage 045 floor finish.

65. SHEET A-623

A. UPPER LEVEL FINISH FLOOR PLAN

1) Replace entire sheet with full-sheet A-401 attached to this Addendum including but not limited to changes noted below.
2) Revise Legend to correct graphic hatches and include homogenous sheet vinyl floor finish.
3) Add room labels throughout.
4) Revise Secure Records Storage 152 floor finish.
5) Revise Interview Room (Soft) 109 floor finish.
6) Revise Community Room Kitchenette 105D floor finish.

66. SHEET A-624

A. MATERIAL LEGEND

1) Replace entire sheet with full-sheet A-624 attached to this Addendum including but not limited to changes noted below.
2) Revise "MT-1" comments.

3) Revise Interior Paint Systems.
4) Revise Special Paint Coatings.
5) Revise "WD-2" comments.

67. SHEET GI401a (TRAINING BUILDING)

A. TRAINING BUILDING – BID ALTERNATES

1) Bid Alternates Legend: update hatch locations to align and correspond with alternate descriptions per 8.5x11 sheet GI401a-A1 attached to this Addendum.
2) Plan view 1, Room 219 Defensive Tactics Training Room: revise hatch to include room as part of ADD ALTERNATE NO. 1C per 8.5x11 sheet GI401a-A1 attached to this Addendum.

68. SHEET A-151a (TRAINING BUILDING)

A. REFLECTED CEILING PLAN - WEST

1) This entire sheet, replace all ceiling types "GWB-1" with "GYP-1" corresponding to the Legend.
2) This entire sheet, replace all ceiling types "GWB-2" with "GYP-2" corresponding to the Legend.
3) At Room 209 Restroom/Shower, revise ceiling type to "GYP-2" per 8.5x11 sheet A-151a-A1 attached to this Addendum.
4) At Room 211 Staging Area, add slope arrow indicating direction of ceiling slope per 8.5x11 sheet A-151a-A1 attached to this Addendum.

69. SHEET A-152a (TRAINING BUILDING)

A. REFLECTED CEILING PLAN - EAST

1) This entire sheet, replace all ceiling types "GWB-1" with "GYP-1" corresponding to the Legend.
2) This entire sheet, replace all ceiling types "GWB-2" with "GYP-2" corresponding to the Legend.
3) At Room 204 Men's Restroom, revise ceiling type to "GYP-2" per 8.5x11 sheet A-152a-A1 attached to this Addendum.
4) At Room 205 Women's Restroom, revise ceiling type to "GYP-2" per 8.5x11 sheet A-152a-A1 attached to this Addendum.

70. SHEET A-251a (TRAINING BUILDING)

A. INTERIOR ELEVATIONS

1) Detail view 11, Corridor 228 - South: revise portion of wall to finish notes "CT-1" per 8.5x11 sheet A-251a-A1 attached to this Addendum.

71. SHEET A-621a (TRAINING BUILDING)

A. FINISH SCHEDULE

1) Replace entire sheet with full-sheet A-621a attached to this Addendum.

72. SHEET A-622a (TRAINING BUILDING)

A. FINISH FLOOR PLAN

1) Replace entire sheet with full-sheet A-622a attached to this Addendum.

73. SHEET A-623a (TRAINING BUILDING)

A. MATERIAL LEGEND

1) Replace entire sheet with full-sheet A-623a attached to this Addendum including but not limited to changes noted below.
2) Revise Paint Systems.
3) Revise "QTZ-1" comments.
4) Revise Walk-off Mat mark "WO-1".

Mechanical Drawings:

Item Description

74. SHEET M-005
- **A.** MECHANICAL SCHEDULES IV
  1) Revise plumbing fixture P-14 remarks to read: CLASS C DUCTILE IRON GRADE INSTEAD OF CLASS E.
  2) Add LOUVER SCHEDULE per 11x17 sheet M-005-A1 attached to this Addendum.

75. SHEET M-102
- **A.** LOWER LEVEL – FOUNDATION PLUMBING PLANT – EAST
  1) Revise plan as shown per 8.5x11 sheet M-102-A1 attached to this Addendum.

76. SHEET M-122
- **A.** LOWER LEVEL – PLUMBING PLAN -EAST
  1) Revise construction note 8 to read: " 1/2-INCH AIR COMPRESSOR AIR DROP FED FROM MECHANICAL ROOM SEE SHEET 5/M-401 FOR CONTINUATION. "
  2) Revise plan as shown per 8.5x11 sheet M-122-A1 attached to this Addendum.

77. SHEET M-124
- **A.** UPPER LEVEL – PLUMBING PLAN -EAST
  1) Revise construction note 9 to read: " 3-INCH DOWNSPOUT DOWN TO LEVEL BELOW. SEE SHEET 5/M-401 FOR CONTINUATION. "
  2) Revise plan as shown per 8.5x11 sheet M-124-A1 attached to this Addendum.

78. SHEET M-125
- **A.** PLATFORM – PLUMBING PLAN - WEST
  1) Relocate TP-55 to be surface mounted on wall south of fire extinguisher.

79. SHEET M-132
- **A.** LOWER LEVEL – MECHANICAL PLAN – EAST
  1) Replace entire sheet with full-size sheet M-132 attached to this Addendum.

80. SHEET M-133
- **A.** UPPER LEVEL – MECHANICAL PLAN – WEST
  1) Revise plan as shown per 8.5x11 sheet M-133-A1 attached to this Addendum.

81. SHEET M-134
- **A.** UPPER LEVEL – MECHANICAL PLAN – EAST
  1) Replace entire sheet with full-size sheet M-134 attached to this Addendum.

82. SHEET M-135
- **A.** PLATFORM – MECHANICAL PLAN – WEST
  1) Replace entire sheet with full-size sheet M-135 attached to this Addendum.

83. SHEET M-154
- **A.** UPPER LEVEL – MECHANICAL REFLECTED CEILING PLAN – EAST
  1) Revise plan as shown per 8.5x11 sheet M-154-A1 attached to this Addendum.

84. SHEET M-401
- **A.** ENLARGED PLUMBING PLANS
  1) Remove all number 4 construction notes on drawing 3 (UPPER LEVEL – PUBLIC RESTROOMS PLUMBING PLAN).

85. SHEET M-403

A. ENLARGED MECHANICAL PLANS

1) Add detail view 6, ROOM 168 AND 176 SECTION per 11x17 sheet M-403-A1 attached to this Addendum.
2) Add detail view 7, HALLWAY 121 SECTION per 11x17 sheet M-403-A1 attached to this Addendum.

86. SHEET M-001a (TRAINING BUILDING)

A. MECHANICAL LEGEND

1) Add LOUVER SCHEDULE per 11x17 sheet M-001a-A1 attached to this Addendum.

87. SHEET M-131a (TRAINING BUILDING)

A. TRAINING BUILDING MECHANICAL FLOOR PLAN – EAST

1) Replace entire sheet with full-size sheet M-131a attached to this Addendum.

88. SHEET M-132a (TRAINING BUILDING)

A. TRAINING BUILDING MECHANICAL FLOOR PLAN – WEST

1) Revise plan as shown per 8.5x11 sheet M-132a-A1 attached to this Addendum.

89. SHEET M-151a (TRAINING BUILDING)

A. TRAINING BUILDING MECHANICAL REFLECTED CEILING PLAN – EAST

1) Revise plan as shown per 11x17 sheet M-151a-A1 attached to this Addendum.

Electrical Drawings:

Item Description

90. SHEET E-002

A. SYSTEMS LEGEND

1) Intrusion Alarm System: add Keypad (KP) and description to read:
"Keypad - Wall mount at +48" AFF unless noted otherwise - Provide single-gang backbox with single-gang blank cover plate, with (1) 1"C. to accessible ceiling space."

91. SHEET E-141

A. LOWER LEVEL – SYSTEMS PLAN - WEST

1) Fitness 020: add Monitor (MON) to west wall.
2) Fitness 020: revise monitor heights so lower edge is 9'-0" AFF.

92. SHEET E-142

A. LOWER LEVEL – SYSTEMS PLAN - EAST

1) Briefing 003: delete (3) System Input/Output plates (SI1) from floor box locations.
2) Briefing 003: delete Microphone Antenna Receiver from ceiling.
3) Briefing 003: add Camera (C), data tag, and keyed note #1 to ceiling.
4) Briefing 003: add Microphone (M), data tag, and keyed note #1 to ceiling.
5) Patrol Conference 030: add data tag and keyed note #1 to Camera (C).

93. SHEET E-143

A. UPPER LEVEL – SYSTEMS PLAN – WEST

1) Keyed Notes: replace Keyed Note #7 to read:
"Route conduit to nearest accessible ceiling space."
2) Public Vestibule 100: add (1) 1"C. and keyed note #7 to exterior post-mounted devices.
3) Public Vestibule 100: add Panic Button (PB) to north wall.
4) Lobby 101: add Keypad (KP) to north wall.
5) Community 105: add data tag and keyed note #1 to (2) Cameras (C) on ceiling.

6) Community 105: add data tag and keyed note #1 to Microphone (M).
7) Command Conference 118: add data tag and keyed note #1 to Camera (C).
8) Command Conference 118: add data tag and keyed note #1 to Microphone (M).

94. SHEET E-144

A. UPPER LEVEL – SYSTEMS PLAN - EAST

1) War 174: add data tag and keyed note #1 to Microphone (M).
2) Investigations Conference 180: add data tag and keyed note #1 to Microphone (M).

95. SHEET E-261

A. SYSTEMS ELEVATIONS

1) Keyed Notes: add Keyed Note #8 to read:
"Network (POE) ceiling microphone array for teleconference."
2) Briefing 003 West Wall Elevation (detail #2): add Camera, mount, and keyed note #3 to ceiling (included on sheet E-142).
3) Briefing 003 West Wall Elevation (detail #2): add Microphone and keyed note #8 to ceiling (included on sheet E-142).
4) Briefing 003 North Wall Elevation (detail #4): add keyed note #3 to Camera.

96. SHEET E-262

A. SYSTEMS ELEVATIONS

1) Keyed Notes: add Keyed Note #5 to read:
"Network (POE) ceiling microphone array for teleconference."
2) War 174 West Wall Elevation (detail #4): add Microphone and keyed note #5 to ceiling (included on sheet E-143).

97. SHEET E-263

A. SYSTEMS ELEVATIONS

1) Keyed Notes: add Keyed Note #6 to read:
"Network (POE) ceiling microphone array for teleconference."
2) Conference 174 West Wall Elevation (detail #2): add Microphone and keyed note #6 to ceiling (included on sheet E-144).
3) Conference 180 North Wall Elevation (detail #5): add Microphone and keyed note #6 to ceiling (included on sheet E-144).

98. SHEET E-264

A. SYSTEMS ELEVATIONS

1) Keyed Notes: add Keyed Note #11 to read:
"Network (POE) ceiling microphone array for teleconference."
2) Community 105 West Wall Elevation (detail #2): add Microphone, mount, and keyed note #11 to ceiling (included on sheet E-143).

99. SHEET E-412

A. SYSTEMS ENLARGED PLANS

1) Lower Level – Interview 055 and 053: revise location of CCTV Camera C-18 to north-side of Interview 053.

100. SHEET E-524

A. AUDIO VISUAL DETAILS

1) Recessed Back Box Behind Monitor (detail #2): revise side-view of Chief PAC526FWP to show (3) built-in duplex with surge protection.

101. SHEET E-525

A. ROOM AUDIO VISUAL RISER DIAGRAMS

1) Large Conference Room AV Riser Diagram (detail #2): revise CAT6 patch cord count to 6 from MDF/IDF to Primary Monitor/TV.
2) Large Conference Room AV Riser Diagram (detail #2): revise CAT6 patch cord count to 4 from MDF/IDF to Alternate Monitor/TV.
3) Large Conference Room AV Riser Diagram (detail #2): add CAT6 patch cord from AV Network Switch to Network (POE) Video Encoder/Decoder.
4) Large Conference Room AV Riser Diagram (detail #2): add keyed note #5 to AV Network Switch inputs.

102. SHEET E-526

A. ROOM AUDIO VISUAL RISER DIAGRAMS

1) Community Room AV Riser Diagram (detail #2): add additional Alternate Monitor/TV per 11x17 sheet E-526-A1 attached to this Addendum.

103. SHEET E-527

A. ACCESS CONTROL DETAILS

1) Replace entire sheet with full-size sheet E-527 attached to this Addendum including but not limited to changes noted below.
2) Keyed Notes: revise keyed note #13 as shown.
3) Keyed Notes: revise keyed note #24 as shown.
4) Keyed Notes: revise keyed note #25 as shown.
5) Access Control System Door Hardware Diagram (detail #1): revise wire tag on Card Reader (CR) as shown.
6) Access Control System Door Hardware Diagram (detail #2): revise wire tag on Card Reader (CR) as shown.
7) Access Control System Door Hardware Diagram (detail #2): delete keyed note #25 from IDS as shown.
8) Access Control System Panic Button Diagram (detail #3): revise detail as shown.
9) Gate Pedestal Base Detail (detail #4): add detail as shown.
10) Gate Pedestal Housing Mounting Detail (detail #5): add detail as shown.

104. SHEET E-528

A. CCTV MOUNTING DETAILS

1) Typical Discrete/Pinhole Camera Mounting (detail #9): add detail per 11x17 sheet E-528-A1 attached to this Addendum.
2) Typical Discrete Microphone Mounting (detail #10): add detail per 11x17 sheet E-528-A1 attached to this Addendum.

105. SHEET E-529

A. CCTV RISER DIAGRAM

1) CCTV Riser Diagram (detail #1): add Typical Interview Room System to Typical IDF Room per 11x17 sheet E-529-A1 attached to this Addendum.

106. SHEET E-521a (TRAINING BUILDING)

A. TELECOM OUTLET DETAILS

1) Typical Din Mounted Telecom. Outlet (1-Port) Interview System Junction Box (detail #13): add detail per 11x17 sheet E-521a-A1 attached to this Addendum

107. SHEET E-523a (TRAINING BUILDING)

A. TELECOM RISER DIAGRAM

1) Keyed Notes: revise keyed note #14 to read:
"Provide media converters and 19" rack mount card cage for extending network to pole enclosures."

Approved Substitutions:

108. In accordance with Section 012500, the following pre-bid substitution requests have been reviewed and found to be acceptable for this project by the design team and the owner:

Section	Item	Manufacturer(s) Approved
072113.16	Formed Metal Wall Panels	AEP-Span
072715	Non-Bituminous Self-Adhering Sheet Air Barrier	SOPREMA
074113.16	Standing Seam Metal Roof Panel Systems	AEP-Span
074233	Plastic Wall Panels	Trespa
088853	Security Glazing	McGrory Glass
102813	Toilet Accessories (2.11B-d Baby Changing Station)	Saniflow
224000	Plumbing Fixtures (2.14 Trench Drain, P-14)	Dura Trench

End of Addendum No. 01

This Addendum is being distributed to all listed plan holders. Recipients are responsible for dissemination of this information to all affected sub-bidders, suppliers, etc.

Attachments:

PW 2022-13 Sign-in Sheet for Pre-Bid Conference – October 6, 2023 — 6 pages

SPECIFICATIONS

SECTION A – INSTRUCTIONS TO BIDDERS – Addendum No. 01		13 pages
095426	SUSPENDED WOOD CEILINGS – Addendum No. 01	7 pages
274116.29	LARGE CONFERENCE ROOM AUDIO-VISUAL SYSTEMS – Addendum No. 01	18 pages
274116.51	TRAINING ROOM AUDIO-VISUAL SYSTEM – Addendum No. 01	17 pages
274116.52	FIRING RANGE AUDIO SYSTEM – Addendum No. 01	8 pages
274116.62	COMMUNITY ROOM & EOC ROOM AUDIO-VISUAL SYSTEM – Addendum No. 01	21 pages
281300	ACCESS CONTROL SYSTEM (LENEL ONGUARD) – Addendum No. 01	17 pages
282300	CCTV SYSTEM (AXIS & OCULARIS) – Addendum No. 01	12 pages

SUPPLEMENTAL DRAWINGS — 39 sheets

C-304-A1	SITE GRADING SECTIONS
C-600-A1	WATER PLAN NORTH
C-601-A1	WATER PLAN SOUTH
C-700-A1	SEWER PLAN NORTH
S-001-A1	STRUCTURAL GENERAL NOTES & COLUMN SCHEDULE
S-111-A1	LOWER LEVEL PLAN - WEST
S-112-A1	LOWER LEVEL PLAN - EAST
S-113-A1	UPPER LEVEL PLAN - WEST
S-115-A1	ROOF FRAMING PLAN - WEST

S-116-A1 ROOF FRAMING PLAN - EAST
S-118-A1 CLT PANEL LAYOUT PLAN - EAST

A-112-A1 LOWER LEVEL - ENLARGED FLOOR & SYMBOL PLAN - EAST
A-113-A1 UPPER LEVEL - ENLARGED FLOOR & SYMBOL PLAN - WEST
A-114-A1 UPPER LEVEL - ENLARGED FLOOR & SYMBOL PLAN - EAST
A-154-A1 UPPER LEVEL - REFLECTED CEILING PLAN - EAST
A-202-A1 EXTERIOR ELEVATIONS
A-253-A1 INTERIOR ELEVATIONS
A-323-A1 ELEVATOR - PLANS / SECTIONS
A-407-A1 ENLARGED VIDEO WALL - PLANS / ELEVATIONS / DETAILS
A-583-A1 CASEWORK & INTERIOR DETAILS

M-005-A1 MECHANICAL SCHEDULES IV
M-102-A1 LOWER LEVEL - FOUNDATION PLUMBING PLAN - EAST
M-122-A1 LOWER LEVEL - PLUMBING PLAN - EAST
M-124-A1 UPPER LEVEL - PLUMBING PLAN - EAST
M-133-A1 UPPER LEVEL - MECHANICAL PLAN - WEST
M-154-A1 UPPER LEVEL - MECHANICAL REFLECTED CEILING PLAN – EAST
M-403-A1 ENLARGED MECHANICAL PLANS

E-526-A1 ROOM AUDIO VISUAL RISER DIAGRAMS
E-528-A1 CCTV MOUNTING DETAILS
E-529-A1 CCTV RISER DIAGRAM

GI401a-A1 TRAINING BUILDING - BID ALTERNATES

A-151a-A1 REFLECTED CEILING PLAN - WEST
A-152a-A1 REFLECTED CEILING PLAN - EAST
A-251a-A1 INTERIOR ELEVATIONS

M-001a-A1 MECHANICAL LEGEND
M-132a-A1 TRAINING BUILDING MECHANICAL FLOOR PLAN - WEST
M-151a-A1 TRAINING BUILDING MECHANICAL REFLECTED CEILING PLAN - EAST
M-401a-A1 ENLARGED PLUMBING PLANS

E-521a-A1 TELECOM OUTLET DETAILS

FULL-SIZE DRAWINGS 28 sheets

C-205 CURB PLAN
C-300 GRADING PLAN NORTH
C-302 GRADING DETAIL - WEST
C-303 GRADING DETAIL - EAST
C-305 SITE GRADING SECTIONS
C-400 OVERALL UTILITY PLAN NORTH
C-500 STORM DRAINAGE PLAN NORTH
C-502 STORM DRAINAGE PROFILES
C-503 STORM DRAINAGE PROFILES CONT
C-702 SEWER PROFILES
C-704 SEWER DETAILS

S-701 LIGHT GAUGE STEEL DETAILS

A-251	INTERIOR ELEVATIONS
A-252	INTERIOR ELEVATIONS
A-401	ENLARGED ENTRY & RECEPTION - PLANS / ELEVATIONS
A-408	ENLARGED CASEWORK - PLANS / ELEVATIONS
A-621	FINISH SCHEDULE
A-622	LOWER LEVEL FINISH FLOOR PLAN
A-623	UPPER LEVEL FINISH FLOOR PLAN
A-624	MATERIAL LEGEND
M-132	LOWER LEVEL - MECHANICAL PLAN - EAST
M-134	UPPER LEVEL - MECHANICAL PLAN - EAST
M-135	PLATFORM - MECHANICAL PLAN - WEST
A-621a	FINISH SCHEDULE
A-622a	FINISH FLOOR PLAN
A-623a	MATERIAL LEGEND
M-131a	TRAINING BUILDING MECHANICAL FLOOR PLAN - EAST
E-527	ACCESS CONTROL DETAILS

City Engineer

for Scott Egger, PE
Director of Public Works

CITY OF LACEY, WASHINGTON
DEPARTMENT OF PUBLIC WORKS
420 COLLEGE STREET SE
LACEY, WA 98501-3400 (360) 491-5600

City of Lacey, Public Works Department
Sign-in Sheet for Pre-Bid Conference

Date: October 6, 2023

Project Number: PW 2022-13
Project Name: New Police Station
Location: Lacey, Washington
Project Manager: John Swidecki, PE
PM Phone & Email: 360.742.8758 jswideck@ci.lacey.wa.us

	Name	Position / Company	Phone	E-mail
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X	Ashley Smith, PE	Design & Construction Manager, City of Lacey Public Works		
	Robert Almada	Chief of Police, City of Lacey Police Department		
X	Bobby Hollis	Deputy Police Chief, City of Lacey Police Department		
X	Jesse Noga	City Inspector, City of Lacey Public Works		
X	Bill Valdez, PE, DBIA	Principal-in-Charge / Partner, KMB architects		
X	Bryan Beley, AIA	Project Manager / Associate, KMB architects	360.253.0210	bryanbeley@kmb-architects.com
X	Janna Peters	Project Architect / Principal, KMB architects		

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	Jesse Noga	Parametrix	360-340-4449	jnoga@parametrix.com
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	ERIC LORENZEN	Superintendent Northwest CASCADE	253 258 1459	estimating@NWCASCADE.com
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	Beau Porter	PM Madsen Elect.	253-208-3300	bporter@madsenelectric.com
	Chris Hansen	SCI Infrastructure	206-242-0633	Estimating@SCIBuilds.com

INSTRUCTIONS TO BIDDERS

PART 0 – GENERAL CONDITIONS

0.01 EXPLANATION TO PROSPECTIVE BIDDERS

A. Bidders shall examine contract and bid documents and the site and shall satisfy themselves as to conditions that exist.

B. Any prospective Bidder desiring an explanation or interpretation of the solicitation, drawings, specifications, or prior approval for an acceptable substitution of a specified product or material must submit a request in writing to the Architect/Engineer (A/E) ten (10) calendar days before the bid due date. Prospective Bidders shall use the provided Request for Interpretation form (Section 006213) or Request for Substitution form (Section 006325), respectively. Oral explanations or instructions given before the award of a contract will not be binding. Any information given a prospective Bidder concerning a solicitation will be furnished promptly to all other prospective Bidders by addendum to the solicitation, if that information is necessary in submitting bids or if the lack of it would be prejudicial to other prospective bidders.

0.02 PREPARATION OF BIDS – CONSTRUCTION

A. Bids must be submitted on the bid proposal forms, or copies of forms, furnished herein by the Owner and properly signed by a duly authorized agent. Each Bidder shall complete the proposal with prices in figures with the extension properly computed. The person signing a bid must initial each change appearing on any bid form. If the bid is made by a corporation, it shall be signed by the corporation's authorized designee. The address of the bidder shall be typed or printed on the bid form in the space provided.

B. If the solicitation includes alternate bid items, failure to bid on the alternates may disqualify the bid.

C. The Contracting Agency will accept only those Proposals properly executed on the physical forms it provides, or electronic forms that the Bidder has been authorized to access. Unless it approves in writing, the Contracting Agency will not accept Proposals on forms attached to the Plans and stamped "Informational".

D. All prices shall be in legible figures (not words) written in ink or typed, and expressed in U.S. dollars and cents.

E. Any correction to a bid made by interlineation, alteration, or erasure, shall be initialed by the signer of the bid.

F. The Bidder shall submit a completed Contractor Certification Wage Law Compliance form, provided by the Contracting Agency. Failure to return this certification within 24 hours of the bid opening will make this Bid Nonresponsive and ineligible for Award. A Contractor Certification of Wage Law Compliance form is included in the Proposal Forms.

G. The Bidder shall make no stipulation on the Bid Form, nor qualify the bid in any manner.

H. A bid by a corporation shall be executed in the corporate name, by the president or a vice president (or other corporate officer accompanied by evidence of authority to sign).

I. A bid by a partnership shall be executed in the partnership name, and signed by a partner.

J. A bid by a joint venture shall be executed in the joint venture name and signed by a member of the joint venture.

0.03 BID DEPOSIT

A. A deposit of at least 5 percent of the total Bid shall accompany each Bid. This deposit may be cash, certified check, cashier's check, or a proposal bond (Surety bond). When a physical Bid deposit or proposal bond is furnished to accompany an electronic Proposal Form, the Bid deposit shall be received by the Contracting Agency at the location specified for receipt of Bids prior to the time set for receipt of Bids. Proposal bonds shall be on a form acceptable to the Contracting Agency and shall be signed by the Bidder and the Surety. A proposal bond shall not be conditioned in any way to modify the minimum 5 percent required. The Surety shall: (1) be registered with the Washington State Insurance Commissioner, and (2) appear on the current Authorized Insurance List in the State of Washington published by the Office of the Insurance Commissioner. The failure to furnish a Bid deposit of a minimum of 5 percent with the Bid or as a physical supplement to the electronic Proposal Form shall make the Bid nonresponsive and shall cause the Bid to be rejected by the Contracting Agency

B. Bid bonds shall contain the following:

1. Contracting Agency-assigned number for the project;
2. Name of the project;
3. The Contracting Agency named as obligee;

4. The amount of the bid bond stated either as a dollar figure or as a percentage which represents five percent of the maximum bid amount that could be awarded;
5. Signature of the bidder's officer empowered to sign official statements. The signature of the person authorized to submit the bid should agree with the signature on the bond, and the title of the person must accompany the said signature;
6. The signature of the surety's officer empowered to sign the bond and the power of attorney.

C. If so stated in the Contract Provisions, bidder must use the bond form included in the Contract Provisions.

D. If so stated in the Contract Provisions, cash will not be accepted for a bid deposit.

~~0.03~~0.04 BID GUARANTEE

A. The Owner will return bid guarantees (other than bid bond) to unsuccessful bidders as soon as practicable, but not sooner than the execution of a contract with the successful bidder. The successful bidder's bid guarantee will be returned to the successful bidder with its official notice to proceed with the work of the contract.

B. The bidder will allow 60 calendar days from bid opening date for acceptance of its bid by the Owner. The bidder will return to the Owner a signed contract, insurance certificate and bond or bond waiver within 10 calendar days after receipt of the contract. If the apparent successful bidder fails to sign all contractual documents or provide the bond and insurance as required or return the documents within 10 days after receipt of the contract, the Owner may terminate the award of the contract.

C. After submitting a physical Bid Proposal to the Owner, the Bidder may withdraw, revise, or supplement it if:

1. The Bidder submits a written request signed by an authorized person and physically delivers it to the place designated for receipt of Bid Proposals, and

2. The Owner receives the request before the time set for receipt of Bid Proposals, and

3. The revised or supplemented Bid Proposal (if any) is received by the Owner before the time set for receipt of Bid Proposals.

If the Bidder's request to withdraw, revise, or supplement its Bid Proposal is received before the time set for receipt of Bid Proposals, the Owner will return the unopened Proposal package to the Bidder. The Bidder must then submit the revised or supplemented package in its entirety. If the Bidder does not submit a revised or supplemented package, then its bid shall be considered withdrawn. Late revised or

supplemented Bid Proposals or late withdrawal requests will be date recorded by the Owner and returned unopened. Mailed, Emailed, or faxed requests to withdraw, revise, or supplement a Bid Proposal are not acceptable.

D. In the event a bidder discovers an error in its bid following the bid opening, the bidder may request to withdraw its bid under the following conditions:

1. Written notification is received by the Owner within 24 hours following bid opening.

2. The bidder provides written documentation of the claimed error to the satisfaction of the Owner within 72 hours following the bid opening.

The Owner will approve or disapprove the request for withdrawal of the bid in writing. If the bidder's request for withdrawal of its bid is approved, the bidder will be released from further obligation to the Owner without penalty. If it is disapproved, the Owner may retain the bidder's bid guarantee.

~~0.04~~0.05 ADDITIVE BID ITEMS

The bid proposal for this contract requires the Bidder to bid Alternates as part of the bid. As such, the Bidder is required to submit a Base Bid and a bid for each of the identified Alternates. To be considered responsive, the Bidder shall submit a price on each and every Bid item included in the Base Bid and all Alternates.
The successful Bidder will be the Bidder submitting the lowest responsible Bid for the highest order Preference that is within the amount of available funds for the project. The following are listed in order from highest to lowest Preference:

1. Preference 1: Lowest total for Base Bid
2. Preference 2: Lowest total for Base Bid plus Alternate No. 1A
3. Preference 3: Lowest total for Base Bid plus Alternate No. 1A plus Alternate No. 1B

The Owner may, at their discretion, award a Contract for the Base Bid, without any additional Alternates, in the event that all Bids exceed the available funds. In any case, the award will be subject to the requirements of the award and execution of the contract identified in Section C, Construction Contract. The sum of the schedule(s) selected by the Owner will fix the awarded contract price and the amount of the contract bond.

~~0.05~~0.06 ACKNOWLEDGEMENT OF ADDENDA

Bidders shall acknowledge receipt of all addenda to this solicitation by identifying the addenda numbers in the space provided for this purpose on the bid proposal form. Failure to do so may result in the bid being declared non-responsive.

~~0.06~~0.07 SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK

The bidder acknowledges that it has taken steps necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to (1) conditions bearing upon transportation, disposal, handling, and storage of materials; (2) the availability of labor, water, electric power, and road; (3) uncertainties of weather, river stages, tides, or similar physical conditions at the site; (4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during the work. The bidder also acknowledges that it has satisfied itself as to character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including exploratory work done by the Owner, as well as from the drawings and specifications made a part of this contract. Any failure of the bidder to take the actions described and acknowledged in this paragraph will not relieve the bidder from responsibility for estimating properly the difficulty and cost of successfully performing the work.

~~0.07~~0.08 BID AMOUNTS

A. The bid prices shown for each item on the bid proposal shall include all labor, material, equipment, overhead and compensation to complete all of the work for that item.

B. The actual cost of building permit (only) and the public utility hookup fees will be a direct reimbursement to the Contractor or paid directly to the permitting agency by the Owner. Fees for these permits should not be included by the Bidder in the bid amount.

C. The Bidder agrees to hold the base bid prices for sixty (60) days from date of bid opening.

~~0.08~~0.09 TAXES

The bid amounts shall not include Washington State Sales Tax (WSST). All other taxes imposed by law shall be included in the bid amount. The Owner will include WSST in progress payments. The Contractor shall pay the WSST to the Department of Revenue and shall furnish proof of payment to the Owner if requested.

~~0.09~~0.10 SUBMISSION OF BIDS

A. Bid Proposals must be submitted on or before the time specified in the Advertisement for Bids.

B. The Bid Proposal shall be submitted to the City Clerk, Lacey, Washington in a sealed envelope addressed to the office specified in the Advertisement for Bids. The envelope shall have printed on the outside:

1. The project number and title: PW 2022-13, NEW POLICE STATION
2. The name and address of the bidder.
3. Identification as Bid Proposal.

C. Bids may be delivered in person to Lacey City Hall, 420 College Street SE, or by mail to City of Lacey, 420 College Street SE, Lacey, WA 98503.

D. If supplemental information is due after the Bid Proposal is due, the document(s) shall also be submitted to the City Clerk, Lacey, Washington in a sealed bid, endorsed upon the outside wrapper with NEW POLICE STATION and "SUPPLEMENTAL INFORMATION" added, or by e-mail to the e-mail address, ProjectAdmin@ci.lacey.wa.us with the subject "PW 2022-13 New Police Station – Supplemental Information". The City will not open or consider any "Supplemental Information" that is received after the time specified or received in a location other than that specified herein.

E. Prior to the bid opening, the Owner's representative will designate the official bid clock. Any part of the bid proposal or bid modification not received prior to the times specified, per the designated bid clock, will not be considered and the bid will be returned to the bidder unopened.

F. A bid may be withdrawn in person by a bidder's authorized representative before the opening of the bids. Bidder(s) representative will be required to show ID and sign on bid summary sheet before it will be released.

G. The City of Lacey is committed to offering reasonable accommodations to persons with disabilities. People with disabilities who wish to request special accommodation, (e.g., sign language interpreters, Braille, etc.) may contact the City Clerk at (360) 491-3212 at least ten (10) business days before the bid opening to discuss any special accommodations that may be necessary. Citizens with hearing impairment may call the TDD line at (800) 833-6388.

H. The Contracting Agency will not open or consider any Bid Proposal that is received after the time specified in the Advertisement for Bids for receipt of Bid Proposals, or received in a location other than that specified in the Advertisement for Bids. The Contracting Agency will not open or consider any "Supplemental Information" that is received after the time specified, or received in a location other than that specified in the Advertisement for Bids.

I. If an emergency or unanticipated event interrupts normal work processes of the Contracting Agency so that Proposals cannot be received at the office designated for receipt of bids, the time specified for receipt of the Proposal will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which the normal work processes of the Contracting Agency resume.

~~0.10~~0.11 BID RESULTS

A. Bids will be publicly opened via a live video stream. Links to the YouTube live video stream can be found at https://cityoflacey.org/rfp or under the specific project section and on the specific project page on the Builders Exchange website. The City will not open or consider any Bid Proposal that is received after the time specified or received in a location other than that specified in the Advertisement for Bids.

B. The right is reserved by the City to waive informalities in the bidding, accept a Proposal of the lowest responsible Bidder, reject any or all Bids, republish the Advertisement for Bids, revise or cancel the Work, or require the Work to be done in another way if the best interest of the City is served.

C. A Bidder who wishes to claim error after the Bids have been publicly opened and read as required by RCW 47.28.090 shall promptly notify the Contracting Agency that an error occurred. The Bidder shall submit a notarized affidavit or declaration under penalty of perjury signed by the Bidder and accompanied by the work sheets used in the preparation of the Bid, requesting relief from the responsibilities of Award. The affidavit or declaration shall describe the specific error(s) and certify that the work sheets are the ones used in preparing the Bid.

D. The affidavit or declaration shall be submitted no later than 5:00 p.m. on the first business day after Bid opening or the claim will not be considered. The Contracting Agency will review the affidavit or declaration and the certified work sheets to determine the validity of the claimed error and if the error is of the kind for which the law allows relief from forfeiture of the Bid deposit. If the Contracting Agency concurs in the claim of error and determines that the error is of the kind that allows relief from forfeiture, the Bidder will be relieved of responsibility and the Bid deposit of the Bidder will be returned. If the Contracting Agency does not concur in the error or determines that the error is not the kind for which the law allows relief, the Contracting Agency may Award the Contract and if the Bidder refuses to execute the Contract, the Bidder's Bid deposit shall be forfeited as required by RCW 47.28.100.

~~0.11~~0.12 LOW RESPONSIBLE BIDDER

A. The City does not pre-qualify Bidders. However, if the apparent low Bidder has not already been determined qualified, the City shall afford seven (7) calendar days after

notification for the low Bidder to provide evidence for evaluation, as to capability to perform the work. The evaluation will include consideration of experience, personnel, equipment, financial resources as well as performance record. The information must be sufficient to enable the Bidder to obtain the required qualification rating prior to the award of the contract.

B. A Bidder will be deemed not responsible if the Bidder does not meet the mandatory bidder responsibility criteria in RCW 39.04.350(1), as amended.

C. The Owner will verify that the Bidder meets the mandatory bidder responsibility criteria in RCW 39.04.350(1). To assess bidder responsibility, the Owner reserves the right to request documentation as needed from the Bidder and third parties concerning the Bidder's compliance with the mandatory bidder responsibility criteria.

D. If the Owner determines the Bidder does not meet the mandatory bidder responsibility criteria in RCW 39.04.350(1) and is therefore not a responsible Bidder, the Owner shall notify the Bidder in writing, with the reasons for its determination. If the Bidder disagrees with this determination, it may appeal the determination within two (2) business days of the Owner's determination by presenting its appeal and any additional information to the Owner. The Owner will consider the appeal and any additional information before issuing its final determination.

E. In addition to the mandatory bidder responsibility, the Owner may adopt relevant supplemental criteria for determining bidder responsibility applicable to a particular project which the bidder must meet (RCW 39.04.350 (2)).

1. At least ten (10) calendar days prior to the bid submittal deadline, a potential bidder may request that the Owner modify the supplemental responsibility criteria. The Owner will evaluate the information submitted by the potential bidder and respond before the bid submittal deadline. If the evaluation results in a change of the criteria, the Owner will issue an addendum to the bidding documents identifying the new criteria.
2. Upon Owner's request, the apparent low bidder must supply the requested responsibility information within two (2) business days of request by Owner. Withholding information or failure to submit all the information requested within the time provided may render the bid non-responsive.
3. If the Owner determines that the apparent low bidder is not responsible, the Owner will notify the bidder of its preliminary determination in writing.
4. The Owner will issue a Final Determination after reviewing information presented at the hearing.
5. If the Owner determines a bidder to be not responsible, the Owner will provide, in writing, the reasons for the determination. If the final determination affirms that the bidder is not responsible, the Owner will not execute a contract with any other

bidder until two (2) business days after the bidder determined to be not responsible has received the final determination.

~~0.12~~0.13 CONTRACT AWARD

A. After opening and reading proposals, the Owner will check them for correctness of extensions of the prices per unit and the total price. If a discrepancy exists between the price per unit and the extended amount of any bid item, the price per unit will control. If a minimum bid amount has been established for any item and the bidder's unit or lump sum price is less than the minimum specified amount, the Owner will unilaterally revise the unit or lump sum price, to the minimum specified amount and recalculate the extension. The total of extensions, corrected where necessary, including sales taxes where applicable and such additives and/or alternates as selected by the Owner, will be used by the Owner for award purposes and to fix the Awarded Contract Price amount and the amount of the contract bond.

1. A bid will be considered responsive if it meets the following requirements:
   a) It is received at the proper time and place.
   b) It meets the stated requirements of the bid proposal.
   c) It is submitted by a licensed/registered contractor within the state of Washington at the time of bid opening and is not banned from bidding by the Department of Labor and Industries.
   d) It is accompanied by a bid guarantee, if required.
   e) It meets the mandatory responsibility criteria established in RCW 39.04.350 and an overall accounting of the supplemental responsibility criteria established for the project.

2. A bid will be considered irregular and will be rejected if:
   a) The Proposal form is not properly executed.
   b) The Proposal does not include a unit price for every Bid item.
   c) The Bidder is not prequalified when so required.
   d) Receipt of Addenda is not acknowledged.
   e) The authorized Proposal form furnished by the Owner is not used or is altered.
   f) A member of a joint venture or partnership and the joint venture or partnership submit Proposals for the same project (in such an instance, both Bids may be rejected).
   g) The completed Proposal form contains any unauthorized additions, deletions, alternate Bids, or conditions.
   h) The Bidder adds provisions reserving the right to reject or accept the award, or enter into the Contract.
   i) A price per unit cannot be determined from the Bid Proposal.
   j) The Bidder fails to submit or properly complete a Subcontractor list.

k) More than one Proposal is submitted for the same project from a Bidder under the same or different names.

B. The Owner reserves the right to accept or reject any or all bid proposals and to waive informalities.

C. The Owner may negotiate bid price adjustments with the low responsive bidder, including changes in the contract documents, to bring the bid within the available funding per RCW 39.04.015.

D. The apparent low bidder, for purpose of award, shall be the responsive and responsible bidder offering the low aggregate amount for the base bid plus selected additive or deductive bid alternates and meeting all other bid submittal requirements.

E. The Contract will only become effective when signed by the Owner. Prior to the Owner's signature, any and all costs incurred shall be the sole responsibility of the bidder.

F. Within 3 business days of Award date, the successful Bidder shall provide the information necessary to execute the Contract to the Owner. The Bidder shall send the contact information, including the full name, email address, and phone number, for the authorized signer and bonding agent to the Owner.

G. Copies of the Contract Provisions, including the unsigned Form of Contract, will be available for signature by the successful bidder on the first business day following award. The number of copies to be executed by the Contractor will be determined by the Owner.

H. Until the Owner executes a contract, no proposal shall bind the Owner nor shall any work begin within the project limits or within Owner-furnished sites. The Contractor shall bear all risks for any work begun outside such areas and for any materials ordered before the contract is executed by the Owner.

I. If the bidder experiences circumstances beyond their control that prevents return of the contract documents within the calendar days after the award date stated above, the Owner may grant up to a maximum of 10 additional calendar days for return of the documents, provided the Owner deems the circumstances warrant it.

J. Before awarding any contract, the Owner may require one or more of these items or actions of the apparent lowest responsible bidder:

1. A complete statement of the origin, composition, and manufacture of any or all materials to be used,

2. Samples of these materials for quality and fitness tests,
3. A progress schedule (in a form the Owner requires) showing the order of and time required for the various phases of the work,
4. A breakdown of costs assigned to any bid item,
5. Attendance at a conference with the Architect or representatives of the Architect,
6. Obtain, and furnish a copy of, a business license to do business in the city or county where the work is located.
7. Any other information or action taken that is deemed necessary to ensure that the bidder is the lowest responsible bidder.

K. The successful bidder shall provide executed payment and performance bond(s) for the full contract amount. The bond may be a combined payment and performance bond; or be separate payment and performance bonds. In the case of separate payment and performance bonds, each shall be for the full contract amount. The bond(s) shall:

1. Be on Contracting Agency-furnished form(s);
2. Be signed by an approved surety (or sureties) that:
   a) Is registered with the Washington State Insurance Commissioner, and
   b) Appears on the current Authorized Insurance List in the State of Washington published by the Office of the Insurance Commissioner,
3. Guarantee that the Contractor will perform and comply with all obligations, duties, and conditions under the Contract, including but not limited to the duty and obligation to indemnify, defend, and protect the Contracting Agency against all losses and claims related directly or indirectly from any failure:
   a) Of the Contractor (or any of the employees, subcontractors, or lower tier subcontractors of the Contractor) to faithfully perform and comply with all contract obligations, conditions, and duties, or
   b) Of the Contractor (or the subcontractors or lower tier subcontractors of the Contractor) to pay all laborers, mechanics, subcontractors, lower tier subcontractors, material person, or any other person who provides supplies or provisions for carrying out the work;
4. Be conditioned upon the payment of taxes, increases, and penalties incurred on the project under titles 50, 51, and 82 RCW; and
5. Be accompanied by a power of attorney for the Surety's officer empowered to sign the bond; and
6. Be signed by an officer of the Contractor empowered to sign official statements (sole proprietor or partner). If the Contractor is a corporation, the bond(s) must be signed by the president or vice president, unless accompanied by written proof of the authority of the individual signing the bond(s) to bind the corporation (i.e., corporate resolution, power of attorney, or a letter to such effect signed by the president or vice president).

L. The Contracting Agency may require Sureties or Surety companies on the Contract Bond to appear and qualify themselves. Whenever the Contracting Agency deems the Surety or Sureties to be inadequate, it may, upon written demand, require the Contractor to furnish additional Surety to cover all remaining Work. Until the added Surety is furnished, payments on the Contract will stop.

M. All decisions made by the Contracting Agency regarding the Award and execution of the Contract or Bid rejection shall be conclusive subject to the scope of judicial review permitted under Washington Law. Such review, if any, shall be timely filed in the Superior Court of the county where the Contracting Agency headquarters is located, provided that where an action is asserted against a county, RCW 36.01.050 shall control venue and jurisdiction.

~~0.13~~0.14 CONTRACT PARTS (ATTACHED)

The contract to be executed as a result of this bid consists of multiple parts, all of which pertain as if fully attached hereto and Bidder shall consider all parts as a complete document. In the event of discrepancies between the various parts, precedent shall be in the following order:

1. Contract Form,
2. Addenda (if any),
3. Proposal Form,
4. Special Provisions,
5. Technical Specifications, if included,
6. Contract Plans,
7. WSDOT Standard Specifications for Road, Bridge, and Municipal Construction,
8. City of Lacey Development Guidelines and Public Works Standards, and
9. WSDOT Standard Plans for Road, Bridge and Municipal Construction

The Bidder is directed to complete and return the forms in Section B as a bid proposal.

BIDDER'S CHECKLIST

The bidder's attention is especially called to the following forms which must be executed in full as required, and submitted with the bid proposal:

1. Proposal: The bid must be shown in the space provided.
2. Proposal Signature Sheet: To be filled in and signed by the bidder. All addenda must be acknowledged.
3. Bid Deposit: Any bid shall be accompanied by a deposit of cash, certified check, cashier's check, or surety bond, in an amount equal to at least five percent (5%) of the total amount bid. Checks shall be payable to the City Clerk, City of Lacey, Washington.
4. If a surety bond is used, it shall be submitted on a form furnished by the Commission and signed by the bidder and his surety company. The sureties' "attorney-in-fact" must be registered with the Washington State Insurance Commissioner. The power of attorney must also be submitted with the bond.
5. Non-Collusion and Debarment Affidavit

The following form must be submitted within 1 hour following the bid submittal deadlines.

6. Subcontractors List

The following form must be submitted within 24 hours following the bid submittal deadlines.

7. Certification of Compliance with Wage Payment Statutes

The following must be submitted by 2:30 P.M. of the second business day following the bid submittal deadline:

8. Supplemental Criteria per B-11 Contractor Qualification Statement

The following must be completed before the contract can be awarded:

9. L&I training on the requirements related to public works and prevailing wages per RCW 39.04.350
10. Certification of Employment Security Department (ESD) good standing

The following forms are to be executed after the contract is awarded:

11. Contract: This agreement to be executed by the successful bidder
12. Performance and Payment Bond
13. Insurance Certificate

Bidder's Checklist

1.	Bid Proposal	
2.	Bid Proposal Signature Sheet Addenda Acknowledged	
3.	Bid Deposit Selection Form	
4.	Contractor's Bid Deposit Surety Bond Power of Attorney included if applicable	
5.	Non-Collusion and Debarment Affidavit	
6.	Subcontractor List	
7.	Certification of Compliance with Wage Payment Statutes	
8.	Supplemental Criteria Contractor Qualification Statement	
9.	L&I Training	
10.	ESD Certification	

SECTION 095426

SUSPENDED WOOD CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Wood-veneer, flat-panel ceilings.
2. Vertical wood slats ceiling. (Additive Alternate No.1D)

1.2 ADMINISTRATIVE REQUIREMENTS

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

B. Preinstallation Meeting: Conduct meeting at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product:
1. Wood-veneer, flat-panel ceilings.
2. Vertical wood slats ceiling. (Additive Alternate No.1D)
3. Manufacturer's installation instructions.

B. Shop Drawings: For suspended wood ceilings.
1. Include reflected ceiling plans, sections, and details, drawn to scale, showing the following:
a. Wood ceiling patterns and joints.
b. Ceiling suspension members.
c. Method of attaching hangers to building structure and locations of cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.
2. Indicate suspension system grid layout and related dimensions, junctions with other Work or ceiling finishes, and inter-relation of mechanical and electrical items related to ceiling system.
3. Indicated ceiling perimeter and penetrations through ceiling; trim, and moldings including the following:
a. Lighting fixtures, diffusers, speakers, sprinklers, and access panels.
4. Submit Shop Drawings that have been engineered and certified by professional engineer licensed in the State in which Project is located.
a. Include seal and signature of professional engineer on Shop Drawings.

C. Samples for Verification: For the following products:
1. Flat Panel Ceilings: 12 inch square Samples of each type, color, and finish.
2. Vertical Wood Slat ceiling: 12” long sample of each type, color and finish.
3. Sound absorbing glass-fiber board insulation: 12 inch square.

D. Delegated-Design Submittal: For design of seismic restraints and attachment devices, indicating compliance with performance and design criteria.
1. Include analysis data signed and sealed by qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For professional engineer indicating experience providing delegated-design engineering services of the kind indicated.
   1. Include documentation that engineer is licensed in state in which Project is located

B. Product Test Reports: For each wood panel ceiling and vertical wood slat ceiling, for tests performed by manufacturer and witnessed by qualified testing agency.

C. Evaluation Reports: For suspended-wood-ceiling framing systems, from ICC-ES.

1.5 CLOSEOUT SUBMITTALS

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

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Suspended-Wood-Ceiling Components: Quantity of each wood-ceiling unit, suspension-system component, accessory, and exposed molding and trim equal to 2 percent of quantity installed.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm that specializes in manufacturing of specified suspended wood ceiling systems and has been in standard production for a minimum of 3 years.

B. Installer Qualifications Company specializing in installing specified suspended wood ceiling systems with a minimum of 3 years documented experience and authorized and certified by manufacturer to install manufacturer's systems.

C. Delegated-Design Engineer Qualifications: Professional engineer experienced in providing delegated-design engineering services of the kind indicated and is legally qualified to practice in state where Project is located.

1.8 DELIVERY, STORAGE, AND HANDLING

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

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

1.9 FIELD CONDITIONS

A. Environmental Limitations: Do not install wood ceiling system until spaces are enclosed and weatherproof, wet Work in spaces is complete and dry, Work above ceilings is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
   1. Store and acclimatize wood products in spaces where they will be installed for a minimum of 72 hours immediately before ceiling installation. Remove plastic wrap to allow panels to climatize.
   2. The wood panels should not be installed in spaces where the temperature or humidity conditions vary from the temperatures and conditions that will be normal in the occupied space.

3. As interior finish products, the solid wood panels are designed for installation in temperature conditions between 50 degrees F and 86 degrees F, in spaces where the building is enclosed, and HVAC systems are functioning and will be in continuous operation. Relative humidity should not fall below 25 percent or exceed 55 percent.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of suspended wood ceiling system that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: 1 year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain each type of suspended wood ceiling system from single source from single manufacturer.

B. Source Limitations: Obtain each type of suspension system from single source from single manufacturer.

2.2 PERFORMANCE CRITERIA

A. Delegated-Design: Engage a qualified professional engineer, as defined in Section 013573 – Delegated-Design Procedures, to design seismic restraints and attachment devices for ceiling systems, including attachment to building construction.

B. Structural Performance: Exterior suspended wood ceilings shall withstand exterior exposure, effects of gravity loads, and the following loads and stresses without showing permanent deformation of ceiling system components or permanent damage to fasteners and anchors:
   1. Wind Load: Uniform pressure indicated on Drawings, acting inward or outward.

C. Seismic Design Criteria:
   1. Design lateral bracing to withstand effects of earthquake motions in compliance with requirements of ASCE 7, CISCA's "Guidelines for Seismic Restraint of Direct-Hung Suspended Ceiling Assemblies - Seismic Zones 3 & 4, and local jurisdiction for the following zones and categories:
      a. Zones: 3 and 4.
      b. Seismic Categories: D, E, and F.
   2. Seismic Separation Joints: Provide seismic separation joints where suspended ceiling areas exceed 2,500 sq. ft. using one of the following methods:
      a. Seismic Separation Joint Clips: As specified in this Section.
      b. Walls and Partitions: Extend walls and partitions a minimum of 6 inches above plane of suspension system grid and laterally brace to structure above.
      c. Soffits: Extend soffits at minimum to align with bottom plane of suspension system grid and laterally brace to structure above.
   3. Exemptions:
      a. Suspended ceiling areas less than or equal to 144 sq. ft. in area and surrounded by walls or partitions connected to structure above are exempt from seismic design requirements.
      b. Suspended ceiling areas less than 1,000 sq. ft. in area are exempt from lateral force bracing requirements.

D. Surface-Burning Characteristics: Comply with ASTM E84; testing by qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Flame-Spread Index: Class A according to ASTM E1264.

2. Flame-Spread Index: Class C according to ASTM E1264 (Add. Alt. 1D)
3. Smoke-Developed Index: 450 or less.

2.3 WOOD-VENEER, FLAT-PANEL CEILINGS

A. Wood Veneer Acoustical Panels (WSC-1): Manufacturer's standard panels consisting of wood veneer bonded to both faces of composite-wood core with concealed edges.
1. Basis-of-Design Product: Subject to compliance with requirements, provide the following:
a. Certainteed Architectural: Semi-Concealed Wood Panels, 5205.
b. Approved substitution from one of the following:
1) Armstrong World Industries, Inc.
2) Geometrik Manufacturing Inc.
3) USG Corporation.
2. Suspension System: SUSP-1.
3. Veneer Face Grade: Manufacturer's standard.
4. Veneer Species: Manufacturer's Plain Slice Maple (VMPO)
5. Veneer Cut: Manufacturer's standard.
6. Panel Perforation Pattern: Manufacturer's P3 pattern.
a. 6 mm round holes at 32 mm staggered.
7. Panel NRC Rating: Not less than 0.45 when tested in accordance with ASTM C423
8. Panel Size: 24 by 48 inch.
9. Panel Thickness: 3/4 inch.
10. Panel Edge Profile: Semi-concealed.
11. Panel Edge Banding and Trim: To match face veneer.
12. Factory Finish: Manufacturer's standard Patina (A).

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

2.4 VERTICAL WOOD SLAT CEILINGS (ADDITIVE ALTERNATE NO. 1D)

A. Vertical Wood Slat Ceiling (WSC-2): Manufacturer's standard panels consisting of solid wood (Poplar).
1. Basis-of-Design Product: Subject to compliance with requirements, provide the following:
a. Armstrong World Industries, Inc.: Woodworks Grille Tegular, Vertical Slats or approved equal.
2. Suspension System: SUSP-1.
3. Manufacturer’s standard Tinted, UV Topcoat Finishes on Solid Wood (Poplar)
a. Finish: Golden Maple (GGM).
4. Panel Installation Layout:
a. 15/16” Tegular Item No. 6723F51L4T5
5. Panel Size: 24 by 48 inch nominal.

B. Wood-Panel Accessories: Wood-panel manufacturer's accessories required to provide a complete installation of ceiling in accordance with manufacturer's written installation instructions.
1. Provide accessories in order to complete to full function integrated light connections as noted on Electrical Drawings, lighting PL2, PL3 and PL4.
a. Clip item 8171WGTTC02 for integrated lighting.

2.5 SUSPENSION SYSTEMS

A. Metal Suspension System, General: Acoustical ceiling manufacturer's standard, direct-hung, metal suspension systems and accessories, die-cut with interlocking components, and designated by type, structural classification, and finish indicated.
1. Material: ASTM C635 steel with G30 galvanized coating.

B. Attachment Devices: Size for 5 times design load indicated in ASTM C635, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

C. Wide-Face, Capped, Double-Web, Steel Suspension System (SUSP-1): Hot-dipped galvanized steel grid and cap.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Armstrong World Industries, Inc.: Prelude XL 15/16" Exposed Tee.
      b. CertainTeed Corp.: 15/16" EZ Stab Classic System.
      c. Rockfon: Chicago Metallic Snap-Grid 200 15/16" Exposed.
      d. USG Interiors, Inc.: Donn DX 15/16-inch Suspension System.
   2. Structural Classification: Heavy-duty system.
   3. Profile: Tee, 15/16 inch face width.
   4. End Condition of Cross Runners: Manufacturer's standard end conditions.
   5. Face Design: Flat, flush.
   6. Finish: Prepainted black unless indicated otherwise.

2.6 SUSPENSION-SYSTEM HANGERS, BRACES, AND TIES

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

B. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
   1. Zinc-Coated, Carbon-Steel Wire: ASTM A641, Class 1 zinc coating, soft temper.
   2. Size: Select wire diameter so its stress at 3 times hanger design load (ASTM C635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.108 inch diameter wire.

C. Flat Hangers and Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint; size and type to meet application, seismic, and ceiling flatness requirements.

D. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed with 0.04 inch thick, galvanized-steel sheet complying with ASTM A653, G90 coating designation; with bolted connections and 5/16 inch diameter bolts.

E. Seismic Stabilizer Bars: Grid-suspension-system manufacturer's standard perimeter stabilizers designed to accommodate seismic forces.

F. Seismic Struts: Suspension-system manufacturer's standard compression struts designed to accommodate seismic forces.

G. Accessories:
   1. Provide suspension system manufacturer's accessories that comply with performance requirements, including attachment devices, hangers, braces, and ties, hold down clips, impact clips, seismic accessories, and moldings.

2.7 SOUND ATTENUATION INSULATION

A. Sound Absorbing Glass-Fiber Board SA.INSUL-3: Specified in Section 098100 – Acoustical Insulation.
   1. Calla Square Lay-in panel 24" x 24" – Item 2820BK – NRC 0.85, CAC 35 or approved equal for Additive Alternate No. 1D.
      a. Color: Black

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing and substrates to which linear wood ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of linear wood ceilings.

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

3.2 PREPARATION

A. Before installation, condition interior architectural woodwork to humidity conditions in installation areas for not less than 72 hours prior to beginning of installation.

B. Measure each ceiling area and establish layout of suspended wood ceilings.
1. Comply with layout shown on Drawings.
2. Balance border widths at opposite edges of each ceiling.
3. Avoid using less-than-half-width or -length panels at borders.

3.3 INSTALLATION

3.4 INSTALLATION OF SUSPENDED WOOD CEILINGS

A. Comply with ASTM C636 and seismic requirements indicated, manufacturer's written instructions, and CISCA's "Ceiling Systems Handbook."

B. Suspend ceiling hangers from building's structural members and as follows:
1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
4. Secure wire hangers to ceiling-suspension members and to supports above with minimum of 3 tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
5. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
6. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
7. Do not attach hangers to steel deck tabs.
8. Do not attach hangers to steel roof deck. Attach hangers to structural members.
9. Space hangers not more than 48 inches on center along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
10. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

C. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

1. Screw-attach moldings to substrate at intervals not more than 16 inches on center and not more than 3 inches from ends, leveling with ceiling suspension system to tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.

D. Grid Suspension Systems: Space main beams at 48 inches on center.
1. Install cross tees to form modules sized in accordance with manufacturer's written installation instructions.
2. Remove and replace dented, bent, or kinked members.

E. Install wood components and accessories in accordance with manufacturer's written instructions and to accommodate natural expansion and contraction of wood products resulting from fluctuations in humidity.

F. Cut wood components for accurate fit at borders and at interruptions and penetrations by other work through ceilings.
1. Stiffen edges of cut wood components as required to eliminate variations in flatness.

G. Treat field-cut edges of wood components in accordance with manufacturer's written recommendations; finish exposed field cuts to match factory finish.
1. Wood-Veneer Units: Edge band exposed field-cut edges.

H. Install wood components in coordination with suspension system and moldings and trim.
1. Install wood components in patterns indicated on Drawings.

I. Install acoustical insulation above wood ceiling components fitting tightly between suspension system grid members.

3.5 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage qualified special inspector to perform the following special inspections:
1. Compliance of seismic design.

B. Acoustical panel ceiling hangers and anchors and fasteners will be considered defective if they do not pass tests and inspections.

3.6 ADJUSTING

A. Adjust sags or twists that develop in ceiling systems and replace materials which are damaged or faulty.

3.7 CLEANING

A. After completion of installation, clean exposed surfaces of ceilings, including trim and edge moldings.
1. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.
2. Remove and reinstall improperly installed material.
3. Remove ceiling components that cannot be successfully cleaned and repaired, to Architect’s satisfaction, to permanently eliminate evidence of damage, including dented units, and replace with new material.
4. Touch-up moderately damaged wood surfaces with same finish materials as in factory.

END OF SECTION 095426

SECTION 274116.29

LARGE CONFERENCE ROOMS AUDIO-VISUAL SYSTEMS

PART 1 - GENERAL

1.1 SCOPE AND RELATED DOCUMENTS

A. Furnish and install a complete Audio-Visual (AV) system as shown on the drawings and as specified herein.

B. This specification covers AV systems for Briefing Room 003, Command Conference Room 118, War Room 174, and CRI Sergent Conference Room 180. For simplicity these systems are referred to as Large Conference Room AV Systems. Refer to specifications and plans for variations in their layouts, parts, and exact requirements.

C. Provide the Training Room wireless microphone system, IP video endpoints, IP based control panel, back boxes, amplifiers, speakers, other devices mentioned in this specification or plans, input faceplates with all associated cabling and outlet and installation of the system as required for a complete and operating system.

D. Install OFCI monitors and monitor mounts. The general contractor shall provide all backing and supports as required for wall and ceiling/pendant monitor mounts. Coordinate exact location and weight requirements with Architect, Engineers, and Owner.

E. Submit All equipment, including wiring, cabling, and outlets furnished and installed under these specifications, shall be guaranteed for a period of one year from the date of final acceptance thereof against all electrical or mechanical defects or failures except that which can be proved to have been caused by misuse. All service and parts shall be provided during the first year by the contractor or their designated agent.

F. The system shall meet ALL of the requirements listed in Section 270000 Low Voltage Systems General Requirements PART 3 “Testing & Complete System Functionality”, prior to “Substantial Completion”.

G. Contractual information, guidelines, requirements, or other work specified to provide a fully functional system for Section 274116.29 includes but is not limited to the sections identified in Section 270000.

1.2 SYSTEM OPERATION

A. The AV system shall provide for the playing of owner provided computer video outputs. The video image shall be displayed on the screens via the owner provided monitors with audio playing over the overhead speakers. The AV system shall also function as a VOIP audio or web video teleconference system.

B. The AV System Control Panel shall control the power and input sources of the Monitor(s), as well as the connected AV equipment, such as the microphones, teleconference cameras, speakers, and cable tv boxes. Additionally, the system shall provide control of motorized shades and lighting presets where required.

C. All wall plates, jacks, cable and accessories shall be provided as required for a fully functional system.

D. A specific quantity of portable assisted listening “kits” shall be provided to comply with the 2010 revision to the Americans with Disabilities Act.

E. Integration to other Low Voltage systems:
   1. Motorized Shade Control:
      a. Provide the necessary cabling to the low voltage inputs of the motorized shade control module. The system's control panel shall be able to trigger an opening or closing of the shades.
   2. Lighting Preset Control:
      a. Provide the necessary cabling to the low voltage inputs of the lighting control module. The system's control panel shall be able to trigger the primary lighting presets for the room.
   3. Fire Alarm System Interface:
      a. The system's control I/O module's auxiliary inputs shall receive a relay closure such that in the event of a fire alarm event, the system's audio output shall be shunted.
   4. Owner's VOIP Network for Softphone integration
      a. Coordinate with the owner for network connection to the central processor for access to their VOIP phone network and assigning softphone extensions to each room for teleconferencing use via the AV system & AV touch screen control GUI.

F. System Programming:
   1. The system shall be controlled by a central processor.
   2. The contractor shall provide programming and configuration of the entire system. This includes, but is not limited to:
      a. GUI design/creation for the touch screen control panel(s)
      b. Preset creation on the control system
      c. Preset creation on the audio digital signal processor (DSP)
      d. Configuration and commissioning of the Dante network audio system
   3. Functions:
      a. The system touch screen control panel shall be programmed to do the following functions at a minimum:
         1) Adjust the volume levels of input sources
         2) Adjust the volume of far end conference audio sources
         3) Adjust master volume level & master mute
         4) Conference Camera modes (Recall PTZ presets & Auto Mode)
         5) TV/Monitor operation
         6) Video sources with live thumbnail video preview
            a) Configure GUI for Drag & Drop Source to Destination with live thumbnails of content
         7) Control of Cable TV Boxes
         8) Control of owner's VOIP Softphone
      b. The system touch screen control panel must be programmed to be password protected to protect the system from being manipulated unless authorized for operation.

1.3 QUALITY ASSURANCE

A. All major system components shall be supplied and installed by an authorized factory distributor. The Installing Contractor and manufacturer shall have furnished and installed similar sound systems continuously for no less than five years. The contractor must have at least two employees holding CTS-D or CTS-I certifications. The contractor must have at least one employee certified in QSC Qsys Level 1 and at least one employee certified in QSC Qsys Level 2. The contractor must have at least 1 employee certified in Audinate Dante Level 3. Submit proof of qualifications for bid and shop drawing submittals: proof of certifications, vendor qualifications, and proof of prior projects. Contract could be rejected if qualifications are not met.

B. All Audio-Visual and Audio Specification sections must be provided and installed by one vendor.

1.4 SUBMITTALS

A. Refer to “As-Built Drawings” for additional requirements.

B. Refer to Section 270000 Low Voltage Systems General Requirements, for additional data sheet submittal requirements and the shop drawing submittal requirements.

1.5 COORDINATION

A. Pre-Installation Project Kick-off Meeting. The Installing Contractor shall contact the Electrical Contractor for the purpose of confirming the actual date of and attending the Pre-Installation Project Kick-Off Meeting at the location selected by the Owner. This meeting shall take place PRIOR to Submittal of equipment data sheets. The Installing Contractor shall be responsible for providing the following items.
   1. Submitting a list of questions and their list of coordination items through the Construction Channels a minimum of 14 Days in advance of the meeting for Owner review.
   2. A sign in sheet (with the project name, Section number and title that the Installing Contractor is representing, date, time, location, the printed name of each person in attendance, their title, phone number, and email address).
   3. Be responsible for taking Meeting Minutes, typing them into a formal document, and distributing them via email to each attendee.
   4. The items discussed at the Pre-Installation project kick-off meeting shall include, but not be limited to:
   5. General location of Rack, assisted listening equipment, and other items.
   6. General questions about system operation, function, and programming.

B. Follow up documentation for the Pre-Installation Project Kick-Off Meeting. The purpose of this information is to illustrate to the Owners Representative that the information discussed during the Pre-Installation Project Kick-Off Meeting was understood by the Installing Contractor.
   1. Each of the above items and items discussed during the meeting shall be included in the Data Sheet Submittals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. See Section 270000 Low Voltage Systems General Requirements for additional information.

B. The System design, devices and/or wiring arrangement shown on the drawings represent that based on various equipment manufacturers.
   1. No substitutions are allowed.

C. Provide all equipment as defined in this specification and shown on the drawings.

D. Refer to PART 1 for any equipment that is not specifically defined.

2.2 CABLE TV BOX

A. The Cable TV box will be owner furnished contractor installed (OFCI). Install two (2) Comcast Model # to be determined.

B. Provide four (4) 1RU 19” universal rack shelves and rack mount in the IDF 216 rack.
   1. One (1) for each Large Conference Room AV System.

C. Mount Cable TV box and video encoder mentioned elsewhere in this specification to rack shelf listed elsewhere in this specification. Tie to and IP-to-IR control module listed elsewhere in this specification. Label device with designated room name/#, and corresponding video source label from system programming.
   1. Dedicate 1 cable tv feed to each room as the 5th video input source.

D. Utilize coaxial, copper patch cables and vertical/horizontal rack wire management as needed (Provided by 272000).

2.3 ETHERNET SWITCH

A. Briefing Room 003 rolling podium AV Ethernet / Network switch
   1. The network switch shall have 8x1G ports with 110W PoE+, 1x1G and 1xSFP uplink ports.
   2. The network switch shall be managed and configured as required for a fully functional AV system.
   3. The network switch shall be manufactured by Netgear, Model # AV Line M4250-9G1F-PoE+ (GSM4210PD).
      a. Provide one (1).
   4. Install in rolling presentation podium / lectern.
   5. Utilize copper patch cables and vertical/horizontal rack wire management as needed (Provided by 272000). Utilize building network outlets, CAT6 patch panels, and copper patch cords at the MDF/IDF rack (Provided by 272000).

B. AV edge Ethernet / Network switches in Command Conference Room 118, War Room 174, and CRI Sergent Conference Room 180
   1. The network switch shall have 8x1G ports with 110W PoE+, 1x1G and 1xSFP uplink ports.
   2. The network switch shall be managed and configured as required for a fully functional AV system.
   3. The network switch shall be manufactured by Netgear, Model # AV Line M4250-9G1F-PoE+ (GSM4210PD).
      a. Provide one (1) for each room.
   4. Install behind Primary display monitor.
   5. Utilize copper patch cables and vertical/horizontal rack wire management as needed (Provided by 272000). Utilize building network outlets, CAT6 patch panels, and copper patch cords at the MDF/IDF rack (Provided by 272000).

C. Main Building AV Ethernet / Network switches
   1. Utilize the network switch provided under specification 274116.62 in the MDF 186 & IDF 107 racks.

2.4 WIRELESS CASTING A/V STREAMING RECEIVER (OFCI) ETHERNET SWITCH

A. Wireless casting devices are owner furnished contractor installed (OFCI). Install quantities shown on plans. The owner's Streaming Receivers are planned to be:
   1. Apple TV for Mobile iOS & Mac OS devices. Connect to NV32 HDMI input 2.
   2. Microsoft Wireless Display Adapter for Android OS/Windows OS devices. Connect to NV32 HDMI input 3 & USB-A.

B. Where located in Podium Racks the contractor shall label and secure to a 19" rack shelf. Briefing Room 003.
   1. Provide a universal 1RU 19" rack shelf quantities as required.
   2. Provide wire management as required to route CAT6 and HDMI patch cables to encoders and network switch.
   3. Patch cables shall be labelled.
   4. Provide HDMI 2.1 Male-Male and Female-Male patch cords as required.
   5. Provide USB Type A Female-Male patch cords as required.

6. Utilize gray copper patch cables as needed (Provided by 272000).

C. Where located at the Display the contractor shall label and secure to the rear of the TV with the owner provided mounts. Command Conference Room 118, War Room 174, and CRI Sergent Conference Room 180.
   1. Provide wire management as required to route CAT6, USB, and HDMI patch cables to encoders and network switch.
   2. Patch cables shall be labelled.
   3. Provide HDMI 2.1 Male-Male and Female-Male patch cords as required.
   4. Utilize gray copper patch cables as needed (Provided by 272000).

2.5 DIGITAL SIGNAL PROCESSOR & CONTROLLER

A. Utilize the central system processor and controller provided under specification 274116.62.

B. Under the scope of work for this specification, provide the additional set-up & programming for the AV Systems as required for complete and fully function systems. For Briefing Room 003, Command Conference Room 118, War Room 174, and CRI Sergent Conference Room 180.

2.6 AMPLIFIER

A. The power amplifier shall be a two-channel network-processing device that is designed to operate exclusively with a QSC Q-SYS ecosystem on a Gigabit Ethernet network. The amplifier shall be powered by a universal switch-mode power supply that supports operation at any AC voltage from 100 to 240 V at 50 or 60 Hz. The power supply shall have power factor correction (PFC) to make the current flow nearly sinusoidal and analogous to the voltage waveform. The amplifier shall offer power save mode to automatically reduce AC power consumption during idle time. The amplifier shall be convection cooled, with the vents at the rear, the side and the front.

B. The amplifier shall utilize a class D output circuit topology with two individual channels providing up to 120 watts total rated power. The amplifier shall be configurable via Q-SYS, including arranging the output channels as single units as well as in bridged, Hi-Z 100V and Hi-Z 70V combinations. When in bridged and Hi-Z mode, the loudspeaker cables shall be connected to adjacent channels + and – outputs. The amplifier's audio signals shall originate in the Q-SYS ecosystem and shall also be configurable in Q-SYS Designer Software (QDS).

C. The power amplifier shall have two flex channels that can be configured as either analog mic/line audio inputs or line level outputs that stream digital audio data into/from the Q-SYS ecosystem in the form of Q-LAN data delivered via the network port. The impedance of each input shall be greater than 10 kΩ balanced or 5 kΩ unbalanced.

D. The power amplifier shall meet the following performance criteria: typical distortion (into 8 ohm loads) of 0.07% to 0.1%; maximum distortion (4 to 8 ohms) of no worse than 1%; a frequency response (into an 8 ohm load) from 20 Hz to 20 kHz at +0.2/-0.8 dB; Signal to Noise Ratio> -100 dB.

E. Channel muting and gain shall be controllable via the Q-SYS ecosystem. The amplifier shall indicate network status and monitoring, including faults.

F. The amplifier shall have output load monitoring on each output. The load monitor shall have the range to detect and calculate impedance of conditions including short circuits, low impedance loudspeakers, and lightly loaded 70 V and 100 V lines. The load monitor shall report the calculated load impedance on each channel via the Q-SYS network. The amplifier front panel shall feature Power LED, Fault LED and Individual Channels Signal and Limit/Protect LEDs. The front panel shall also feature one ID button to identify the product in QDS.

G. The amplifier rear panel shall feature a single RJ-45 jack for connecting to the Q-LAN network, enabling integration into the Q-SYS ecosystem for bi-directional passage of digital audio, control signals, and status monitoring data. The rear panel shall provide one blue 6-pin 3.5mm Euro connector for the Flex Channels and one green 4-pin 5mm Euro connector for loudspeaker cable connection. The amplifier rear panel shall also provide one black 6-pin 3.5mm Euro connector for four GPIO pins, one 3.3V Power pin and one Ground pin that extend Q-SYS control to or from external devices.

H. The amplifier shall be 1.75 in (44 mm) high, 8.7 in (221 mm) wide, and 11.25 in (286 mm) deep. The amplifier shall have a net weight of 6.2 lb (2.81 kg).

I. The multi-channel system-processing amplifier shall be the QSC Q-SYS SPA-Qf 60x2.

J. The multi-channel amplifier shall be manufactured by QSC Model # SPA-Qf 60x2.
1. Provide four (4) – one per each room.
2. Mount behind the primary display monitor.
3. Utilize gray copper patch cables as needed (Provided by 272000).

2.7 SPEAKERS

A. The ceiling mount 2-way co-axial system shall incorporate a 6.5-inch woofer with treated-paper cone and a 19 mm aluminum dome tweeter. The tweeter shall be mounted coaxially in front of the woofer on a waveguide that matches the directivity of the two drivers at the crossover point.

B. The system shall meet the following performance criteria: conical coverage angle of 140 degrees; frequency response of 65 Hz to 20 kHz +0/-10 dB, measured on axis; sensitivity of 87 dB SPL in half space at 1 meter with an input of 4 V rms; maximum continuous output of 106 dB SPL; maximum peak output of 112 dB SPL on axis at 1 meter; power handling of 60 watts for 8 hours with an IEC noise signal; recommended amplifier power of 120 watts; nominal impedance of 16 ohms.

C. The loudspeaker shall have a switchable low-distortion, wide-bandwidth laminated core transformer with taps for 60, 30, 15, and 7.5 watts at 70V and 60, 30, and 15 watts at 100V. The system shall be switchable between 16Ω (bypass) and constant-voltage operation.

D. The loudspeaker shall have a low-profile powder coated steel back can. The baffle and the grille shall have a white paintable finish (RAL 9010) with UV inhibitors to prevent discoloration. The enclosure shall retain the grille magnetically. Any logo on the grille shall be removable without leaving a blemish.

E. The loudspeaker shall have a double-stepped long-travel dog-ear blind mounting system that can capture ceiling thicknesses from 0 to 2.25 in. The conduit cover plate shall be removable, retained by a captive Phillips head screw. A mud ring shall be provided to allow pre-installation wiring. The loudspeaker connections shall be a locking 4-pole Euro-block that accepts four 18 AWG wire pairs.

F. The loudspeaker shall be listed as safe for use in air-handling spaces under UL1480 and UL2043. The loudspeaker shall meet or exceed IP-34 for ingress protection; it shall meet the IEC 60529 IP-X3 splash rating. The switchable transformer shall be listed under UL1876. The baffle shall meet UL94-V0 and UL94-5VB flammability ratings and shall comply with IEC60849/EN60849 safety standards.

G. The loudspeaker's enclosure shall be 3.95 in (10.0 cm) high and 13.39 in (34.0 cm) in diameter. The loudspeaker shall weigh no more than 9.3 lb (4.2 kg).

H. The ceiling mount 2-way co-axial system shall be manufactured by QSC Model # AD-C6T-LP.
1. Provide quantities as shown on floor plans.
2. Speakers shall be white. Prior to ordering confirm color with Architect.

3. Install in ACT ceiling with provided C- ring & tile rail accessories per manufacturer's instructions.
4. Wire the speakers in split zones with 70-volt groups not exceeding 80% of each channel's wattage.

2.8 CONTROL PANELS (CP1)

A. Provide a touch screen control panel for overall control of the AV system.

B. The panel shall at a minimum have a 7" TFT active matrix color LCD display.

C. The panel will be IP controllable with a 10/100Base-T NIC and powered by PoE 802.3af.

D. See 1.02 System Operation elsewhere in this specification for control panel functions.

E. The control panel shall be manufactured by QSC, model # TSC-70-G3 & TSC-710t-G3 Tabletop Mount.
1. Provide four (4) each – one set for each room.

F. Where located on Podium Rack the contractor shall label and secure to the top of the podium after all owner equipment is provided for podium device mockup and approval. Briefing Room 003.
1. Provide wire management as required to route CAT6 cable to network switch.
2. Patch cables shall be labelled.
3. Utilize gray copper patch cables as needed (Provided by 272000).

G. Where located on Conference Room Table the contractor shall label and set on top of the table. Command Conference Room 118, War Room 174, and CRI Sergent Conference Room 180
1. Provide wire management as required to route CAT6 cable to floor box switch.
2. Patch cables shall be labelled.
3. Utilize gray copper patch cables as needed (Provided by 272000).

2.9 SYSTEM PROCESSOR EXPANDER I/O MODULES

A. NETWORK (IP) to Control I/O
1. The peripheral shall provide eight (8) general-purpose inputs and eight (8) general-purpose outputs that are remotely configurable, providing an interface for LED indicators, switches, relays, potentiometers, and custom or third party controls to the peripheral. The collection of inputs and outputs shall have an individual +12 VDC terminal (up to 100mA available for each type, protected by a self-resetting fuse) and ground reference for use with potentiometers (input), relay coils and LEDs (output), or other purposes. Inputs and outputs shall be independently configurable from the system processor. The peripheral shall operate natively on a standard gigabit Ethernet infrastructure available from a broad range of network infrastructure manufacturers and shall support 802.1x authentication.
2. The peripheral shall operate on PoE or DC power input and have the following front panel controls and indicators: Unit ID button, green ID LED, and blue Power LED. A web interface shall provide basic network and security configuration, status, and log retrieval. The peripheral shall be natively integrated into Q-SYS Designer Software for network discovery, real-time configuration, control, monitoring, and supervision.
3. The peripheral's rear panel shall provide two 2-pin power Euroblock connectors for daisy-chainable DC power, eight (8) general-purpose inputs and eight (8) general-purpose outputs on a dual-row 20-pin Euroblock connector with individual +12 VDC and ground pins, a recessed settings reset button, and two (2) RJ45 connectors for daisy-chainable Ethernet configured as Q-SYS Network ports: one (1) PoE port, RJ45 1000 Mbps only; one (1) Pass-thru port, RJ45 1000 Mbps only.

4. The peripheral shall feature multiple mounting options including a standard 19-inch rack or surfaces such as under-table or on-wall. It shall be one-quarter (1/4) rack space wide and less than one (1) rack unit tall (1.59 inches / 4.04 cm), allowing mounting alongside quarter-rack width QSC Q-SYS QIO peripherals using an optional rack tray kit. The peripheral shall include two (2) reversible steel angle brackets for surface mounting.
5. The peripheral dimensions shall be 1.59" x 4.25" x 5.5" (4.04cm x 10.80cm x 13.97cm).
6. The peripheral shall be manufactured by QSC Model # QIO-GP8x8.
    a. Provide two (2) for shade control and lighting control interface and locate one in MDF 186 and one in IDF 216 Rack.
    b. Interconnect with multi-conductor cabling as required to trigger shade open & closed states.
    c. Interconnect with multi-conductor cabling as required to trigger lighting preset states.

B. NETWORK (IP) to IR Infrared Control
1. The peripheral shall provide one input port and four output ports that are remotely configurable, providing an interface for off-the-shelf IR receivers and emitters. The peripheral shall include a power pin for external receivers and a local activity LED for each output. The peripheral shall provide access to an extensive collection of IR codes that is accurate and maintained while permitting the reception, storage, and routing of additional IR codes. Output ports shall also support RS-232, transmit-only. All ports shall be independently configurable from the system processor. The peripheral shall operate natively on a standard gigabit Ethernet infrastructure available from a broad range of network infrastructure manufacturers and shall support 802.1x authentication.
2. The peripheral shall operate on PoE or DC power input and have the following front panel controls and indicators: Unit ID button, green ID LED, and blue Power LED. A web interface shall provide basic network and security configuration, status, and log retrieval. The peripheral shall be natively integrated into Q-SYS Designer Software for network discovery, real-time configuration, control, monitoring, and supervision.
3. The peripheral's rear panel shall provide two 2-pin power Euroblock connectors for daisy-chainable DC power, a 3-pin Euroblock connector for IR input, a dual-row 8-pin Euroblock connector for IR output, four red IR activity LEDs, a recessed settings reset button, and two RJ45 connectors for daisy-chainable Ethernet configured as Q-SYS Network ports: one PoE port, RJ45 1000 Mbps only; one Pass-thru port, RJ45 1000 Mbps only.
4. The peripheral shall feature multiple mounting options including a standard 19-inch rack or surfaces such as under-table or on-wall. It shall be one-quarter (1/4) rack space wide and less than one rack unit tall (1.59 inches / 4.04 cm), allowing mounting alongside quarter-rack width QSC Q-SYS QIO peripherals using an optional rack tray kit. The peripheral shall include two reversible steel angle brackets for surface mounting.
5. The peripheral dimensions shall be 1.59" x 4.25" x 5.5" (4.04cm x 10.80cm x 13.97cm).
6. The peripheral shall be manufactured by QSC Model # QIO-IR1x4.
    a. Provide one (1) for IR Infrared control of Cable TV Set Boxes and locate in MDF 186 Rack.
    b. Provide IR Emitters as required for the OFCI Cable TV devices listed elsewhere in this specification.

C. Label all devices and patch cords.

D. Provide 19" Rack Mount Bracket manufactured by QSC model # QIO-RMK.

E. Provide and install devices as shown on the drawings.

F. Provide required wiring and coordinate with all trades required for a complete and fully functional system.

2.10 NETWORK VIDEO ENDPOINT (3-IN / 2-OUT)

A. The network video endpoint shall be a component in a distribution system that routes 4K60 4:4:4 video over a Gigabit Ethernet network. It shall use Q-SYS Shift data compression to ensure highest quality with very low latency. The endpoint shall have three HDMI 2.0 Inputs and two HDMI 2.0 outputs and shall be fully compliant with HDCP 1.4 and 2.2. It shall also shall support AV bridging with QSC Q-SYS PTZ-12x72 and PTZ-20x60 cameras. It shall also have an RJ45 network port with Power over Ethernet (802.3bt) compatibility.

B. The network video endpoint shall natively route audio data through a QSC Q-SYS network without needing to use AES67 or the Q-SYS Media Stream Receiver. Its sound card-level stereo analog audio inputs and outputs shall be on 3.5 mm TRS connectors. It shall function as a transmitter or as a receiver, depending on the configuration by the user.

C. The network video endpoint shall be mountable in a standard AV rack or on a surface. It shall be a half rack space wide and one rack unit (1.75 inch) tall, allowing it to be mounted beside other half-rack equipment such as the Q-SYS I/O-8 Flex and QSC SPA Series power amplifiers.

D. The network video endpoint shall be powered by a 48-volt external power supply or through the network port using Power over Ethernet.

E. The network video endpoint shall be manufactured by QSC Model # NV-32-H.
   1. Provide four (4) – one per room.

F. Where located in Podium Rack - Briefing Room 003:
   1. Configure as a Peripheral Mode Encoder.
   2. Connect HDMI Output 1 to the OFCI computer monitor on the rolling presentation podium.
   3. Rack mount in rolling presentation podium with included hardware.
   4. Provide HDMI 2.1 patch cords as required.
   5. Provide USB USB3.0 A/B patch cords as required.
   6. Provide one (1) PoE++ Power Injector (IEEE 802.3bt Type 4) or External 48VDC 1.5A output plug-in 120VAC input power supply.
   7. Utilize gray copper patch cables as needed (Provided by 272000).

G. Where located at the Display - Command Conference Room 118, War Room 174, and CRI Sergent Conference Room 180:
   1. Configure as a Peripheral Mode Decoder.
   2. Connect HDMI Output 1 to the primary display monitor.
   3. Mount behind TV on bracket. Manufactured by Chief Model # PAC251.
      a. Provide three (3) – one per room .
   4. Provide HDMI 2.1 patch cords as required.
   5. Provide USB USB3.0 A/B patch cords as required.
   6. Provide one (1) PoE++ Power Injector (IEEE 802.3bt Type 4) or External 48VDC 1.5A output plug-in 120VAC input power supply.
   7. Utilize gray copper patch cables as needed (Provided by 272000).

2.11 NETWORK VIDEO ENDPOINT (2-IN / 1-OUT)

A. The network video endpoint shall have one HDMI 2.0 input, one USB-C input, and one HDMI 2.0 output. The endpoint must support video distribution for formats up to 3840x2160p60 4:4:4 from both HDMI and USB-C inputs. The USB-C input of the network video endpoint shall support a single connection for audio and video distribution through USB-C alt-mode DisplayPort, bridging audio and video signals to an application on the host via UAC/UVC, and USB-C PD (power delivery) of up to 65 Watts shall be available for device charging. The endpoint shall support Consumer Electronic Control (CEC) of connected devices on the HDMI Output. The endpoint shall support USB HID signal routing between hosts and devices.

B. The network video endpoint shall be user configurable to be either a transmitter (encoder) or receiver (decoder). The network video endpoint shall use Q-SYS Shift data compression to ensure high-quality and low-latency network video transport of video formats up to and including 3840x2160p60 with 4:4:4 chroma sampling. It shall support HDCP 1.4 & 2.3 and encrypt video transmission on the network. The HDMI 2.0 output must scale incoming content from the network and local input connections.

C. The endpoint shall be powered by an external 12V DC 9 A auxiliary power supply or via PoE Type 3, Class 5 (40w at PD, 45W at PSE) from a capable network switch or midspan injector. It is acceptable for an auxiliary power supply to be required if device charging is needed.

D. The network video endpoint shall operate natively on a standard gigabit Ethernet infrastructure available from a broad range of network infrastructure manufacturers, employing DiffServe quality of service (QoS), IGMP, IEEE 1588-2008 (PTPv2) precision time protocol, UDP/IP audio, and video transport with floating point format audio data representation. The endpoint shall support 802.1x authentication. The endpoint shall communicate with the system audio processor without needing AES67, Dante, or Media Stream receiver components.

E. The network endpoint shall measure 7.3 x 5.2 x 1.2 in (185 x 131.5 x 30.5 mm).

F. The network video endpoint shall be manufactured by Q-SYS Model # NV-21-HU.
   1. Provide fifteen (15)
      a. Rack mount one (1) – one per each rolling presentation podium with included hardware and configure as an encoder. Connect to owner's Laptop docking station model TBD as the 4th video source in the room.
      b. Rack mount four (4) at the MDF 186 rack next to Comcast Cable TV boxes and configure as an encoder.
      c. Surface mount three (3) to the inside of the TechPed of each conference table and configure as a encoder.
      d. Surface mount seven (7) to the rear of each display monitor and configure as a decoder.
   2. Provide HDMI 2.1 patch cords as required.
   3. Provide USB USB-C patch cords as required at the podium. The USB-C cable shall be able to transmit data and device charging power of 65 watts minimum.
   4. Provide four (4) power supplies manufactured by QSC Model #NV-21-PSU - one for each podium or conference table encoder location.
   5. Provide seven (7) rear TV Monitor mounts for video decoders manufactured by Chief Model # PAC251.
   6. Utilize gray copper patch cables as needed (Provided by 272000).

2.12 IN-ROOM PC / COMPUTER

A. The in-room PC / computer and wireless mouse/keyboard shall be owner furnished and owner installed with the exception that the contractor is required to mount the computer to the rack shelf and assist with the connection of patch cables with cable management.

B. The in-room PC / computer will be Lenovo ThinkCentre Tiny model. Four will be provided – one for each podium / lectern or TV location as shown on plans.

C. Provide one (1) 1RU 19" universal rack shelf and rack mount in the rolling presentation podium rack – Briefing Room 003.

D. Connect to each NV32 HDMI input 1.

2.13 SURGE SUPPRESSORS/POWER CONDITIONERS

A. Rack Mount Type:
1. The AV system shall have a 1U rack-mountable surge suppression unit. It shall be capable of a 15 AMP load at 120 volts.
2. The unit shall also be capable of remote turn-on with a contact closure.
3. The surge suppressor shall be manufactured by Juice Goose, model # CQ-1515-RX.
   a. Provide one (1) – one at each podium / lectern.
   b. Rack mount in the rolling presentation podium.
   c. The surge protector shall be connected to a dedicated 15A circuit, provided at the rear of the rack location or in the floor box.

2.14 ROLLING PRESENTATION PODIUM / LECTERN

A. The EIA Compliant 19” AV Lectern shall be Middle Atlantic Products model # L5-TURFR-43LDW. AV Lectern shall be available in 23”, 33”, or 43” widths, with 1 or 2 rack bays and a storage area, depending on model (refer to chart).

B. Overall dimensions shall be 39” H x 43” W x 31” D (refer to chart). Usable height shall be 12 rack spaces per bay. AV Lectern frames shall ship fully assembled and be constructed of steel. Total weight capacity with Middle Atlantic finishing kit shall be provided by Middle Atlantic per the specific configuration.

C. Each rack bay shall come equipped with 1 pair of 11-gauge steel rack rail tapped with 10-32 mounting holes in universal EIA spacing, black e-coat finish and numbered rack spaces.

D. AV Lectern rack shall have 1 70 CFM thermostatically controlled fans per bay. AV Lectern shall have a slide-out keyboard shelf, 38.56” W x 2.25” H x 12.06” D. AV Lectern shall have a side shelf with a useable area of 20.93” W x 7.49” H x 7.56” D.

E. Thermostatically controlled fans shall be powered on at 87°F and turn off at 85°F. AV Lectern shall include a 15 Amp, 8 outlet surge-protected power strip with a 10’ cord.

F. Models with turret shall have customizable Presenter’s Panel, which can accept touchscreens and other panel mounted devices with an overall size of __”H x __”W x __8.31” D (refer to chart).

G. Models with turret shall include connectivity panel with two 15 Amp outlets, two type A USB USBs and AVIP device plates that support SVGA, HDMI, 3.5mm stereo, CAT 5/6 and USB.

H. AV Lectern shall have venting on the top. AV Lectern shall be finished in a durable black powder coat.

I. Finishing kit shall ship separately from rack, be available in a Sota or Klasik style and be model # L5-__K-__ (design online at LegrandAV.com), and secured to the Lectern. Top, sides and front doors shall be available in Veneer, High Pressure Laminate materials, visit LegrandAV. com for list of available finishes. **Confirm exact finish material kit and color with architect prior to ordering lectern.**

J. AV Lectern rack shall include 4 fine floor casters.

K. AV Lectern rack shall comply with the requirements of RoHS EU Directive 2011/96/EU.

L. AV Lectern rack shall be manufactured by an ISO 9001 and ISO 14001 registered company.

M. AV Lectern frame shall be warranted to be free from defects in material or workmanship under normal use and conditions for the lifetime of the rack, fans shall be warrantied for a period of three years.

N. Provide one (1) Podium / Lectern – for Briefing Room 003.
   1. Provide nylon snakeskin cable management between the rack and the floor box for the bundle of power and data.
   2. Designate one podium as the master controller & room source for when rooms are combined into 1 presentation & training room.

O. The storage drawer shall be 2RU and manufactured by Middle Atlantic Model # UD2 or equal.
   1. Provide One (1) reserve for presentation material storage such as patch cords, white board markers, etc – one for the podium / lectern in Briefing Room 003.

2.15 CONFERENCE ROOM TABLE CABLE & EQUIPMENT PEDESTAL

A. Equipment pedestal is only required in rooms with a conference room table - Command Conference Room 118, War Room 174, and CRI Sergent Conference Room 180.

B. TechPed™ steel frame shall be 25.58”H x 13.25” W x 18.25”D (refer to chart).

C. TechPed™ Series shall be adjustable from 26 ½” to 29 ½” in overall height.

D. TechPed™ Series shall be constructed of welded steel, with a maximum weight capacity of 400 lbs. per pedestal.

E. TechPed™ Series shall be coated with a fingerprint resistant textured black powder coat.

F. TechPed™ Series shall provide passive ventilation.

G. TechPed™ Series shall have provisions for electronics mounting and cable management, using included Lever Lock™ cable management accessories (one 10” wide vertical panel, two .8” wide vertical panels and one 1.94” wide vertical panel included).

H. TechPed™ Series shall include a 4 rackspace mounting area.

I. TechPed™ Series shall accommodate vertical power strips, 15.5” or less in height.

J. TechPed™ Series finishing kit TP-K13__ (refer to chart) shall be constructed of 3/4” triple refined MDF and be easily removable for installation and servicing. Finishing kit shall be available in a thermolaminate material, visit middleatlantic.com for list of available finishes. **Confirm exact finish material kit and color with architect prior to ordering lectern.**

K. TechPed™ Series and all components shall be GREENGUARD Gold Certified.

L. TechPed™ Series shall be manufactured by an ISO 9001 and ISO 14001 registered company. Steel Components shall be warrantied to be free from defects in material or workmanship under normal use and conditions for the lifetime of the product. Thermolaminate components shall be warrantied to be free from defects in material or workmanship under normal use and conditions for a period of 7 years.

M. The Conference Table Support System shall be manufactured by Middle Atlantic Products Model # TechPed™ series, model # TP-F1318.
   1. Provide three (3) – one for each room listed above.

2.16 FLAT PANEL MONITORS & MOUNTS

A. Provided by the owner and installed by the Contractor.

B. See floor plans and AV Detail sheets for exact quantities and locations.

C. Coordinate with engineers and the owner for exact make and model of display. Anticipated models are LG UR340C or UH5F-H commercial series displays.

D. Coordinate with engineers and the owner for exact make and model of display mounts. Anticipated models are Chief PNR & PDR series Articulating / Swivel / Tilt mounts with Chief PSBU series VESA bracket. Mounted directly over the recessed back box / wall monitor equipment enclosure listed elsewhere in this specification.

E. The general contractor shall provide in-wall backing/blocking to support up to 500lbs or more at each Monitor / Display / TV mounting location.

2.17 WALL MONITOR EQUIPMENT ENCLOSURE

A. The wall monitor equipment enclosure shall be provided by the AV contractor and installed by Division 26.

B. Provide one (1) per Monitor or Information Display location. See floor plans for exact quantities and locations.
   1. Provide one (1) Chief wall enclosure model # CHIEF PAC526FWP6 14”x14” with 16”x16” flange (white).
   2. Locate power and data outlets in the monitor back box.
   3. At locations that are rough-in only (future monitor) provide blank cover (white).

2.18 COMMUNITY ROOM MICROPHONE SYSTEM

A. Wireless Microphones:
   1. Wireless microphones are only required in Briefing Room 003. Provide a complete wireless microphone system to include charging stations and all associated cabling. Coordinate the microphone operating frequencies with the receiver frequencies.
   2. The frequency-agile FM wireless microphone system shall consist of a receiver and the appropriate transmitter, and shall operate in the UHF bands of 470.125–529.975 MHz or 530.000–589.975 MHz. The frequency-agile FM wireless receiver shall be all-metal and shall provide an automatic scanning function to select appropriate local usable channels for proper wireless system operation. It shall be a True Diversity receiver with two independent internal receiver sections, automatically selecting the highest quality signal for the receiver’s output. All receiver settings shall be adjusted by using a control dial and BACK button on the receiver’s front panel. The system will be equipped with an advanced pilot tone digital identification system to ensure that the desired wireless transmitter allows the receiver to be unmuted, reducing noise from unwanted signals. The receiver shall have an IR sync window on the front panel to sync settings with transmitters. It shall also have a dual-mode front panel display that switches between a standard view, which provides continuous indication of RF signal strength, frequency, mute status, audio modulation level of the received signal and other transmitter information, and a performance view, which highlights key metering. The receiver shall have a rear panel selector to lift the ground connection from pin 1 of the XLR-type output connector to prevent ground loops. The receiver shall be able to be powered by 12V DC 1A. Antennas shall be located on the rear of the receiver and shall incorporate standard BNC-type connectors to allow them to be detached from the receiver to facilitate the receiver being used with external antennas or antenna distribution devices. Switchable 12V DC power shall be provided on the BNC-type connectors. An accessory bracket should allow for the antennas to be located at the front of the receiver. The receiver can be rack-mounted singly or in pairs in a single rack space. The receiver’s design shall provide totally silent audio output mute when the wireless transmitter is turned off or the signal is lost. The wireless receiver and the supplied metal rack-mounting brackets shall be industrial black.

3. The frequency-agile FM wireless body-pack transmitter shall have microphone and instrument level inputs. It shall provide DC voltage to power microphones requiring DC bias. The body-pack transmitter shall be part of a wireless microphone system operating in the bands of 470.125–529.975 MHz or 530.000–589.975 MHz. The body-pack transmitter shall have a reversible clip allowing for up or down cable entry. The transmitter shall have a screw-down 4-pin connector and a viewable fuel gauge to indicate the remaining battery life. Frequencies shall be selected using the transmitter's soft-touch controls. The transmitter shall also be equipped with a multifunction button that can be programmed to perform one of two functions when pressed and held: turn off RF transmission or switch to a preselected backup frequency. (The multifunction button can also be disabled.) The device shall have a dual-color LED that illuminates green when the power is on and illuminates red when the transmitter is muted or battery power is low. There shall be an adjustment to allow input gain changes in 2 dB steps with a total range of 30 dB. There shall be a switchable 125 Hz high-pass filter. The transmitter shall include a pilot tone to identify the wireless transmitter to the wireless receiver. The transmitter shall utilize two RF output power levels and shall operate on two AA batteries. The battery compartment shall be locking. All setting adjustments shall be via soft-touch controls and shall remain as set even if the transmitter loses power or the batteries are removed. The transmitter shall have an IR sync button to allow receiver settings to be synced with the transmitter. An OLED screen shall be provided to show transmitter setup parameters or frequency. Charging terminals on the base of the transmitter shall work with an optional smart charging dock to recharge AA NiMH batteries installed in the transmitter. The transmitter shall have a removable and field-replaceable antenna.
4. The frequency-agile FM wireless handheld transmitter shall be part of a wireless microphone system operating in the bands of 470.125–529.975 MHz or 530.000–589.975 MHz. The transmitter shall come with either a dynamic or a condenser cardioid microphone capsule, which shall screw onto the transmitter's industry-standard thread mount. Each capsule shall incorporate internal shock mounting and have a two-stage integral pop filter. The transmitter shall also work with additional capsules specifically designed for the transmitter (available separately) as well as other compatible capsules. The transmitter shall have a metal housing with a plastic antenna end cap. The transmitter shall transmit a digital pilot tone that allows the receiver to unmute. The transmitter shall also be equipped with a multifunction button that can be programmed to perform a specific function when pressed and held: mute the audio; mute the audio even when the transmitter is locked; turn off RF transmission; or switch to a preselected backup frequency. (The multifunction button can also be disabled.) A dual-color LED indicator shall illuminate green when the power is on and red when the transmitter is muted or battery power is low. An OLED screen shall be provided to show transmitter setup parameters or frequency. The microphone shall have an audio input level adjustment range of 30 dB in 2 dB steps. It shall also have a switchable 150 Hz high-pass filter. All setting adjustments shall be via soft-touch controls and shall remain as set even if the transmitter loses power or the batteries are removed. The transmitter shall have an IR sync button to allow receiver settings to be synced with the transmitter. The transmitter shall operate on two AA batteries and contain a Hi/Lo RF power selector. A battery fuel gauge shall be incorporated to indicate the status of the internal batteries. Charging terminals on the base of the transmitter shall work with an optional smart charging dock to recharge AA NiMH batteries installed in the transmitter. The transmitter shall be supplied with a heavy-duty stand clamp.
5. A two-bay charging dock shall also be available as an optional component. It shall charge AA NiMH batteries that are installed in body-pack or handheld transmitters. The charging dock shall automatically shut off if alkaline or damaged batteries are detected in the transmitters. A single power supply shall power up to five linked docks. A networked version of the charging dock shall also be available as an optional component. The networked dock shall be capable of monitoring the charging status of all transmitters in up to five linked docks.

6. The Wireless Microphone (Handheld) shall be manufactured by Audio Technica Model # ATW-3212/C710. Includes: ATW-R3210 receiver and ATW-T3202 handheld transmitter with ATW-C710 cardioid condenser microphone capsule.
   a. Provide one (1) kits – one for the podium / lectern in Briefing Room 003.
7. The Wireless Microphone (Ear-Worn) shall be manufactured by Audio Technica Model # ATW-3211/894X. Includes: ATW-R3210 receiver and ATW-T3201 body-pack transmitter with BP894xcH MicroSet cardioid condenser headworn microphone (black). Includes windscreens, clothing clip, and dual-ear adapter kit.
   a. Provide one (1) kits – one for the podium / lectern in Briefing Room 003.
8. Rack mount the wireless microphone receivers in the rolling presentation podium with the included rack mount hardware. Utilize the included flexible UHF antennas.
   a. Connect the unbalanced ¼" TS outputs to 3.5mm unbalanced stereo input of NV32 in rack with the appropriate patch cord: (1) 3.5mm male TRS to (2) ¼" male TS (Y-Cable).
9. The Wireless Microphone two-bay charging dock shall be manufactured by Audio Technica Model # ATW-CHG3.
   a. Provide one (1) kits – one for the podium / lectern in Briefing Room 003 and locate on the rolling presentation podium.
10. Clearly label microphones and associated charging cradle so that microphone labels correspond with labels within DSP programming.

B. Beamforming Array Ceiling Microphone for teleconference
1. The beamforming array microphone, designed for use in conference rooms, boardrooms, and other meeting spaces, shall mount flush or on the surface of a drop ceiling or hard ceiling, or in open architecture spaces using a standard VESA mount. The microphone shall come with surface- and flush-mount adapters, a flush-mount cover, mounting screws and nuts, tile-bridge assembly, installation template, a seismic cable, Euroblock connectors, snap bushings, and a hole cover that can be used when only a single conduit is connected.
2. The microphone shall have six individual output channels, which, collectively, can be configured with up to 32 user-defined microphone pickup zones. Output Channel 1 shall be configurable with up to 16 user-defined Coverage Zones to ensure coverage of nonpriority or unplanned participants. Output Channels 2–6 shall be configurable with up to 16 user-defined Priority Zones to ensure priority pickup of participants in known locations. The microphone's 90-degree orthogonal beams shall function across all output channels, enabling it to focus on particular points in space and prevent the pickup of unwanted noise. Voice activity detection (VAD) technology shall enable the microphone to discern between a voice and unwanted noises such as paper shuffling.
3. The microphone shall have an onboard DSP with functions that include automix, acoustic echo cancelation, noise reduction, automatic gain control, and 4-band EQ. The face of the microphone shall be outfitted with a reset button and an IR window to receive mute and other control signals from an included IR remote.
4. The microphone shall have a frequency response of 60 Hz to 18,000 Hz and be capable of handling sound input levels up to 102 dB.
5. The microphone shall support Dante network digital audio protocol for signal transmission.
6. The Beamforming Ceiling Array Microphone shall be manufactured by Audio Technica, Model # ATND1061DAN Beamforming Ceiling Array Microphone.
   a. Provide four (4) – one per each room.
   b. Install flush mount in ACT Ceiling with the provided mounting accessories. Install with safety cable per manufacturer's instructions.
   c. Utilize gray copper patch cables as needed (Provided by 272000).

2.19 TELECONFERENCE CAMERA (PARTICIPANTS VIEW)

A. The video camera shall have an RJ-45 connector for connecting to a 1000 Mbps Ethernet network. The camera shall only be powered via Power over Ethernet (PoE). The camera shall use the network for transmitting video to one or more bridging endpoints without the need for USB extenders. The camera shall also use the network for control and monitoring.

B. The camera shall have a 1/2.8" CMOS 4K image sensor with a ≥55dB signal-to-noise ratio. The lens shall have a 12x optical zoom, a horizontal field of view of 80° - 7.5°, and a focal length of 3.47 - 41.65mm. The camera shall utilize motors for pan, tilt, and zoom (PTZ) and output a IP video stream from the camera directly to the bridging endpoint. The camera movement shall be controlled exclusively via the network. The camera output shall have a 16:9 aspect ratio.

C. The camera shall include a bracket to allow for the camera to be surface mounted. The camera should have an optional mounting accessory for ceiling mounted installations. The camera should have necessary imaging controls to allow for inverted mounting.

D. The camera shall have an operating temperature range of 0°C - 40°C and a storage temperature range of -40°C - 60°C. The camera shall weigh no more than 2.4 kg and shall not exceed 142mm x 201mm x 170mm (width, height, depth) in size.

E. The camera shall integrate natively with the QSC Q-SYS Ecosystem for discovery, control, signal routing, firmware management, and bridging.

F. The camera shall be manufactured by QSC Model # Q-SYS NC-12x80.
   1. Provide one (1) – one per Briefing Room 003 (wall).
   2. Wall mount with included wall mount bracket.
   3. Utilize gray copper patch cables as needed (Provided by 272000).
   4. Utilize QSC QSYS Automatic Camera Preset Recall Plugin based on positional data gathered from the ceiling microphone array.

2.1 TELECONFERENCE CAMERA (PRESENTER / INSTRUCTOR / CONF TABLE VIEW)

A. The video camera shall have an RJ-45 connector for connecting to a 1000 Mbps Ethernet network. The camera shall only be powered via Power over Ethernet (PoE). The camera shall use the network for transmitting video to one or more bridging endpoints without the need for USB extenders. The camera shall also use the network for control and monitoring.

B. The camera shall have a 1/2.8" CMOS 4K image sensor with a ≥55dB signal-to-noise ratio. The lens shall have a 20x optical zoom, a horizontal field of view of 60°- 3.5°, and a focal length of 6.25-125mm. The camera shall utilize motors for pan, tilt, and zoom (PTZ) and output an IP video stream from the camera directly to the bridging endpoint. The camera movement shall be controlled exclusively via the network. The camera output shall have a 16:9 aspect ratio.

C. The camera shall include a bracket to allow for the camera to be surface mounted. The camera should have an optional mounting accessory for ceiling mounted installations. The camera should have necessary imaging controls to allow for inverted mounting.

D. The camera shall have an operating temperature range of 0°C - 40°C and a storage temperature range of -40°C - 60°C. The camera shall weigh no more than 2.4 kg and shall not exceed 142mm x 201mm x 170mm (width, height, depth) in size.

E. The camera shall integrate natively with the QSC Q-SYS Ecosystem for discovery, control, signal routing, firmware management, and bridging.

F. The camera shall be the QSC Q-SYS NC-20x60.
   1. Provide four (4) – one per each room. Briefing Room (ceiling), Command Conference Room 118 (Monitor), War Room 174 (Monitor), and CRI Sergent Conference Room 180 (Monitor).

2. Where ceiling mount, mount each camera with QSC Model # PTZ-CMB1 ceiling mount bracket. Provide one (1).
3. Where monitor mounted, mount each camera with Chief PAC810 bracket. Provide three (3).
4. Utilize gray copper patch cables as needed (Provided by 272000).
5. Utilize QSC QSYS Automatic Camera Preset Recall Plugin based on positional data gathered from the ceiling microphone array.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install each system shown as indicated, in accordance with equipment manufacturer's instructions, and with recognized industry practices.

B. Mount the projector in the ceiling per manufacturer's recommendations.

C. All low voltage and signal wiring shall be run exposed in the ceiling space.

D. Program the Switcher/Receiver per manufacturers recommended settings. All devices with RS-232 controls in the system shall be controlled by the Switcher/Receiver.

3.2 SYSTEM TESTING

A. The system testing shall conform to the requirements of Section 270000.

B. The Installing Vendor shall provide the staff with walkie-talkies, test equipment, additional equipment, resources, and time necessary to support BCE Engineers to provide the Commissioning of this System. The Installing Vendor shall demonstrate to BCE Engineers the complete operation of each device, head end functionality, system configuration, and software functionality. The Installing Vendor shall also make adjustments to the equipment and changes to the program settings, as requested. This testing shall be typical of four (4) locations, selected by the Electrical Engineer.

3.3 INTEGRATION TO OTHER LOW VOLTAGE SYSTEMS

A. See "System Operation" listed elsewhere in this specification for more information.

3.4 ON-SITE TRAINING

A. On-site training shall follow a written training plan, prepared in advance. The training plan shall outline the topics to be covered, the publications to be used, and the training schedule.

B. Supply two (2) hours minimum of training for the Owner's staff in operating and maintenance of the television distribution system. Training time shall be extended as necessary to satisfy the Owner's Representative that all pertinent topics have been adequately covered.

C. The training shall be conducted after the operating and Maintenance Manuals for the Project are completed and available for use during the training session.

D. Maintain a training sign-in sheet, upon which participants in the training session, including the instructors, shall record their names. Training sign-in sheet shall be dated.

E. The training shall be conducted by a representative of the equipment manufacturer who is thoroughly familiar with the equipment and its features, and also with the installation on this Project. The training shall include instruction and field demonstration. As a minimum, the training shall cover, but not be limited to, the following topics:
1. General Overview of the system, including purpose and principle of operation.
2. System features, including expansion capability.

3. Interpretation of system outputs (indicators, displays, etc.).
4. Operation of system controls (gain controls, slope adjustment, etc.).
5. Recommended maintenance procedures and intervals.
6. Detailed trouble-shooting instructions.
7. Explanation of service agreement options.

F. At the conclusion of the training session, insert a copy of the training sign-in sheet into the Operating and Maintenance Manuals. Submit another copy of the training sign-in sheet to the Architect.

3.5 AS-BUILT DOCUMENTATION

A. Operation and maintenance manuals and the as-built drawings shall conform to the requirements of section 270000.

END OF SECTION 274116.51

SECTION 274116.51

TRAINING ROOM AUDIO-VISUAL SYSTEMS

PART 1 - GENERAL

1.1 SCOPE AND RELATED DOCUMENTS

A. Furnish and install a complete Audio-Visual (AV) system as shown on the drawings and as specified herein under Alternate 1D. See each Alternate Scopes of work on plans for more information.

B. The training classroom is divisible and needs to operate in two room modes depending on the function of the space. Combined with one side being the primary presentation location and split with each side operating independently.

C. Provide the Training Room wireless microphone system, IP video endpoints, IP based control panel, back boxes, amplifiers, speakers, other devices mentioned in this specification or plans, input faceplates with all associated cabling and outlet and installation of the system as required for a complete and operating system.

D. Install OFCI monitors and monitor mounts. The general contractor shall provide all backing and supports as required for wall and ceiling/pendant monitor mounts. Coordinate exact location and weight requirements with Architect, Engineers, and Owner.

E. Submit All equipment, including wiring, cabling, and outlets furnished and installed under these specifications, shall be guaranteed for a period of one year from the date of final acceptance thereof against all electrical or mechanical defects or failures except that which can be proved to have been caused by misuse. All service and parts shall be provided during the first year by the contractor or their designated agent.

F. The system shall meet ALL of the requirements listed in Section 270000 Low Voltage Systems General Requirements PART 3 “Testing & Complete System Functionality”, prior to “Substantial Completion”.

G. Contractual information, guidelines, requirements, or other work specified to provide a fully functional system for Section 274116.51 includes but is not limited to the sections identified in Section 270000.

1.2 SYSTEM OPERATION

A. The AV system shall provide for the playing of owner provided computer video outputs. The video image shall be displayed on the screens via the owner provided monitors with audio playing over the overhead speakers. The AV system shall also function as a VOIP audio or web video teleconference system.

B. The A/V System Control Panel shall control the power and input sources of the Monitor(s), as well as the connected AV equipment, such as the microphones, teleconference cameras, speakers, and cable tv boxes. Additionally, the system shall provide control of motorized shades and lighting presets.

C. All wall plates, jacks, cable and accessories shall be provided as required for a fully functional system.

D. A specific quantity of portable assisted listening “kits” shall be provided to comply with the 2010 revision to the Americans with Disabilities Act.

E. Integration to other Low Voltage systems:
   1. Motorized Shade Control:
      a. Provide the necessary cabling to the low voltage inputs of the motorized shade control module. The system's control panel shall be able to trigger an opening or closing of the shades.
   2. Lighting Preset Control:
      a. Provide the necessary cabling to the low voltage inputs of the lighting control module. The system's control panel shall be able to trigger the primary lighting presets for the room.
   3. Fire Alarm System Interface:
      a. The system's control I/O module's auxiliary inputs shall receive a relay closure such that in the event of a fire alarm event, the system's audio output shall be shunted.
   4. Owner's VOIP Network for Softphone integration
      a. Coordinate with the owner for network connection to the central processor for access to their VOIP phone network and assigning softphone extensions to each room for teleconferencing use via the AV system & AV touch screen control GUI.

F. System Programming:
   1. The system shall be controlled by a central processor.
   2. The contractor shall provide programming and configuration of the entire system. This includes, but is not limited to:
      a. GUI design/creation for the touch screen control panel(s)
      b. Preset creation on the control system
      c. Preset creation on the audio digital signal processor (DSP)
      d. Configuration and commissioning of the Dante network audio system
   3. Functions:
      a. The system touch screen control panel shall be programmed to do the following functions at a minimum:
         1) Adjust the volume levels of input sources
         2) Adjust the volume of far end conference audio sources
         3) Adjust master volume level & master mute
         4) Conference Camera modes (Recall PTZ presets & Auto Mode)
         5) TV/Monitor operation
         6) Video sources with live thumbnail video preview
            a) Configure GUI for Drag & Drop Source to Destination with live thumbnails of content
         7) Control of Cable TV Boxes
         8) Control of owner's VOIP Softphone
         9) Split / Combine Operation Mode
      b. The system touch screen control panel must be programmed to be password protected to protect the system from being manipulated unless authorized for operation.

1.3 QUALITY ASSURANCE

A. All major system components shall be supplied and installed by an authorized factory distributor. The Installing Contractor and manufacturer shall have furnished and installed similar sound systems continuously for no less than five years. The contractor must have at least two employees holding CTS-D or CTS-I certifications. The contractor must have at least one employee certified in QSC Qsys Level 1 and at least one employee certified in QSC Qsys Level 2. The contractor must have at least 1 employee certified in Audinate Dante Level 3. Submit proof of qualifications for bid and shop drawing submittals: proof of certifications, vendor qualifications, and proof of prior projects. Contract could be rejected if qualifications are not met.

B. All Audio-Visual and Audio Specification sections must be provided and installed by one vendor.

1.4 SUBMITTALS

A. Refer to “As-Built Drawings” for additional requirements.

B. Refer to Section 270000 Low Voltage Systems General Requirements, for additional data sheet submittal requirements and the shop drawing submittal requirements.

1.5 COORDINATION

A. Pre-Installation Project Kick-off Meeting. The Installing Contractor shall contact the Electrical Contractor for the purpose of confirming the actual date of and attending the Pre-Installation Project Kick-Off Meeting at the location selected by the Owner. This meeting shall take place PRIOR to Submittal of equipment data sheets. The Installing Contractor shall be responsible for providing the following items.
   1. Submitting a list of questions and their list of coordination items through the Construction Channels a minimum of 14 Days in advance of the meeting for Owner review.
   2. A sign in sheet (with the project name, Section number and title that the Installing Contractor is representing, date, time, location, the printed name of each person in attendance, their title, phone number, and email address).
   3. Be responsible for taking Meeting Minutes, typing them into a formal document, and distributing them via email to each attendee.
   4. The items discussed at the Pre-Installation project kick-off meeting shall include, but not be limited to:
   5. General location of Rack, assisted listening equipment, and other items.
   6. General questions about system operation, function, and programming.

B. Follow up documentation for the Pre-Installation Project Kick-Off Meeting. The purpose of this information is to illustrate to the Owners Representative that the information discussed during the Pre-Installation Project Kick-Off Meeting was understood by the Installing Contractor.
   1. Each of the above items and items discussed during the meeting shall be included in the Data Sheet Submittals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. See Section 270000 Low Voltage Systems General Requirements for additional information.

B. The System design, devices and/or wiring arrangement shown on the drawings represent that based on various equipment manufacturers.
   1. No substitutions are allowed.

C. Provide all equipment as defined in this specification and shown on the drawings.

D. Refer to PART 1 for any equipment that is not specifically defined.

2.2 CABLE TV BOX

A. The Cable TV box will be owner furnished contractor installed (OFCI). Install two (2) Comcast Model # to be determined.

B. Provide two (2) 1RU 19” universal rack shelves and rack mount in the IDF 216 rack.

C. Mount Cable TV box and video encoder mentioned elsewhere in this specification to rack shelf listed elsewhere in this specification. Tie to and IP-to-IR control module listed elsewhere in this specification. Label device with designated room name/#, and corresponding video source label from system programming.
   1. In split room mode, dedicate 1 cable tv feed to each room as the 5th video input source.

D. Utilize coaxial, copper patch cables and vertical/horizontal rack wire management as needed (Provided by 272000).

2.3 ETHERNET SWITCH

A. Training Classroom rolling podium AV Ethernet / Network switch
   1. The network switch shall have 8x1G ports with 110W PoE+, 1x1G and 1xSFP uplink ports.
   2. The network switch shall be managed and configured as required for a fully functional AV system.
   3. The network switch shall be manufactured by Netgear, Model # AV Line M4250-9G1F-PoE+ (GSM4210PD). Provide two (2). Install one in each rolling presentation podium / lectern.
   4. Utilize copper patch cables and vertical/horizontal rack wire management as needed (Provided by 272000). Utilize building network outlets, CAT6 patch panels, and copper patch cords at the MDF/IDF rack (Provided by 272000).

B. Training Building AV Ethernet / Network switch
   1. Utilize the network switch provided under specification 274116.62 in the IDF 216 rack.

2.4 WIRELESS CASTING A/V STREAMING RECEIVER (OFCI) ETHERNET SWITCH

A. Wireless casting devices are owner furnished contractor installed (OFCI). Install quantities shown on plans. The owner's Streaming Receivers are planned to be:
   1. Apple TV for Mobile iOS & Mac OS devices. Connect to NV32 HDMI input 2.
   2. Microsoft Wireless Display Adapter for Android OS/Windows OS devices. Connect to NV32 HDMI input 3 & USB-A.

B. Where located in Podium Racks the contractor shall label and secure to a 19" rack shelf
   1. There are two (2) podium / lecterns in training classroom 221.
   2. Provide a universal 1RU 19" rack shelf quantities as required.
   3. Provide wire management as required to route CAT6, USB, and HDMI patch cables to encoders and network switch.
   4. Patch cables shall be labelled.
   5. Provide HDMI 2.1 Male-Male and Female-Male patch cords as required.
   6. Provide USB Type A Female-Male patch cords as required.
   7. Utilize gray copper patch cables as needed (Provided by 272000).

2.5 DIGITAL SIGNAL PROCESSOR & CONTROLLER

A. Utilize the central system processor and controller provided under specification 274116.62.

B. Under Bid Alternate 1D provide the additional programming for the Training Classroom AV system as required for a complete and fully function system.

2.6 AMPLIFIER

A. The amplifier power amplifier shall be a four-channel network-processing device that is designed to operate exclusively with a QSC Q-SYS ecosystem on a Gigabit Ethernet network. The amplifier shall be powered by a universal switch-mode power supply that supports operation at any AC voltage from 100 to 240 V at 50 or 60 Hz. The power supply shall have power factor correction (PFC) to make the current flow nearly sinusoidal and analogous to the voltage waveform. The amplifier shall offer power save mode to automatically reduce AC power consumption during idle time. The amplifier shall be convection cooled, with the vents at the rear, the side and the front.

B. The amplifier shall utilize a class D output circuit topology with four individual channels providing up to 240 watts total rated power. The amplifier shall be configurable via Q-SYS, including arranging the output channels as single units as well as in bridged, Hi-Z 100V and Hi-Z 70V combinations. When in bridged and Hi-Z mode, the loudspeaker cables shall be connected to adjacent channels + and – outputs. The amplifier's audio signals shall originate in the Q-SYS ecosystem and shall also be configurable in Q-SYS Designer Software (QDS).

C. The power amplifier shall have two flex channels that can be configured as either analog mic/line audio inputs or line level outputs that stream digital audio data into/from the Q-SYS ecosystem in the form of Q-LAN data delivered via the network port. The impedance of each input shall be greater than 10 kΩ balanced or 5 kΩ unbalanced.

D. The power amplifier shall meet the following performance criteria: typical distortion (into 8 ohm loads) of 0.07% to 0.1%; maximum distortion (4 to 8 ohms) of no worse than 1%; a frequency response (into an 8 ohm load) from 20 Hz to 20 kHz at +0.2/-0.8 dB; Signal to Noise Ratio> -100 dB.

E. Channel muting and gain shall be controllable via the Q-SYS ecosystem. The amplifier shall indicate network status and monitoring, including faults.

F. The amplifier shall have output load monitoring on each output. The load monitor shall have the range to detect and calculate impedance of conditions including short circuits, low impedance loudspeakers, and lightly loaded 70 V and 100 V lines. The load monitor shall report the calculated load impedance on each channel via the Q-SYS network. The amplifier front panel shall feature Power LED, Fault LED and Individual Channels Signal and Limit/Protect LEDs. The front panel shall also feature one ID button to identify the product in QDS.

G. The amplifier rear panel shall feature a single RJ-45 jack for connecting to the Q-LAN network, enabling integration into the Q-SYS ecosystem for bi-directional passage of digital audio, control signals, and status monitoring data. The rear panel shall provide one blue 6-pin 3.5mm Euro connector for the Flex Channels and two green 4-pin 5mm Euro connectors for loudspeaker cable connection. The amplifier rear panel shall also provide one black 6-pin 3.5mm Euro connector for four GPIO pins, one 3.3V Power pin and one Ground pin that extend Q-SYS control to or from external devices.

H. The amplifier shall be 1.75 in (44 mm) high, 8.7 in (221 mm) wide, and 11.25 in (286 mm) deep. The amplifier shall have a net weight of 6.4 lb (2.9 kg).

I. The multi-channel amplifier shall be manufactured by QSC Model # SPA-Qf 60x4.
   1. Provide one (1).
   2. Mount behind the primary display monitor.
   3. Utilize gray copper patch cables as needed (Provided by 272000).

2.7 SPEAKERS

A. The ceiling mount 2-way co-axial system shall incorporate a 6.5-inch woofer with treated-paper cone and a 19 mm aluminum dome tweeter. The tweeter shall be mounted coaxially in front of the woofer on a waveguide that matches the directivity of the two drivers at the crossover point.

B. The system shall meet the following performance criteria: conical coverage angle of 140 degrees; frequency response of 65 Hz to 20 kHz +0/-10 dB, measured on axis; sensitivity of 87 dB SPL in half space at 1 meter with an input of 4 V rms; maximum continuous output of 106 dB SPL; maximum peak output of 112 dB SPL on axis at 1 meter; power handling of 60 watts for 8 hours with an IEC noise signal; recommended amplifier power of 120 watts; nominal impedance of 16 ohms.

C. The loudspeaker shall have a switchable low-distortion, wide-bandwidth laminated core transformer with taps for 60, 30, 15, and 7.5 watts at 70V and 60, 30, and 15 watts at 100V. The system shall be switchable between 16Ω (bypass) and constant-voltage operation.

D. The loudspeaker shall have a low-profile powder coated steel back can. The baffle and the grille shall have a white paintable finish (RAL 9010) with UV inhibitors to prevent discoloration. The enclosure shall retain the grille magnetically. Any logo on the grille shall be removable without leaving a blemish.

E. The loudspeaker shall have a double-stepped long-travel dog-ear blind mounting system that can capture ceiling thicknesses from 0 to 2.25 in. The conduit cover plate shall be removable, retained by a captive Phillips head screw. A mud ring shall be provided to allow pre-installation wiring. The loudspeaker connections shall be a locking 4-pole Euro-block that accepts four 18 AWG wire pairs.

F. The loudspeaker shall be listed as safe for use in air-handling spaces under UL1480 and UL2043. The loudspeaker shall meet or exceed IP-34 for ingress protection; it shall meet the IEC 60529 IP-X3 splash rating. The switchable transformer shall be listed under UL1876. The baffle shall meet UL94-V0 and UL94-5VB flammability ratings and shall comply with IEC60849/EN60849 safety standards.

G. The loudspeaker's enclosure shall be 3.95 in (10.0 cm) high and 13.39 in (34.0 cm) in diameter. The loudspeaker shall weigh no more than 9.3 lb (4.2 kg).

H. The ceiling mount 2-way co-axial system shall be manufactured by QSC Model # AD-C6T-LP.
   1. Provide quantities as shown on floor plans.
   2. Speakers shall be white. Prior to ordering confirm color with Architect.
   3. Install in ACT ceiling with provided C- ring & tile rail accessories per manufacturer’s instructions.
   4. Wire the speakers in split zones with 70-volt groups not exceeding 80% of each channel’s wattage.

2.8 CONTROL PANELS (CP1)

A. Provide a touch screen control panel for overall control of the A/V system.

B. The panel shall at a minimum have a 7” TFT active matrix color LCD display.

C. The panel will be IP controllable with a 10/100Base-T NIC and powered by PoE 802.3af.

D. See 1.02 System Operation elsewhere in this specification for control panel functions.

E. The control panel shall be manufactured by QSC, model # TSC-70-G3 & TSC-710t-G3 Tabletop Mount.
   1. Provide two (2) each.

F. Where located on Podium Rack the contractor shall label and secure to the top of the podium after all owner equipment is provided for podium device mockup and approval.
   1. Provide wire management as required to route CAT6 cable to network switch.
   2. Patch cables shall be labelled.
   3. Utilize gray copper patch cables as needed (Provided by 272000).

2.9 SYSTEM PROCESSOR EXPANDER I/O MODULES

A. NETWORK (IP) to Control I/O
   1. The peripheral shall provide eight (8) general-purpose inputs and eight (8) general-purpose outputs that are remotely configurable, providing an interface for LED indicators, switches, relays, potentiometers, and custom or third party controls to the peripheral. The collection of inputs and outputs shall have an individual +12 VDC terminal (up to 100mA available for each type, protected by a self-resetting fuse) and ground reference for use with potentiometers (input), relay coils and LEDs (output), or other purposes. Inputs and outputs shall be independently configurable from the system processor. The peripheral shall operate natively on a standard gigabit Ethernet infrastructure available from a broad range of network infrastructure manufacturers and shall support 802.1x authentication.
   2. The peripheral shall operate on PoE or DC power input and have the following front panel controls and indicators: Unit ID button, green ID LED, and blue Power LED. A web interface shall provide basic network and security configuration, status, and log retrieval. The peripheral shall be natively integrated into Q-SYS Designer Software for network discovery, real-time configuration, control, monitoring, and supervision.
   3. The peripheral's rear panel shall provide two 2-pin power Euroblock connectors for daisy-chainable DC power, eight (8) general-purpose inputs and eight (8) general-purpose outputs on a dual-row 20-pin Euroblock connector with individual +12 VDC and ground pins, a recessed settings reset button, and two (2) RJ45 connectors for daisy-chainable Ethernet configured as Q-SYS Network ports: one (1) PoE port, RJ45 1000 Mbps only; one (1) Pass-thru port, RJ45 1000 Mbps only.
   4. The peripheral shall feature multiple mounting options including a standard 19-inch rack or surfaces such as under-table or on-wall. It shall be one-quarter (1/4) rack space wide and less than one (1) rack unit tall (1.59 inches / 4.04 cm), allowing mounting alongside quarter-rack width QSC Q-SYS QIO peripherals using an optional rack tray kit. The peripheral shall include two (2) reversible steel angle brackets for surface mounting.
   5. The peripheral dimensions shall be 1.59" x 4.25" x 5.5" (4.04cm x 10.80cm x 13.97cm).
   6. The peripheral shall be manufactured by QSC Model # QIO-GP8x8.
      a. Provide one (1) for shade control and lighting control interface and locate in IDF 216 Rack.
      b. Interconnect with multi-conductor cabling as required to trigger shade open & closed states.
      c. Interconnect with multi-conductor cabling as required to trigger lighting preset states.

B. NETWORK (IP) to IR Infrared Control
   1. The peripheral shall provide one input port and four output ports that are remotely configurable, providing an interface for off-the-shelf IR receivers and emitters. The peripheral shall include a power pin for external receivers and a local activity LED for each output. The peripheral shall provide access to an extensive collection of IR codes that is accurate and maintained while permitting the reception, storage, and routing of additional IR codes. Output ports shall also support RS-232, transmit-only. All ports shall be independently configurable from the system processor. The peripheral shall operate natively on a standard gigabit Ethernet infrastructure available from a broad range of network infrastructure manufacturers and shall support 802.1x authentication.

2. The peripheral shall operate on PoE or DC power input and have the following front panel controls and indicators: Unit ID button, green ID LED, and blue Power LED. A web interface shall provide basic network and security configuration, status, and log retrieval. The peripheral shall be natively integrated into Q-SYS Designer Software for network discovery, real-time configuration, control, monitoring, and supervision.
3. The peripheral's rear panel shall provide two 2-pin power Euroblock connectors for daisy-chainable DC power, a 3-pin Euroblock connector for IR input, a dual-row 8-pin Euroblock connector for IR output, four red IR activity LEDs, a recessed settings reset button, and two RJ45 connectors for daisy-chainable Ethernet configured as Q-SYS Network ports: one PoE port, RJ45 1000 Mbps only; one Pass-thru port, RJ45 1000 Mbps only.
4. The peripheral shall feature multiple mounting options including a standard 19-inch rack or surfaces such as under-table or on-wall. It shall be one-quarter (1/4) rack space wide and less than one rack unit tall (1.59 inches / 4.04 cm), allowing mounting alongside quarter-rack width QSC Q-SYS QIO peripherals using an optional rack tray kit. The peripheral shall include two reversible steel angle brackets for surface mounting.
5. The peripheral dimensions shall be 1.59" x 4.25" x 5.5" (4.04cm x 10.80cm x 13.97cm).
6. The peripheral shall be manufactured by QSC Model # QIO-IR1x4.
    a. Provide one (1) for IR Infrared control of Cable TV Set Boxes and locate in IDF 216 Rack.
    b. Provide IR Emitters as required for the OFCI Cable TV devices listed elsewhere in this specification.

C. Label all devices and patch cords.

D. Provide 19" Rack Mount Bracket manufactured by QSC model # QIO-RMK.

E. Provide and install devices as shown on the drawings.

F. Provide required wiring and coordinate with all trades required for a complete and fully functional system.

2.10 NETWORK VIDEO ENDPOINT (3-IN / 2-OUT)

A. The network video endpoint shall be a component in a distribution system that routes 4K60 4:4:4 video over a Gigabit Ethernet network. It shall use Q-SYS Shift data compression to ensure highest quality with very low latency. The endpoint shall have three HDMI 2.0 Inputs and two HDMI 2.0 outputs and shall be fully compliant with HDCP 1.4 and 2.2. It shall also shall support AV bridging with QSC Q-SYS PTZ-12x72 and PTZ-20x60 cameras. It shall also have an RJ45 network port with Power over Ethernet (802.3bt) compatibility.

B. The network video endpoint shall natively route audio data through a QSC Q-SYS network without needing to use AES67 or the Q-SYS Media Stream Receiver. Its sound card-level stereo analog audio inputs and outputs shall be on 3.5 mm TRS connectors. It shall function as a transmitter or as a receiver, depending on the configuration by the user.

C. The network video endpoint shall be mountable in a standard AV rack or on a surface. It shall be a half rack space wide and one rack unit (1.75 inch) tall, allowing it to be mounted beside other half-rack equipment such as the Q-SYS I/O-8 Flex and QSC SPA Series power amplifiers.

D. The network video endpoint shall be powered by a 48-volt external power supply or through the network port using Power over Ethernet.

E. The network video endpoint shall be manufactured by QSC Model # NV-32-H.
1. Provide two (2) – one per each podium / lectern.
2. Configure as a Peripheral Mode Encoder.
3. Connect HDMI Output 1 to the OFCI computer monitor on the rolling presentation podium.
4. Rack mount in rolling presentation podium with included hardware.

5. Provide HDMI 2.1 patch cords as required.
6. Provide USB USB3.0 A/B patch cords as required.
7. Provide one (1) PoE++ Power Injector (IEEE 802.3bt Type 4) or External 48VDC 1.5A output plug-in 120VAC input power supply.
8. Utilize gray copper patch cables as needed (Provided by 272000).

2.11 NETWORK VIDEO ENDPOINT (2-IN / 1-OUT)

A. The network video endpoint shall have one HDMI 2.0 input, one USB-C input, and one HDMI 2.0 output. The endpoint must support video distribution for formats up to 3840x2160p60 4:4:4 from both HDMI and USB-C inputs. The USB-C input of the network video endpoint shall support a single connection for audio and video distribution through USB-C alt-mode DisplayPort, bridging audio and video signals to an application on the host via UAC/UVC, and USB-C PD (power delivery) of up to 65 Watts shall be available for device charging. The endpoint shall support Consumer Electronic Control (CEC) of connected devices on the HDMI Output. The endpoint shall support USB HID signal routing between hosts and devices.

B. The network video endpoint shall be user configurable to be either a transmitter (encoder) or receiver (decoder). The network video endpoint shall use Q-SYS Shift data compression to ensure high-quality and low-latency network video transport of video formats up to and including 3840x2160p60 with 4:4:4 chroma sampling. It shall support HDCP 1.4 & 2.3 and encrypt video transmission on the network. The HDMI 2.0 output must scale incoming content from the network and local input connections.

C. The endpoint shall be powered by an external 12V DC 9 A auxiliary power supply or via PoE Type 3, Class 5 (40w at PD, 45W at PSE) from a capable network switch or midspan injector. It is acceptable for an auxiliary power supply to be required if device charging is needed.

D. The network video endpoint shall operate natively on a standard gigabit Ethernet infrastructure available from a broad range of network infrastructure manufacturers, employing DiffServe quality of service (QoS), IGMP, IEEE 1588-2008 (PTPv2) precision time protocol, UDP/IP audio, and video transport with floating point format audio data representation. The endpoint shall support 802.1x authentication. The endpoint shall communicate with the system audio processor without needing AES67, Dante, or Media Stream receiver components.

E. The network endpoint shall measure 7.3 x 5.2 x 1.2 in (185 x 131.5 x 30.5 mm).

F. The network video endpoint shall be manufactured by Q-SYS Model # NV-21-HU.
1. Provide eight (8)
   a. Rack mount two (2) – one per each rolling presentation podium with included hardware and configure as an encoder. Connect to owner's Laptop docking station model TBD as the 4th video source in the room.
   b. Rack mount two (2) at the IDF 216 rack next to Comcast Cable TV boxes and configure as an encoder.
   c. Surface mount four (4) to the rear of each display monitor and configure as a decoder.
2. Provide HDMI 2.1 patch cords as required.
3. Provide USB USB-C patch cords as required at the podium. The USB-C cable shall be able to transmit data and device charging power of 65 watts minimum.
4. Provide two (2) power supplies manufactured by QSC Model #NV-21-PSU - one for each podium encoder location.
5. Provide four (4) rear TV Monitor mounts for video decoders manufactured by Chief Model # PAC251.
6. Utilize gray copper patch cables as needed (Provided by 272000).

2.12 IN-ROOM PC / COMPUTER

A. The in-room PC / computer and wireless mouse/keyboard shall be owner furnished and owner installed with the exception that the contractor is required to mount the computer to the rack shelf and assist with the connection of patch cables with cable management.

B. The in-room PC / computer will be Lenovo ThinkCentre Tiny model. Two will be provided – one per each podium / lectern.

C. Provide two (2) 1RU 19" universal rack shelf and rack mount in the rolling presentation podium rack.

D. Connect to each NV32 HDMI input 1.

2.13 SURGE SUPPRESSORS/POWER CONDITIONERS

A. Rack Mount Type:
1. The AV system shall have a 1U rack-mountable surge suppression unit. It shall be capable of a 15 AMP load at 120 volts.
2. The unit shall also be capable of remote turn-on with a contact closure.
3. The surge suppressor shall be manufactured by Juice Goose, model # CQ-1515-RX.
   a. Provide two (2) – one per each podium / lectern.
   b. Rack mount in the rolling presentation podium.
   c. The surge protector shall be connected to a dedicated 15A circuit, provided at the rear of the rack location or in the floor box.

2.14 ROLLING PRESENTATION PODIUM / LECTERN

A. The EIA Compliant 19" AV Lectern shall be Middle Atlantic Products model # L5-TURFR-43LDW. AV Lectern shall be available in 23", 33", or 43" widths, with 1 or 2 rack bays and a storage area, depending on model (refer to chart).

B. Overall dimensions shall be 39" H x 43" W x 31" D (refer to chart). Usable height shall be 12 rack spaces per bay. AV Lectern frames shall ship fully assembled and be constructed of steel. Total weight capacity with Middle Atlantic finishing kit shall be provided by Middle Atlantic per the specific configuration.

C. Each rack bay shall come equipped with 1 pair of 11-gauge steel rack rail tapped with 10-32 mounting holes in universal EIA spacing, black e-coat finish and numbered rack spaces.

D. AV Lectern rack shall have 1 70 CFM thermostatically controlled fans per bay. AV Lectern shall have a slide-out keyboard shelf, 38.56" W x 2.25" H x 12.06" D. AV Lectern shall have a side shelf with a useable area of 20.93" W x 7.49" H x 7.56" D.

E. Thermostatically controlled fans shall be powered on at 87°F and turn off at 85°F. AV Lectern shall include a 15 Amp, 8 outlet surge-protected power strip with a 10' cord.

F. Models with turret shall have customizable Presenter's Panel, which can accept touchscreens and other panel mounted devices with an overall size of __"H x __"W x __8.31" D (refer to chart).

G. Models with turret shall include connectivity panel with two 15 Amp outlets, two type A USB USBs and AVIP device plates that support SVGA, HDMI, 3.5mm stereo, CAT 5/6 and USB.

H. AV Lectern shall have venting on the top. AV Lectern shall be finished in a durable black powder coat.

I. Finishing kit shall ship separately from rack, be available in a Sota or Klasik style and be model # L5-__K-__ (design online at LegrandAV.com), and secured to the Lectern. Top, sides and front doors shall be available in Veneer, High Pressure Laminate materials, visit LegrandAV. com for list of available finishes. **Confirm exact finish material kit and color with architect prior to ordering lectern.**

J. AV Lectern rack shall include 4 fine floor casters.

K. AV Lectern rack shall comply with the requirements of RoHS EU Directive 2011/96/EU.

L. AV Lectern rack shall be manufactured by an ISO 9001 and ISO 14001 registered company.

M. AV Lectern frame shall be warranted to be free from defects in material or workmanship under normal use and conditions for the lifetime of the rack, fans shall be warrantied for a period of three years.

N. Provide two (2) Podiums / Lecterns.
1. Provide nylon snakeskin cable management between the rack and the floor box for the bundle of power and data.
2. Designate one podium as the master controller & room source for when rooms are combined into 1 presentation & training room.

O. The storage drawer shall be 2RU and manufactured by Middle Atlantic Model # UD2 or equal.
1. Provide two (2) reserve for presentation material storage such as patch cords, white board markers, etc – one for each podium / lectern.

2.15 FLAT PANEL MONITORS & MOUNTS

A. Provided by the owner and installed by the Contractor.

B. See floor plans and AV Detail sheets for exact quantities and locations.

C. Coordinate with engineers and the owner for exact make and model of display. Anticipated models are LG UR340C or UH5F-H commercial series displays.

D. Coordinate with engineers and the owner for exact make and model of display mounts. Anticipated models are Chief PNR & PDR series Articulating / Swivel / Tilt mounts with Chief PSBU series VESA bracket. Mounted directly over the recessed back box / wall monitor equipment enclosure listed elsewhere in this specification.

E. The general contractor shall provide in-wall backing/blocking to support up to 500lbs or more at each Monitor / Display / TV mounting location.

2.16 WALL MONITOR EQUIPMENT ENCLOSURE

A. The wall monitor equipment enclosure shall be provided by the AV contractor and installed by Division 26.

B. Provide one (1) per Monitor or Information Display location. See floor plans for exact quantities and locations.
1. Provide one (1) Chief wall enclosure model # CHIEF PAC526FWP6 14”x14” with 16”x16” flange (white).
2. Locate power and data outlets in the monitor back box.
3. At locations that are rough-in only (future monitor) provide blank cover (white).

2.17 COMMUNITY ROOM ASSITED LISTENING SYSTEM

A. Provide a complete stationary assisted listening system to include all associated cabling.

B. The stationary assisted listening system shall contain the following components:
   1. The stationary RF Transmitter (72MHz) shall be manufactured by Listen Tech, model # LT-803-072 and shall be compatible with the assisted listening receivers listed in this specification.
      a. Provide two (2).
      b. Locate in podium / lectern rack and connect to output of NV32 with an unbalanced 3.5mm to dual RCA/Phono patch cord.
      c. Provide two (2) rack mount kit Model # LA-326.
   2. The 90 Degree Helical Antenna (72MHz) shall be manufactured by Listen Tech, model # LA-123.
      a. Provide two (2).
   3. Receiver:
      a. The portable receiver shall operate wirelessly in the 72Mhz band and be fully digital.
      b. The wireless receiver shall be manufactured by Listen Tech, Model # LR-3200-072
         1) Provide eight (8)
   4. Neck Loop:
      a. Neck loops shall provide wireless transmission to T-Coil compatible hearing aids and cochlear implants.
      b. The neck loop shall plug directly into the wireless receiver.
      c. The neck loop shall be manufactured by Listen Tech, Model # LA-430
         1) Provide four (4)
   5. Earphone:
      a. The single piece earphone shall be manufactured by Listen Tech, model LA-161
         1) Provide eight (8)
   6. USB Charger:
      a. The USB Charger shall provide 4-ports.
      b. The USB Charger shall be manufactured by Listen Tech, Model # LA-423.
         1) Provide two (2)
   7. Assistive Listening Notification Signage Kit
      a. The Assistive Listening Notification Signage Kit shall be manufactured by Listen Tech, Model # LA-304.
         1) Provide two (2)
      b. Coordinate with the architect prior to rough-in for exact location.
   8. ALS Device Storage Drawer:
      a. The storage drawer shall be 2RU
      b. The storage drawer shall be manufactured by Middle Atlantic Model # UD2 or equal.

C. The kit “LP-4VP-072-01” plus additional neck loops may be provided.

D. Split parts evenly between the two podium / lecterns

E. Clearly label receivers and associated charger so that microphones remain in correct section of the room and receiver labels correspond with labels within DSP programming.

F. Test and commission each component and provide training on how to operate the transmitters and receivers.

2.18 COMMUNITY ROOM MICROPHONE SYSTEM

A. Wireless Microphones:
   1. Provide a complete wireless microphone system to include charging stations and all associated cabling. Coordinate the microphone operating frequencies with the receiver frequencies.

2. The frequency-agile FM wireless microphone system shall consist of a receiver and the appropriate transmitter, and shall operate in the UHF bands of 470.125–529.975 MHz or 530.000–589.975 MHz. The frequency-agile FM wireless receiver shall be all-metal and shall provide an automatic scanning function to select appropriate local usable channels for proper wireless system operation. It shall be a True Diversity receiver with two independent internal receiver sections, automatically selecting the highest quality signal for the receiver's output. All receiver settings shall be adjusted by using a control dial and BACK button on the receiver's front panel. The system will be equipped with an advanced pilot tone digital identification system to ensure that the desired wireless transmitter allows the receiver to be unmuted, reducing noise from unwanted signals. The receiver shall have an IR sync window on the front panel to sync settings with transmitters. It shall also have a dual-mode front panel display that switches between a standard view, which provides continuous indication of RF signal strength, frequency, mute status, audio modulation level of the received signal and other transmitter information, and a performance view, which highlights key metering. The receiver shall have a rear panel selector to lift the ground connection from pin 1 of the XLR-type output connector to prevent ground loops. The receiver shall be able to be powered by 12V DC 1A. Antennas shall be located on the rear of the receiver and shall incorporate standard BNC-type connectors to allow them to be detached from the receiver to facilitate the receiver being used with external antennas or antenna distribution devices. Switchable 12V DC power shall be provided on the BNC-type connectors. An accessory bracket should allow for the antennas to be located at the front of the receiver. The receiver can be rack-mounted singly or in pairs in a single rack space. The receiver's design shall provide totally silent audio output mute when the wireless transmitter is turned off or the signal is lost. The wireless receiver and the supplied metal rack-mounting brackets shall be industrial black.
3. The frequency-agile FM wireless body-pack transmitter shall have microphone and instrument level inputs. It shall provide DC voltage to power microphones requiring DC bias. The body-pack transmitter shall be part of a wireless microphone system operating in the bands of 470.125–529.975 MHz or 530.000–589.975 MHz. The body-pack transmitter shall have a reversible clip allowing for up or down cable entry. The transmitter shall have a screw-down 4-pin connector and a viewable fuel gauge to indicate the remaining battery life. Frequencies shall be selected using the transmitter's soft-touch controls. The transmitter shall also be equipped with a multifunction button that can be programmed to perform one of two functions when pressed and held: turn off RF transmission or switch to a preselected backup frequency. (The multifunction button can also be disabled.) The device shall have a dual-color LED that illuminates green when the power is on and illuminates red when the transmitter is muted or battery power is low. There shall be an adjustment to allow input gain changes in 2 dB steps with a total range of 30 dB. There shall be a switchable 125 Hz high-pass filter. The transmitter shall include a pilot tone to identify the wireless transmitter to the wireless receiver. The transmitter shall utilize two RF output power levels and shall operate on two AA batteries. The battery compartment shall be locking. All setting adjustments shall be via soft-touch controls and shall remain as set even if the transmitter loses power or the batteries are removed. The transmitter shall have an IR sync button to allow receiver settings to be synced with the transmitter. An OLED screen shall be provided to show transmitter setup parameters or frequency. Charging terminals on the base of the transmitter shall work with an optional smart charging dock to recharge AA NiMH batteries installed in the transmitter. The transmitter shall have a removable and field-replaceable antenna.

4. The frequency-agile FM wireless handheld transmitter shall be part of a wireless microphone system operating in the bands of 470.125–529.975 MHz or 530.000–589.975 MHz. The transmitter shall come with either a dynamic or a condenser cardioid microphone capsule, which shall screw onto the transmitter's industry-standard thread mount. Each capsule shall incorporate internal shock mounting and have a two-stage integral pop filter. The transmitter shall also work with additional capsules specifically designed for the transmitter (available separately) as well as other compatible capsules. The transmitter shall have a metal housing with a plastic antenna end cap. The transmitter shall transmit a digital pilot tone that allows the receiver to unmute. The transmitter shall also be equipped with a multifunction button that can be programmed to perform a specific function when pressed and held: mute the audio; mute the audio even when the transmitter is locked; turn off RF transmission; or switch to a preselected backup frequency. (The multifunction button can also be disabled.) A dual-color LED indicator shall illuminate green when the power is on and red when the transmitter is muted or battery power is low. An OLED screen shall be provided to show transmitter setup parameters or frequency. The microphone shall have an audio input level adjustment range of 30 dB in 2 dB steps. It shall also have a switchable 150 Hz high-pass filter. All setting adjustments shall be via soft-touch controls and shall remain as set even if the transmitter loses power or the batteries are removed. The transmitter shall have an IR sync button to allow receiver settings to be synced with the transmitter. The transmitter shall operate on two AA batteries and contain a Hi/Lo RF power selector. A battery fuel gauge shall be incorporated to indicate the status of the internal batteries. Charging terminals on the base of the transmitter shall work with an optional smart charging dock to recharge AA NiMH batteries installed in the transmitter. The transmitter shall be supplied with a heavy-duty stand clamp.
5. A two-bay charging dock shall also be available as an optional component. It shall charge AA NiMH batteries that are installed in body-pack or handheld transmitters. The charging dock shall automatically shut off if alkaline or damaged batteries are detected in the transmitters. A single power supply shall power up to five linked docks. A networked version of the charging dock shall also be available as an optional component. The networked dock shall be capable of monitoring the charging status of all transmitters in up to five linked docks.
6. The Wireless Microphone (Handheld) shall be manufactured by Audio Technica Model # ATW-3212/C710. Includes: ATW-R3210 receiver and ATW-T3202 handheld transmitter with ATW-C710 cardioid condenser microphone capsule.
    a. Provide two (2) kits – one per podium / lectern.
7. The Wireless Microphone (Ear-Worn) shall be manufactured by Audio Technica Model # ATW-3211/894X. Includes: ATW-R3210 receiver and ATW-T3201 body-pack transmitter with BP894xcH MicroSet cardioid condenser headworn microphone (black). Includes windscreens, clothing clip, and dual-ear adapter kit.
    a. Provide two (2) kits – one per podium / lectern
8. Rack mount the wireless microphone receivers in the rolling presentation podium with the included rack mount hardware. Utilize the included flexible UHF antennas.
    a. Connect the unbalanced ¼" TS outputs to 3.5mm unbalanced stereo input of NV32 in rack with the appropriate patch cord: (1) 3.5mm male TRS to (2) ¼" male TS (Y-Cable).
9. The Wireless Microphone two-bay charging dock shall be manufactured by Audio Technica Model # ATW-CHG3.
    a. Provide two (2) kits – one per podium / lectern and locate on the rolling presentation podium.
10. Clearly label microphones and associated charging cradle so that microphones remain in correct section of the room and microphone labels correspond with labels within DSP programming.

B. Beamforming Array Ceiling Microphone for teleconference
   1. The beamforming array microphone, designed for use in conference rooms, boardrooms, and other meeting spaces, shall mount flush or on the surface of a drop ceiling or hard ceiling, or in open architecture spaces using a standard VESA mount. The microphone shall come with surface- and flush-mount adapters, a flush-mount cover, mounting screws and nuts, tile-bridge assembly, installation template, a seismic cable, Euroblock connectors, snap bushings, and a hole cover that can be used when only a single conduit is connected.
   2. The microphone shall have six individual output channels, which, collectively, can be configured with up to 32 user-defined microphone pickup zones. Output Channel 1 shall be configurable with up to 16 user-defined Coverage Zones to ensure coverage of nonpriority or unplanned participants. Output Channels 2–6 shall be configurable with up to 16 user-defined Priority Zones to ensure priority pickup of participants in known locations. The microphone's 90-degree orthogonal beams shall function across all output channels, enabling it to focus on particular points in space and prevent the pickup of unwanted noise. Voice activity detection (VAD) technology shall enable the microphone to discern between a voice and unwanted noises such as paper shuffling.
   3. The microphone shall have an onboard DSP with functions that include automix, acoustic echo cancelation, noise reduction, automatic gain control, and 4-band EQ. The face of the microphone shall be outfitted with a reset button and an IR window to receive mute and other control signals from an included IR remote.
   4. The microphone shall have a frequency response of 60 Hz to 18,000 Hz and be capable of handling sound input levels up to 102 dB.
   5. The microphone shall support Dante network digital audio protocol for signal transmission.
   6. The Beamforming Ceiling Array Microphone shall be manufactured by Audio Technica, Model # ATND1061DAN Beamforming Ceiling Array Microphone.
      a. Provide two (2) – one per each room.
      b. Install flush mount in ACT Ceiling with the provided mounting accessories. Install with safety cable per manufacturer's instructions.
      c. Utilize gray copper patch cables as needed (Provided by 272000).

2.19 TELECONFERENCE CAMERA (PARTICIPANTS VIEW)

A. The video camera shall have an RJ-45 connector for connecting to a 1000 Mbps Ethernet network. The camera shall only be powered via Power over Ethernet (PoE). The camera shall use the network for transmitting video to one or more bridging endpoints without the need for USB extenders. The camera shall also use the network for control and monitoring.

B. The camera shall have a 1/2.8" CMOS 4K image sensor with a ≥55dB signal-to-noise ratio. The lens shall have a 12x optical zoom, a horizontal field of view of 80° - 7.5°, and a focal length of 3.47 - 41.65mm. The camera shall utilize motors for pan, tilt, and zoom (PTZ) and output a IP video stream from the camera directly to the bridging endpoint. The camera movement shall be controlled exclusively via the network. The camera output shall have a 16:9 aspect ratio.

C. The camera shall include a bracket to allow for the camera to be surface mounted. The camera should have an optional mounting accessory for ceiling mounted installations. The camera should have necessary imaging controls to allow for inverted mounting.

D. The camera shall have an operating temperature range of 0°C - 40°C and a storage temperature range of -40°C - 60°C. The camera shall weigh no more than 2.4 kg and shall not exceed 142mm x 201mm x 170mm (width, height, depth) in size.

E. The camera shall integrate natively with the QSC Q-SYS Ecosystem for discovery, control, signal routing, firmware management, and bridging.

F. The camera shall be manufactured by QSC Model # Q-SYS NC-12x80.
   1. Provide two (2) – one per each half of room.

2. Wall mount with included wall mount bracket.
3. Utilize gray copper patch cables as needed (Provided by 272000).
4. Utilize QSC QSYS Automatic Camera Preset Recall Plugin based on positional data gathered from the ceiling microphone array.

2.1 TELECONFERENCE CAMERA (PRESENTER / INSTRUCTOR VIEW)

A. The video camera shall have an RJ-45 connector for connecting to a 1000 Mbps Ethernet network. The camera shall only be powered via Power over Ethernet (PoE). The camera shall use the network for transmitting video to one or more bridging endpoints without the need for USB extenders. The camera shall also use the network for control and monitoring.

B. The camera shall have a 1/2.8" CMOS 4K image sensor with a ≥55dB signal-to-noise ratio. The lens shall have a 20x optical zoom, a horizontal field of view of 60°- 3.5°, and a focal length of 6.25-125mm. The camera shall utilize motors for pan, tilt, and zoom (PTZ) and output an IP video stream from the camera directly to the bridging endpoint. The camera movement shall be controlled exclusively via the network. The camera output shall have a 16:9 aspect ratio.

C. The camera shall include a bracket to allow for the camera to be surface mounted. The camera should have an optional mounting accessory for ceiling mounted installations. The camera should have necessary imaging controls to allow for inverted mounting.

D. The camera shall have an operating temperature range of 0°C - 40°C and a storage temperature range of -40°C - 60°C. The camera shall weigh no more than 2.4 kg and shall not exceed 142mm x 201mm x 170mm (width, height, depth) in size.

E. The camera shall integrate natively with the QSC Q-SYS Ecosystem for discovery, control, signal routing, firmware management, and bridging.

F. The camera shall be the QSC Q-SYS NC-20x60.
1. Provide two (2) – one per each half of room.
2. Ceiling mount each camera with QSC Model # PTZ-CMB1 ceiling mount bracket. Provide one (1).
3. Utilize gray copper patch cables as needed (Provided by 272000).
4. Utilize QSC QSYS Automatic Camera Preset Recall Plugin based on positional data gathered from the ceiling microphone array.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install each system shown as indicated, in accordance with equipment manufacturer's instructions, and with recognized industry practices.

B. Mount the projector in the ceiling per manufacturer's recommendations.

C. All low voltage and signal wiring shall be run exposed in the ceiling space.

D. Program the Switcher/Receiver per manufacturers recommended settings. All devices with RS-232 controls in the system shall be controlled by the Switcher/Receiver.

3.2 SYSTEM TESTING

A. The system testing shall conform to the requirements of Section 270000.

B. The Installing Vendor shall provide the staff with walkie-talkies, test equipment, additional equipment, resources, and time necessary to support BCE Engineers to provide the Commissioning of this System. The Installing Vendor shall demonstrate to BCE Engineers the complete operation of each device, head end functionality, system configuration, and software functionality. The Installing Vendor shall also make adjustments to the equipment and changes to the program settings, as requested. This testing shall be typical of four (4) locations, selected by the Electrical Engineer.

3.3 INTEGRATION TO OTHER LOW VOLTAGE SYSTEMS

A. See “System Operation” listed elsewhere in this specification for more information.

3.4 ON-SITE TRAINING

A. On-site training shall follow a written training plan, prepared in advance. The training plan shall outline the topics to be covered, the publications to be used, and the training schedule.

B. Supply two (2) hours minimum of training for the Owner’s staff in operating and maintenance of the television distribution system. Training time shall be extended as necessary to satisfy the Owner’s Representative that all pertinent topics have been adequately covered.

C. The training shall be conducted after the operating and Maintenance Manuals for the Project are completed and available for use during the training session.

D. Maintain a training sign-in sheet, upon which participants in the training session, including the instructors, shall record their names. Training sign-in sheet shall be dated.

E. The training shall be conducted by a representative of the equipment manufacturer who is thoroughly familiar with the equipment and its features, and also with the installation on this Project. The training shall include instruction and field demonstration. As a minimum, the training shall cover, but not be limited to, the following topics:
1. General Overview of the system, including purpose and principle of operation.
2. System features, including expansion capability.
3. Interpretation of system outputs (indicators, displays, etc.).
4. Operation of system controls (gain controls, slope adjustment, etc.).
5. Recommended maintenance procedures and intervals.
6. Detailed trouble-shooting instructions.
7. Explanation of service agreement options.

F. At the conclusion of the training session, insert a copy of the training sign-in sheet into the Operating and Maintenance Manuals. Submit another copy of the training sign-in sheet to the Architect.

3.5 AS-BUILT DOCUMENTATION

A. Operation and maintenance manuals and the as-built drawings shall conform to the requirements of section 270000.

END OF SECTION 274116.51

SECTION 274116.52

FIRING RANGE AUDIO SYSTEM

PART 1 - GENERAL

1.1 SCOPE AND RELATED DOCUMENTS

A. Furnish and install a complete Audio / Paging system as shown on the drawings and as specified herein.

B. Provide the Firing Range paging microphone system, back boxes, amplifiers, speakers, other devices mentioned in this specification or plans, input faceplates with all associated cabling and outlet and installation of the system as required for a complete and operating system.

C. Submit All equipment, including wiring, cabling, and outlets furnished and installed under these specifications, shall be guaranteed for a period of one year from the date of final acceptance thereof against all electrical or mechanical defects or failures except that which can be proved to have been caused by misuse. All service and parts shall be provided during the first year by the contractor or their designated agent.

D. The system shall meet ALL of the requirements listed in Section 270000 Low Voltage Systems General Requirements PART 3 “Testing & Complete System Functionality”, prior to “Substantial Completion”.

E. Contractual information, guidelines, requirements, or other work specified to provide a fully functional system for Section 274116.52 includes but is not limited to the sections identified in Section 270000.

1.2 SYSTEM OPERATION

A. The audio system shall provide for the paging and playing of pre-recorded messages with audio playing over the overhead speakers.

B. The Paging System Control Panel shall control the paging status and pre-recorded message triggers.

C. All wall plates, jacks, cable and accessories shall be provided as required for a fully functional system.

D. Integration to other Low Voltage systems:
   1. Fire Alarm System Interface:
      a. The system’s control I/O module’s auxiliary inputs shall receive a relay closure such that in the event of a fire alarm event, the system’s audio output shall be shunted.
   2. Owner’s VOIP Network for Softphone integration
      a. Coordinate with the owner for network connection to the central processor for access to their VOIP phone network and assigning softphone extensions to each room for teleconferencing use via the AV system & AV touch screen control GUI.

E. System Programming:
   1. The system shall be controlled by a central processor.
   2. The contractor shall provide programming and configuration of the entire system. This includes, but is not limited to:
      a. Preset creation on the control system
      b. Preset creation on the audio digital signal processor (DSP)
      c. Configuration and commissioning of the network audio system

3. Functions:
   a. The paging microphone shall page all speakers when engaged from the Range Master's office.

1.3 QUALITY ASSURANCE

A. All major system components shall be supplied and installed by an authorized factory distributor. The Installing Contractor and manufacturer shall have furnished and installed similar sound systems continuously for no less than five years. The contractor must have at least two employees holding CTS-D or CTS-I certifications. The contractor must have at least one employee certified in QSC Qsys Level 1 and at least one employee certified in QSC Qsys Level 2. The contractor must have at least 1 employee certified in Audinate Dante Level 3. Submit proof of qualifications for bid and shop drawing submittals: proof of certifications, vendor qualifications, and proof of prior projects. Contract could be rejected if qualifications are not met.

B. All Audio-Visual and Audio Specification sections must be provided and installed by one vendor.

1.4 SUBMITTALS

A. Refer to "As-Built Drawings" for additional requirements.

B. Refer to Section 270000 Low Voltage Systems General Requirements, for additional data sheet submittal requirements and the shop drawing submittal requirements.

1.5 COORDINATION

A. Pre-Installation Project Kick-off Meeting. The Installing Contractor shall contact the Electrical Contractor for the purpose of confirming the actual date of and attending the Pre-Installation Project Kick-Off Meeting at the location selected by the Owner. This meeting shall take place PRIOR to Submittal of equipment data sheets. The Installing Contractor shall be responsible for providing the following items.
   1. Submitting a list of questions and their list of coordination items through the Construction Channels a minimum of 14 Days in advance of the meeting for Owner review.
   2. A sign in sheet (with the project name, Section number and title that the Installing Contractor is representing, date, time, location, the printed name of each person in attendance, their title, phone number, and email address).
   3. Be responsible for taking Meeting Minutes, typing them into a formal document, and distributing them via email to each attendee.
   4. The items discussed at the Pre-Installation project kick-off meeting shall include, but not be limited to:
      a. General location of Rack, assisted listening equipment, and other items.
      b. General questions about system operation, function, and programming.

B. Follow up documentation for the Pre-Installation Project Kick-Off Meeting. The purpose of this information is to illustrate to the Owners Representative that the information discussed during the Pre-Installation Project Kick-Off Meeting was understood by the Installing Contractor.
   1. Each of the above items and items discussed during the meeting shall be included in the Data Sheet Submittals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. See Section 270000 Low Voltage Systems General Requirements for additional information.

B. The System design, devices and/or wiring arrangement shown on the drawings represent that based on various equipment manufacturers.
   1. No substitutions are allowed.

C. Provide all equipment as defined in this specification and shown on the drawings.

D. Refer to PART 1 for any equipment that is not specifically defined.

2.2 ETHERNET SWITCH

A. Training Building AV Ethernet / Network switch
   1. Utilize the network switch provided under specification 274116.62 in the IDF 216 rack.

2.3 DIGITAL SIGNAL PROCESSOR & CONTROLLER

A. Utilize the central system processor and controller provided under specification 274116.62.

B. Under the scope of work for this specification, provide the additional set-up & programming for the Firing Range audio system as required for a complete and fully function system.

2.4 AMPLIFIER

A. The amplifier shall contain all solid-state circuitry with a high-efficiency Class D output section. The amplifier shall have a universal power supply that utilizes active power factor correction and operates on 100 to 240 volts, 50 to 60 Hz, AC mains power. The power supply shall switch to a very low-power standby state after 25 minutes of inactivity and shall switch on in less than 1 second when an input signal appears, with the audio automatically resuming previous levels without causing audible pops or other noises. The amplifier shall consume no more than 40 watts at idle and less than 3 watts in full standby. The amplifier shall have a chassis-mounted IEC mains connector and shall be equipped with a removable power cord. A “remote” connection on the rear panel will allow the amplifier to be put into standby.

B. The amplifier shall have four audio channels, each with its own input and output. Switches on the rear panel shall allow each channel to be configured independently for 4Ω or 8Ω loads or for 70V or 100V distributed lines. The amplifier shall be rated at 200 watts per channel (nominal) into 4Ω and 8Ω loads and into 70- and 100-volt distributed lines. The amplifier’s power supply-sharing topology shall provide a maximum of 400 watts to each pair of channels, with limiters automatically permitting each channel to deliver up to 400 watts as required. A selectable 80 Hz high-pass filter shall be available to reduce risk of loudspeaker transformer saturation. The amplifier shall have SPDT relay outputs (common, normally open, and normally closed) for providing system operational status to third-party devices.

C. The amplifier shall be cooled by fan-forced air, with intake at the chassis sides and exhaust through the front, and shall have a recommended ambient temperature operating range of 0 to 35° C; the maximum operational range of ambient temperature shall be -10 to 50° C.

D. The amplifier shall be UL listed, CE and RoHS/WEEE compliant, and FCC Class B certified.

E. The amplifier inputs shall be balanced but also capable of operating unbalanced, with an input impedance of 10 kΩ or higher and able to handle signals of 12.3 V rms (+24 dBu) before clipping. The inputs shall use four green 3-position Euro-style connectors with a 3.5 mm pitch. The four channel outputs shall use two green 4-position Euro-Style connectors with a 5 mm pitch and two retention screws. A black 5-position Euro-style connector with a 3.5 mm pitch shall allow for optional remote control of standby and for amplifier status verification. The amplifier’s input sensitivity voltage shall be +4 dBu (1.2 V rms) at full gain.

F. Notwithstanding the 80 Hz bridged mono high-pass filter, the amplifier's frequency response shall be flat within ±0.5 dB over 20 Hz to 20 kHz. The unweighted signal to noise ratio shall be greater than 103 dB over 20 Hz to 20 kHz.

G. The amplifier shall reside in a black 1 rack space high, 19-inch rack-mountable chassis with dimensions (height × width × depth) 1.75 × 19 × 13.6 in (44 × 483 × 345 mm).

H. The amplifier's front panel shall have only LED indicators, and no switches, knobs, nor other controls. The front panel LEDs shall be one power indicator, along with a signal indicator and a limiter/protect indicator for each channel.

I. The amplifier's rear panel shall contain all the input, output, remote, and mains connections. It shall also contain a rotary gain and a bicolor LED indicator for each channel. Each channel's gain control shall be labeled in dB of attenuation, with "0" at maximum gain, or fully clockwise, and an infinity symbol at minimum, or full counterclockwise. Each channel's LED shall light green to indicate presence of an output signal or red to indicate limiting or protect mode. The rear panel shall contain four subminiature groups of three toggle switches for configuring the amplifier channels and engaging the 80 Hz high-pass filters. The four possible configurations for each channel shall be 4 ohm, 8 ohm, 70V, and 100V. The maximum gain in these configurations shall be: 27 dB (4 ohm); 30 dB (8 ohm); 35 dB (70V); and 37.4 dB (100V).

J. The amplifier's net weight shall be 9.3 lb (4.2 kg) and its shipping weight, 13.9 lb (6.3 kg)

K. The amplifier shall be the QSC MP-A40V.
1. Provide one (1).
2. Locate in IDF 216 Rack
3. Feed with 4-channel audio expander module listed elsewhere in this specification.

2.5 FLUSH MOUNT SPEAKERS

A. The ceiling mount 2-way co-axial system shall incorporate a 4.5-inch woofer with treated-paper cone and a 19 mm aluminum dome tweeter. The tweeter shall be mounted coaxially in front of the woofer on a waveguide that matches the directivity of the two drivers at the crossover point.

B. The system shall meet the following performance criteria: conical coverage angle of 150 degrees; frequency response of 70 Hz to 20 kHz +0/-10 dB, measured on axis; sensitivity of 87 dB SPL in half space at 1 meter with an input of 4 V rms; maximum continuous output of 102 dB SPL; maximum peak output of 108 dB SPL on axis at 1 meter; power handling of 30 watts for 8 hours with an IEC noise signal; recommended amplifier power of 60 watts; nominal impedance of 16 ohms.

C. The loudspeaker shall have a switchable low-distortion, wide-bandwidth laminated core transformer with taps for 30, 15, 7.5 and 3.8 watts at 70V and 30, 15 and 7.5 watts at 100V. The system shall be switchable between 16Ω (bypass) and constant-voltage operation.

D. The loudspeaker shall have a low-profile powder coated steel back can. The baffle and the grille shall have a white paintable finish (RAL 9010) with UV inhibitors to prevent discoloration. The enclosure shall retain the grille magnetically. Any logo on the grille shall be removable without leaving a blemish.

E. The loudspeaker shall have a double-stepped long-travel dog-ear blind mounting system that can capture ceiling thicknesses from 0 to 2.25 in. The conduit cover plate shall be removable, retained by a captive Phillips head screw. A mud ring shall be provided to allow pre-installation wiring. The loudspeaker connections shall be a locking 4-pole Euro-block that accepts four 18 AWG wire pairs.

F. The loudspeaker shall be listed as safe for use in air-handling spaces under UL1480 and UL2043. The loudspeaker shall meet or exceed IP-34 for ingress protection; it shall meet the IEC 60529 IP-X3 splash rating. The switchable transformer shall be listed under UL1876. The baffle shall meet UL94-V0 and UL94-5VB flammability ratings and shall comply with IEC60849/EN60849 safety standards.

G. The loudspeaker's enclosure shall be 3.93 in (10.0 cm) high and 11.02 in (28.0 cm) in diameter. The loudspeaker shall weigh no more than 6.6 lb (3.0 kg).

H. The ceiling mount 2-way co-axial system shall be manufactured by QSC model # AD-C4T-LP.

I. Provide quantities as shown on floor plans.
1. Speakers shall be black. Prior to ordering confirm color with Architect.
2. Install in ACT ceiling with provided C- ring & tile rail accessories per manufacturer's instructions.
3. Wire the speakers in 70-volt groups not exceeding 80% of each channel's wattage.

2.6 SURFACE MOUNT SPEAKERS

A. The small format, surface mount loudspeaker system shall be a two-way full-range design. The loudspeaker low-frequency transducer shall be an 4-inch (100 mm) woofer with a polypropylene cone and a 1-inch (25 mm) voice coil. The loudspeaker high-frequency transducer shall be a 1-inch (25 mm) aluminum dome tweeter with a 1-inch voice-coil. The loudspeaker system shall be capable of operation in low-impedance (8Ω) bypass mode or over a 70/100V distributed audio line via a built-in low-loss, low-saturation 16-watt transformer.

B. The loudspeaker system shall meet the following performance criteria: effective frequency range of 70 Hz to 20 kHz (free-field, -10 dB from on-axis sensitivity); broad-band sensitivity of 85 dB SPL (on-axis, free-field sensitivity, 2.83V, 1 m); maximum rated SPL (calculated) of 97 dB continuous and 103 dB peak; rated power capacity of 11.3V or 16W (two-hours, IEC60268-1 noise); recommended amplifier power of 32W; rated impedance of 8 Ohms. The loudspeaker system's nominal coverage angle shall be 130 degrees (-6 dB) conical.

C. The loudspeaker system shall connect via a 4-pole Euroblock connector on the rear of the loudspeaker enclosure. The enclosure shall be constructed of paintable high-impact ABS polymer in either of two RAL colors: black (9011) or white (9010). The front of the full range system shall be protected by a grille of powder-coated steel. The enclosure shall be fitted with two brass inserts that accept an included yoke mount. The loudspeaker may be used in either horizontal or vertical deployments.

D. The enclosure shall be 9.1 in (230 mm) high, 6.3 in (160 mm) wide, and 5.9 in (150 mm) deep. The loudspeaker system shall have a net weight of no more than 5.3 lb (2.4 kg).

E. The two-way full-range loudspeaker system shall be manufactured by QSC Model # AC-S4T.

F. Provide quantities as shown on floor plans.
1. Speakers shall be black. Prior to ordering confirm color with Architect.
2. Install in ACT ceiling with provided C- ring & tile rail accessories per manufacturer's instructions.
3. Wire the speakers in 70-volt groups not exceeding 80% of each channel's wattage.

2.7 PAGING STATION

A. The Q-Sys Page Station is a QSC Q-Sys system audio input and output device. The system shall operate on a native gigabit Ethernet network, employing DiffServ quality of service, IEEE 1588 audio clock synchronization, UDP/IP data transport, and floating-point format audio data representation. The overall system latency from analog input to synchronized analog output(s) shall be 2.5 ms or less. For routed networks, the end to end system latency shall be 3.2 ms or less.

B. The Page Station shall have the capability of being redundant in that it provides redundant "hot" network connections for seamless audio stream failover. The Page Station shall be capable of utilizing Power over Ethernet (PoE), or an external +24V power supply.

C. The audio I/O capacity of the Page Station shall be one microphone and one auxiliary input and one auxiliary line out. The Page Station shall also support up to four GPIO connections.

D. The Page Station shall have the following front panel controls and indicators: 240 x 64 monochrome LCD graphics display, BUSY - red LED, READY - green LED, RECORD - red LED, keypad activity - green LEDs, Zone BUSY indicators - red LEDs, Zone READY indicators - green LEDs, TALK / START indicator - green LED. The PS-1650 and PS-1600 shall have 17 capacitive touch buttons, the PS-800 shall have 9 capacitive touch buttons, and the PS-400 shall have 5 capacitive touch buttons.

E. The PS-XXXXG (gooseneck models) shall have a fixed gooseneck microphone. All models shall provide microphone verification ensuring that the microphone is present and capable of being used.

F. The Page Station shall have the following rear panel connectors: Q-Sys Network LAN A and LAN B - RJ45 1000 MBps only, GPIO - 6 pin Euro connector, DC Power +24V inlet - 2 pin Euro connector, Aux Line input - 3 pin Euro connector, Aux Line output - 3 pin Euro connector.

G. The Q-Sys Page Station dimensions shall be: (HWD) 10.4" x 8.3" x 1.5" (26.4 mm x 21.1 mm x 3.8 mm).

H. The system input and output device shall be the QSC Q-Sys Page Station Model # PS-1600G.
1. Provide one (1) desk mounted in the Range Master's office. Coordinate exact location with architect prior to rough-in.

I. Utilize gray copper patch cables as needed (Provided by 272000).

2.8 SYSTEM PROCESSOR EXPANDER I/O MODULES

A. NETWORK (IP) to Two Mic/Line Input & Two Analog Line Output Expander
1. The peripheral shall provide two (2) channels of analog audio output with two (2) channels of analog audio input that are remotely configurable for microphone or line-level signals. These inputs shall be fully monitored and supervised with configurable impedance measurement to detect connected devices with the ability to drive programmable logic or scripted programming. The peripheral shall accommodate up to two (2) networked audio channels in each direction, formatted as Q-LAN networked audio, between the system processor. The peripheral shall operate natively on a standard gigabit Ethernet infrastructure available from a broad range of network infrastructure manufacturers. The peripheral shall employ DiffServ quality of service, IGMP, IEEE 1588-2008 (PTPv2) precision time protocol, and UDP/IP audio data transport with floating-point format audio data representation. The peripheral shall support 802.1x authentication. The peripheral shall not require IEEE 802.1AS, IEEE 802.1Qat, or IEEE 802.1Qav support on the network infrastructure to function. The overall system latency from analog input to synchronized analog outputs anywhere on the network shall be 3.167 ms. The system shall also be able to achieve an overall system latency of 3.167 ms over Layer-3 routed network infrastructure without any additional hardware, software, or connection services between subnets.
2. The peripheral shall operate on PoE or DC power input and have the following front panel controls and indicators: Unit ID button, green ID LED, and blue Power LED. A web interface shall provide basic network and security configuration, status, and log retrieval. The peripheral shall be natively integrated into Q-SYS Designer Software for network discovery, real-time configuration, control, monitoring, supervision, and network audio routing.

3. The peripheral's rear panel shall provide two 2-pin power Euroblock connectors for daisy-chainable DC power, two (2) balanced audio outputs and two (2) balanced audio inputs on individual 6-pin Euroblock connectors, a recessed settings reset button, and two (2) RJ45 connectors for daisy-chainable Ethernet configured as Q-SYS Network ports: one (1) PoE port, RJ45 1000 Mbps only; one (1) Pass-thru port, RJ45 1000 Mbps only.
4. The peripheral shall feature multiple mounting options including a standard 19-inch rack or surfaces such as under-table or on-wall. It shall be one-quarter (1/4) rack space wide and less than one (1) rack unit tall (1.59 inches / 4.04 cm), allowing mounting alongside quarter-rack width QSC Q-SYS QIO peripherals using an optional rack tray kit. The peripheral shall include two (2) reversible steel angle brackets for surface mounting.
5. The peripheral dimensions shall be 1.59" x 4.25" x 8.5" (4.04cm x 10.80cm x 21.59cm).
6. The peripheral shall be manufactured by QSC QIO-ML2x2.
    a. Provide one (1) and locate in IDF 216 rack with paging amplifier.

B. Label all devices and patch cords.

C. Provide 19" Rack Mount Bracket manufactured by QSC model # QIO-RMK.

D. Provide and install devices as shown on the drawings.

E. Provide required wiring and coordinate with all trades required for a complete and fully functional system.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install each system shown as indicated, in accordance with equipment manufacturer's instructions, and with recognized industry practices.

B. Mount the speakers in the ceiling per manufacturer's recommendations.

C. All low voltage and signal wiring shall be run exposed in the ceiling space.

3.2 SYSTEM TESTING

A. The system testing shall conform to the requirements of Section 270000.

B. The Installing Vendor shall provide the staff with walkie-talkies, test equipment, additional equipment, resources, and time necessary to support BCE Engineers to provide the Commissioning of this System. The Installing Vendor shall demonstrate to BCE Engineers the complete operation of each device, head end functionality, system configuration, and software functionality. The Installing Vendor shall also make adjustments to the equipment and changes to the program settings, as requested. This testing shall be typical of four (4) locations, selected by the Electrical Engineer.

3.3 INTEGRATION TO OTHER LOW VOLTAGE SYSTEMS

A. See "System Operation" listed elsewhere in this specification for more information.

3.4 ON-SITE TRAINING

A. On-site training shall follow a written training plan, prepared in advance. The training plan shall outline the topics to be covered, the publications to be used, and the training schedule.

B. Supply two (2) hours minimum of training for the Owner's staff in operating and maintenance of the television distribution system. Training time shall be extended as necessary to satisfy the Owner's Representative that all pertinent topics have been adequately covered.

C. The training shall be conducted after the operating and Maintenance Manuals for the Project are completed and available for use during the training session.

D. Maintain a training sign-in sheet, upon which participants in the training session, including the instructors, shall record their names. Training sign-in sheet shall be dated.

E. The training shall be conducted by a representative of the equipment manufacturer who is thoroughly familiar with the equipment and its features, and also with the installation on this Project. The training shall include instruction and field demonstration. As a minimum, the training shall cover, but not be limited to, the following topics:
1. General Overview of the system, including purpose and principle of operation.
2. System features, including expansion capability.
3. Interpretation of system outputs (indicators, displays, etc.).
4. Operation of system controls (gain controls, slope adjustment, etc.).
5. Recommended maintenance procedures and intervals.
6. Detailed trouble-shooting instructions.
7. Explanation of service agreement options.

F. At the conclusion of the training session, insert a copy of the training sign-in sheet into the Operating and Maintenance Manuals. Submit another copy of the training sign-in sheet to the Architect.

3.5 AS-BUILT DOCUMENTATION

A. Operation and maintenance manuals and the as-built drawings shall conform to the requirements of section 270000.

END OF SECTION 274116.51

SECTION 274116.62

COMMUNITY ROOM & EOC AUDIO-VISUAL SYSTEMS

PART 1 - GENERAL

1.1 SCOPE AND RELATED DOCUMENTS

A. Furnish and install a complete Audio-Visual (AV) system as shown on the drawings and as specified herein. Additionally, AV head-end equipment listed in this specification will also serve as the head-end for other rooms as referenced in other AV specifications for setup and programming. The system shall be programmed to operate in Community Room mode with the capacity for future expansion to add an EOC (Emergency Operations Center) mode. EOC system infrastructure is rough-in only under base bid with pathways, data cables, and supporting power for future devices and a future installation.

B. Provide the Community Room wireless microphone system, IP video endpoints, IP based control panel, back boxes, amplifiers, speakers, projector, projection screen, cameras, microphones, lectern, other devices mentioned in this specification or plans, input faceplates with all associated cabling and outlet and installation of the system as required for a complete and operating system.

C. Install OFCI monitors and monitor mounts. The general contractor shall provide all backing and supports as required for wall and ceiling/pendant monitor mounts. Coordinate exact location and weight requirements with Architect, Engineers, and Owner.

D. Submit All equipment, including wiring, cabling, and outlets furnished and installed under these specifications, shall be guaranteed for a period of one year from the date of final acceptance thereof against all electrical or mechanical defects or failures except that which can be proved to have been caused by misuse. All service and parts shall be provided during the first year by the contractor or their designated agent.

E. The system shall meet ALL of the requirements listed in Section 270000 Low Voltage Systems General Requirements PART 3 “Testing & Complete System Functionality”, prior to “Substantial Completion”.

F. Contractual information, guidelines, requirements, or other work specified to provide a fully functional system for Section 274116.62 includes but is not limited to the sections identified in Section 270000.

1.2 SYSTEM OPERATION

A. The AV system shall provide for the playing of the owner provided computer video outputs. The video image shall be projected or displayed on the screens via the contractor provided projector and the owner provided monitors with audio playing over the overhead speakers. The AV system shall also function as a VOIP audio or web video teleconference system.

B. The A/V System Control Panel shall control the power and input sources of the Projector and Monitor(s), as well as the connected AV equipment, such as the microphones, teleconference cameras, motorized projector screen, speakers, and cable tv boxes. Additionally, the system shall provide control of motorized shades and lighting presets.

C. All wall plates, jacks, cable and accessories shall be provided as required for a fully functional system.

D. A specific quantity of portable assisted listening “kits” shall be provided to comply with the 2010 revision to the Americans with Disabilities Act.

E. Integration to other Low Voltage systems:
   1. Motorized Shade Control:
      a. Provide the necessary cabling to the low voltage inputs of the motorized shade control module. The system's control panel shall be able to trigger an opening or closing of the shades.
   2. Lighting Preset Control:
      a. Provide the necessary cabling to the low voltage inputs of the lighting control module. The system's control panel shall be able to trigger the primary lighting presets for the room.
   3. Fire Alarm System Interface:
      a. The system's control I/O module's auxiliary inputs shall receive a relay closure such that in the event of a fire alarm event, the system's audio output shall be shunted.
   4. Owner's VOIP Network for Softphone integration
      a. Coordinate with the owner for network connection to the central processor for access to their VOIP phone network and assigning softphone extensions to each room for teleconferencing use via the AV system & AV touch screen control GUI.

F. System Programming:
   1. The system shall be controlled by a central processor.
   2. The contractor shall provide programming and configuration of the entire system. This includes, but is not limited to:
      a. GUI design/creation for the touch screen control panel(s)
      b. Preset creation on the control system
      c. Preset creation on the audio digital signal processor (DSP)
      d. Configuration and commissioning of the Dante network audio system
   3. Functions:
      a. The system touch screen control panel shall be programmed to do the following functions at a minimum:
         1) Adjust the volume levels of input sources
         2) Adjust the volume of far end conference audio sources
         3) Adjust master volume level & master mute
         4) Conference Camera modes (Recall PTZ presets & Auto Mode)
         5) Projector and TV/Monitor operation
         6) Projection Screen operation
         7) Video sources with live thumbnail video preview
            a) Configure GUI for Drag & Drop Source to Destination with live thumbnails of content
         8) Control of Cable TV Boxes
         9) Control of owner's VOIP Softphone
      b. The system touch screen control panel must be programmed to be password protected to protect the system from being manipulated unless authorized for operation.

1.3 QUALITY ASSURANCE

A. All major system components shall be supplied and installed by an authorized factory distributor. The Installing Contractor and manufacturer shall have furnished and installed similar sound systems continuously for no less than five years. The contractor must have at least two employees holding CTS-D or CTS-I certifications. The contractor must have at least one employee certified in QSC Qsys Level 1 and at least one employee certified in QSC Qsys Level 2. The contractor must have at least 1 employee certified in Audinate Dante Level 3. Submit proof of qualifications for bid and shop drawing submittals: proof of certifications, vendor qualifications, and proof of prior projects. Contract could be rejected if qualifications are not met.

1.4 SUBMITTALS

A. Refer to “As-Built Drawings” for additional requirements.

B. Refer to Section 270000 Low Voltage Systems General Requirements, for additional data sheet submittal requirements and the shop drawing submittal requirements.

1.5 COORDINATION

A. Pre-Installation Project Kick-off Meeting. The Installing Contractor shall contact the Electrical Contractor for the purpose of confirming the actual date of and attending the Pre-Installation Project Kick-Off Meeting at the location selected by the Owner. This meeting shall take place PRIOR to Submittal of equipment data sheets. The Installing Contractor shall be responsible for providing the following items.
   1. Submitting a list of questions and their list of coordination items through the Construction Channels a minimum of 14 Days in advance of the meeting for Owner review.
   2. A sign in sheet (with the project name, Section number and title that the Installing Contractor is representing, date, time, location, the printed name of each person in attendance, their title, phone number, and email address).
   3. Be responsible for taking Meeting Minutes, typing them into a formal document, and distributing them via email to each attendee.
   4. The items discussed at the Pre-Installation project kick-off meeting shall include, but not be limited to:
   5. General location of Rack, assisted listening equipment, and other items.
   6. General questions about system operation, function, and programming.

B. Follow up documentation for the Pre-Installation Project Kick-Off Meeting. The purpose of this information is to illustrate to the Owners Representative that the information discussed during the Pre-Installation Project Kick-Off Meeting was understood by the Installing Contractor.
   1. Each of the above items and items discussed during the meeting shall be included in the Data Sheet Submittals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. See Section 270000 Low Voltage Systems General Requirements for additional information.

B. The System design, devices and/or wiring arrangement shown on the drawings represent that based on various equipment manufacturers.
   1. No substitutions are allowed.

C. Provide all equipment as defined in this specification and shown on the drawings.

D. Refer to PART 1 for any equipment that is not specifically defined.

2.2 CABLE TV BOX

A. The Cable TV box will be owner furnished contractor installed (OFCI). Install two (2) Comcast Model # to be determined.

B. Provide two (2) 1RU 19” universal rack shelves and rack mount in the IDF 107 rack.

C. Mount Cable TV box and video encoder mentioned elsewhere in this specification to rack shelf listed elsewhere in this specification. Tie to and IP-to-IR control module listed elsewhere in this specification. Label device with designated room name/#, and corresponding video source label from system programming.

D. Utilize coaxial, copper patch cables and vertical/horizontal rack wire management as needed (Provided by 272000).

2.3 ETHERNET SWITCH

A. Community Room rolling podium AV Ethernet / Network switch
   1. The network switch shall have 8x1G ports with 110W PoE+, 1x1G and 1xSFP uplink ports.
   2. The network switch shall be managed and configured as required for a fully functional AV system.
   3. The network switch shall be manufactured by Netgear, Model # AV Line M4250-9G1F-PoE+ (GSM4210PD).
   4. Provide one (1).
   5. Install in rolling presentation podium / lectern.
   6. Utilize copper patch cables and vertical/horizontal rack wire management as needed (Provided by 272000). Utilize building network outlets, CAT6 patch panels, and copper patch cords at the MDF/IDF rack (Provided by 272000).

B. Main Building AV Ethernet / Network switches
   1. The network switches shall have 40x1G ports with 960W PoE+, and 8xSFP+ uplink ports.
   2. The network switches shall be managed and configured as required for a fully functional AV system.
   3. The network switches shall be manufactured by Netgear, Model # AV Line M4250-40G8XF-PoE+ (GSM4248PX). Provide two (2). Locate one each in MDF 186 and IDF 107.
   4. Provide four (4) SFP modules compatible with single mode fiber optic LC duplex. Utilize two (2) SFP modules for each switch for connecting centralized switches in a ring topology.
   5. Provide four (4) SFP modules compatible with single mode fiber optic LC duplex. Utilize two (2) SFP modules for each switch for connecting centralized switches in a ring topology.
   6. Utilize copper patch cables and vertical/horizontal rack wire management as needed (Provided by 272000). Utilize building fiber optic backbone, light interface units (LIUs), and fiber optic patch cords (Provided by 272000). Coordinate with owner’s I.S. Department prior to patching fiber.

C. Training Building AV Ethernet / Network switch
   1. The network switch shall have 24x1G ports with 480W PoE+, and 4xSFP+ uplink ports.
   2. The network switch shall be managed and configured as required for a fully functional AV system.
   3. The network switch shall be manufactured by Netgear, Model # AV Line M4250-26G4XF-PoE+ (GSM4230PX). Provide one (1). Locate in IDF 216.
   4. Provide two (2) SFP modules compatible with single mode fiber optic LC duplex. Utilize two (2) SFP modules for each switch for connecting centralized switches in a ring topology.
   5. Utilize copper patch cables and vertical/horizontal rack wire management as needed (Provided by 272000). Utilize building fiber optic backbone, light interface units (LIUs), and fiber optic patch cords (Provided by 272000). Coordinate with owner’s I.S. Department prior to patching fiber.

2.4 WIRELESS CASTING A/V STREAMING RECEIVERS

A. Wireless casting devices are owner furnished contractor installed (OFCI). Install quantities shown on plans. The owner’s Streaming Receivers are planned to be:
   1. Apple TV for Mobile iOS & Mac OS devices. Connect to NV32 HDMI input 2.
   2. Microsoft Wireless Display Adapter for Android OS/Windows OS devices. Connect to NV32 HDMI input 3 & USB-A.

B. Where located in Podium Rack the contractor shall label and secure to a 19” rack shelf
   1. Provide a universal 1RU 19” rack shelf quantities as required.

2. Provide wire management as required to route CAT6 and HDMI patch cables to encoders and network switch.
3. Patch cables shall be labelled.
4. Provide HDMI 2.1 Male-Male and Female-Male patch cords as required.
5. Provide USB Type A Female-Male patch cords as required.
6. Utilize gray copper patch cables as needed (Provided by 272000).

2.5 DIGITAL SIGNAL PROCESSOR & CONTROLLER

A. The System Processor shall be a fully integrated audio, video and control processor intended for use in centralized or edge processing deployment architecture designs. The system processor shall leverage the Dell R250 Server Platform utilizing Intel® Xeon® processors running a real-time Linux operating system developed by QSC, LLC.

B. The system processor shall operate natively on a standard gigabit Ethernet infrastructure available from a broad range of network infrastructure manufacturers, employing DiffServ quality of service, IGMP, IEEE 1588-2008 (PTPv2) precision time protocol, UDP/IP audio and video transport with floating-point format audio data representation. The system shall support 802.1x authentication. The system shall not require IEEE 802.1AS, IEEE 802.1Qat, or IEEE 802.1Qav support on the network infrastructure to function. The overall system latency from analog input to synchronized analog outputs anywhere on the network shall be 3.167 mS. The system shall also be able to achieve an overall system latency of 3.167 mS over Layer-3 routed network infrastructure without any additional hardware, software or connection services between subnets.

C. The system processor shall manage external control interfaces such as Touchscreen Controllers, Paging Stations, Networked Audio I/O Expanders, Network Connected Amplifiers, AV-to-USB Bridging interfaces and IP-based PTZ Conference Room Cameras. The System Processor shall include a built-in SSD for Media File storage with a minimum size of 480 GB.

D. The system processor shall natively offer a minimum network channel capacity of 256 x 256 channels with each stream being configurable as either native Q-LAN networked audio format or AES67 formatted audio streams plus up to 64 x 64 channels of generic Media / WAN streaming capacity.

E. The system processor shall offer up to 64 channels of built-in Acoustic Echo Cancelation at the default tail length of 200 mS which can optionally be configured via software for 100 mS, 300 mS or 400 mS tail length affecting minimum and maximum channel capacity on a linear sliding scale.

F. The system processor shall natively offer up to 64 Softphone instances assignable to the built-in network interface ports.

G. The system processor shall include support for up to 4 tracks of audio recording and 16 tracks of audio playback. Audio playback capacity may be expanded by field application of software licenses to expand this capacity to either 32, 64, or 128 tracks of playback.

H. The system processor shall be scalable by field application of a software license which expands the network I/O capacity to 384 x 384, the generic Media / WAN streaming capacity to 96 x 96, the amount of Acoustic Echo Cancelation at the default tail length of 200 mS to 96 channels, with 50% more general purpose processing power.

I. Additionally, the system processor shall include 8 x 8 Software-based Dante network audio channels and is licensable for up to 256 x 256 Software-based Dante capacity. Software-based Dante channels used subtract from the overall baseline 256 x 256 or capacity scaled 384 x 384 network audio capacity.

J. The rear panel shall offer four network interfaces with individually configurable network services for the purposes of Q-SYS Networking on LAN A: RJ45 at 1000 Mbps only and LAN B: RJ45 at 1000 Mbps only, plus AUX LAN A and AUX LAN B at 10/100/1000 Mbps for integration with other IT services, management, monitoring, or control. The system processor shall offer as standard an internal AC Mains power supply. One RJ45 connection for the Dell iDRAC (integrated Dell Remote Access Controller) port for securely integrating low-level hardware diagnostics, local, and remote monitoring with standard IT toolsets.

K. A web interface shall provide basic network, services, and security configuration, status, and log retrieval. The system processor shall be natively integrated into Q-SYS Designer Software for network discovery, real-time configuration, control, monitoring, supervision, and management. A 9-pin D-Sub connector shall provide RS232 serial communications for integration with, and control of or control by, external devices.

L. The system processor shall store, and operate from, a single design that shall be comprised of audio, video, and control components, wiring, links, text, and graphics on a single or multiple schematic pages. Designs shall include any of the following audio DSP, video, test and measurement components, control components, and layout components: Acoustic Echo Cancellers, Audio Players, Audio Streaming components, Crossfaders, Crossovers, Delay components, Auto Gain control elements, Compressors, Gates, Duckers, Expanders, Ambient Noise Compensators, Limiters, Gain blocks, Graphic Equalizers, Parametric Equalizers, FIR Filters, All-Pass Filters, Band-Pass Filters, Band-Stop Filters, High-Pass Filters, Low-Pass Filters, FIR High-Pass filters, FIR Low-Pass Filters, Dual-Shelf Equalizers, Notch Filters, Meters, Matrix Mixers, Gain-Sharing Automatic Mixers, Gated Automatic Mixers, Signal Routers, Public Address Routers, Room Combiners, Signal Presence Meters, SIP Softphone instances, Tone Generators, Noise Generators, Dual Trace FFT Measurement Modules, Real Time Analyzers, Signal Injectors, Signal Probes, Logic, Value and Position control functions, Lua scripting components, Command Buttons and Triggers, Camera Router, USB Audio Bridge, USB Video Bridge.

M. The system processor shall be optionally enabled with a comprehensive control engine having user space access to a Lua programming environment and ability to host 3rd party plugin integrations via a field applicable software license.

N. The system processor shall support custom user control interfaces on either proprietary touch screen controllers, network computers utilizing a control application, iOS devices, or any device with a standard web browser. Custom control interfaces shall be capable of having multiple user-selectable pages with different controls on each.

O. The system processor shall be 1RU with an enclosure measuring 1.68” x 18.97” x 23.03” (4.28 cm x 48.20 cm x 58.50 cm).

P. The system processor and control engine shall be the Q-SYS Core 610.

Q. Provide one (1) Q-SYS Core 610.
   1. The Q-SYS Core 610 shall be mounted in the MDF Server rack provided by 272000 contractor. MDF Power outlets are fed by the central building UPS and backup generator provided by Division 26 contractor.
   2. Coordinate with the City’s I.S. Dept for all device IP Address planning, server setup, users, permissions, and connecting additional LAN ports to the owner’s network as required for QSC Core Manager on-premise servicing options or remote connection, if permitted, for remote servicing options.
   3. The Q-SYS Core 610 shall serve as the central processor for AV systems in Lacey PD & Training Building. The Community Room 105, Information Displays (IDM), Briefing Room 003, Command Conf Room 118, War Room 174, CRI Sergent Conference Room 180, and Firing Range 212. Additionally, for Training Classroom 221 per Bid Alternate 1D.

R. Provide additional licenses as required for a complete and functional system. Including but not limited to:
   1. Q-SYS Core 610 UCI Deployment Software License, Perpetual. Model # SLQUD-610-P.
   2. Q-SYS Core 610 Scripting Engine Software License, Perpetual. Model # SLQSE-610-P.
   3. Q-SYS Software-based Dante 128x128 Channel License, Perpetual. Model # SLDAN-128-P for Core 610.

2.6 AMPLIFIER

A. The amplifier shall contain all solid-state circuitry with a high-efficiency Class D output section. The amplifier shall have a universal power supply that utilizes active power factor correction and operates on 100 to 240 volts, 50 to 60 Hz, AC mains power. The power supply shall switch to a very low-power standby state after 25 minutes of inactivity and shall switch on in less than 1 second when an input signal appears, with the audio automatically resuming previous levels without causing audible pops or other noises. The amplifier shall consume no more than 40 watts at idle and less than 3 watts in full standby. The amplifier shall have a chassis-mounted IEC mains connector and shall be equipped with a removable power cord. A “remote” connection on the rear panel will allow the amplifier to be put into standby.

B. The amplifier shall have four audio channels, each with its own input and output. Switches on the rear panel shall allow each channel to be configured independently for 4Ω or 8Ω loads or for 70V or 100V distributed lines. The amplifier shall be rated at 200 watts per channel (nominal) into 4Ω and 8Ω loads and into 70- and 100-volt distributed lines. The amplifier’s power supply-sharing topology shall provide a maximum of 400 watts to each pair of channels, with limiters automatically permitting each channel to deliver up to 400 watts as required. A selectable 80 Hz high-pass filter shall be available to reduce risk of loudspeaker transformer saturation. The amplifier shall have SPDT relay outputs (common, normally open, and normally closed) for providing system operational status to third-party devices.

C. The amplifier shall be cooled by fan-forced air, with intake at the chassis sides and exhaust through the front, and shall have a recommended ambient temperature operating range of 0 to 35° C; the maximum operational range of ambient temperature shall be -10 to 50° C.

D. The amplifier shall be UL listed, CE and RoHS/WEEE compliant, and FCC Class B certified.

E. The amplifier inputs shall be balanced but also capable of operating unbalanced, with an input impedance of 10 kΩ or higher and able to handle signals of 12.3 V rms (+24 dBu) before clipping. The inputs shall use four green 3-position Euro-style connectors with a 3.5 mm pitch. The four channel outputs shall use two green 4-position Euro-Style connectors with a 5 mm pitch and two retention screws. A black 5-position Euro-style connector with a 3.5 mm pitch shall allow for optional remote control of standby and for amplifier status verification. The amplifier’s input sensitivity voltage shall be +4 dBu (1.2 V rms) at full gain.

F. Notwithstanding the 80 Hz bridged mono high-pass filter, the amplifier’s frequency response shall be flat within ±0.5 dB over 20 Hz to 20 kHz. The unweighted signal to noise ratio shall be greater than 103 dB over 20 Hz to 20 kHz.

G. The amplifier shall reside in a black 1 rack space high, 19-inch rack-mountable chassis with dimensions (height × width × depth) 1.75 × 19 × 13.6 in (44 × 483 × 345 mm).

H. The amplifier’s front panel shall have only LED indicators, and no switches, knobs, nor other controls. The front panel LEDs shall be one power indicator, along with a signal indicator and a limiter/protect indicator for each channel.

I. The amplifier's rear panel shall contain all the input, output, remote, and mains connections. It shall also contain a rotary gain and a bicolor LED indicator for each channel. Each channel's gain control shall be labeled in dB of attenuation, with "0" at maximum gain, or fully clockwise, and an infinity symbol at minimum, or full counterclockwise. Each channel's LED shall light green to indicate presence of an output signal or red to indicate limiting or protect mode. The rear panel shall contain four subminiature groups of three toggle switches for configuring the amplifier channels and engaging the 80 Hz high-pass filters. The four possible configurations for each channel shall be 4 ohm, 8 ohm, 70V, and 100V. The maximum gain in these configurations shall be: 27 dB (4 ohm); 30 dB (8 ohm); 35 dB (70V); and 37.4 dB (100V).

J. The amplifier's net weight shall be 9.3 lb (4.2 kg) and its shipping weight, 13.9 lb (6.3 kg)

K. The amplifier shall be the QSC MP-A40V.
1. Provide one (1).
2. Locate in IDF 107 Rack
3. Feed with 4-channel audio expander module listed elsewhere in this specification.

2.7 SPEAKERS

A. Pendant Mount Speakers:
1. The pendant-style 2-way co-axial system shall incorporate a 6.5-inch woofer with treated-paper cone and a 19 mm aluminum dome tweeter. The tweeter shall be mounted coaxially in front of the woofer on a waveguide that matches the directivity of the two drivers at the 1900 Hz crossover point.
2. The system shall meet the following performance criteria: conical coverage angle of 135 degrees; effective frequency range of 56 Hz to 20 kHz +0/-10 dB, measured on axis; broadband sensitivity of 88 dB (measured at 1 m with 4 V rms input); maximum continuous output of 106 dB SPL and maximum peak output of 112 dB SPL on axis at 1 meter; power handling of 60 watts for 8 hours with an IEC noise signal; recommended amplifier power of 120 watts; nominal impedance of 16 ohms.
3. The loudspeaker shall have a switchable low-distortion, wide-bandwidth laminated core transformer with taps for 60, 30, 15, and 7.5 watts at 70V and 60, 30, and 15 watts at 100V. The system shall be switchable between 16Ω (bypass) and constant-voltage operation.
4. The loudspeaker shall have an ABS enclosure. The baffle and the grille shall have either a white (RAL 9010) or black (RAL 9011) paintable finish with UV inhibitors to prevent discoloration. The enclosure shall retain the grille magnetically. Any logo on the grille shall be removable without leaving a blemish.
5. The loudspeaker enclosure shall have a steel hanger tab for support and shall include two 3.25 m quick-link 2 mm suspension cables with slip-lock fasteners. The loudspeaker connections shall be a locking 4-pole Euro-block that accepts two 12 AWG wire pairs.
6. The loudspeaker shall be listed as safe for use in air-handling spaces under UL1480. The loudspeaker shall meet or exceed IP-34 for ingress protection. The switchable transformer shall be listed under UL1876 and shall be CE and RoHS compliant. The baffle shall meet UL94-V0 and UL94-5VB flammability ratings and shall comply with IEC60849/EN60849 safety standards.
7. The loudspeaker's enclosure shall be 12.7 in (32.3 cm) high and 11.3 in (28.7 cm) in diameter. The loudspeaker shall weigh no more than 9 lb (4.1 kg).
8. The pendant-style 2-way co-axial system shall be manufactured by QSC Model # AD-P6T.
   a. Speakers, cables, boxes, covers, and wire management shall be Black. Prior to ordering confirm color with Architect.
   b. Wire the speakers in rows/zones as shown on plans with 70-volt groups not exceeding 80% of each channel's wattage. Due to the slanted roof and varying ceiling/floor distances, each row will require slightly different equalization settings when the contractor commissions the system with the required acoustical measurement and tuning.

2.8 CONTROL PANELS (CP1)

A. Provide a touch screen control panel for overall control of the A/V system.

B. The panel shall at a minimum have a 7” TFT active matrix color LCD display.

C. The panel will be IP controllable with a 10/100Base-T NIC and powered by PoE 802.3af.

D. See 1.02 System Operation elsewhere in this specification for control panel functions.

E. The control panel shall be manufactured by QSC, model # TSC-70-G3 & TSC-710t-G3 Tabletop Mount.
   1. Provide one (1) each.

F. Where located on Podium Rack the contractor shall label and secure to the top of the podium after all owner equipment is provided for podium device mockup and approval.
   1. Provide wire management as required to route CAT6 cable to network switch.
   2. Patch cables shall be labelled.
   3. Utilize gray copper patch cables as needed (Provided by 272000).

2.9 SYSTEM PROCESSOR EXPANDER I/O MODULES

A. NETWORK (IP) to Control I/O
   1. The peripheral shall provide eight (8) general-purpose inputs and eight (8) general-purpose outputs that are remotely configurable, providing an interface for LED indicators, switches, relays, potentiometers, and custom or third party controls to the peripheral. The collection of inputs and outputs shall have an individual +12 VDC terminal (up to 100mA available for each type, protected by a self-resetting fuse) and ground reference for use with potentiometers (input), relay coils and LEDs (output), or other purposes. Inputs and outputs shall be independently configurable from the system processor. The peripheral shall operate natively on a standard gigabit Ethernet infrastructure available from a broad range of network infrastructure manufacturers and shall support 802.1x authentication.
   2. The peripheral shall operate on PoE or DC power input and have the following front panel controls and indicators: Unit ID button, green ID LED, and blue Power LED. A web interface shall provide basic network and security configuration, status, and log retrieval. The peripheral shall be natively integrated into Q-SYS Designer Software for network discovery, real-time configuration, control, monitoring, and supervision.
   3. The peripheral’s rear panel shall provide two 2-pin power Euroblock connectors for daisy-chainable DC power, eight (8) general-purpose inputs and eight (8) general-purpose outputs on a dual-row 20-pin Euroblock connector with individual +12 VDC and ground pins, a recessed settings reset button, and two (2) RJ45 connectors for daisy-chainable Ethernet configured as Q-SYS Network ports: one (1) PoE port, RJ45 1000 Mbps only; one (1) Pass-thru port, RJ45 1000 Mbps only.
   4. The peripheral shall feature multiple mounting options including a standard 19-inch rack or surfaces such as under-table or on-wall. It shall be one-quarter (1/4) rack space wide and less than one (1) rack unit tall (1.59 inches / 4.04 cm), allowing mounting alongside quarter-rack width QSC Q-SYS QIO peripherals using an optional rack tray kit. The peripheral shall include two (2) reversible steel angle brackets for surface mounting.
   5. The peripheral dimensions shall be 1.59" x 4.25" x 5.5" (4.04cm x 10.80cm x 13.97cm).
   6. The peripheral shall be manufactured by QSC Model # QIO-GP8x8.
      a. Provide one (1) for shade control and lighting control interface and locate in IDF 107 Rack.
      b. Interconnect with multi-conductor cabling as required to trigger shade open & closed states.
      c. Interconnect with multi-conductor cabling as required to trigger lighting preset states.

B. NETWORK (IP) to Four Analog Line Output Expander

1. The peripheral shall provide four (4) channels of analog audio output that are remotely configurable. The peripheral shall receive up to 4 networked audio channels, formatted as Q-LAN networked audio, from the system processor. The peripheral shall operate natively on a standard gigabit Ethernet infrastructure available from a broad range of network infrastructure manufacturers. The peripheral shall employ DiffServ quality of service, IGMP, IEEE 1588-2008 (PTPv2) precision time protocol, and UDP/IP audio data transport with floating-point format audio data representation. The peripheral shall support 802.1x authentication. The peripheral shall not require IEEE 802.1AS, IEEE 802.1Qat, or IEEE 802.1Qav support on the network infrastructure to function. The overall system latency to analog output from any analog input on the network shall be 3.167 ms. The system shall also be able to achieve an overall system latency of 3.167 ms over Layer-3 routed network infrastructure without any additional hardware, software, or connection services between subnets.
2. The peripheral shall operate on PoE or DC power input and have the following front panel controls and indicators: Unit ID button, green ID LED, and blue Power LED. A web interface shall provide basic network and security configuration, status, and log retrieval. The peripheral shall be natively integrated into Q-SYS Designer Software for network discovery, real-time configuration, control, monitoring, supervision, and network audio routing.
3. The peripheral's rear panel shall provide two 2-pin power Euroblock connectors for daisy-chainable DC power, four (4) balanced audio outputs on a 12-pin Euroblock connector, a recessed settings reset button, and two (2) RJ45 connectors for daisy-chainable Ethernet configured as Q-SYS Network ports: one (1) PoE port, RJ45 1000 Mbps only; one (1) Pass-thru port, RJ45 1000 Mbps only.
4. The peripheral shall feature multiple mounting options including a standard 19-inch rack or surfaces such as under-table or on-wall. It shall be one-quarter (1/4) rack space wide and less than one (1) rack unit tall (1.59 inches / 4.04 cm), allowing mounting alongside quarter-rack width QSC Q-SYS QIO peripherals using an optional rack tray kit. The peripheral shall include two (2) reversible steel angle brackets for surface mounting.
5. The peripheral dimensions shall be 1.59" x 4.25" x 8.5" (4.04cm x 10.80cm x 21.59cm).
6. The peripheral shall be manufactured by QSC, Model # QIO-L4o.
   a. Provide one (1) for 70V amplifier and locate in IDF 107 Rack.
   b. Interconnect with shielded mic/line cabling to amplifier inputs as required.

C. NETWORK (IP) to IR Infrared Control

1. The peripheral shall provide one input port and four output ports that are remotely configurable, providing an interface for off-the-shelf IR receivers and emitters. The peripheral shall include a power pin for external receivers and a local activity LED for each output. The peripheral shall provide access to an extensive collection of IR codes that is accurate and maintained while permitting the reception, storage, and routing of additional IR codes. Output ports shall also support RS-232, transmit-only. All ports shall be independently configurable from the system processor. The peripheral shall operate natively on a standard gigabit Ethernet infrastructure available from a broad range of network infrastructure manufacturers and shall support 802.1x authentication.
2. The peripheral shall operate on PoE or DC power input and have the following front panel controls and indicators: Unit ID button, green ID LED, and blue Power LED. A web interface shall provide basic network and security configuration, status, and log retrieval. The peripheral shall be natively integrated into Q-SYS Designer Software for network discovery, real-time configuration, control, monitoring, and supervision.
3. The peripheral's rear panel shall provide two 2-pin power Euroblock connectors for daisy-chainable DC power, a 3-pin Euroblock connector for IR input, a dual-row 8-pin Euroblock connector for IR output, four red IR activity LEDs, a recessed settings reset button, and two RJ45 connectors for daisy-chainable Ethernet configured as Q-SYS Network ports: one PoE port, RJ45 1000 Mbps only; one Pass-thru port, RJ45 1000 Mbps only.

4. The peripheral shall feature multiple mounting options including a standard 19-inch rack or surfaces such as under-table or on-wall. It shall be one-quarter (1/4) rack space wide and less than one rack unit tall (1.59 inches / 4.04 cm), allowing mounting alongside quarter-rack width QSC Q-SYS QIO peripherals using an optional rack tray kit. The peripheral shall include two reversible steel angle brackets for surface mounting.
5. The peripheral dimensions shall be 1.59" x 4.25" x 5.5" (4.04cm x 10.80cm x 13.97cm).
6. The peripheral shall be manufactured by QSC Model # QIO-IR1x4.
    a. Provide one (1) for IR Infrared control of Cable TV Set Boxes and locate in IDF 107 Rack.
    b. Provide IR Emitters as required for the OFCI Cable TV devices listed elsewhere in this specification.

D. Label all devices and patch cords.

E. Provide 19” Rack Mount Bracket manufactured by QSC model # QIO-RMK.

F. Provide and install devices as shown on the drawings.

G. Provide required wiring and coordinate with all trades required for a complete and fully functional system.

2.10 NETWORK VIDEO ENDPOINT (3-IN / 2-OUT)

A. The network video endpoint shall be a component in a distribution system that routes 4K60 4:4:4 video over a Gigabit Ethernet network. It shall use Q-SYS Shift data compression to ensure highest quality with very low latency. The endpoint shall have three HDMI 2.0 Inputs and two HDMI 2.0 outputs and shall be fully compliant with HDCP 1.4 and 2.2. It shall also shall support AV bridging with QSC Q-SYS PTZ-12x72 and PTZ-20x60 cameras. It shall also have an RJ45 network port with Power over Ethernet (802.3bt) compatibility.

B. The network video endpoint shall natively route audio data through a QSC Q-SYS network without needing to use AES67 or the Q-SYS Media Stream Receiver. Its sound card-level stereo analog audio inputs and outputs shall be on 3.5 mm TRS connectors. It shall function as a transmitter or as a receiver, depending on the configuration by the user.

C. The network video endpoint shall be mountable in a standard AV rack or on a surface. It shall be a half rack space wide and one rack unit (1.75 inch) tall, allowing it to be mounted beside other half-rack equipment such as the Q-SYS I/O-8 Flex and QSC SPA Series power amplifiers.

D. The network video endpoint shall be powered by a 48-volt external power supply or through the network port using Power over Ethernet.

E. The network video endpoint shall be manufactured by QSC Model # NV-32-H.
1. Provide one (1)
2. Configure as a Peripheral Mode Encoder.
3. Connect HDMI Output 1 to the OFCI computer monitor on the rolling presentation podium.
4. Rack mount in rolling presentation podium with included hardware.
5. Provide HDMI 2.1 patch cords as required.
6. Provide USB USB3.0 A/B patch cords as required.
7. Provide one (1) PoE++ Power Injector (IEEE 802.3bt Type 4) or External 48VDC 1.5A output plug-in 120VAC input power supply.
8. Utilize gray copper patch cables as needed (Provided by 272000).

2.11 NETWORK VIDEO ENDPOINT (2-IN / 1-OUT)

A. The network video endpoint shall have one HDMI 2.0 input, one USB-C input, and one HDMI 2.0 output. The endpoint must support video distribution for formats up to 3840x2160p60 4:4:4 from both HDMI and USB-C inputs. The USB-C input of the network video endpoint shall support a single connection for audio and video distribution through USB-C alt-mode DisplayPort, bridging audio and video signals to an application on the host via UAC/UVC, and USB-C PD (power delivery) of up to 65 Watts shall be available for device charging. The endpoint shall support Consumer Electronic Control (CEC) of connected devices on the HDMI Output. The endpoint shall support USB HID signal routing between hosts and devices.

B. The network video endpoint shall be user configurable to be either a transmitter (encoder) or receiver (decoder). The network video endpoint shall use Q-SYS Shift data compression to ensure high-quality and low-latency network video transport of video formats up to and including 3840x2160p60 with 4:4:4 chroma sampling. It shall support HDCP 1.4 & 2.3 and encrypt video transmission on the network. The HDMI 2.0 output must scale incoming content from the network and local input connections.

C. The endpoint shall be powered by an external 12V DC 9 A auxiliary power supply or via PoE Type 3, Class 5 (40w at PD, 45W at PSE) from a capable network switch or midspan injector. It is acceptable for an auxiliary power supply to be required if device charging is needed.

D. The network video endpoint shall operate natively on a standard gigabit Ethernet infrastructure available from a broad range of network infrastructure manufacturers, employing DiffServe quality of service (QoS), IGMP, IEEE 1588-2008 (PTPv2) precision time protocol, UDP/IP audio, and video transport with floating point format audio data representation. The endpoint shall support 802.1x authentication. The endpoint shall communicate with the system audio processor without needing AES67, Dante, or Media Stream receiver components.

E. The network endpoint shall measure 7.3 x 5.2 x 1.2 in (185 x 131.5 x 30.5 mm).

F. The network video endpoint shall be manufactured by Q-SYS Model # NV-21-HU.
   1. Provide six (6)
      a. Rack mount one (1) at the rolling presentation podium with included hardware and configure as an encoder. Connect to owner's Laptop docking station model TBD as the 4th video source in the room.
      b. Rack mount two (2) at the IDF 107 rack next to Comcast Cable TV boxes and configure as an encoder.
      c. Surface mount one (1) on top of the projector bracket and configure as a decoder.
      d. Surface mount two (2) to the rear of the secondary display monitors and configure as a decoder.
   2. Provide HDMI 2.1 patch cords as required.
   3. Provide USB USB-C patch cords as required at the podium. The USB-C cable shall be able to transmit data and device charging power of 65 watts minimum.
   4. Provide one (1) power supply manufactured by QSC Model #NV-21-PSU for the podium encoder location.
   5. Provide two (2) rear TV Monitor mounts for video decoders manufactured by Chief Model # PAC251.
   6. Utilize gray copper patch cables as needed (Provided by 272000).

2.12 IN-ROOM PC / COMPUTER

A. The in-room PC / computer and wireless mouse/keyboard shall be owner furnished and owner installed with the exception that the contractor is required to mount the computer to the rack shelf and assist with the connection of patch cables with cable management.

B. The in-room PC / computer will be Lenovo ThinkCentre Tiny model.

C. Provide one (1) 1RU 19” universal rack shelf and rack mount in the rolling presentation podium rack.

D. Connect to NV32 HDMI input 1.

2.13 SURGE SUPPRESSORS/POWER CONDITIONERS

A. Rack Mount Type:
1. The AV system shall have a 1U rack-mountable surge suppression unit. It shall be capable of a 15 AMP load at 120 volts.
2. The unit shall also be capable of remote turn-on with a contact closure.
3. The surge suppressor shall be manufactured by Juice Goose, model # CQ-1515-RX.
   a. Provide one (1).
   b. Rack mount in the rolling presentation podium.
   c. The surge protector shall be connected to a dedicated 15A circuit, provided at the rear of the rack location or in the floor box.

2.14 ROLLING PRESENTATION PODIUM / LECTERN

A. The EIA Compliant 19” AV Lectern shall be Middle Atlantic Products model # L5-TURFR-43LDW. AV Lectern shall be available in 23”, 33”, or 43” widths, with 1 or 2 rack bays and a storage area, depending on model (refer to chart).

B. Overall dimensions shall be 39” H x 43” W x 31” D (refer to chart). Usable height shall be 12 rack spaces per bay. AV Lectern frames shall ship fully assembled and be constructed of steel. Total weight capacity with Middle Atlantic finishing kit shall be provided by Middle Atlantic per the specific configuration.

C. Each rack bay shall come equipped with 1 pair of 11-gauge steel rack rail tapped with 10-32 mounting holes in universal EIA spacing, black e-coat finish and numbered rack spaces.

D. AV Lectern rack shall have 1 70 CFM thermostatically controlled fans per bay. AV Lectern shall have a slide-out keyboard shelf, 38.56” W x 2.25” H x 12.06” D. AV Lectern shall have a side shelf with a useable area of 20.93” W x 7.49” H x 7.56” D.

E. Thermostatically controlled fans shall be powered on at 87°F and turn off at 85°F. AV Lectern shall include a 15 Amp, 8 outlet surge-protected power strip with a 10’ cord.

F. Models with turret shall have customizable Presenter’s Panel, which can accept touchscreens and other panel mounted devices with an overall size of __”H x __”W x __8.31” D (refer to chart).

G. Models with turret shall include connectivity panel with two 15 Amp outlets, two type A USB USBs and AVIP device plates that support SVGA, HDMI, 3.5mm stereo, CAT 5/6 and USB.

H. AV Lectern shall have venting on the top. AV Lectern shall be finished in a durable black powder coat.

I. Finishing kit shall ship separately from rack, be available in a Sota or Klasik style and be model # L5-__K-__ (design online at LegrandAV.com), and secured to the Lectern. Top, sides and front doors shall be available in Veneer, High Pressure Laminate materials, visit LegrandAV. com for list of available finishes. **Confirm exact finish material kit and color with architect prior to ordering lectern.**

J. AV Lectern rack shall include 4 fine floor casters.

K. AV Lectern rack shall comply with the requirements of RoHS EU Directive 2011/96/EU.

L. AV Lectern rack shall be manufactured by an ISO 9001 and ISO 14001 registered company.

M. AV Lectern frame shall be warranted to be free from defects in material or workmanship under normal use and conditions for the lifetime of the rack, fans shall be warrantied for a period of three years.

N. Provide one (1) Podium / Lectern.
   1. Provide nylon snakeskin cable management between the rack and the floor box for the bundle of power and data.

O. The storage drawer shall be 2RU and manufactured by Middle Atlantic Model # UD2 or equal.
   1. Provide One (1) reserve for presentation material storage such as patch cords, white board markers, etc.

2.15 MOTORIZED PROJECTION SCREEN

A. The motorized projector screen shall be provided and installed by the AV contractor on this project. Coordinate with all trades as required for rough-in of enclosure, power, controls, and screen prior to installation.

B. The motorized projector screen shall be 133” diagonal / 116”x65”, 16:9 aspect ratio, with 2ft of black drop included in order to fine tune the screen viewing surface’s optimal height and stop limit.

C. The motorized projector screen surface shall have 1.1 gain, a viewing half angle of 85 degrees, and shall be model # HD Progressive 1.1.

D. The motorized projector screen shall be manufactured by Legrand Da-Lite model # 21798LS
   1. Provide one (1).
   2. It is required to order the enclosure and the screen separately to guarantee that the rough-in is completed in advance of the screen installation and so that the screen does not get damaged prior to final commissioning.

E. Provide one (1) Da-Lite Video Projector Interface. Connect to control I/O expander listed elsewhere in this specification located in IDF 107.

2.16 PROJECTOR

A. The projector shall be an 8,000 Lumen, WUXGA, 1-chip DLP laser phosphor projector and Black in color.

B. The projector shall have inputs for 2x HDMI In (compliant with HDMI 2.0b, HDCP2.2) / 1 x Display Port (1.2a) / 1 xHDBaseT (HDCP1.4) / 1 x 3D SYNC In.

C. The projector shall have outputs for 1 x HDMI Out (Loop through HDMI1/HDMI2/HDBaseT/DP) 1 x 3D SYNC Out 1 x DC 12V Out 1 x Audio out, 3.5mm phone jack.

D. The projector shall be manufactured by Barco Model # G50-W8.
   1. Provide one (1).

E. The projector lens shall be manufactured by Barco Model # R9801784.
   1. Provide one (1).

F. The projector mount shall be provided to meet the requirements shown on plans. Provide mounts manufactured by Chief Model #’s CNS024 24” ext. column, CMA110 ceiling mount, and RPAU universal projector mount.

G. All mounting hardware, cables, and cable management shall be black.

H. Utilize gray copper patch cables as needed (Provided by 272000).

I. The general contractor shall provide in-ceiling structural blocking/backing to support up to 100lbs or more at each projector mounting location.

2.17 FLAT PANEL MONITORS & MOUNTS

A. Provided by the owner and installed by the Contractor.

B. See floor plans and AV Detail sheets for exact quantities and locations.

C. Coordinate with engineers and the owner for exact make and model of display. Anticipated models are LG UR340C or UH5F-H commercial series displays.

D. Coordinate with engineers and the owner for exact make and model of display mounts. Anticipated models are Chief PDR series Articulating / Swivel / Tilt mounts with Chief PSBU series VESA bracket. Mounted directly over the recessed back box / wall monitor equipment enclosure listed elsewhere in this specification.

E. The general contractor shall provide in-wall backing/blocking to support up to 300lbs or more at each Monitor / Display / TV mounting location.

2.18 WALL MONITOR EQUIPMENT ENCLOSURE

A. The wall monitor equipment enclosure shall be provided by the AV contractor and installed by Division 26.

B. Provide one (1) per Monitor or Information Display location. See floor plans for exact quantities and locations.
   1. Provide one (1) Chief wall enclosure model # CHIEF PAC526FWP6 14”x14” with 16”x16” flange (white).
   2. Locate power and data outlets in the monitor back box.
   3. At locations that are rough-in only (future monitor) provide blank cover (white).

2.19 COMMUNITY ROOM ASSITED LISTENING SYSTEM

A. Provide a complete stationary assisted listening system to include all associated cabling.

B. The stationary assisted listening system shall contain the following components:
   1. The stationary RF Transmitter (72MHz) shall be manufactured by Listen Tech, model # LT-803-072 and shall be compatible with the assisted listening receivers listed in this specification.
      a. Provide one (1).
      b. Locate in podium / lectern rack and connect to output of NV32 with an unbalanced 3.5mm to dual RCA/Phono patch cord.
      c. Provide rack mount kit Model # LA-326.
   2. The 90 Degree Helical Antenna (72MHz) shall be manufactured by Listen Tech, model # LA-123.
      a. Provide one (1).
   3. Receiver:
      a. The portable receiver shall operate wirelessly in the 72Mhz band and be fully digital.
      b. The wireless receiver shall be manufactured by Listen Tech, Model # LR-3200-072
         1) Provide four (4) for EACH kit
   4. Neck Loop:
      a. Neck loops shall provide wireless transmission to T-Coil compatible hearing aids and cochlear implants.
      b. The neck loop shall plug directly into the wireless receiver.
      c. The neck loop shall be manufactured by Listen Tech, Model # LA-430
         1) Provide two (2) for EACH kit

5. Earphone:
   a. The single piece earphone shall be manufactured by Listen Tech, model LA-161
      1) Provide four (4) for EACH kit
6. USB Charger:
   a. The USB Charger shall provide 4-ports.
   b. The USB Charger shall be manufactured by Listen Tech, Model # LA-423.
7. Assistive Listening Notification Signage Kit
   a. The Assistive Listening Notification Signage Kit shall be manufactured by Listen Tech, Model # LA-304.
   b. Coordinate with the architect prior to rough-in for exact location.
8. ALS Device Storage Drawer:
   a. The storage drawer shall be 2RU
   b. The storage drawer shall be manufactured by Middle Atlantic Model # UD2 or equal.

C. The kit “LP-4VP-072-01” plus additional neck loops may be provided.

D. Test and commission each component and provide training on how to operate the transmitters and receivers.

2.20 COMMUNITY ROOM MICROPHONE SYSTEM

A. Wireless Microphones:
1. Provide a complete wireless microphone system to include charging stations and all associated cabling. Coordinate the microphone operating frequencies with the receiver frequencies.
2. The frequency-agile FM wireless microphone system shall consist of a receiver and the appropriate transmitter, and shall operate in the UHF bands of 470.125–529.975 MHz or 530.000–589.975 MHz. The frequency-agile FM wireless receiver shall be all-metal and shall provide an automatic scanning function to select appropriate local usable channels for proper wireless system operation. It shall be a True Diversity receiver with two independent internal receiver sections, automatically selecting the highest quality signal for the receiver’s output. All receiver settings shall be adjusted by using a control dial and BACK button on the receiver’s front panel. The system will be equipped with an advanced pilot tone digital identification system to ensure that the desired wireless transmitter allows the receiver to be unmuted, reducing noise from unwanted signals. The receiver shall have an IR sync window on the front panel to sync settings with transmitters. It shall also have a dual-mode front panel display that switches between a standard view, which provides continuous indication of RF signal strength, frequency, mute status, audio modulation level of the received signal and other transmitter information, and a performance view, which highlights key metering. The receiver shall have a rear panel selector to lift the ground connection from pin 1 of the XLR-type output connector to prevent ground loops. The receiver shall be able to be powered by 12V DC 1A. Antennas shall be located on the rear of the receiver and shall incorporate standard BNC-type connectors to allow them to be detached from the receiver to facilitate the receiver being used with external antennas or antenna distribution devices. Switchable 12V DC power shall be provided on the BNC-type connectors. An accessory bracket should allow for the antennas to be located at the front of the receiver. The receiver can be rack-mounted singly or in pairs in a single rack space. The receiver’s design shall provide totally silent audio output mute when the wireless transmitter is turned off or the signal is lost. The wireless receiver and the supplied metal rack-mounting brackets shall be industrial black.

3. The frequency-agile FM wireless body-pack transmitter shall have microphone and instrument level inputs. It shall provide DC voltage to power microphones requiring DC bias. The body-pack transmitter shall be part of a wireless microphone system operating in the bands of 470.125–529.975 MHz or 530.000–589.975 MHz. The body-pack transmitter shall have a reversible clip allowing for up or down cable entry. The transmitter shall have a screw-down 4-pin connector and a viewable fuel gauge to indicate the remaining battery life. Frequencies shall be selected using the transmitter's soft-touch controls. The transmitter shall also be equipped with a multifunction button that can be programmed to perform one of two functions when pressed and held: turn off RF transmission or switch to a preselected backup frequency. (The multifunction button can also be disabled.) The device shall have a dual-color LED that illuminates green when the power is on and illuminates red when the transmitter is muted or battery power is low. There shall be an adjustment to allow input gain changes in 2 dB steps with a total range of 30 dB. There shall be a switchable 125 Hz high-pass filter. The transmitter shall include a pilot tone to identify the wireless transmitter to the wireless receiver. The transmitter shall utilize two RF output power levels and shall operate on two AA batteries. The battery compartment shall be locking. All setting adjustments shall be via soft-touch controls and shall remain as set even if the transmitter loses power or the batteries are removed. The transmitter shall have an IR sync button to allow receiver settings to be synced with the transmitter. An OLED screen shall be provided to show transmitter setup parameters or frequency. Charging terminals on the base of the transmitter shall work with an optional smart charging dock to recharge AA NiMH batteries installed in the transmitter. The transmitter shall have a removable and field-replaceable antenna.
4. The frequency-agile FM wireless handheld transmitter shall be part of a wireless microphone system operating in the bands of 470.125–529.975 MHz or 530.000–589.975 MHz. The transmitter shall come with either a dynamic or a condenser cardioid microphone capsule, which shall screw onto the transmitter's industry-standard thread mount. Each capsule shall incorporate internal shock mounting and have a two-stage integral pop filter. The transmitter shall also work with additional capsules specifically designed for the transmitter (available separately) as well as other compatible capsules. The transmitter shall have a metal housing with a plastic antenna end cap. The transmitter shall transmit a digital pilot tone that allows the receiver to unmute. The transmitter shall also be equipped with a multifunction button that can be programmed to perform a specific function when pressed and held: mute the audio; mute the audio even when the transmitter is locked; turn off RF transmission; or switch to a preselected backup frequency. (The multifunction button can also be disabled.) A dual-color LED indicator shall illuminate green when the power is on and red when the transmitter is muted or battery power is low. An OLED screen shall be provided to show transmitter setup parameters or frequency. The microphone shall have an audio input level adjustment range of 30 dB in 2 dB steps. It shall also have a switchable 150 Hz high-pass filter. All setting adjustments shall be via soft-touch controls and shall remain as set even if the transmitter loses power or the batteries are removed. The transmitter shall have an IR sync button to allow receiver settings to be synced with the transmitter. The transmitter shall operate on two AA batteries and contain a Hi/Lo RF power selector. A battery fuel gauge shall be incorporated to indicate the status of the internal batteries. Charging terminals on the base of the transmitter shall work with an optional smart charging dock to recharge AA NiMH batteries installed in the transmitter. The transmitter shall be supplied with a heavy-duty stand clamp.
5. A two-bay charging dock shall also be available as an optional component. It shall charge AA NiMH batteries that are installed in body-pack or handheld transmitters. The charging dock shall automatically shut off if alkaline or damaged batteries are detected in the transmitters. A single power supply shall power up to five linked docks. A networked version of the charging dock shall also be available as an optional component. The networked dock shall be capable of monitoring the charging status of all transmitters in up to five linked docks.

6. The Wireless Microphone (Handheld) shall be manufactured by Audio Technica Model # ATW-3212/C710. Includes: ATW-R3210 receiver and ATW-T3202 handheld transmitter with ATW-C710 cardioid condenser microphone capsule.
   a. Provide one (1) kit.
7. The Wireless Microphone (Ear-Worn) shall be manufactured by Audio Technica Model # ATW-3211/894X. Includes: ATW-R3210 receiver and ATW-T3201 body-pack transmitter with BP894xcH MicroSet cardioid condenser headworn microphone (black). Includes windscreens, clothing clip, and dual-ear adapter kit.
   a. Provide one (1) kit.
8. Rack mount the wireless microphone receivers in the rolling presentation podium with the included rack mount hardware. Utilize the included flexible UHF antennas.
   a. Connect the unbalanced ¼" TS outputs to 3.5mm unbalanced stereo input of NV32 in rack with the appropriate patch cord: (1) 3.5mm male TRS to (2) ¼" male TS (Y-Cable).
9. The Wireless Microphone two-bay charging dock shall be manufactured by Audio Technica Model # ATW-CHG3.
   a. Provide one (1) and locate on the rolling presentation podium.

B. Beamforming Array Ceiling Microphone for teleconference
1. The beamforming array microphone, designed for use in conference rooms, boardrooms, and other meeting spaces, shall mount flush or on the surface of a drop ceiling or hard ceiling, or in open architecture spaces using a standard VESA mount. The microphone shall come with surface- and flush-mount adapters, a flush-mount cover, mounting screws and nuts, tile-bridge assembly, installation template, a seismic cable, Euroblock connectors, snap bushings, and a hole cover that can be used when only a single conduit is connected.
2. The microphone shall have six individual output channels, which, collectively, can be configured with up to 32 user-defined microphone pickup zones. Output Channel 1 shall be configurable with up to 16 user-defined Coverage Zones to ensure coverage of nonpriority or unplanned participants. Output Channels 2–6 shall be configurable with up to 16 user-defined Priority Zones to ensure priority pickup of participants in known locations. The microphone's 90-degree orthogonal beams shall function across all output channels, enabling it to focus on particular points in space and prevent the pickup of unwanted noise. Voice activity detection (VAD) technology shall enable the microphone to discern between a voice and unwanted noises such as paper shuffling.
3. The microphone shall have an onboard DSP with functions that include automix, acoustic echo cancelation, noise reduction, automatic gain control, and 4-band EQ. The face of the microphone shall be outfitted with a reset button and an IR window to receive mute and other control signals from an included IR remote.
4. The microphone shall have a frequency response of 60 Hz to 18,000 Hz and be capable of handling sound input levels up to 102 dB.
5. The microphone shall support Dante network digital audio protocol for signal transmission.
6. The Beamforming Ceiling Array Microphone shall be manufactured by Audio Technica, Model # ATND1061DAN Beamforming Ceiling Array Microphone.
   a. Provide one (1).
   b. Provide VESA (75mm) mount with pendant pipe hardware as required to mount to the bottom of the soffit as shown on drawings at the indicated height. Install with safety cable per manufacturers instructions.
   c. All mounting hardware, boxes, covers, and wire management shall be Black.
   d. Utilize gray copper patch cables as needed (Provided by 272000).

2.21 TELECONFERENCE CAMERA (PARTICIPANTS VIEW)

A. The video camera shall have an RJ-45 connector for connecting to a 1000 Mbps Ethernet network. The camera shall only be powered via Power over Ethernet (PoE). The camera shall use the network for transmitting video to one or more bridging endpoints without the need for USB extenders. The camera shall also use the network for control and monitoring.

B. The camera shall have a 1/2.8" CMOS 4K image sensor with a ≥55dB signal-to-noise ratio. The lens shall have a 12x optical zoom, a horizontal field of view of 80° - 7.5°, and a focal length of 3.47 - 41.65mm. The camera shall utilize motors for pan, tilt, and zoom (PTZ) and output a IP video stream from the camera directly to the bridging endpoint. The camera movement shall be controlled exclusively via the network. The camera output shall have a 16:9 aspect ratio.

C. The camera shall include a bracket to allow for the camera to be surface mounted. The camera should have an optional mounting accessory for ceiling mounted installations. The camera should have necessary imaging controls to allow for inverted mounting.

D. The camera shall have an operating temperature range of 0°C - 40°C and a storage temperature range of -40°C - 60°C. The camera shall weigh no more than 2.4 kg and shall not exceed 142mm x 201mm x 170mm (width, height, depth) in size.

E. The camera shall integrate natively with the QSC Q-SYS Ecosystem for discovery, control, signal routing, firmware management, and bridging.

F. The camera shall be manufactured by QSC Model # Q-SYS NC-12x80.
   1. Provide two (2).
   2. Wall mount with included wall mount bracket.
   3. Utilize gray copper patch cables as needed (Provided by 272000).
   4. Utilize QSC QSYS Automatic Camera Preset Recall Plugin based on positional data gathered from the ceiling microphone array.

2.22 TELECONFERENCE CAMERA (PRESENTER / INSTRUCTOR VIEW)

A. The video camera shall have an RJ-45 connector for connecting to a 1000 Mbps Ethernet network. The camera shall only be powered via Power over Ethernet (PoE). The camera shall use the network for transmitting video to one or more bridging endpoints without the need for USB extenders. The camera shall also use the network for control and monitoring.

B. The camera shall have a 1/2.8" CMOS 4K image sensor with a ≥55dB signal-to-noise ratio. The lens shall have a 20x optical zoom, a horizontal field of view of 60°- 3.5°, and a focal length of 6.25-125mm. The camera shall utilize motors for pan, tilt, and zoom (PTZ) and output an IP video stream from the camera directly to the bridging endpoint. The camera movement shall be controlled exclusively via the network. The camera output shall have a 16:9 aspect ratio.

C. The camera shall include a bracket to allow for the camera to be surface mounted. The camera should have an optional mounting accessory for ceiling mounted installations. The camera should have necessary imaging controls to allow for inverted mounting.

D. The camera shall have an operating temperature range of 0°C - 40°C and a storage temperature range of -40°C - 60°C. The camera shall weigh no more than 2.4 kg and shall not exceed 142mm x 201mm x 170mm (width, height, depth) in size.

E. The camera shall integrate natively with the QSC Q-SYS Ecosystem for discovery, control, signal routing, firmware management, and bridging.

F. The camera shall be the QSC Q-SYS NC-20x60.
   1. Provide two (2).
   2. Ceiling mount each camera with QSC Model # PTZ-CMB1 ceiling mount bracket.

3. Utilize gray copper patch cables as needed (Provided by 272000).
4. Utilize QSC QSYS Automatic Camera Preset Recall Plugin based on positional data gathered from the ceiling microphone array.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install each system shown as indicated, in accordance with equipment manufacturer's instructions, and with recognized industry practices.

B. Mount the projector in the ceiling per manufacturer's recommendations.

C. All low voltage and signal wiring shall be run exposed in the ceiling space.

D. Program the Switcher/Receiver per manufacturers recommended settings. All devices with RS-232 controls in the system shall be controlled by the Switcher/Receiver.

3.2 SYSTEM TESTING

A. The system testing shall conform to the requirements of Section 270000.

B. The Installing Vendor shall provide the staff with walkie-talkies, test equipment, additional equipment, resources, and time necessary to support BCE Engineers to provide the Commissioning of this System. The Installing Vendor shall demonstrate to BCE Engineers the complete operation of each device, head end functionality, system configuration, and software functionality. The Installing Vendor shall also make adjustments to the equipment and changes to the program settings, as requested. This testing shall be typical of four (4) locations, selected by the Electrical Engineer.

3.3 INTEGRATION TO OTHER LOW VOLTAGE SYSTEMS

A. See "System Operation" listed elsewhere in this specification for more information.

3.4 ON-SITE TRAINING

A. On-site training shall follow a written training plan, prepared in advance. The training plan shall outline the topics to be covered, the publications to be used, and the training schedule.

B. Supply two (2) hours minimum of training for the Owner's staff in operating and maintenance of the television distribution system. Training time shall be extended as necessary to satisfy the Owner's Representative that all pertinent topics have been adequately covered.

C. The training shall be conducted after the operating and Maintenance Manuals for the Project are completed and available for use during the training session.

D. Maintain a training sign-in sheet, upon which participants in the training session, including the instructors, shall record their names. Training sign-in sheet shall be dated.

E. The training shall be conducted by a representative of the equipment manufacturer who is thoroughly familiar with the equipment and its features, and also with the installation on this Project. The training shall include instruction and field demonstration. As a minimum, the training shall cover, but not be limited to, the following topics:
1. General Overview of the system, including purpose and principle of operation.
2. System features, including expansion capability.
3. Interpretation of system outputs (indicators, displays, etc.).
4. Operation of system controls (gain controls, slope adjustment, etc.).
5. Recommended maintenance procedures and intervals.

6. Detailed trouble-shooting instructions.
7. Explanation of service agreement options.

F. At the conclusion of the training session, insert a copy of the training sign-in sheet into the Operating and Maintenance Manuals. Submit another copy of the training sign-in sheet to the Architect.

3.5 AS-BUILT DOCUMENTATION

A. Operation and maintenance manuals and the as-built drawings shall conform to the requirements of section 270000.

END OF SECTION 274116.62

SECTION 281300

ACCESS CONTROL SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions and Divisions 0 and 1 Specification Sections, apply to work of this Section.

B. Section 260000 - General Electrical Conditions.

1.2 SCOPE AND RELATED DOCUMENTS

A. The project Access Control System shall be a LenelS2 OnGuard System that will be integrated with the City-Wide Access Control Protocol. The Installing Vendor shall provide new equipment at the project site and include the necessary programming for viewing reports, changing card holder information, changing card holder access capabilities, and control functions of the new Access Control System to and from the following locations:
   1. Locally at the project site.
   2. Remotely at the Owner's Administrative Offices.
   3. Remotely at the Owner's Technology Department Offices.

B. Furnish and install a complete Access Control System as described herein and as shown on the Plans; to be wired, connected, and left in first class operating condition. The system shall include, but not be limited to: Access Control Panel(s), Access Control Reader Interface(s), Input Board(s), Output Board(s), Power Supplies, Card Readers, Door Position Switches, hard wired Electric Locks / Electrified Exit Devices (where indicated within this specification), WIFI IP Enabled Electric (where indicated within this specification), hard wired / WIFI / software connection to each electro-mechanical lock as indicated on the Access Control System and Electro-Mechanical Door Hardware Matrix, Duress Buttons, device Input supervision, control relays, conduit, junction boxes, fittings, wire, connections to devices, and all other necessary material for a completely reliable and fully functional system. The Access Control System shall also interface with the elevator system control system to provide floor-by-floor user profile permission-based card access programming with additional relays to be coordinated with elevator installation contractor.

C. The Access Control System shall also function as an Emergency Lock Down System.

D. A PC shall display real-time status of the doors on the graphic map of the building.

E. The system shall meet ALL of the requirements listed in Section 270000 Low Voltage Systems General Requirements PART 3 "Testing & Complete System Functionality", prior to "Substantial Completion".

F. Contractual information, guidelines, requirements, or other work specified to provide a fully functional system for Section 281300 includes, but is not limited to the sections identified in Section 277100 Finish Hardware.

G. Provide all programming as required to the satisfaction of the Owner.

H. The entire Access Control System and related appurtenance shall be provided (as indicated in this specification or in other specifications), installed (as indicated in this specification or in other specifications), wired, terminated, programmed, tested, commissioned, and warranted by Section 281300 for a complete and fully functional system.

1.3 QUALITY ASSURANCE

A. The awarded installation vendor must be an active Washington State LenelS2 VAR (Value Added Reseller) authorized to sell & install LenelS2 OnGuard systems at the time of bid.

B. The system, devices, and equipment, shall be manufactured under the appropriate category by Underwriters' Laboratories, Inc. (UL), and shall bear the UL label. Partial or pending listings are not acceptable. The installation of EACH device and/or component shall be in compliance with the UL listing. The system, devices, and equipment shall fully comply with the latest issue of these standards, where applicable, which includes, but is not limited to:
   1. National Fire Protection Association (NFPA) - USA:
      a. NFPA 70 National Electrical Code
      b. NFPA 101 Life Safety Code
   2. Underwriters Laboratories Inc. (UL) - USA:
      a. UL 294 Access Control Systems
      b. UL 1034 Burglary-Resistant Rated
      c. UL 1076 Proprietary Burglar Alarm Units and Systems
   3. Meet or exceed Building Codes and Standards:
      a. Local Authority Having Jurisdiction (AHJ) Requirements
      b. State
         1) WAC 51-20 Washington Barrier Free Regulations
      c. National
         1) National Electrical Code (see NFPA 70)
         2) Americans with Disabilities Act
      d. International
         1) International Building Code
         2) International Electrical Code (see NFPA 70)
         3) International Fire Code

C. Approvals:
   1. The system shall have proper listing and/or approval from the following nationally recognized agencies:
      a. UL Underwriters Laboratories Inc.
      b. Factory Mutual.
      c. FCC.

D. The Installing Vendor shall meet each of the requirements defined in Section 270000 “Testing & Complete System Functionality”.

E. The Installing Vendor shall provide a Staff Commitment Letter in the Submittal and Shop Drawings submittal package, that states the following:
   1. The Installing Vendor shall identify and designate two (2) Manufacturer Trained and Certified Installing Vendor Technicians for the duration of this project.
      a. The Installing Vendor shall submit copies of the above designated technicians Manufacturer Certification(s).
         1) LenelS2 OnGuard Fundamentals and Advanced Access Control - Installer Certifications.
      b. Additional Installing Vendor field technicians may also work on the site, but only while one of the two designated technicians are on-site.
   2. The Installing Vendor shall identify and designate a Project Manager whose responsibilities will include, but are not limited to:
      a. The Primary Point of Contact between the Owner and the Installing Vendor. It is acceptable for this person to be the Lead Technician.
      b. Scheduling of technicians to perform the work on the Owner’s premises.

c. Scheduling of any meetings shall be on the Owners premises.

F. Service and Software Modifications:
1. Provide the services of a Manufacturer Certified/Authorized Technician to perform all system upgrades or changes.
2. For non-emergency service, response time of the technician to the site shall not exceed 4 hours. If the call is received by the Installing Vendor before 1:00pm, service shall be provided that day, and if the call is received after that time, then the response shall be the following business day.
3. Provide all hardware and documentation necessary to modify the system on-site. Modification includes addition and/or deletion of system devices, changes to system operation, and custom label changes for devices.

1.4 SYSTEM OPERATION

A. Integration to other Low Voltage systems:
1. Wireless Reader support – The Access Control System shall support the Mercury enabled Aperio 8:1 Hub from ASSA ABLOY and/or the Allegion/Schlage PIM400 series with Allegion/Schlage AD_400 series or Allegion/Schlage NDE locks allowing connectivity to wireless readers if required for future expansion. No wireless locksets are being provided under the bid.
2. Intrusion Alarm System – The Access Control System shall provide integration with the Intrusion Alarm System for monitoring purposes and basic controls only. The Access Control System shall not disable or interrupt the Intrusion Alarm System while the Intrusion Alarm System is in the armed state. Provide connectivity to the Intrusion Alarm System Control Panel. Coordinate with the Intrusion Alarm System installing contractor.
3. CCTV System – At this time, the Access Control System shall remain separated from the CCTV system since the current CCTV/VMS system is not compatible to integrate with the LenelS2 OnGuard basis of design.
4. Fire Alarm System – Release of the fire shutters and door hold opens upon lock down scenario.

1.5 SUBMITTALS AND SHOP DRAWINGS:

A. See Section 270000 Low Voltage Systems General Requirements for additional requirements.

B. Provide ALL required submittal documents in Training Materials listed elsewhere in this specification.

C. Data Sheets and other Documentation:
1. Pre-Installation project kick-off meeting.
a. The Installing Vendor shall provide the Meeting Minutes for the Pre-Installation project kick-off meeting.
2. Submit the “System Device Naming Matrix” listed elsewhere in this specification, with the Data Sheet submittal.
3. Follow up documentation for the pre-Installation project kick-off meeting shall be provided as described under “Coordination” identified elsewhere in this specification.
4. The Materials List shall identify the specification section, quantity of each item, the manufacturer, model number, and brief description of each item.
a. Provide data sheets for each item listed on the materials list.
b. Provide indicating arrows on data sheets that have multiple items on the data sheet.
5. Provide all Test Forms for review.
6. Provide documentation of the On-Site System Information Binder enclosure.

a. Include the list of documents that will be provided in the On-Site System Information Binder.
b. Provide a sample copy of the Training Syllabus.
c. Provide a sample copy of the Step-by-Step Instructions.

7. The Installing Vendor shall submit copies of the (2) designated technicians Manufacturer Certification(s) for EACH item listed below.
   a. LenelS2 OnGuard – Installer Certification.

D. Shop Drawings shall include the following items:
1. The System Riser Diagram shall show the MDF and EACH designated IDF separately.
   a. Show each system component and device connected to and installed in the MDF and each IDF.

E. EACH Card Reader door and device that is connected to the Access Control System shall be identified by the architectural designated door number.

1.6 ABBREVIATIONS

A. OFOI – Owner furnished; owner installed

B. OFCI – Owner furnished; contractor installed

C. CFCI – Contractor furnished; contractor installed

PART 2 - PRODUCTS

2.1 MATERIALS

A. See Section 270000 Low Voltage Systems General Requirements for additional information.

B. LenelS2 / Carrier manufactures the products that are used for the basis of design for this specification. Additional materials are specified below for a complete system.
1. Substitutions will not be approved on this project.

C. Provide all equipment as defined in the specification(s) and shown on the drawings.

2.2 COORDINATION

A. The Installing Vendor shall include each of the following items in their bid for this project.

B. Refer to “Submittals” for additional coordination requirements.
1. Pre-Installation Project Kick-off Meeting. The Pre-Installation Project Kick-off Meeting is imperative to the owner and is required to review the owner’s specific system operation and expectations that are unique to the owner. The Installing Vendor shall contact the Electrical Contractor for the purpose of confirming the actual date of and attending the Pre-Installation Project Kick-Off Meeting at the location selected by the Owner (somewhere within the City). This meeting shall take place PRIOR to Submittal of equipment data sheets. The Installing Vendor shall be responsible for providing the following items.
2. A sign in sheet (with the project name, Section number and title that the Installing Vendor is representing, date, time, location, the printed name of each person in attendance, their title, phone number, and email address).
3. Be responsible for taking Meeting Minutes, typing them into a formal document, and distributing them via email to each attendee, the Architect, and the Engineer.
4. The items discussed at the Pre-Installation project kick-off meeting shall include, but not be limited to:

a. Auto Unlock Doors on a timed schedule.
b. Database migration.
c. Access Control System general operation.
d. IP Addresses for the Access Control System equipment.
e. Confirm equipment layout in the MDF and EACH designated IDF location with the Owner's IT Department.
f. Device Naming. See "System Device Naming Matrix" elsewhere in this specification.
g. Configuration settings.
h. General coordination with staff.
i. General location of equipment and other items.
j. General questions about system operation, function, and programming.
k. The placement of wall mounted Equipment shall be identified, discussed, and confirmed for the placement of the equipment in the MDF Room and EACH designated IDF location.

C. Follow up documentation for the Pre-Installation Project Kick-Off Meeting. The purpose of this information is to illustrate to the Owner's Access Control System representative and the Owner's IT Department that the information discussed during the Pre-Installation Project Kick-Off Meeting was understood by the Installing Vendor.
1. Each of the above items and items discussed during the meeting shall be included in the Data Sheet Submittals.

2.3 ACCESS CONTROL SERVER/APPLIANCE AND SYSTEM SOFTWARE

A. The Owner will furnish the LenelS2 branded server:
1. Contractor to provide programming of the Server/Appliance as required.

B. OFCI Server Software. The Access Control Server/Appliance Software (LenelS2 OnGuard) shall be programmed for this project. This project shall operate completely and independently from other locations within the City. Coordinate with the City's IT department as required.

C. OFCI Software Licenses:
1. The owner shall provide single software-based license key that resides on each Access Control System appliance to control licensed features and/or components.
a. Software licenses shall be upgradable and/or amendable via email or download from Manufacturer secured web site.
b. The Access Control System appliance shall support a minimum of 50 concurrent client connections.
1) Individual license keys for traditional client workstations and/or physical hardware license keys shall not be acceptable.

D. Graphic Map software:
1. The Contractor is to provide the software and program the system.
2. The Access Control System shall support graphical maps through import of popular graphic formats (BMP. GIF. JPEG. PNG. PDF. TIP. And WMF.).
3. The Access Control System shall have the ability to place system icons including card readers, input and output points, video cameras, and other access control field hardware to indicate their location in the facility.
4. When the building is in the Emergency Lock Down mode, the Graphic Map shall display the live real-time status of doors (opened or closed and locked or unlocked).

E. LDAP database integration:
1. The Contractor is to provide integration to the existing LDAP user database.

F. Security integration:

1. Contractor is to provide integration into the new Bosch Intrusion alarm system for monitoring status and reports.

2.4 ACCESS CONTROL SYSTEM HEAD-END EQUIPMENT

A. The Head-end Equipment shall be configured to enable a complete and fully functional system to operate with the City's software.
   1. LenelS2 OnGuard

2.5 ACCESS CONTROL PANEL (ACP) AND RELATED MODULES

A. It will be the Installing Vendor's responsibility to ensure that the specified equipment is fully and completely compatible with the existing equipment.

B. Each ACP shall provide full distributed processing of all access control system operations.

C. The ACP shall include an on-board LAN/WAN communication module and shall link to the Access Control System software via the Local Area Network.
   1. Manufactured by Mercury. Provide quantities of each item as required.
      a. Network Node; Intelligent System Controller (ISC).
         1) Model # LNL-3300
      b. Network Node, Intelligent Single Door Controller (ISDC).
         1) Model # LNL-X2210
      c. Network Node, Intelligent Dual Reader Controller (IDRC).
         1) Model # LNL-X2220
      d. Access Control Single Reader Interface
         1) Model # LNL-1300-S3
      e. Access Control Dual Reader Interface
         1) Model # LNL-1320-S3
      f. Input Blade.
         1) Model # LNL-1100-S3
      g. Output Blade.
         1) Model # LNL-1200-S3
   2. Provide quantities as required.

D. Provide Life Safety Power or Altronix Trove Integrated Mercury power systems for Access Control Panels and Access Control Panel Power Supplies with intelligent power supply for monitoring. Size each enclosure as required for that area's total quantity of control panels, reader interfaces, expansion boards, power supplies, and 10% spare room for future dual-reader interface expansion.

2.6 ACCESS CONTROL SYSTEM POWER SUPPLIES (ACPS)

A. The Access Control Power Supply (ACPS) shall be used to power system related equipment as required. The power supply shall be U.L. listed. The ACPS shall have automatic switch over to stand-by batteries when AC power fails, and have AC fail supervision which is a Form "C" contact closure upon loss of power.

B. The ACPS's shall ONLY be installed in the MDF and EACH designated IDF location, unless noted otherwise on the drawings.

C. The Access Control System shall monitor EACH ACPS provided for this project. Monitor EACH of the following terminals:
   1. Provide connection for (1) Access Control System Input within EACH ACPS that is provided for this project to monitor the 120vac power fail contacts.

2. Provide connection for (1) Access Control System Input within EACH ACPS that is provided for this project to monitor the Low Battery supervision contacts.

D. Provide ACPS's for low voltage requirements of the Access Control System. This includes, but is not limited to the following items:
1. Hard Wired Electric Latch Retraction Exit Devices (where applicable).
2. Hard Wired Electric Locks (where applicable).
3. Hard Wired Electric Strikes (where applicable).
4. Request to Exit (REX) motion sensors (where applicable).
5. Miscellaneous system related appurtenances.

E. Provide quantities as required consolidated into the Access control Panel enclosure listed in the previous section.

2.7 SURGE SUPPRESSION

A. Provide (1) dedicated TVSS at EACH 120vac hard wired connection point.

B. Provide manufacturer and model number as specified in Section 264300.

2.8 NETWORK EQUIPMENT

A. Router(s)/Switch(s):
1. The Owner will provide the Router(s) and Switch(s) at the MDF and each ceiling ONT location indicated on the drawings. The Owner shall provide the necessary LAN/WAN infra-structure programming to establish connection to the LAN/WAN.

B. Patch Panels:
1. See Section 272000 Data and Voice Infrastructure for Patch Panel requirements.

2.9 BATTERY BACKUP FOR COMPLETE SYSTEM OPERATION

A. Battery backup power shall be an integral part of the Access Control system.

B. Provide and install gel-cell, maintenance free batteries, as required. Provide battery backup power for the entire Access Control system to provide one (1) hour of standby operation. Batteries shall be sized to provide at least 20% spare capacity.
1. Provide quantities as required for maintaining or exceeding the submittal calculation requirements listed elsewhere in Section 270000 "Submittals and Shop Drawings".

C. EACH Power Supply shall have automatic switch over to stand-by batteries when AC power fails. The power supply/charger shall be an integral portion of the control panel and/or power supply and be capable of charging fully discharged system batteries to 100% in 8 hours.

D. All batteries shall be placed inside a non-key lockable (Thumb-Turn Cam Lock), metal enclosure that is approved by the manufacturer.

E. Each battery shall have the date of installation written on the battery with a permanent marker. The date shall be legible and clearly written in 1" numbers and be visible when the enclosure door is open.

2.10 FIELD DEVICES

A. Review the Access Control System Riser Diagram for Card Reader related equipment that is NOT shown on the drawings, but shall be provided and installed for this project.

B. Prior to Bidding and Ordering ANY equipment, it shall be the responsibility of the Installing Vendor to confirm the Owners existing Access Cards will work on the specified equipment. Coordinate with owner.

C. Card Readers: Provide one (1) Card Reader at EACH location shown on the drawings. Card readers shall connect to the Access Control Panel (ACP), for a fully functional system, as required.
   1. Card Readers shall meet the following minimum requirements:
      a. PRIOR to ordering, obtain written approval of the color selection.
      b. Manufacturer's lifetime warranty.
      c. OSDP (RS-485) Secure communication protocol. Wiegand is not an approved protocol.
   2. Single Gang & Mullion Mount - Smart Card Reader:
      a. Multi-Technology 125kHz / 13.56MHz readers shall simultaneous provide support for a wide range of smart cards – including HID® iCLASS®, MIFARE® and DESFire® EV1 and EV2 – in addition to support for standard proximity cards and mobile ready credential support.
      b. Mount to a single-gang electrical box, post/bollard, gate pedestal, or mullion frame where noted.
      c. Interior/Exterior Wall Mount Reader (typical) shall be manufactured by LenelS2: BlueDiamond Multi-Technology Series Model # LNL-R10320-05TB. Provide quantities, as shown on the drawings.
      d. Interior/Exterior Mullion Mounted Reader shall be manufactured LenelS2: BlueDiamond Multi-Technology Series Model # LNL-R10330-05TB. Provide quantities, as shown on the drawings.
      e. Provide spacer as required.
   3. Credentials:
      a. PRIOR to ordering any credentials, confirm with the owner and design engineers for the exact brand, model, type, style, facility code, and order sequence/serial numbers for this project.
      b. Provide 300 Cards.
      c. Manufactured by LenelS2 Model # LNL-EV28KPP S2-EV28KPP – Pre-Encoded DESFire EV2 ISO Composite 8K 13.56MHz credential cards.

D. Door Position Switches (DPS's):
   1. Recessed Mount:
      a. Coordinate with the Intrusion Alarm System Installing Vendor as required.

E. Panic Button:
   1. The panic button shall be red with a polycarbonate clear plastic hinging cover, illuminated red momentary push button, and ordered custom label "PANIC / ALERT"
   2. Confirm the exact alert, notification types, and functions for panic buttons located through-out the building.
   3. Panic buttons for the vestibule shall also trigger the locking of secure vestibule doors as described on plans.
   4. Provide STI Safety Technology International: Model # SS2026ZA-EN

F. Door Release Button:
   1. Provide Alarm Controls: Model # DRC-6 where required. Coordinate with owner and contractors for device location on counter, separate ¾" conduit with back box, and programming requirements. Apply self-lamenting printed labels for each button.

G. Vehicle Gate Pedestal:

1. The vehicle gate pedestal shall be provided under this specification 281300 and installed by the division 26 electrical contractor. Install per manufacturer's directions and provide all mounting hardware as required.
2. Provide (1) 48" height card reader / intercom pedestal with mounting enclosure.
    a. Pedestal Pro #48-9C-BLK 48" height card reader pedestal
    b. Pedestal Pro # Lando-CS-14x10-E Intercom and Card Reader Housing/Cover 14" Wide x 10" Tall
        1) Surface Mount both the 2N IP Force Video Intercom and LenelS2 Card Reader onto housing plate side-by-side.

H. Spare Cables:
1. Provide spare cabling as shown on the drawings.

2.11 FLEXIBILITY IN SYSTEM DESIGN LAYOUT

A. Where indicated on the drawings, the Installing Vendor shall have the flexibility in their design to provide system equipment at any of the MDF/IDF's and/or Systems Plywood Back Board locations that are SPECIFICALLY identified on the drawings for this equipment.

B. Coordinate the exact location of field devices with the Architect, prior to installation.

2.12 SYSTEM CABLES, CONNECTORS, AND PATCH CORDS

A. See PART 3 of this specification and Section 270000 for additional requirements.

B. ALL cables and conductors shall be the same size and color throughout EACH cable run. Such as from EACH field device to the terminals on the ACP, ACRI, and Power Supply.
1. The color of the overall cable jackets shall be white.

C. Cables/Conductors: The minimum allowable size conductors are specified below. Use larger conductors and/or additional conductors, as required. Prior to Bidding, consult with the system Manufacturer that the following cable types are acceptable. It shall be the Installing Vendors responsibility to provide and install Manufacturer approved cables. Use the Manufacturers equivalent cable requirements, to meet all code requirements [such as "Wet Rated" or "Aerial Rated" cable] for the appropriate devices.
1. CAT6 cable(s):
    a. Refer to Section 272000.
2. Multi-Conductor access control cabling (centralized deployment):
    a. Provide Composite Cable manufactured by West Penn or Windy City Wire that includes the individual wires listed below. Provide a composite cable with the appropriate conductors required to support all devices at the door from a central location including power conductors for door hardware sized as required for the provided Div.8 hardware.
3. Readers (OSDP):
    a. Plenum: West Penn 1PR22P (22/1P Shielded), or approved equal.
        1) Provide additional conductors for Reader control of LED's as specified, as required.
4. Door Position Switches (DPS's):
    a. Non-Plenum: West Penn 224 (18/2ns), or approved equal.
    b. Plenum: West Penn 25224B (18/2ns), or approved equal.
5. Electro-Mechanical Locks and/or Electrified Exit Devices:
    a. Non-Plenum: West Penn 227 (12/2ns), or approved equal.
    b. Plenum: West Penn 25227B (12/2ns), or approved equal.
6. Panic (PB) or Emergency Lockdown Button (ELD):

a. Non-Plenum: West Penn 244 (18/4ns), or approved equal.
b. Plenum: West Penn 25244B (18/4ns), or approved equal.

7. Door Release Button (DR) station
   a. Plenum: West Penn 25273B (22/12ns), or approved equal

D. Connectors/Terminations: Use the manufacturer approved wire strippers and crimping tool as required.
1. CAT6 cable(s):
   a. Refer to Section 272000.
2. Maintain all cable and system requirements.

E. Patch Cords: Size EACH cable length to provide ease of maintenance, while not leaving excessive slack.
1. CAT6 cable(s):
   a. Refer to Section 272000.
2. Maintain all cable requirements.

2.13 TEST FORMS

A. See Section 270000 Low Voltage Systems General Requirements for “Test Forms” and “Testing & Complete System Functionality”, and “Testing” listed elsewhere in this specification for more information.

B. The Installing Vendor shall include in the pricing of their bid, the time and materials to completely fill out EACH TEST FORM. Electronic copies of the required Test Forms will be provided to the Installing Vendor upon award of the project.
1. Sample Test Forms are provided at the end of this specification. An electronic copy of this Test Form will be provided to the Installing Vendor upon request.

2.14 TRAINING MATERIALS AND PROGRAMMING SURVEY

A. The Installing Vendor shall include in the Pricing of their Bid, the time and materials necessary to generate and create the following Documentation, provide the staff and necessary equipment as required to provide the following services, as described below.

B. EACH of the documents shall have the following:
1. At the top of the document list the Name or Title of the document, the Section Number, and Section Title.
2. Header of document:
   a. The Project Name and the current date.
3. Footer of document:
   a. Use multiple pages as required, but identify each page by having the footer state “Page 1 of X”, “Page 2 of X”, etc.

C. Interview the Owner for no less than a minimum of one (1) 4-Hour session. Allow for additional time if required, at no additional cost to the Owner. The Installing Vendor LEAD TECHNICIAN AND BACKUP TECHNICIAN shall be present for this meeting. The purpose of this Interview is to verbally discuss all of the feature sets of the system. The dialog shall describe the benefits for implementing each of the systems features, thus allowing the Owner to make an informed decision on the how they can maximize the functional operation of their system.
   1. Prior to starting the Interview process with the Owner, have EACH attendee fill out a "Sign in Sheet" listing EACH attendee's name, department they work in, and their phone number.
   2. Provide a detailed list of features with a document titled "Section 282300 CCTV System – PRE-INTERVIEW of Owner Requested Systems Programming Sheet". This shall be provided in the "Submittal and Shop Drawings" with the Section 270000 submittal. This shall be used as the basis of discussion for the Interview process.
      a. For EACH separate software feature, provide a row with an ascending number indicating the "Item #" (on the far-left side of the page).
      b. Next to the Item #, provide a Yes, No, and N/A column. This shall be checked off by the Installing Vendor during the course of the Interview, to determine which options the Owner would like to have programmed.
      c. On each row, provide a brief description of the feature set.
      d. On the far right of each row, provide adequate space to write comments.
   3. All parties shall review the drawings and discuss the intended functions of EACH device. This will allow all parties to have a complete understanding of EACH system devices purpose and the performance requirements of the system that was identified during the Interview process.
   4. At the conclusion of the Interview with the Owner, prior to leaving the premises, the Installing Vendor shall do the following:
      a. Review with the Owner, by verbally recapping EACH of the feature sets listed on the "Section 281300 Access Control System – PRE-INTERVIEW of Owner Requested Systems Programming Sheet" and reiterating this with a Yes (the Owner wants this feature) or No (the Owner does not want this feature). Make any corrections as required.
      b. Provide no less than three (3) copies of the completely filled out, "Section 281300 Access Control System – PRE-INTERVIEW of Owner Requested Systems Programming Sheet" to the Engineer.
   5. For Bidding Purposes, the Installing Vendor shall be expected to program the system to Industry Standards, based on a project of this size, scope, typical functionality for this market segment, and as described throughout this specification.
      a. Review the testing requirements specified elsewhere within this specification for additional information.

D. Within five (5) business days of the conclusion of the Interview, provide the following documents to the Engineer for review:
   1. The updated Interview Document with a new title of "Section 281300 Access Control System – Owner Requested Systems Programming Sheet". This shall have the Yes, No, and N/A columns electronically filled out to demonstrate what will and will not be programmed. Include at the conclusion of this document, the following;
      a. The date(s) of the Interview with the Owner.
      b. The address, building name, room name, and room number of the location that the Interview took place at.
      c. Provide copies of the sign in sheet(s).
   2. A Training Syllabus titled "Section 281300 Access Control System – Training Syllabus", based on the features that the Owner has selected to be programmed into their system.

E. Training Manuals for the Site Staff:
1. At the 1st training session, prior to starting, provide a quantity of up to ten (10) training manuals to the site staff.
2. The training manual shall be specific to the site (i.e. Binder spine, binder cover insert, and the binder's internal documents).
3. Each of the training manuals shall be in a 3-ring "D" style binder. The binder shall be sized to allow for 20% additional documentation. The spine of the binder shall have a clear cover with an insert clearly typed with the following label "Section 281300 Access Control System – (site name here) training manual". The binder shall have a clear front cover with an insert clearly typed with the title of the spine on the front sheet, located at the top of the page, and centered. Under the title of the spine, the following information shall also be included on the front sheet of the binder; the site name and site address, the project name and project address, the current date, the installing vendors name, address, contact name and phone. Each binder shall include the following;
   a. Use color coded numbered tabs to separate each item defined below and for each device that was installed. Provide these items in the following order:
      1) Provide an 8½" x 11" clear heavy plastic sheet in front of a table of contents page as the first page of the binder indicating each of the equipment or device documents contained in each tab section.
      2) "Section 281300 Access Control System – (Site Name Here) Training Syllabus".
      3) Provide the Power Point Presentation using actual screen shots of typical functions that are specifically intended to demonstrate the aspects of the owner's new system. These shall be step-by-step instructions of the most common features that are used on the software. This includes, but is not limited to;
         a) How to use the search functions to find a specific date, specific time, or specific object.
         b) How to change card holder information.
         c) How to activate the Emergency Lock Down system.
         d) How to Reset the Emergency Lock Down system.
4. Include Color copies of EACH slide that was presented in the power point presentation. Provide a maximum of three (3) legible slides per page, with lines beside each slide to write notes.
5. Include the Manufacturers Software Users Manual(s).

2.15 ADDITIONAL SYSTEM EQUIPMENT

A. See Part 3 of this specification for additional provision of system Equipment and/or Labor.

PART 3 - EXECUTION

3.1 GENERAL

A. See Section 270000 Low Voltage Systems General Requirements for additional information.

B. Prior to rough-in, coordinate with the Architect for the exact location(s).

C. Install all equipment, devices, and cabling, per the manufacturer's recommendation.

D. Coordinate with the Owner for final programming and testing.

3.2 INSTALLATION

A. Each cable run shall be continuous, without any splices, from the device to the terminal strip on the system panel or power supply. Any cable run that does not meet this requirement shall be replaced at no additional cost to the Owner.

B. Setup, connect, and configure the Servers/Workstations/Monitors per the manufacturer's recommendations to operate as intended.

3.3 MOUNTING HEIGHTS, LOCATIONS, AND SETTINGS

A. Mount enclosures as specified in Section 270000.

B. Prior to Bidding, the Installing Vendor(s) shall confirm and coordinate the actual quantities and locations of the power requirements with the electrical contractor see "Power Supplies" and "Flexibility in System Design Layout" listed elsewhere in this specification. At a minimum, provide 120vac wiring and connections to the ACP(s) and all power supplies as required for a fully functional system.

C. Prior to rough-in, coordinate with the Architect for the exact location(s).

D. Install EACH of the devices and/or equipment per the manufacturer's recommendation.

E. Access Control Panel's (ACP's):
   1. Install EACH ACP as recommended by the manufacturer.

F. Card Readers:
   1. Install EACH Card Reader:
      a. Flush to the wall surface.
         1) Surface mounted boxes are unacceptable.
      b. Coordinate with the Architect for exact mounting height.

G. Door Position Switches shall be installed on the latch side of the door, NOT the hinge side. At the upper portion of the door, on the top of the door (recessed mount), and 4" to 6" from the edge of the door. Install per manufacturers recommendations. After installation the door shall be able to close properly without rubbing on the door position switch.
   1. Recessed Mount Door Position Switches:
      a. Drill a hole for a snug fit per the manufacturer's instructions. Do NOT use hole saws or other tools that will not produce an exact diameter hole. Loose-fitting door positions are not acceptable. It will be the responsibility of the Installing Vendor to satisfy the Architect for a proper installation.

H. Electric Locks and/or Electrified Exit Devices shall be powered by the Access Control System Power Supply's (ACPS's):
   1. The following items shall be provided by the Division 28 Security Contractor.
      a. EDPS and ACPS's that power the Electrified Exit Devices (ED). Included with the quantity of fused power outputs and relays as required for a complete and functional installation.
   2. The following items shall be provided by the Division 8 Door Hardware supplier.
      a. Electric Locks and/or Electrified Exit Devices.
      b. Auto-Operators and associated power supplies with interfacing contacts/relays.
      c. It is the division 28 contractor's responsibility to coordinate with the Div.8 contractor prior to rough-in and ordering equipment to ensure all hardware is compatible.
   3. Mounting of ACPS's, wiring, and terminations of ALL Electro-Mechanical locks shall be by the Access Control System Installing Vendor/Contractor.

3.4 PROGRAMMING AND CONFIGURATION

A. Provide all programming as required to the satisfaction of the Owner.

B. Provide additional programming as required on doors with dual card readers to support an internal lock-toggle/dog-down feature with LED feedback to allow the owner to temporarily hold the lock open with a 40-minute timer as a typical timeout.

C. Provide additional lock-toggle/dog-down control from the owner's specified software dashboard profiles to allow specific staff members to temporarily override the door lock schedule on owner specified doors dooring the pre-construction meeting. For example, the main vestibule doors and main admin office doors.

3.5 TESTING

A. Commission the system as required to ensure it is complete and fully operational.

3.6 TRAINING

A. Training for Site Staff:
   1. The training sessions shall be held at the project Site.
      a. Provide Training for up to ten (10) Site Staff.
      b. Provide a total of two (2) separate training sessions for the Owners personnel. Schedule both training sessions with the Owner, providing a minimum of 14 days advance notice, and offer a minimum of three dates to choose from.
   2. The Site Training Session(s) shall only take place AFTER the Owners Administrative Staff have had their first training session.
   3. The 1st Training Session shall consist of:
      a. Providing the printed Training Manuals to EACH attendee, as described elsewhere in this specification in "Training Materials and Programming Survey".
      b. Being conducted by one of the designated Installing Vendor technicians. The training shall be a minimum of one (1) 2-Hour session that shall be held on the same day, and provide a thorough and in-depth full feature training session. Provide additional training time as required, to answer EACH of the staff's questions, at no additional cost to the Owner.
      c. Using an Installing Vendors laptop and projector, connect to the Owners WAN and demonstrate each of these features and functions.
         1) At the Owners option, the Installing Vendor may be allowed to provide the Training Session on the Owners Workstation.
   4. The 2nd Training Session shall consist of:
      a. A refresher training session shall be held approximately 30 days after the first training session. The training session shall be a minimum of two (2) hours that may be conducted by one of the Installing Vendors designated technicians that attended the first training session. Provide additional training time as required, to answer EACH of the staff's questions, at no additional cost to the Owner.
      b. Using an Installing Vendors laptop and projector, connect to the Owners WAN and demonstrate each of the features and functions that the Owner's staff would like clarification on.
         1) No less than five (5) business days in advance of this meeting, the Installing Vendor shall request from the Owner, EACH of the items that the Owner would like clarification on.
      c. The documents that were filled out during the "Interview with the Owner" shall be used as the reference document.

d. At the Owners option, the Installing Vendor may be allowed to provide the Training Session on the Owners Workstation.

3.7 AS-BUILTS

A. Provide all As-Built documentation as defined in Section 270000 Low Voltage Systems General Requirements and listed elsewhere in this specification.

B. Update all documents provided in the Submittal and Shop Drawings to accurately reflect the actual equipment that was provided for this project, and the actual locations of the installed equipment.

C. The Installing Vendor shall include in the pricing of their bid, the time and materials to generate and create the documentation, as described below.

1. Provide an “Equipment Information Sheet”, in the O & M manuals. At a minimum, from left to right, provide the following information;
   a. Manufacturer’s Name.
   b. Equipment Device Type (such as Workstation, Control Panel, etc).
   c. Location (such as MDF room 103, or area of building).
   d. Floor Plans of equipment location, Wire Routes, and Door Numbers.

ACCESS CONTROL SYSTEM TEST FORM

Test Date:		
Arch Door #/Name:		
System Door #:		
Door Location:		
Card Reader Door:		
Door Lock Style:		
Lock Serial #:		
IP ADDRESS		
MAC ADDRESS		
Port #:		

					System Feature	Comments
Visual Inspection - at System Server						
Item 1	**Yes**	**No**	**N/A**		The Door Name & ID# is correctly identified.	
Item 2	**Yes**	**No**	**N/A**		Auto Unlock time is programmed correctly.	
Item 3	**Yes**	**No**	**N/A**		Valid Card read displays correct information.	
Item 4	**Yes**	**No**	**N/A**		Invalid Card read displays correct information.	
Item 5	**Yes**	**No**	**N/A**		Door held open displays in the Event Log.	
Item 6	**Yes**	**No**	**N/A**		Door forced open displays in the Event Log.	
Item 7	**Yes**	**No**	**N/A**		Event log “Tags” CCTV Video Clip link.	
Visual Inspection - at MDF/IDF location						
Item 8	**Yes**	**No**	**N/A**		Is the Cabling installed in a neat manner?	
Item 9	**Yes**	**No**	**N/A**		Are all of the cables labeled properly?	
Item 10	**Yes**	**No**	**N/A**		Are all cables installed without any splices?	
Item 11	**Yes**	**No**	**N/A**		Are all cables of the approved type?	
Item 12	**Yes**	**No**	**N/A**		Do all the cables have proper service loop?	
Item 13	**Yes**	**No**	**N/A**		Are all cables the proper color?	
Visual Inspection - at Door location						
Item 14	**Yes**	**No**	**N/A**		Is the Card Reader installed properly?	
Item 15	**Yes**	**No**	**N/A**		Door unlocks upon valid Card Read.	
Item 16	**Yes**	**No**	**N/A**		Card Reader sounder indicates Card read.	
Item 17	**Yes**	**No**	**N/A**		Card Reader LED’s display lock status.	
Item 18	**Yes**	**No**	**N/A**		The REX motion sensor is operating correctly.	
Item 19	**Yes**	**No**	**N/A**		REX unlocks the Door (it should NOT)	
Item 20	**Yes**	**No**	**N/A**		Door held open alarms as programmed.	
Item 21	**Yes**	**No**	**N/A**		Valid Card read activates the ADA Button.	
Item 22	**Yes**	**No**	**N/A**		Emergency Lock Down secures this door.	
Item 23	**Yes**	**No**	**N/A**		The Door closes and locks securely.	
Item 24	**Yes**	**No**	**N/A**		The Door Hardware is operating correctly.	

Signature Print

Technician: _____ _____

Representing: _____ Date: _____

Owner Rep: _____ _____

Representing: _____ Date: _____

Architect: _____ _____

Representing: _____ Date: _____

GOVERNING ACCEPTANCE FORM

						TEST FORMS	COMMENTS
Item 1		PASS		FAIL		N/A	PRE -INTERVIEW QUESTIONAIRE	
Item 2		PASS		FAIL		N/A	Each individual Card Reader PERFORMANCE TESTS	
Item 3		PASS		FAIL		N/A	Access Control Server Test Form	
Item 4		PASS		FAIL		N/A	Training Syllabus	
Item 5		PASS		FAIL		N/A	Training Session #1	
Item 6		PASS		FAIL		N/A	Training Session #2	

Training Session #1
COMPLETED ☐ INCOMPLETE ☐ COMMENTS _____

Training Session #2
COMPLETED ☐ INCOMPLETE ☐ COMMENTS _____

The undersigned having been engaged as the Installing Vendor for the **___(OWNERS NAME HERE)_____** confirm that the **_____(NAME OF PROJECT)_____**, confirm that the **SECTION 28 13 00 ACCESS CONTROL SYSTEM** equipment was installed in accordance with the specifications, drawings, wiring diagrams, instructions, and directions provided to **___(INSTALLING VENDORS NAME HERE)_____** by the Manufacturer. It has been completely tested, demonstrated and accepted by the Owners representative.

Once ALL of the above items have 'passed' the Performance test ALL Training has been 'Completed' the Warranty shall be deemed the Owners ability to use the Complete System Functionality as it was designed. From that date forward the warranty period as defined in the project documents shall begin and be in full force and effect, from the most current date.

The signatures listed below do NOT release the Installing Vendor/Contractor from fulfilling all of the requirements outlined within the project documents. The Owner reserves the right to have any and all corrections made, that do not comply with the project documents.

The following parties witnessed the Performance Tests and /or approve of the results of the Governing Acceptance Form.

	Print	Signature
Technician:	_____	_____
Representing:	_____ Date:	_____
Owner Rep:	_____	_____
Representing:	_____ Date:	_____
Architect:	_____	_____
Representing:	_____ Date:	_____

END OF SECTION 281300

SECTION 282300

CLOSED CIRCUIT TELEVISION SYSTEM (CCTV)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions and Divisions 0 and 1 Specification Sections, apply to work of this Section.

1.2 SCOPE AND RELATED DOCUMENTS

A. **Training Building CCTV camera scope varies under each Alternate Bid. Refer to Alternate Bid Plans E-001a, all electrical sheets, and Architectural Alternate Bid descriptions for more information.**

B. The project CCTV System shall be an extension of the owner's existing multi-campus Qognify Ocularis CCTV System with Axis brand IP CCTV cameras. Servers, software, and camera licenses are owner-furnished and contractor-installed. The Installing Vendor shall provide new equipment at the project site and include the necessary programming for viewing, and playback control functions of the new CCTV System to and from the following locations:
   1. Remote Viewing Monitor/PC.

C. Provide a complete and fully operational ALL IP Camera CCTV system and Interview Room system meeting the functional and operation requirements of this section and all related sections. The System includes but is not limited to cameras, lenses, camera housings, environmental enclosures and accessories, remote viewing software, video monitors, IP converters, lighted signs, switches, power supplies and low-voltage power cables, mounting hardware, brackets, fasteners, all other parts, hardware and components for a complete and coordinated system.
   1. The building CCTV system server, Ocularis, is owner-furnished and contractor-installed. The contractor shall do a base set-up & programming as described in this specification.
   2. The Interview Room system server, Evidence, is owner-furnished and owner-installed. The contractor shall coordinate with the owner for testing and minimum set-up/configuration requirements of the installed parts prior to their server integration. Including but not limited to IP addresses, firmware, video stream settings, embedding microphone audio to streams, relays/general purpose ins/outs, triggers for recording start/stop with markers, camera server destination, etc.

D. After the new installation the contractor shall update the Ocularis software with the new floor plans/as-builts/maps, cameras, controls, and dashboards. All CCTV devices at the building campus shall be shown.

E. Provide camera installation, aiming, activation of OFCI licenses, and initial set up programming per manufacturer recommendations, owner standards outlined within this specification, and per any other configuration requests that come from the pre-construction meeting with the owner. The owner will provide additional programming after they are satisfied with the initial set up that meets their standards.

F. All cameras shall be Wide Dynamic Range Day/Night cameras.

G. All cameras shall be a minimum of 3MP per lens/sensor per owner standards. See camera details and matrix for more information.

H. The CCTV System shall utilize the new data infrastructure cabling, as described in Section 272000 – Data Infrastructure. Review these specifications and see the CCTV System Riser Diagram for more information.

I. The Installing Vendor shall configure the system as described and shown. All Closed-Circuit Television equipment shall conform to IEEE 802.3af specifications.

J. The system shall meet ALL of the requirements listed in Section 270000 Low Voltage Systems General Requirements PART 3 “Testing & Complete System Functionality”, prior to “Substantial Completion”.

K. Contractual information, guidelines, requirements, or other work specified to provide a fully functional system for Section 282300 includes but is not limited to the sections identified in Section 270000 and Section 272000.

1.3 QUALITY ASSURANCE

A. The Installing Contractor shall provide a Staff Commitment Letter in the Submittal and Shop Drawings submittal package, that states the following:
   1. The Installing Contractor shall identify and designate Manufacturer Trained and Certified Installing Vendor Technicians for the duration of this project.
      a. To be deemed a qualified Installing Contractor for this project, 2 technicians shall hold the following Manufacturers Certifications PRIOR to installation for this project:
         1) The Installing Contractor shall submit copies of the above designated technicians Manufacturer Certification(s). The Installing Contractor must be certified in Ocularis as the primary installing Contractor. Sub-tier Contractors will not be allowed on this project.
         2) Prior to installation, submit training certifications for Ocularis separately after obtained for review and records.
   2. The Installing Contractor shall identify and designate a Project Manager whose responsibilities will include, but are not limited to:
      a. The Primary Point of Contact between the Owner and the Installing Contractor. It is acceptable for this person to be the Lead Technician.
      b. Scheduling of technicians to perform the work on the Owners premises.
      c. Scheduling of any meetings.
         1) All meetings shall be on the Owners premises.
      d. Scheduling and coordination of any deliveries to the Owners premises.

B. The system, devices, and equipment, shall be manufactured under the appropriate category by Underwriters' Laboratories, Inc. (UL), and shall bear the UL label. Partial or pending listings are not acceptable. The installation of EACH device and/or component shall be in compliance with the UL listing. The system, devices, and equipment shall fully comply with the latest issue of these standards, where applicable, which includes, but is not limited to:
   1. National Fire Protection Association (NFPA) - USA:
      a. NFPA 70 National Electrical Code
      b. NFPA 72 National Fire Alarm Code
   2. Underwriters Laboratories Inc. (UL) - USA:
      a. UL 50 NEMA 4X Enclosures for Electrical Equipment
      b. UL 1950 Electrical Safety
   3. Meet or exceed Building Codes and Standards:
      a. Local Authority Having Jurisdiction (AHJ) Requirements
      b. State:
         1) WAC 51-20 Washington Barrier Free Regulations

c. National:
1) National Electrical Code (see NFPA 70)
d. International:
1) International Building Code
2) International Electrical Code (see NFPA 70)

C. Approvals:
1. The system shall have proper listing and/or approval from the following nationally recognized agencies:
a. UL Underwriters Laboratories Inc.
b. ULC Underwriters Laboratories Canada.
c. IP66 Water/Dust Protection.
d. IEC 60068-2-75 Impact Protection.

D. Service and Software Modifications:
1. Provide the services of a Manufacturer Certified/Authorized Technician to perform all system software modifications, upgrades or changes.
2. Provide all hardware, software, programming tools and documentation necessary to modify the system on-site. Modification includes addition and/or deletion of system devices, changes to system operation, and custom label changes for devices. The system structure and software shall place no limit on the type or extent of software modifications on-site.

1.4 SYSTEM OPERATION

A. The CCTV System shall record EACH camera when motion is present in EACH Cameras Field-of-View.

B. The Owner's existing PC's that are connected to the LAN and/or WAN shall accommodate the following features:
1. View Live Video from any site.
2. View Recorded Video from any site.
3. Provide the ability to export video clips from the Video Server(s) to email and CD.

1.5 SUBMITTALS AND SHOP DRAWINGS

A. See Section 270000 Low Voltage Systems General Requirements for additional requirements.

B. Refer to "As-Built Drawings" for additional requirements.

C. Data Sheets and other documentation.
1. Installing Contractor Staff qualifications. Provide the following information:
a. Provide a copy of technicians (from the Installing Contractor local office) Factory Certifications for the following items once obtained:
1) Qognify Ocularis
b. Provide the Installing Contractor Staff Commitment Letter as described in "Quality Assurance" listed elsewhere in this specification.
2. The Materials List shall identify the specification section, quantity of each item, the manufacturer, model number, and brief description of each item.
a. Provide data sheets for each item listed on the materials list.
b. Provide indicating arrows on data sheets that have multiple items on the data sheet.
c. Provide complete PDF export from System Design Tool for each camera installed.

D. Shop Drawings shall include the following items:
1. The CCTV System Riser Diagram shall show the MDF & IDFs.
a. Show each system component and device connected to and installed in the MDF.

2. EACH camera shall be identified by a Camera ID #.
   a. Utilize provided
   b. Where interior cameras are shown, the number sequence shall continue (starting at the main entrance and going clockwise), only after all of the exterior cameras have been identified.
   c. EACH Fixed exterior camera shall show the cameras Field-of-View (two lines in a “V” shaped pattern, projecting outwards from the camera).
   d. Each Interior camera shall show direction-of-view with an arrow projecting outward from the camera.
   e. The Shop Drawings shall show the intended Field-of-View for all Fixed Cameras. Use light “hatching” to show this area. This shall be shown on the Site Plan(s).
      1) Site Plans: Show all exterior devices on the poles and on the structure.

E. See Section 270000 Low Voltage Systems General Requirements for additional requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

A. See Section 260000 Electrical General Conditions for additional information.

B. See Section 270000 Low Voltage Systems General Requirements for additional information.

C. See Section 272000 Data and Voice Infrastructure for additional equipment requirements.

D. Axis manufactures the CCTV Cameras that are used for the basis of design for this specification.
   1. Substitutions will not be approved on this project.

E. Other than the CCTV System software, CCTV System cameras, the design, devices and/or wiring arrangement shown on the drawings represent that based on various equipment manufacturers outlined in this specification. Any changes resulting from differences between the specified product and other manufacturers or substitute manufacturers, shall be the responsibility of the Installing Vendor.
   1. Substitutions of the specified equipment and/or supplier will be considered provided that sufficient documentation is provided to the Engineer which certifies that the equipment and or supplier qualification meets the requirement of these specifications. Any request for substitution shall be submitted by the Installing Vendor in writing so as to be received by the Engineer not later than (10) days prior to the bid due date. Approval by the Engineer will be issued by addendum prior to the bid date.

F. Provide all equipment as defined in the specification(s) and shown on the drawings.

G. Refer to PART 1 for any equipment that is not specifically defined.

2.2 SYSTEM WORKSTATION(S)

A. Remote Monitor/PC(s):
   1. The Remote Monitor/PC viewing(s) stations shall be used for this project.
      a. Remote Monitoring Software: The system software shall be loaded on the Monitor/ PC’s. The Installing Vendor shall provide, load, configure, and test the new software on EACH PC, as required.
         1) Coordinate with the Owners IT Department, as required.
         2) No Substitutions will be accepted.
      b. Provide and Install the most current version of CCTV System software on the CCTV System Remote Monitor/PC(s). Coordinate with the IT Department, as required.

B. EXISTING/Owner Provided Workstation(s):
1. The EXISTING/Owner Provided Workstation(s) shall be used for this project. These workstations are intended to be used for tasks other than for this system.
a. Remote Monitoring Software: The system software shall be loaded on the Owner provided PC's. The Installing Vendor shall provide, load, configure, and test the new software on EACH PC, as required.
1) Coordinate with the Owner to confirm which PC's will receive the new software.
2) Coordinate with the Owners IT Department, as required.
3) No Substitutions will be accepted.

2.3 VIDEO SERVER(S) AND SYSTEM SOFTWARE

A. Software is provided by the owner but configured and installed by a qualified contractor.

B. The following functional software capabilities are to be considered standard, without the need for add-on software or hardware. Not all of the system features are listed in this specification. This information shall be used as a summary of the requirements. This summary does not lessen the specified system Make, Model Number, and performance requirements in any way.

C. CCTV System Recording and Storage Requirements:
1. ANY and ALL Recording shall ALWAYS Record Network IP Cameras at the following resolution settings:
2. Have the oldest video data written over first (i.e.: First In, First Out), while the most current video shall always remain on the hard drive.

D. The recording of cameras shall not be halted or stopped in any way, in order to view Live or Recorded image(s).
1. Storage Requirements: The Video Server(s) shall have a minimum of (14) Days of on-site video storage, prior to the writing over of any video data. Use the following information to calculate the hard drive storage space.
2. Fixed Cameras shall Record at 15% of motion/activity during the hours of 6:00am-11:00pm.
3. Fixed Cameras shall Record at 5% of motion/activity during the hours of 11:00pm-6:00am.
4. Hard Drive Storage shall be calculated using the above requirements.

E. Bandwidth Requirements: The Video Server(s) minimum bandwidth requirements shall be calculated using the following criteria, unless noted otherwise on the plans:
1. Cameras shall be set to default image quality (6 in Ocularis).
2. Cameras shall be set to their maximum resolution.
3. All camera's frame rates shall be set to a minimum of 15 frames per second, or to each individual camera sensor's maximum configured frame rate if 15 frames per second is not an option for that sensor at the above defined image quality and resolution.
4. The above settings shall be used in determining required bandwidth required by the Server. Coordinate with Owner for final installed camera settings.

F. Video Server: The Ocularis Video Server(s) shall be provided by the Owner. Servers shall be installed, configured/programmed and tested by the CCTV contractor to the owner's satisfaction. The video server is centrally located. The server will be sized per the archive storage requirements of the district, camera settings described in this specification and in the camera matrix. Refer to CCTV detail sheets for more information.
1. Coordinate with the Owner to determine storage requirements needed based on the Storage Requirements section above.

2. Coordinate with the Owner for minimum bandwidth throughput requirements needed based on the Bandwidth Requirements section above. Provide System Design Tool export mentioned elsewhere in this specification to the Owner for this purpose.

G. CFCI CCTV System Licensing:
1. The owner shall provide the camera licenses required for this project. Coordinate with the Owner's IT Department to utilized the Owner's server.
2. The contractor is required to provide the initial programming and set up that is consistent with the existing programming found in the existing server.

H. Coordinate with the Owners IT Department for a complete and functional installation and base configuration per their standards, as required.

2.4 NETWORK RELATED EQUIPMENT

A. Data Infrastructure:
1. See Section 272000 Data Infrastructure shall provide EACH of the following items at EACH location required:
   a. All patch Cables.
      1) Device/Camera Patch Cables provided by division 272000 and installed by division 282300 CCTV contractor.
   b. Cat6 Cable Infrastructure.
   c. Patch Panels.
   d. Fiber Optic Infrastructure.

B. ALL Racks shall be provided by Section 272000.

C. Coordinate with Section 272000, Telecommunications contractor and Owner's representative during pre-construction meeting and as required for the Installing Vendor to install the CCTV Server, Media Converters, and any Additional CCTV System equipment within these racks.

2.5 FIELD DEVICES

A. Cameras:
1. See camera details and camera matrix on drawings for more information.
2. Interior/Exterior Fixed IP Mega-Pixel SINGLE DOME MULTI SENSOR CAMERA:
   a. The multi-sensor cameras shall be the Axis 15-megapixel, WDR User-Configurable Multi-Sensor Day/Night Indoor/Outdoor Dome IP Camera Model # Axis P3719-PLE with 1/2.5 CMOS sensors, Dome Camera Cover with clear bubble.
   b. Provide Recessed Ceiling mount model # AXIS T94N01L as required.
   c. Provide Pendant adapter model # AXIS T94N01D as required. Provide Pendant wall mount model # AXIS T91D61 as required.
   d. Provide Pole Mount Adapter model # AXIS T91B67 as required.
   e. Provide Corner Mounting Bracket model # AXIX T91A64 as required.
3. The Interior/Exterior Fixed IP Mega-Pixel DOME DUAL SENSOR CAMERAS:
   a. The camera shall be the Axis 2x5-megapixel WDR Day/Night Indoor IP Camera Model # P4707-PLVE with 1/2.7 CMOS sensor, Surface Mount or In-Ceiling Dome Camera Cover with clear bubble or most current version available.
   b. Provide Pendant adapter model # AXIS T94N02D as required.

c. Provide Pendant wall mount model # AXIS T91D61 as required.
d. Provide Pole Mount Adapter model # AXIS T91B67 as required.

4. The Interior/Exterior Fixed IP Mega-Pixel DOME SINGLE SENSOR CAMERAS:
   a. The camera shall be the Axis 1x5-megapixel WDR Day/Night Indoor IP Camera Model # P3267-LVE or P3267-LV with 1/2.7 CMOS sensor, Surface Mount or In-Ceiling Dome Camera Cover with clear bubble or most current version available.
   b. Provide Recessed Ceiling mount model # AXIS TP3201-E as required.
   c. Provide Pendant adapter model # AXIS TP3103-E as required.
   d. Provide Pendant wall mount model # AXIS T91E61 as required.
   e. Provide Pole Mount Adapter model # AXIS T91B47 as required.

2.6 INTERCOM DOOR STATION (IDS)

A. Provide IP Intercom Door Station with 2-way audio, video where noted, integrate video into the CCTV system, integrate controls into Access Control system, and coordinate with the owner to integrate into their SIP phone system.

1. At the vehicle gate pedestals entrance provide Axis 2N Model: IP Force - 1 Button, with HD Camera, pictograms, and card reader ready - Order No.: 01334-001. No substitutions.
   a. At each exterior (IDS) location, provide one (1) 2N Model: Surface Mounting box
   b. Coordinate with owner for connecting to master station VoiP video phone at reception and any additional extensions if there is no answer at the master station. Confirm labeling of button with owner prior to installation.
2. At the exterior of the main entrance provide Axis 2N Model: IP Force - 1 Button, without Camera - Order No.: 01336-001. No substitutions.
   a. Provide one (1) at the exterior (IDS) location. Provide one (1) 2N Model: Flush Mounting box for brick, wood, or metal paneling.
   b. Coordinate with owner for connecting to master station VoiP video phone at reception and any additional extensions if there is no answer at the master station such as dispatch. Confirm labeling of button with owner prior to installation.
3. At the interior of the main entrance vestibule provide Axis 2N Model: IP Force - 1 Button, with HD Camera, pictograms, and card reader ready - Order No.: 01334-001. No substitutions.
   a. Provide one (1) at the interior (IDS) location, provide one (1) 2N Model: Flush Mounting box for brick, wood, or metal paneling.
   b. Coordinate with owner for connecting to master station VoiP video phone at reception and any additional extensions if there is no answer at the master station such as dispatch. Confirm labeling of both buttons with owner prior to installation.

2.7 INTERVIEW ROOM EQUIPMENT

A. Per each interview room provide a complete physical system installation and coordination with the owner for the software configuration. Server and server programming is owner-furnish and owner-installed. The contractor shall provide the minimum hardware configuration required per the owner's direction. For each room provide:

1. Provide one (1) 18x18x8 Junction box / enclosure with removable back plate, DIN Rail and hinging cover with a lock to hold head-end equipment. Clearly label all enclosures, cables, and equipment. Locate outside of room per plans with power duplex inside.

2. Provide one (1) Meanwell 120VAC/12VDC 60W PSU and mount to DIN Rail.
3. Provide one (1) Axis model # F9114 Main Unit Breakout IO.
   a. Mount in junction box and power via Data Drop / PoE (30W) (Data per 272000).
   b. Provide Axis model # TF9903 DIN Rail Clip.
   c. Provide (2) Axis model # Surveillance Card 1TB microSDXC Card

1) Each card provides approximately 96 hours of recording storage for x2 cameras recording at 1080p/30fps with H.264 High Quality compression.

d. Program as required to trigger recording start/stop actions and markers in the CCTV software and merging audio stream with video streams. Coordinate with the owner for additional programming requirements, recording preferences, microSD card setting options, and base configuration prior to them integrating into their evidence archive.

4. Provide one (1) Axis model # F4105-LRE Modular Fixed Dome Sensor camera.
   a. Provide one (1) Axis model # F2105-RE Standard Sensor for F4105 camera.
   b. Provide one (1) Axis model # Axis-TU6005 Plenum Cable for Camera Sensor 26ft or 65ft as required.
   c. Mount on ceiling of interview room with ¾" conduit homerun to junction box.
5. Provide one (1) Axis model # F7225-RE Pinhole Sensor camera.
   a. Provide one (1) Axis model # F8202 flat mount for Pinhole camera.
   b. Provide one (1) Axis model # Axis-TU6005 Plenum Cable for Camera Sensor 26ft or 65ft as required.
   c. Mount in recessed wall outlet at +48" AFF with 1-gang discrete pinhole camera cover plate, tamper-proof screws, and ¾" conduit homerun to junction box.
6. Provide one (1) Louroe model # Verifact D-V discrete low impedance electret condenser microphone.
   a. Flush Mount plate on recessed backbox at +48" AFF with 1-gang discrete pinhole camera cover plate, tamper-proof screws, and ¾" conduit homerun to junction box.
   b. Power with 12VDC power supply.
   c. Connect to audio input of base unit.
   d. Provide plenum rated shielded microphone cabling (1-pair + ground) West Penn 25291B or Belden 9451P.
7. Provide Interview In Progress Room Sign Light by Rekall Dynamics, Model # RD2020-12-IIP-BLU-NON.
   a. Mount where shown on plans at +8ft AFF.
   b. Provide 12VDC version (9W), Color BLUE, with IIP "Interview In Progress" text.
   c. Power with 12VDC power supply and 12awg/2-conductor solid conductor cable.
   d. Provide quantities as shown on plans.
8. Recording switch
   a. Provide single gang Double-Pole Single-Throw ON-OFF Toggle Switch. Leviton 1222-2W or pre-approved substitution.
   b. Mount to single gang custom plate with custom engraving "INTERVIEW RECORDING", "ON" & "OFF"
   c. Connect to power supply & Interview Room Sign lights.
   d. Connect 1 pole to 12VDC for sign light 12awg/2-conductor solid conductor cable.
   e. Connect 1 pole to F9114 I/O input of base unit with 1-pair wiring for recording relay. Provide plenum rated cabling (1-pair + ground) West Penn 25221B or Belden 6500UE.

2.8 POWER OVER ETHERNET (POE) INJECTORS

A. PoE injectors are not required where a new camera is being fed from a new MDF/IDF. New network switches will be provided by the owner with adequate capacity.

B. Provide 1RU rack shelves and 1RU horizontal wire management as required where there is a rack.

2.9 SYSTEM CABLES, CONNECTORS, AND PATCH CORDS

A. All Category and Fiber Optic patch cords shall be provided under Division 272000. Coordinate with the Telecommunications contractor for quantity, sizing, color, and required delivery date of the cables.

B. Camera and Device-end Patch Cords shall be installed by the CCTV vendor.

C. Camera and Device-end Patch Cords: Size EACH cable length to provide ease of maintenance, while not leaving excessive slack.
   1. CAT6 cable(s):
      a. Refer to Section 272000.
         1) The color of all system Patch Cords shall match the infrastructure cables.

D. See PART 3 of this specification and Section 270000 for additional information.

2.10 TRAINING MATERIALS AND PROGRAMMING SURVEY

A. Interview the Owner for no less than a minimum of one (1) 2-Hour session. Allow for additional time if required, at no additional cost to the Owner. The Installing Contractor LEAD TECHNICIAN shall be present for this meeting. The purpose of this Interview is to verbally discuss all of the feature sets of the system. The dialog shall describe the benefits for implementing each of the systems features, thus allowing the Owner to make an informed decision on the how they can maximize the functional operation of their system.
   1. Prior to starting the Interview process with the Owner, have EACH attendee fill out a “Sign in Sheet” listing EACH attendee’s name, department they work in, and their phone number.
   2. Provide a detailed list of features with a document titled “Section 282300 CCTV System – PRE-INTERVIEW of Owner Requested Systems Programming Sheet”. This shall be provided in the “Submittal and Shop Drawings” with the Section 270000 submittal. This shall be used as the basis of discussion for the Interview process.
   3. For Bidding Purposes, the Installing Contractor shall be expected to program the system to Industry Standards, based on a project of this size, scope, typical functionality for this market segment, and as described throughout this specification.
      a. Review the testing requirements specified elsewhere within this specification for additional information.

B. Training Manuals for the Site Staff:
   1. At the 1st training session, prior to starting, provide a quantity of up to ten (10) training manuals to the site staff.
   2. The training manual shall be specific to the site (i.e. Binder spine, binder cover insert, and the binder’s internal documents).
   3. Each of the training manuals shall be in a 3-ring “D” style binder. The binder shall be sized to allow for 20% additional documentation. The spine of the binder shall have a clear cover with an insert clearly typed with the following label “Section 282300 CCTV System – (site name here) training manual”. The binder shall have a clear front cover with an insert clearly typed with the title of the spine on the front sheet, located at the top of the page, and centered. Under the title of the spine, the following information shall also be included on the front sheet of the binder; the site name and site address, the project name and project address, the current date, the installing vendors name, address, contact name and phone. Each binder shall include the following;
      a. Use color coded numbered tabs to separate each item defined below and for each device that was installed. Provide these items in the following order.

1) Provide an 8½" x 11" clear heavy plastic sheet in front of a table of contents page as the first page of the binder indicating each of the equipment or device documents contained in each tab section.
2) "Section 282300 CCTV System – (Site Name Here) Training Syllabus".

4. Include the Manufacturers Software Users Manual(s).

2.11 ADDITIONAL SYSTEM EQUIPMENT

A. See Part 3 of this specification for additional provision of system Equipment and/or Labor.

PART 3 - EXECUTION

3.1 GENERAL

A. See Section 270000 Low Voltage Systems General Requirements for additional information.

B. See Section 272000 Data and Voice Infrastructure for additional cable and installation requirements.

C. See Section 270528 Pathways for Communications additional installation requirements.

D. Prior to rough-in, coordinate with the Engineer for the exact location(s).

E. Install all cabling, devices, and/or equipment per the manufacturer's recommendation.

3.2 INSTALLATION

A. Each cable run shall be continuous, without any splices, from the device to the terminal strip on the system patch panel(s). Any cable run that does not meet this requirement shall be replaced at no additional cost to the Owner.

B. Setup, connect, and configure the Servers/Workstations/Monitors per the manufacturer's recommendations to operate as intended. Load, configure, and test the software for a fully functional system.

3.3 MOUNTING HEIGHTS, LOCATIONS, AND SETTINGS

A. CCTV System Head end and other hardware:
1. All Head end equipment shall be rack mounted.

B. Rack(s):
1. All cabling for the rack(s) shall have Service Loops and Cable management.

C. General Camera Information:
1. Prior to rough-in, examine the surrounding area and the cameras intended Field-of-View (FoV) (from the perspective of where the camera is to be installed). Cameras shall be installed with an unobstructed FoV. This includes but is not limited to; existing objects, such as lights, exit signs, or other physical impediments.
2. Any camera that has the final and approved FoV that is obstructed will require the Installing to relocate the camera, at no additional cost to the Owner.
3. Coordinate with the Engineer and all trades to ensure that the cameras FoV will not be obstructed. Prior to relocating any camera, obtain written direction from the Engineer.
a. Coordinate with the Owner to relocate banners, art, or anything else that may block the cameras FoV and/or mounting requirements.
b. Wall Mount Cameras shall be installed at the following locations:

1) At all areas as shown on the drawings.

D. Camera Mounting:
1. All cameras shall be flush to the ceiling or wall surface, unless otherwise noted.
2. Exterior Camera Mounting Requirements:
a. Reinforce the Structure and Mounting Surface to properly secure the mounting of Exterior Cameras, as required.
b. Install per camera manufacturer recommendations.
3. Interior Camera Mounting Requirements:
a. Install per camera manufacturer recommendations.

E. Camera Focusing:
1. After the CCTV System has been powered up, cameras have been back focused (where applicable) and configured, then the camera shall then be positioned as discussed during the Interview with the Owner, which is described in “Training Materials and Programming Survey” listed elsewhere within this specification.
a. Fixed Cameras shall be adjusted and focused for the intended Field of View (FoV). Readjust the cameras to the Owners needs, as required.

F. Remote Viewing of VIDEO SERVER(S)(s):
1. Load and configure the software on the Owners Existing PC’s and remote viewing monitor/PC(s) as required.
2. Train the Owners IT department how to load and configure the software on additional PC’s, as required.

3.4 TRAINING

A. Training for Site Staff:
1. The training sessions shall be held at the project Site.
a. Provide Training for up to ten (10) Site Staff.
b. Provide a total of two (2) separate training sessions for the Owners personnel. Schedule both training sessions with the Owner, providing a minimum of 14 days advance notice, and offer a minimum of three dates to choose from.
2. The 1st Training Session shall consist of:
a. Providing the printed Training Manuals to EACH attendee, as described elsewhere in this specification in “Training Materials and Programming Survey”.
b. The training shall be a minimum of one (1) 4-Hour session and provide a thorough and in-depth full feature training session. Provide additional training time as required, to answer EACH of the staff’s questions, at no additional cost to the Owner. This training shall address EACH of the software features that meet the Owners requirements identified on the documents that were filled out during the “Interview with the Owner”. This includes, but is not limited to:
1) The “Section 282300 CCTV System – Owner Requested Systems Programming Sheet”.
a) Using an Installing Contractor laptop and projector, connect to the Owners WAN and demonstrate each of these features and functions.
2) At the Owners option, the Installing Contractor may be allowed to provide the Training Session on the Owners Workstation.
3. The 2nd Training Session shall consist of:
a. A refresher training session shall be held approximately 30 days after the first training session. The training session shall be a minimum of two (2) hours that may be conducted by one of the Installing Contractors designated technicians that attended the first training session. Provide additional training time as required, to answer EACH of the staff’s questions, at no additional cost to the Owner.

b. Using an Installing Contractors laptop and projector, connect to the Owners WAN and demonstrate each of the features and functions that the Owner's staff would like clarification on.
   1) No less than five (5) business days in advance of this meeting, the Installing Vendor shall request from the Owner, EACH of the items that the Owner would like clarification on.
      a) The documents that were filled out during the "Interview with the Owner" shall be used as the reference document.
      b) At the Owners option, the Installing Contractor may be allowed to provide the Training Session on the Owners Workstation.
   2) Following the 2nd training session, the Installing Contractor shall include additional programming to accommodate system functionality changes, based on the requirements of the Owner.
      a) Provide up to two (2) hours of system programming changes.

4. Upon completion of training, provide a letter from the customer on the customer's letterhead acknowledging that the training requirements have been met.

3.5 AS-BUILTS

A. Provide all As-Built documentation as defined in Section 270000 Low Voltage Systems General Requirements and listed elsewhere in this specification.

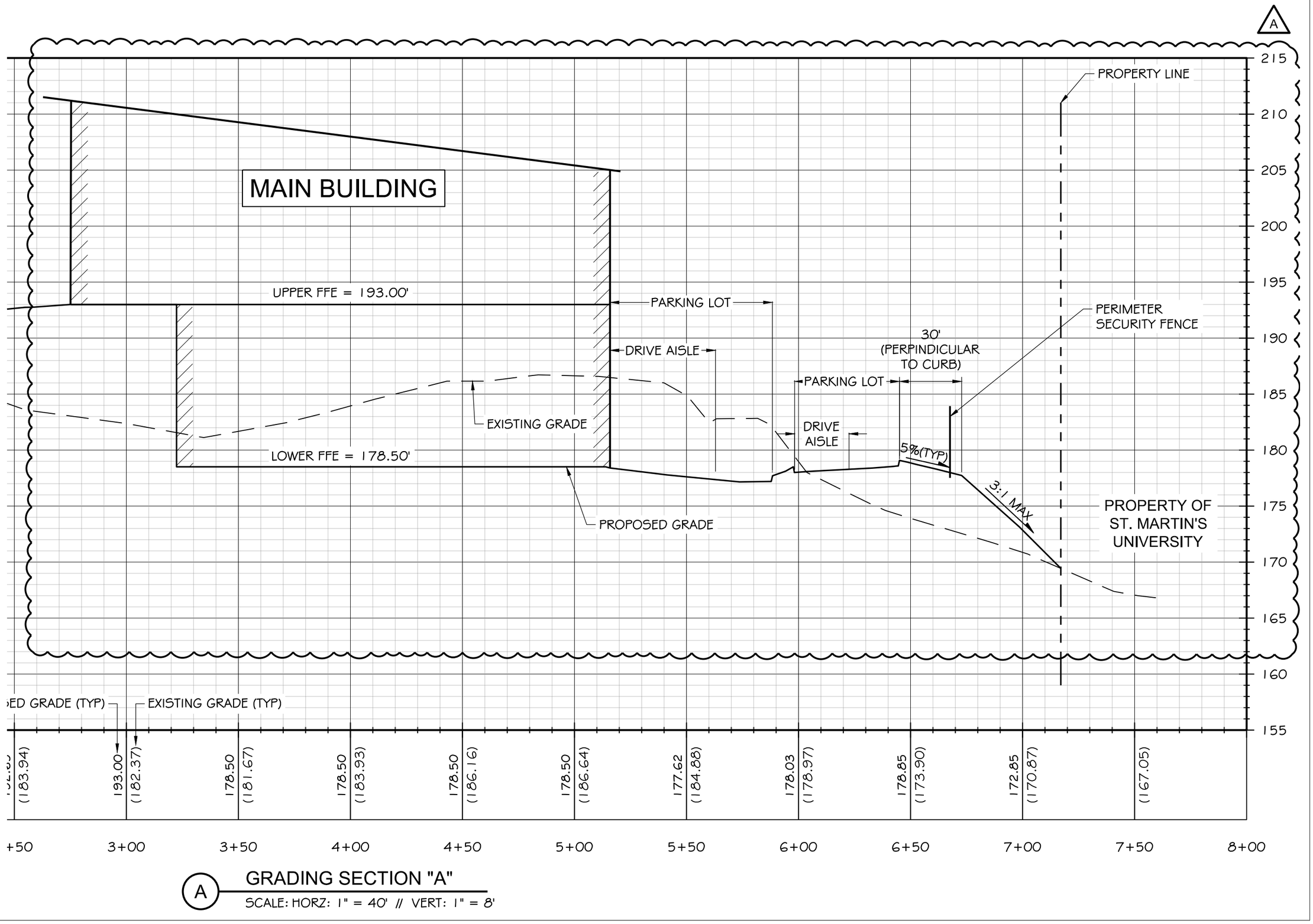
B. Update all documents provided in the Submittal and Shop Drawings to accurately reflect the actual equipment that was provided for this project, and the actual locations of the installed equipment.

C. The Installing Vendor shall include in the pricing of their bid, the time and materials to generate and create the documentation, as described below.
   1. Provide an "Equipment Information Sheet", in the O & M manuals. At a minimum, from left to right, provide the following information;
      a. Each row shall have an "Item #".
      b. Manufacturers Name.
      c. Equipment Device Type (such as Workstation, Control Panel, etc).
      d. Location (such as MDF room 240, or area of building).
      e. IP Address.
      f. Software Name.
      g. Software Version that is installed on the device.
      h. List the "Highest Level" configurable password for EACH device.
      i. List "EACH System Operator" password.
      j. List all other password settings for EACH device.

D. Provide ALL CD(s)/DVD(s) of installation software, legally required software licenses, and the associated documentation to reinstall all portions of the software that is running on the new and/or existing Server/Workstations.

E. Upon final acceptance of the CCTV system by the customer, provide a letter of acceptance from the customer on the customer's letter head accepting the CCTV system as installed and that the CCTV system is fully operational and all training requirements have been met.

END OF SECTION 282300



A GRADING SECTION "A"

SCALE: HORZ: 1" = 40' // VERT: 1" = 8'

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NEW POLICE STATION
CITY OF LACEY

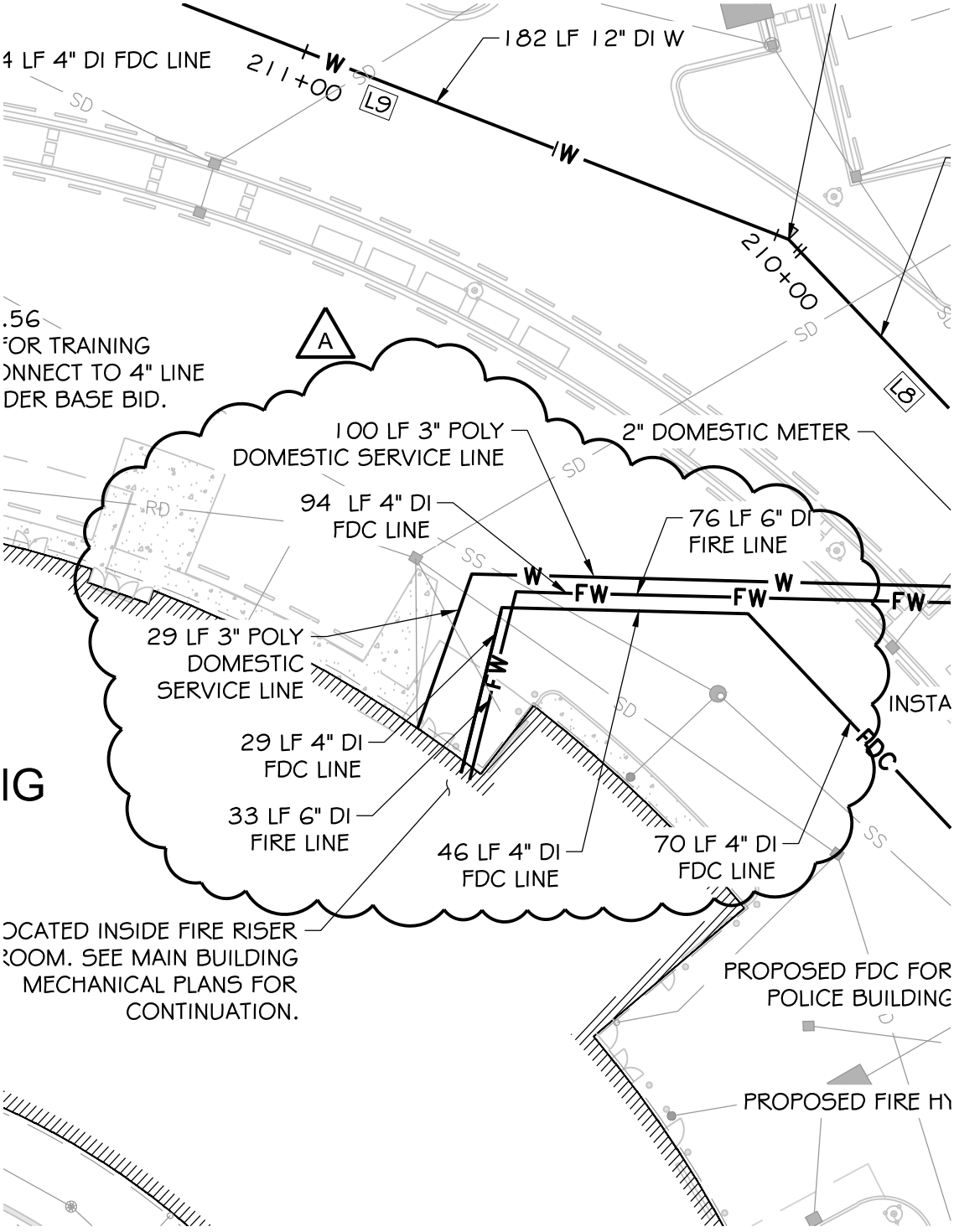
222 COLLEGE STREET SE, LACEY, WA 98503
CITY PROJECT NO. PW 2022-13

ORIGINAL SHEET SIZE = 11 x 17
HALF SIZE REDUCTIONS = N/A

REVISIONS:
A ADDENDUM NO. 01 10.16.2023

DATE:
10.16.2023
ADDENDUM NO. 01

SHEET NO.
C-304-A1
SITE GRADING SECTIONS



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KPFF Project # 1018202200044

NEW POLICE STATION
CITY OF LACEY
222 COLLEGE STREET SE, LACEY, WA 98503
CITY PROJECT NO. PW 2022-13

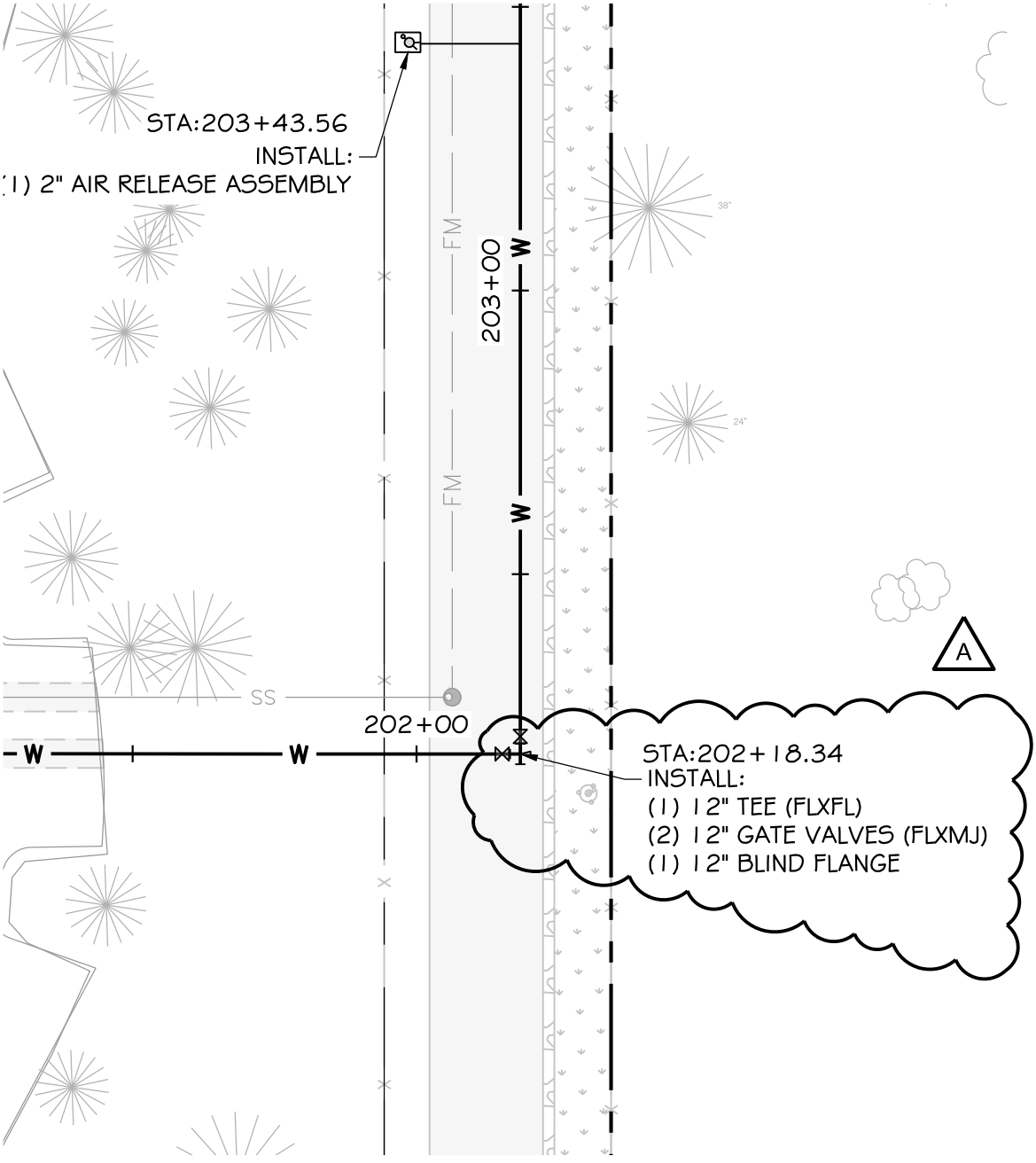
ORIGINAL SHEET SIZE = 11 x 17
HALF SIZE REDUCTIONS = N/A

REVISIONS:
A ADDENDUM NO. 01 10.16.2023

DATE:
10.16.2023

ADDENDUM NO. 01

SHEET NO.
C-600-A1
WATER PLAN NORTH



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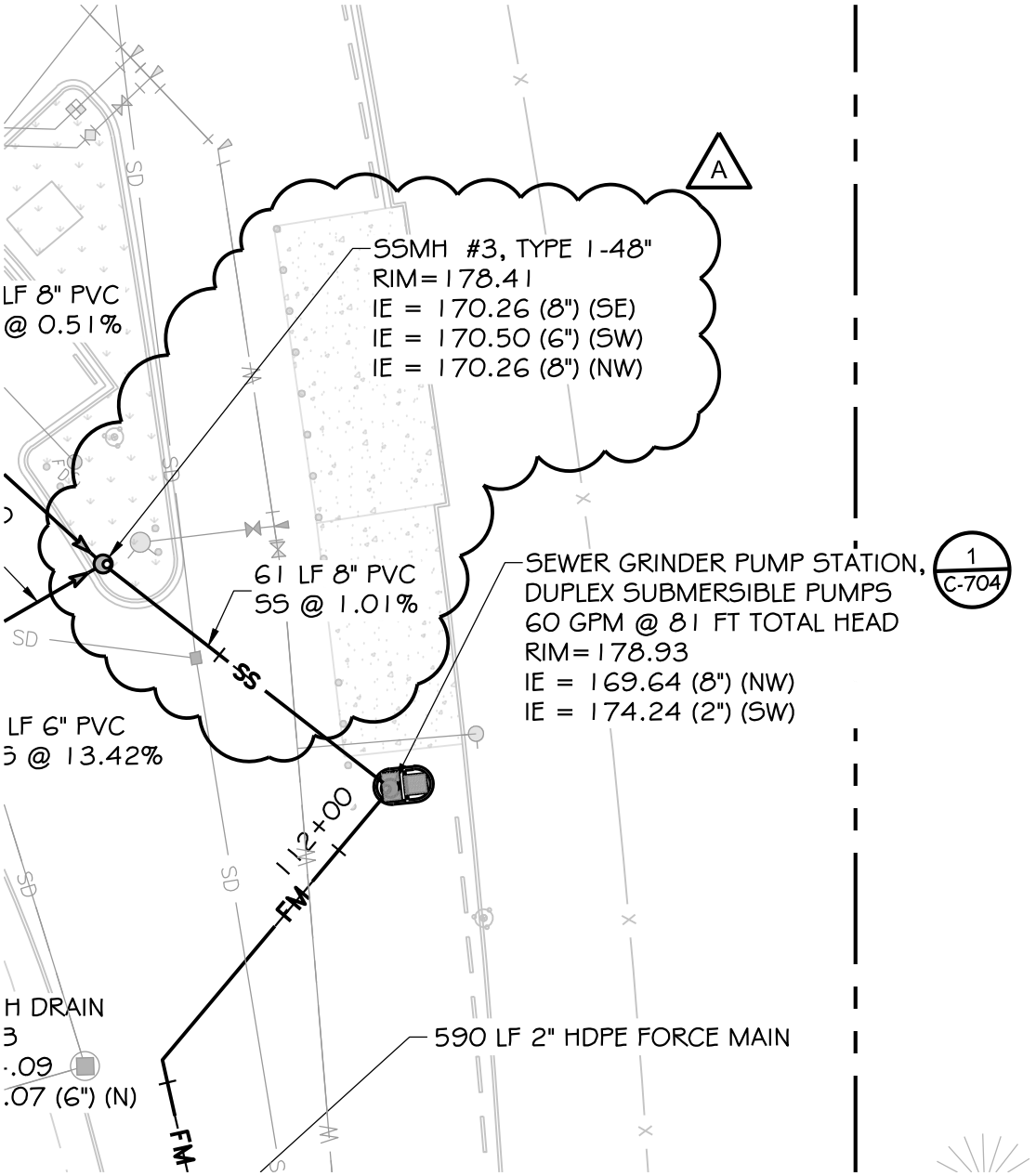
SHEET NO.
C-601-A1
WATER PLAN SOUTH



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SHEET NO.
C-700-A1
SEWER PLAN NORTH

A

COLD FORMED METAL FRAMING:

1. ALL COLD FORMED METAL FRAMING SHALL CONFORM TO THE CURRENT EDITION OF AISI S100, "NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS", AS ADOPTED BY THE GOVERNING BUILDING CODE.
2. COLD FORMED METAL FRAMING PRODUCTS SHALL BE MANUFACTURED BY MEMBERS OF THE STEEL STUD MANUFACTURER'S ASSOCIATION (SSMA).
3. COLD FORMED METAL FRAMING MEMBERS SHALL BE OF THE TYPE, SHAPE, SIZE, GAUGE, AND SPACING SHOWN ON THE DRAWINGS.
4. MEMBER TYPES AND SIZES ON THE DRAWINGS REFER TO MEMBER TYPES, SIZES, AND MISCELLANEOUS FRAMING ELEMENTS DEFINED BY THE SSMA AND ICC ESR-3064P.
5. STEEL USED IN METAL FRAMING AND STRAP BRACING SHALL CONFORM TO ASTM A653 OR A1003.
6. MINIMUM YIELD STRENGTH FOR 22, 20, AND 18-GAUGE STEEL IS TO BE 33 KSI. MINIMUM YIELD STRENGTH FOR 16, 14, 12, AND 10-GAUGE STEEL IS TO BE 50 KSI.
7. COLD FORMED METAL FRAMING SHALL BE GALVANIZED WITH A MINIMUM CP60 COATING.
8. STUDS SHALL BE SECURELY SEATED IN TOP AND BOTTOM TRACKS FOR FULL END BEARING.
9. A MINIMUM OF TWO STUDS SHALL BE PROVIDED AT WALL ENDS, INTERSECTIONS, CORNERS, AND AT EACH SIDE OF ALL OPENINGS.
10. STEEL STUDS IN LOAD BEARING WALLS SHALL ALIGN VERTICALLY WITH THE JOIST, TRUSS, OR WALL STUD SUPPORTED ABOVE.
11. BRIDGING SHALL BE PROVIDED PER THE TYPICAL DETAILS AT 4'-0" OC MAX IN BEARING WALLS AND 5'-0" OC MAX IN NON-BEARING WALLS.
12. TRACK SECTIONS SHALL BE UNPUNCHED AND HAVE A MINIMUM FLANGE DEPTH OF 1 ¼ INCHES. SLOTTED TRACK MAY ONLY BE USED WHERE SPECIFICALLY INDICATED.
13. CONNECTIONS OF COLD FORMED METAL FRAMING SHALL BE AS SHOWN ON THE DRAWINGS.
14. WELDING OF COLD FORMED METAL FRAMING SHALL BE IN ACCORDANCE WITH AWS D1.3, "STRUCTURAL WELDING CODE – SHEET STEEL". ALL WELDERS SHALL BE QUALIFIED FOR THE WELDS BEING PERFORMED.
15. SCREW SPACING AND EDGE DISTANCE SHALL NOT BE LESS THAN 3 TIMES THE DIAMETER OF THE SCREW.
16. PENETRATION OF SCREWS SHALL NOT BE LESS THAN 3 EXPOSED THREADS. SCREWS SHALL BE INSTALLED PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

COLUMN SCHEDULE

MARK	SIZE	BASE PLATE
C3	HSS3X3X1/4	9"x9"x5/8" UNO
C4	HSS4X4X1/4	12"x12"x3/4"
C5.A	HSS5X5X5/16	13"x13"x3/4"
C5.B	HSS5X5X1/4	13"x13"x3/4"
C6.2	HSS6X6X1/2	14"x14"x1"
C6.A	HSS6X6X3/8	14"x14"x1"
C6.B	HSS6X6X1/4	14"x14"x3/4"
C6.C	HSS6X6X5/16	14"x14"x3/4"
C7	HSS7X7X1/2	15"x15"x1"
C8	HSS8X8X3/8	16"x16"x1"
C10W	W10X49	24"x24"x1 1/2"

A

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JASON PAUL TORNOW STATE OF WASHINGTON 47450 STRUCTURAL ENGINEER PROFESSIONAL ENGINEER

NEW POLICE STATION
CITY OF LACEY
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CITY PROJECT NO. PW 2022-13

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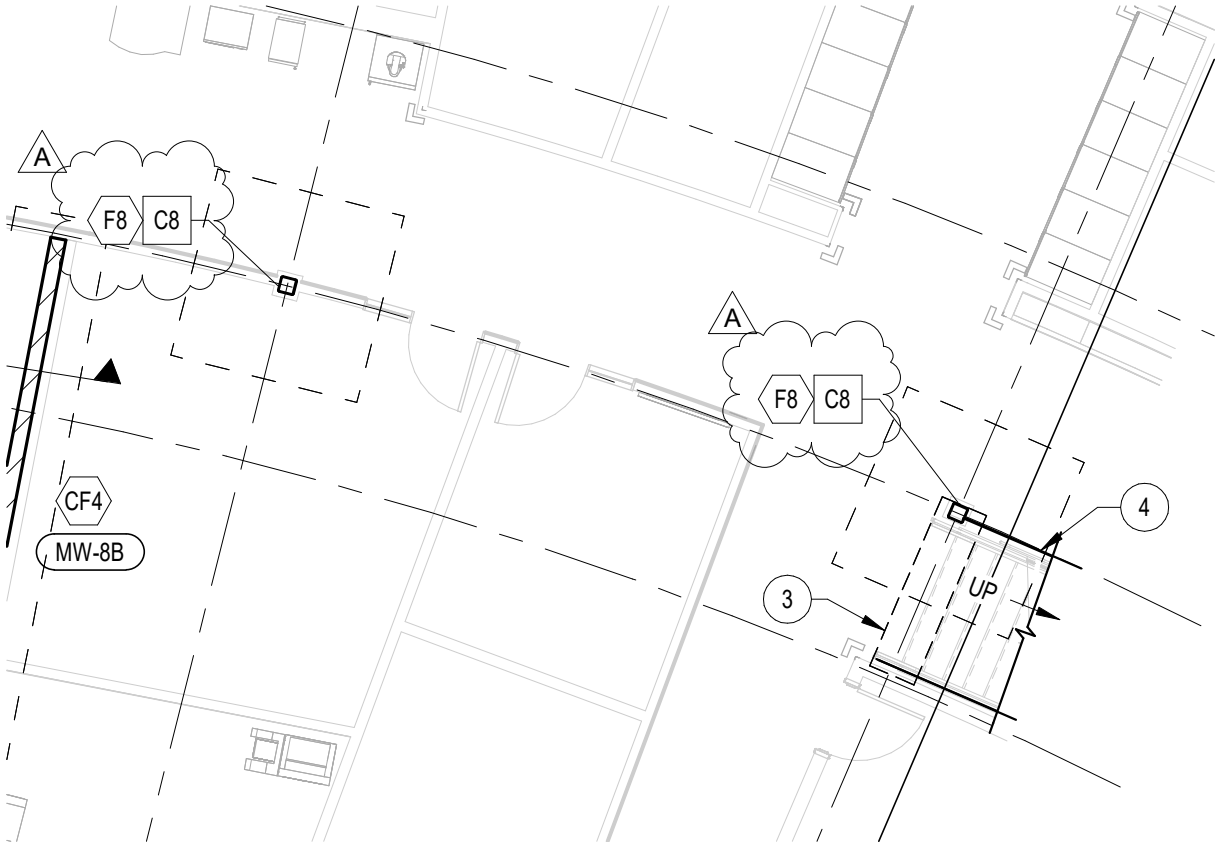
SHEET NO.
S-001-A1

STRUCTURAL GENERAL NOTES

& COLUMN SCHEDULE



1 LOWER LEVEL FOUNDATION PLAN - WEST (PARTIAL)

SCALE: 1/8" = 1'-0"

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SHEET NO.
S-111-A1
LOWER LEVEL PLAN - WEST

1 LOWER LEVEL FOUNDATION PLAN - EAST (PARTIAL)

SCALE: 1/8" = 1'-0"

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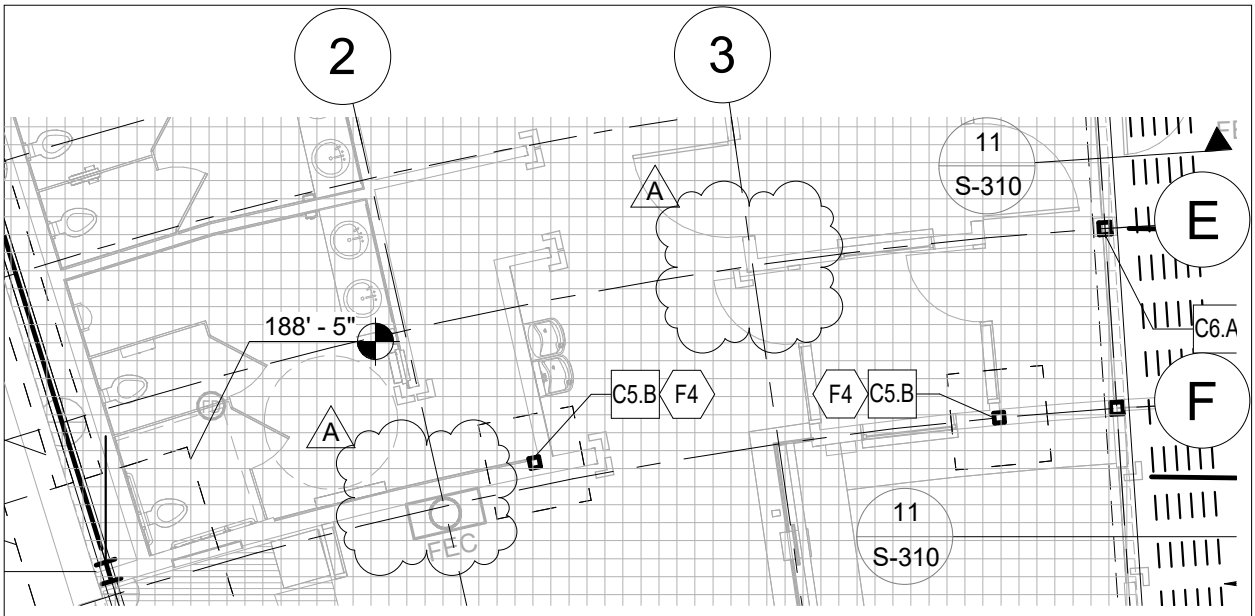
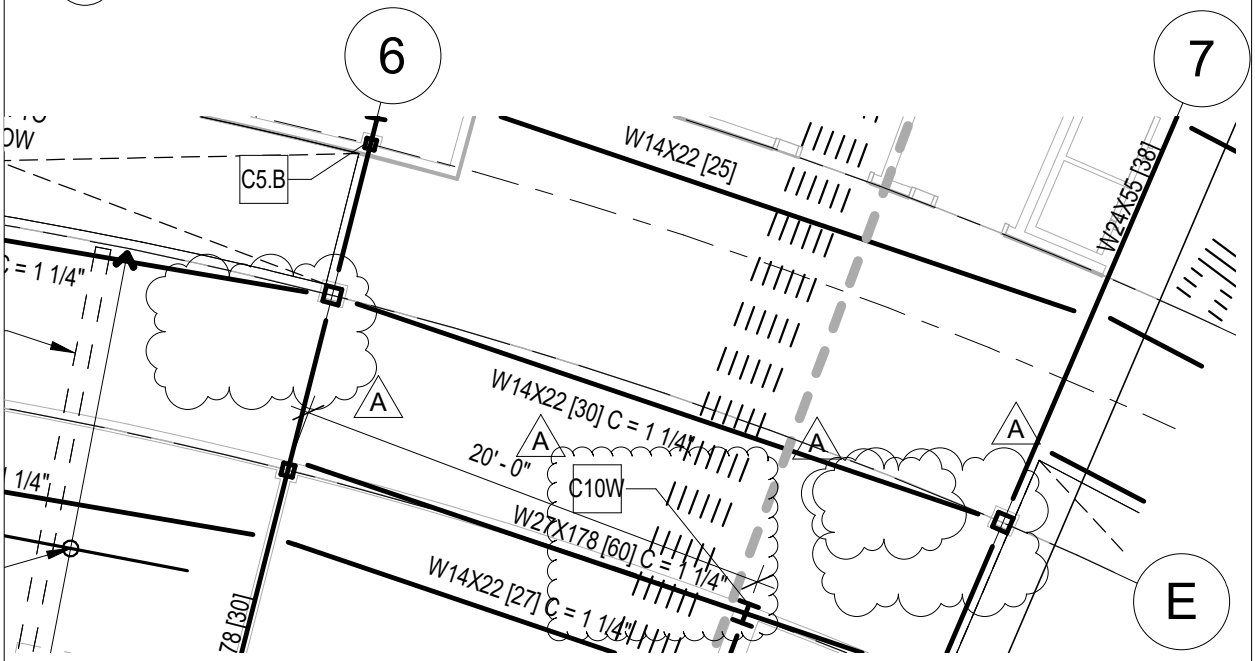
SHEET NO.
S-112-A1

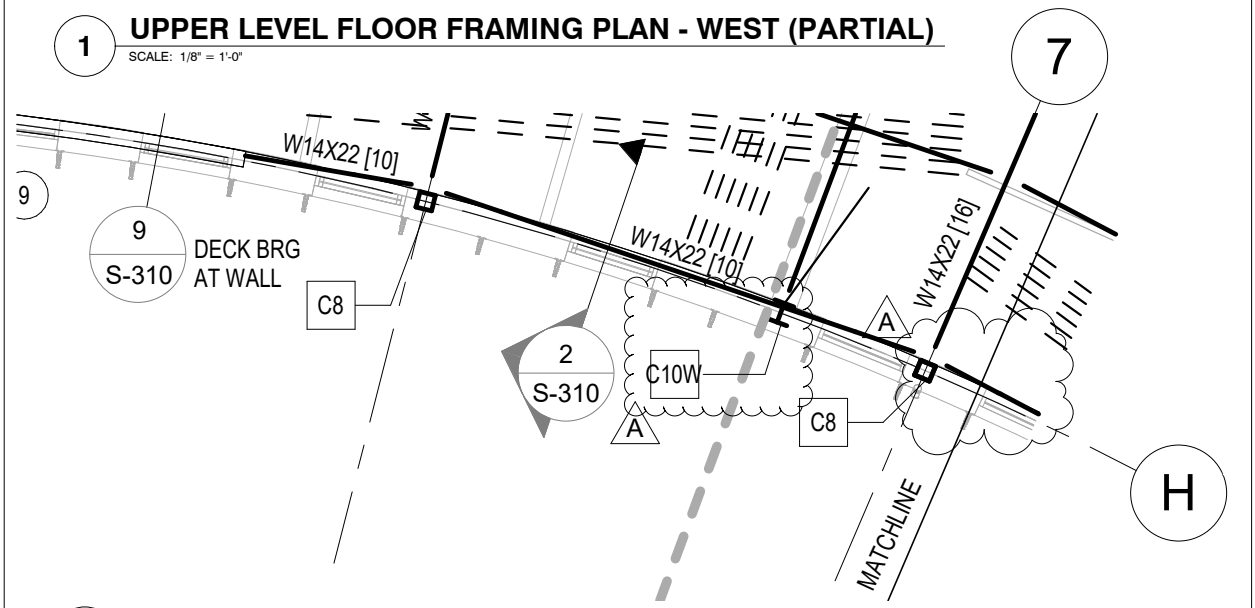
LOWER LEVEL PLAN - EAST



1 **UPPER LEVEL FLOOR FRAMING PLAN - WEST (PARTIAL)**
SCALE: 1/8" = 1'-0"



1 **UPPER LEVEL FLOOR FRAMING PLAN - WEST (PARTIAL)**
SCALE: 1/8" = 1'-0"



1 **UPPER LEVEL FLOOR FRAMING PLAN - WEST (PARTIAL)**
SCALE: 1/8" = 1'-0"

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PROFESSIONAL ENGINEER

NEW POLICE STATION
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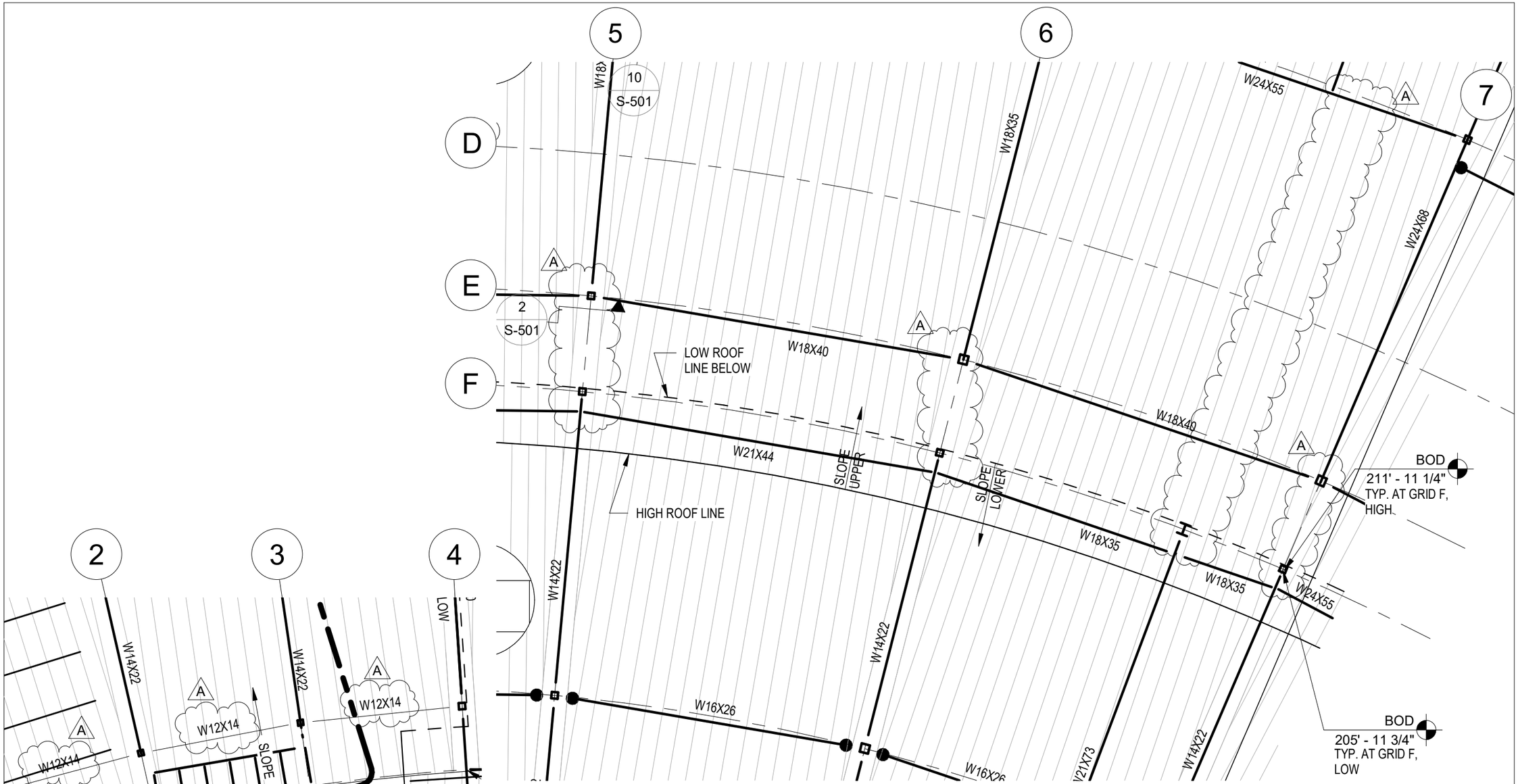
SHEET NO.
S-113-A1
UPPER LEVEL PLAN - WEST



1 **ROOF FRAMING PLAN - WEST (PARTIAL)**
SCALE: 1/8" = 1'-0"

1 **ROOF FRAMING PLAN - WEST (PARTIAL)**
SCALE: 1/8" = 1'-0"

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JASON PAUL TORGERSON
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NEW POLICE STATION
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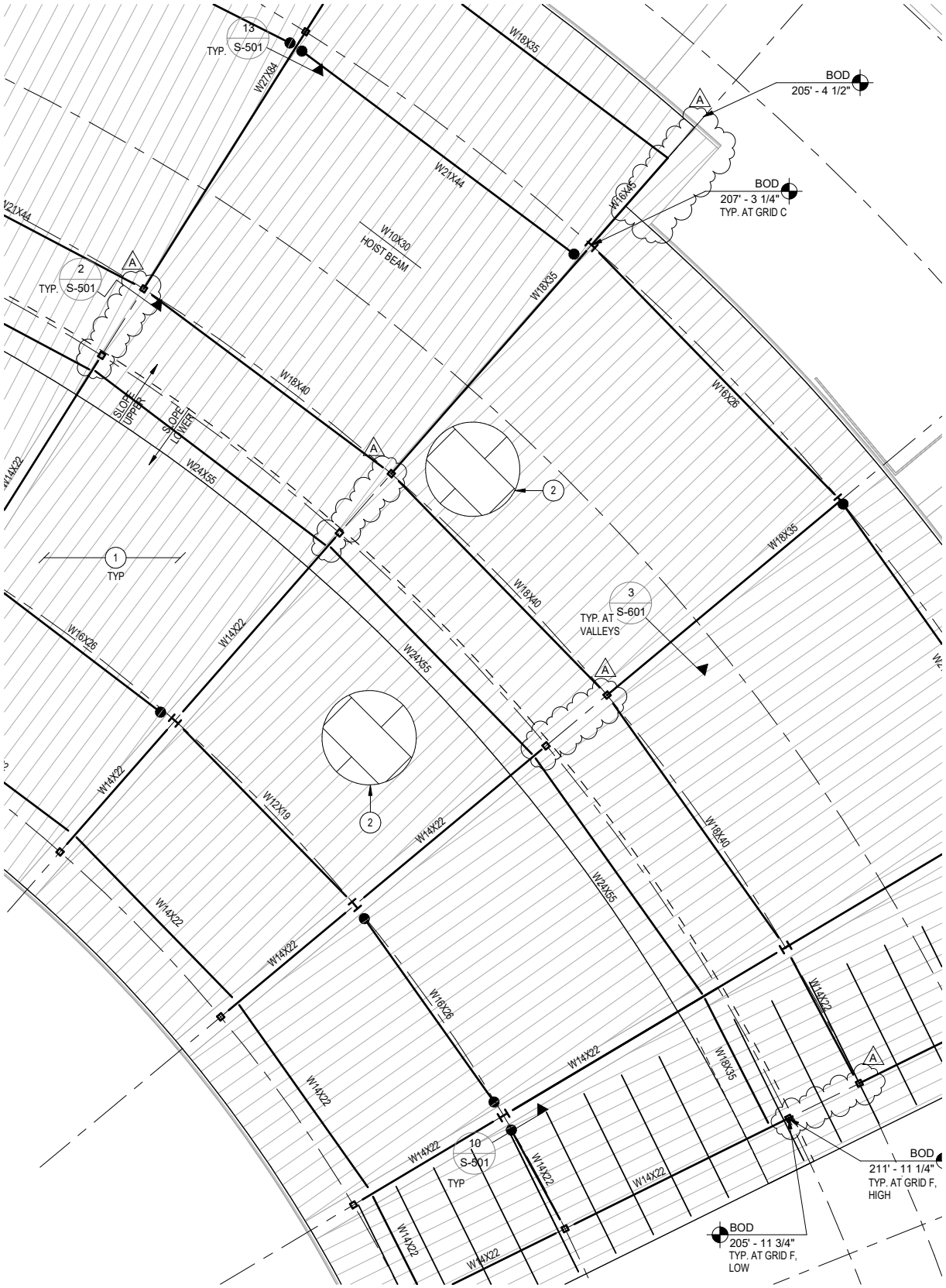
SHEET NO.
S-115-A1
ROOF FRAMING PLAN - WEST



1 ROOF FRAMING PLAN - EAST (PARTIAL)

SCALE: NOT TO SCALE

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JASON PAUL TORNQUIST
STATE OF WASHINGTON
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PROFESSIONAL ENGINEER

NEW POLICE STATION
CITY OF LACEY
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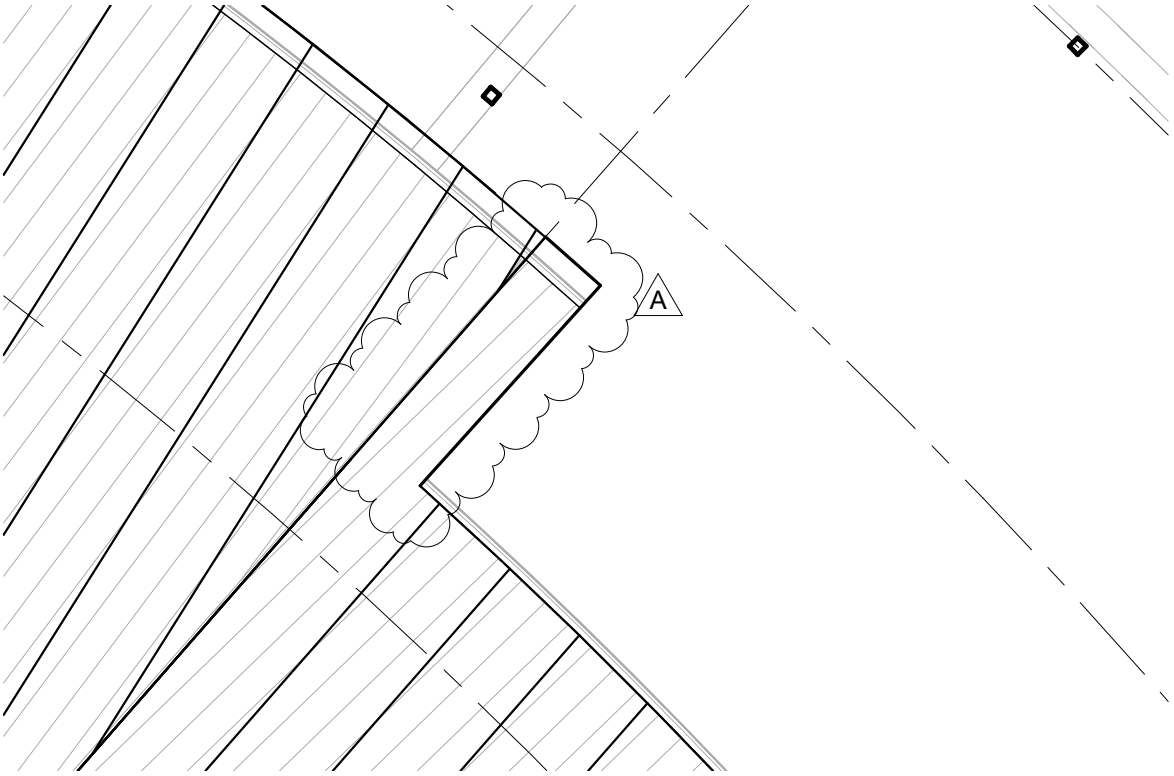
SHEET NO.
S-116-A1
ROOF FRAMING PLAN - EAST



1 **CLT PANEL LAYOUT PLAN - EAST (PARTIAL)**
SCALE: 1/8" = 1'-0"

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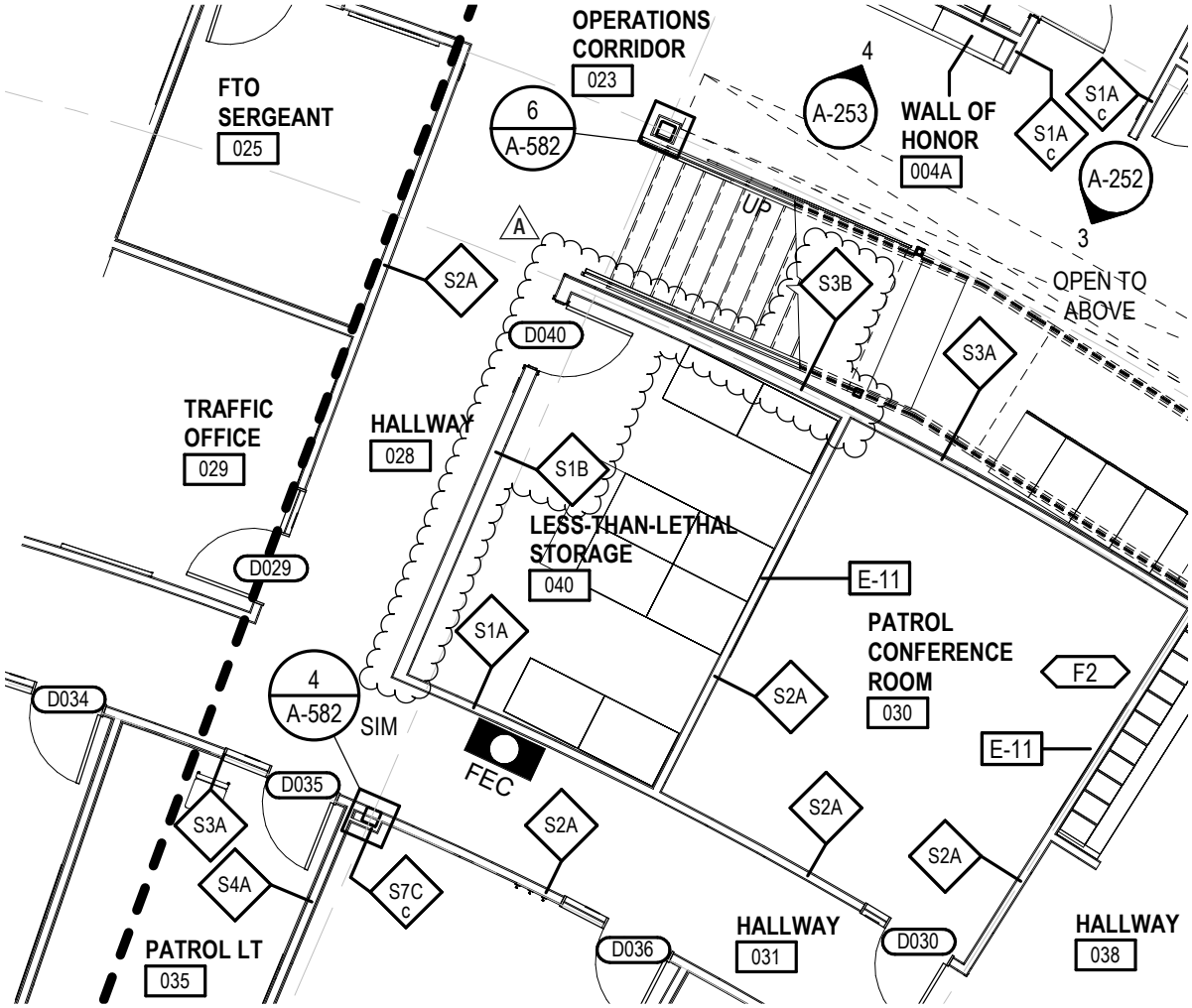
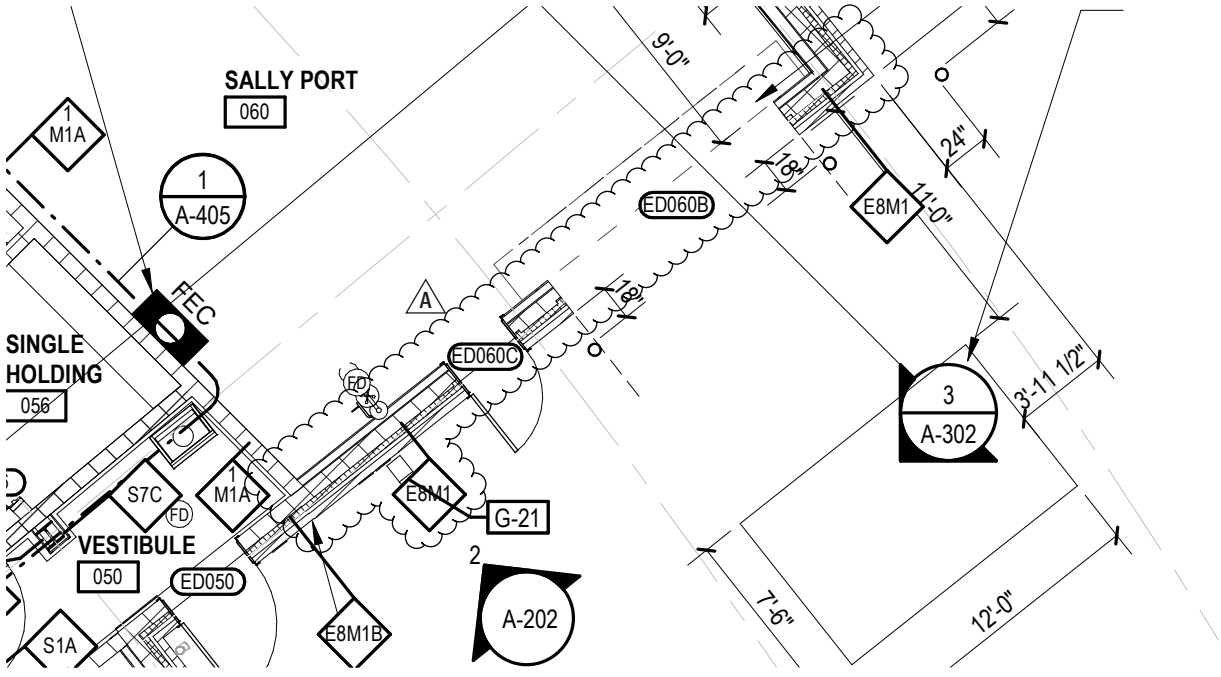
SHEET NO.
S-118-A1
CLT PANEL LAYOUT PLAN - EAST



PROJECT NORTH

LOWER LEVEL - FLOOR PLAN - EAST (PARTIAL)

SCALE: 1/8" = 1'-0"



PROJECT NORTH

LOWER LEVEL - FLOOR PLAN - EAST (PARTIAL)

SCALE: 1/8" = 1'-0"

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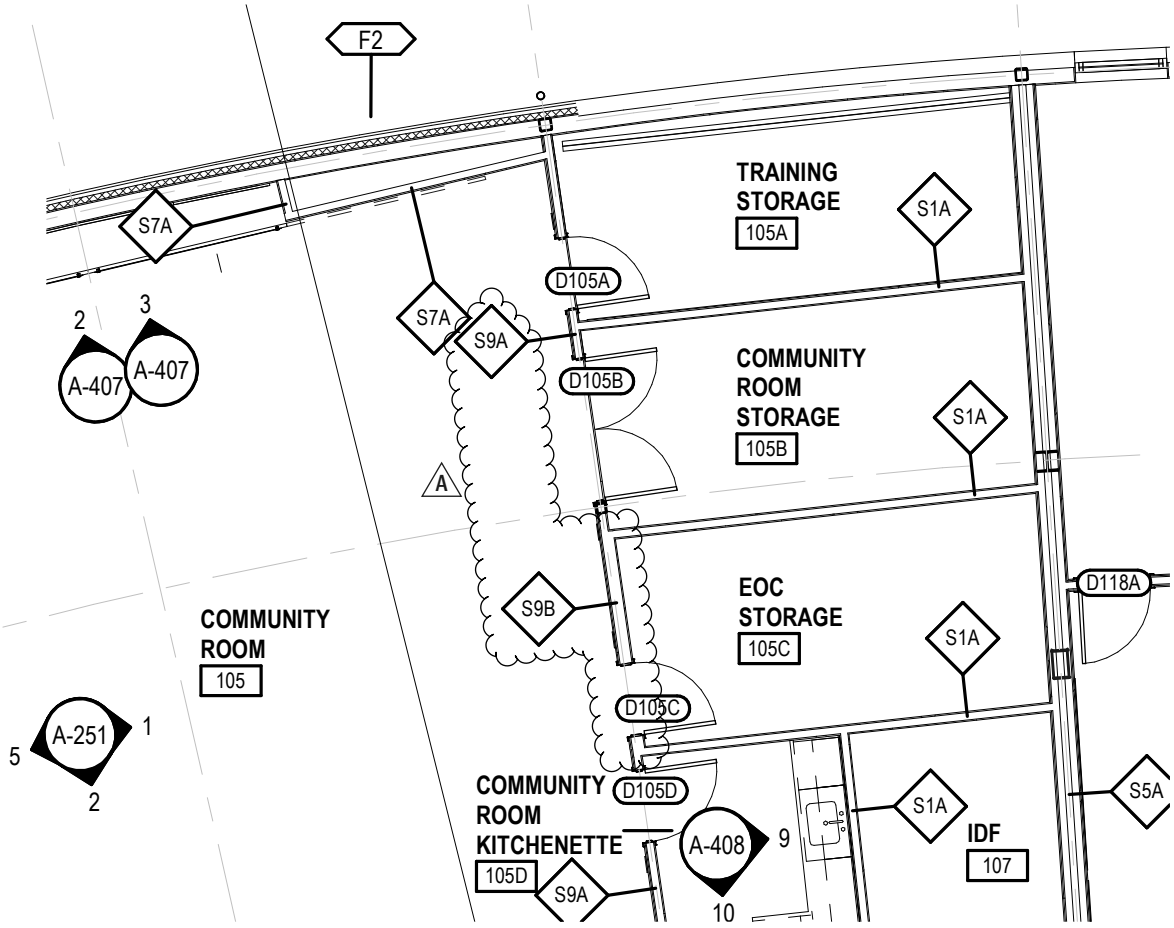
SHEET NO.
A-112-A1

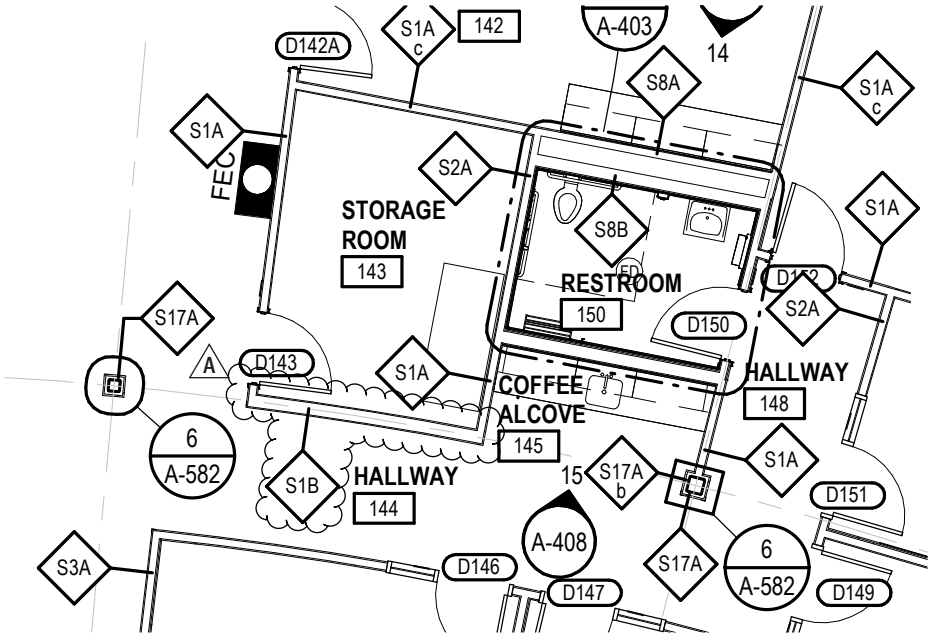
LOWER LEVEL - ENLARGED FLOOR & SYMBOL PLAN - EAST



PROJECT NORTH

MAIN LEVEL - FLOOR PLAN - WEST (PARTIAL)

SCALE: 1/8" = 1'-0"



PROJECT NORTH

MAIN LEVEL - FLOOR PLAN - WEST (PARTIAL)

SCALE: 1/8" = 1'-0"

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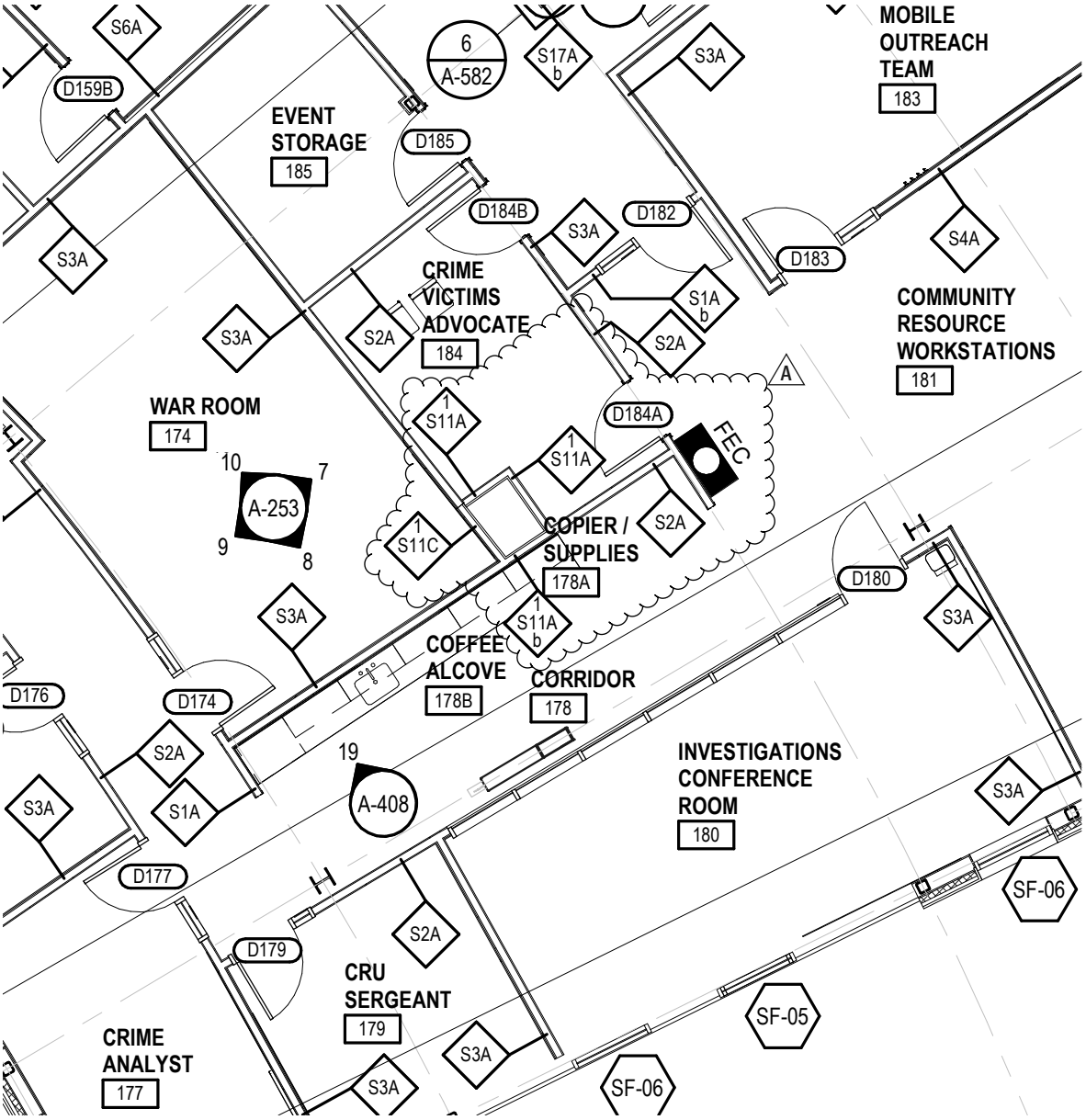
SHEET NO.

A-113-A1

UPPER LEVEL - ENLARGED FLOOR & SYMBOL PLAN - WEST



PROJECT NORTH

UPPER LEVEL - FLOOR PLAN - EAST (PARTIAL)

SCALE: 1/8" = 1'-0"

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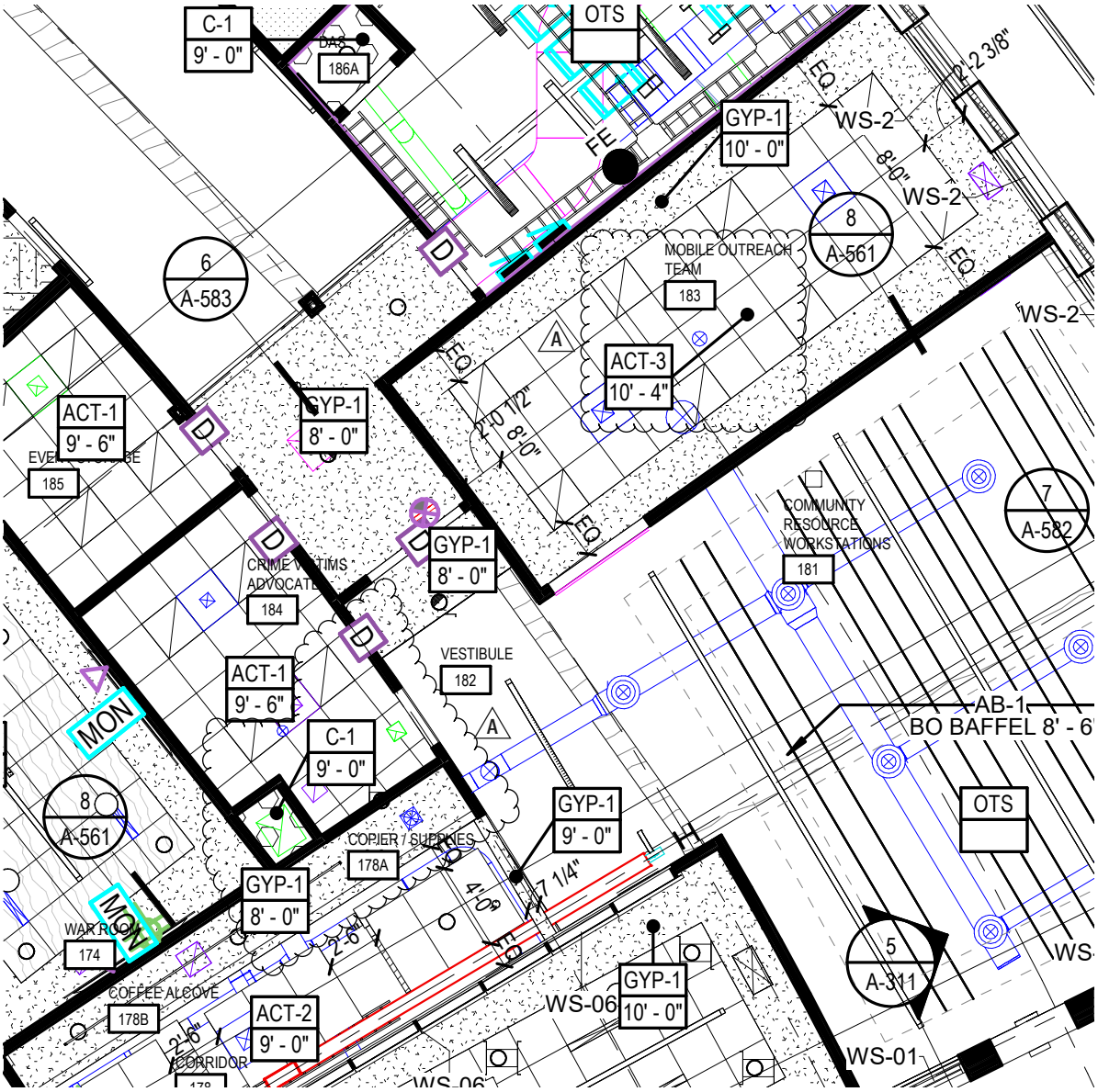
ADDENDUM NO. 01

SHEET NO.

A-114-A1

UPPER LEVEL - ENLARGED FLOOR & SYMBOL PLAN - EAST



1 REFLECTED CEILING PLAN- UPPER LEVEL EAST (PARTIAL)

1/8" = 1'-0"

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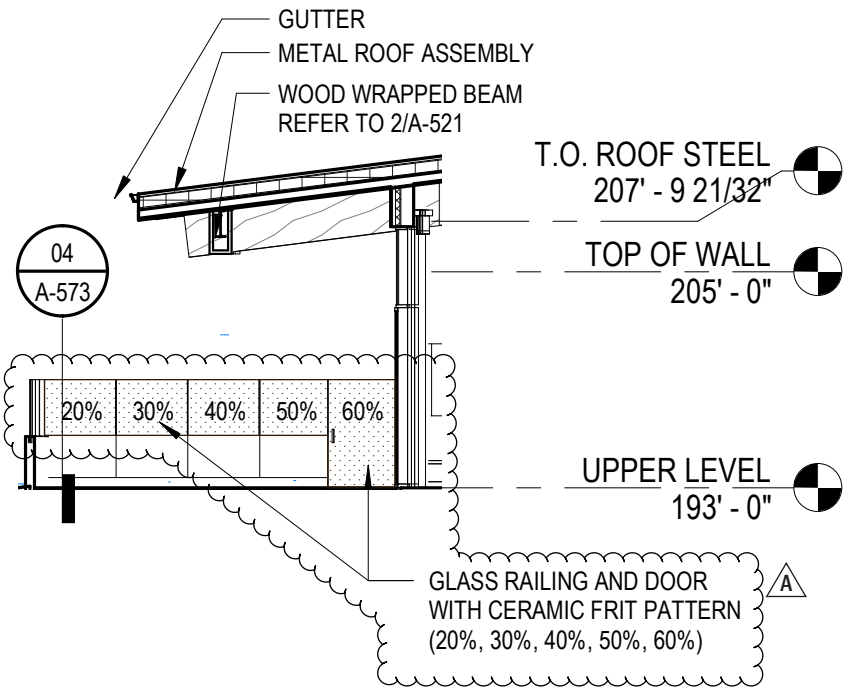
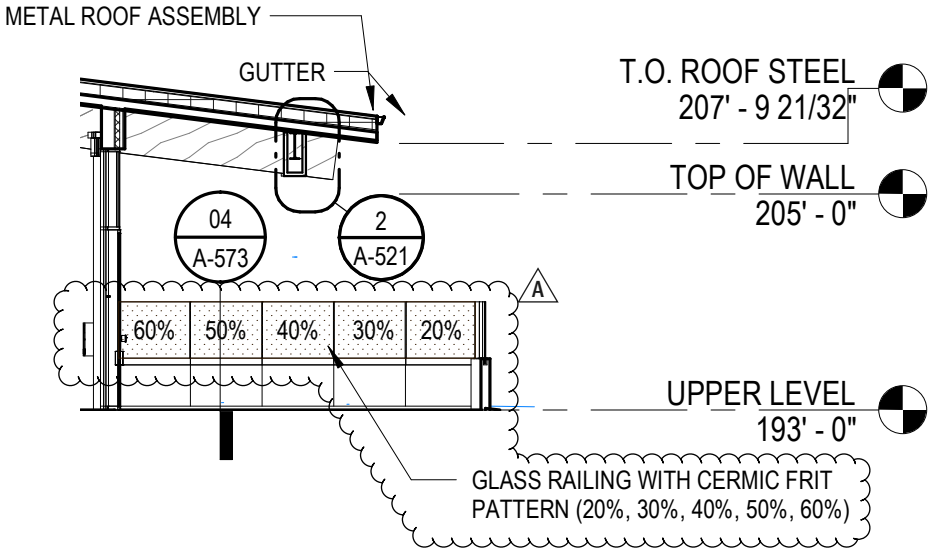
SHEET NO.
A-154-A1

UPPER LEVEL - REFLECTED CEILING PLAN - EAST



11 BREAK ROOM PATIO- E
3/32" = 1'-0"



9 BREAK ROOM PATIO- W
3/32" = 1'-0"

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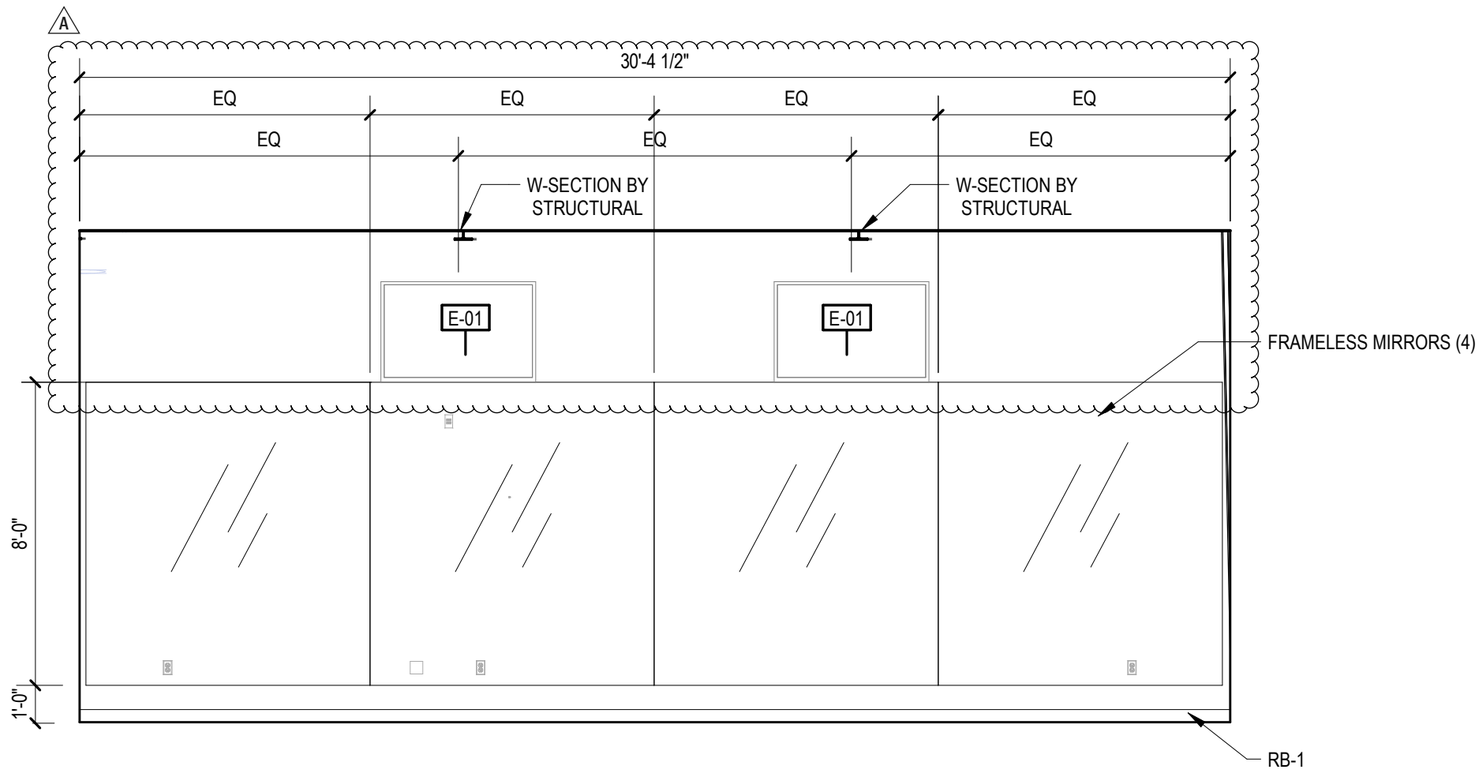
SHEET NO.
A-202-A1
EXTERIOR ELEVATIONS



6 FITNESS ROOM 020 - W
1/4" = 1'-0"

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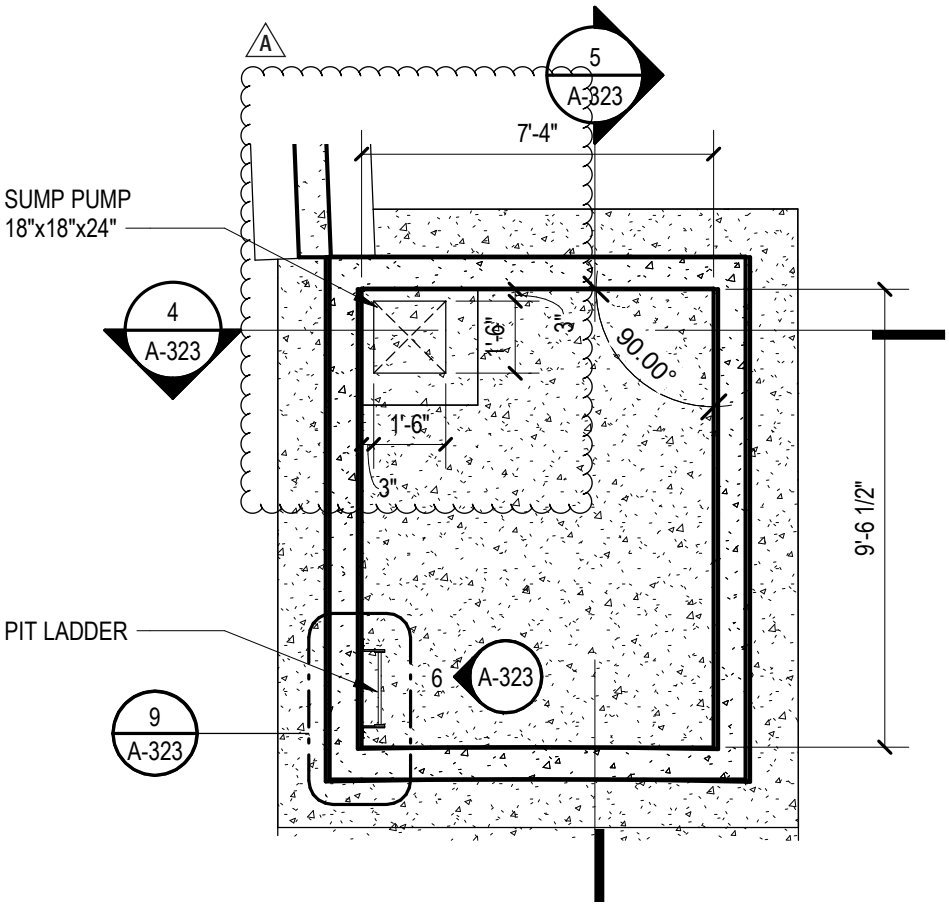
ADDENDUM NO. 01

SHEET NO.
A-253-A1
INTERIOR ELEVATIONS



3 FLOOR PLAN- ELEVATOR PIT

1/4" = 1'-0"

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KMB Project No. 22022

NEW POLICE STATION
CITY OF LACEY

222 COLLEGE STREET SE, LACEY, WA 98503

CITY PROJECT NO. PW 2022-13

ORIGINAL SHEET SIZE = 11 x 17
HALF SIZE REDUCTIONS = N/A

REVISIONS:

A ADDENDUM NO. 01 10.16.2023

DATE:
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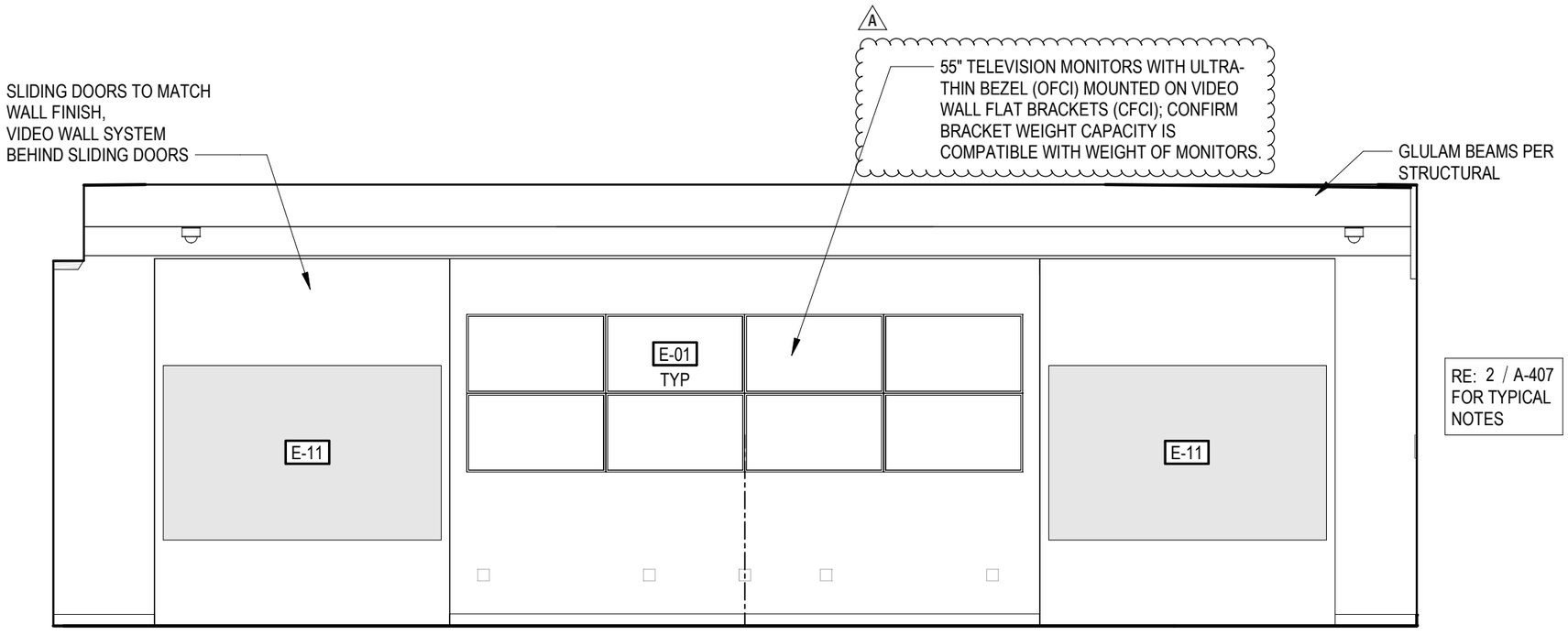
SHEET NO.

A-323-A1

ELEVATOR - PLANS / SECTIONS



3 COMMUNITY ROOM 105 - N TVS
1/4" = 1'-0"

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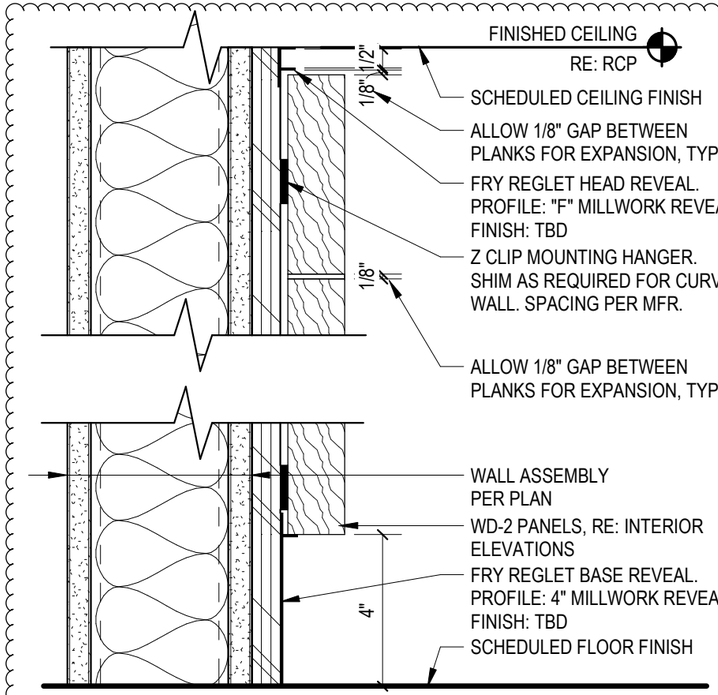
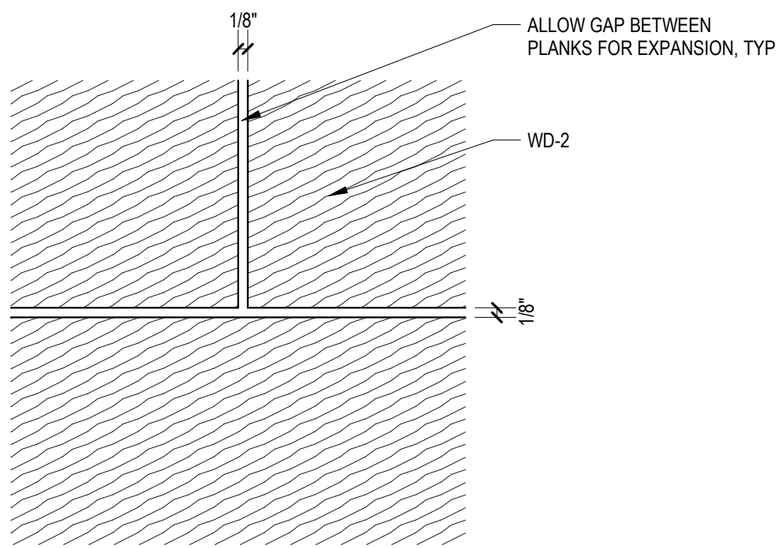
SHEET NO.
A-407-A1

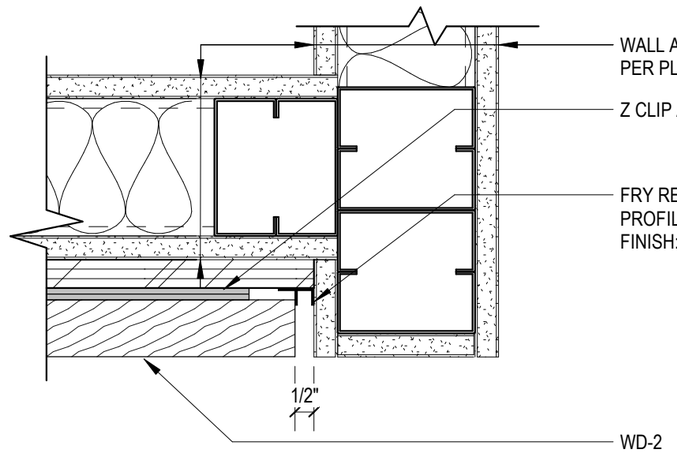
ENLARGED VIDEO WALL - PLANS/ ELEVATIONS / DETAILS



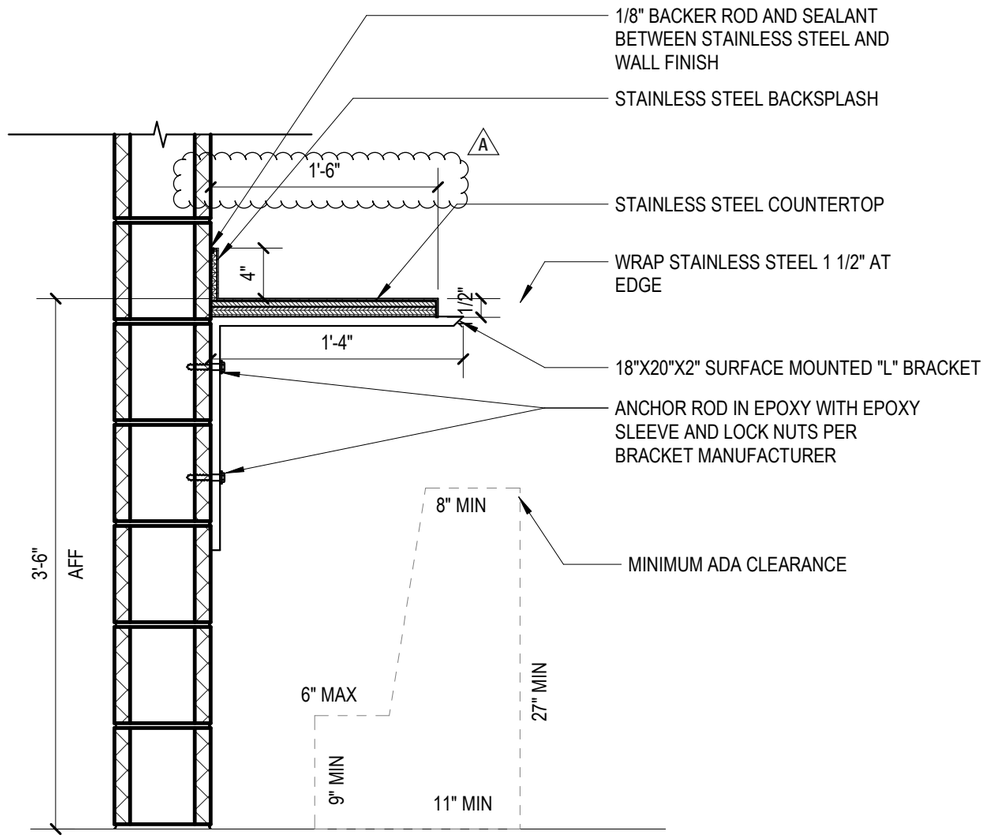
11 WD-2 BASE AND HEADER
3" = 1'-0"



13 WD-2 PLANK ELEVATION
6" = 1'-0"



12 WD-2 TO GYP JAMB
3" = 1'-0"



10 COUNTER TOP AT OPEN BASE @ CMU WALL
1" = 1'-0"

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SHEET NO.
A-583-A1

CASEWORK & INTERIOR DETAILS

LOUVER SCHEDULE

UNIT NO	MANUFACTURER	MODEL	LOCATION	SYSTEM	DIMENSIONS			REMARKS
					W (IN)	H (IN)	D (IN)	
LV-101	RUSKIN	ELF 375DX	MECHANICAL / RISER ROOM 061	INTAKE	72	50	4	1,2,3
LV-102	RUSKIN	ELF 375DX	MECHANICAL / RISER ROOM 061	EXHAUST	54	24	4	1,2
LV-103	RUSKIN	ELF 375DX	MECHANICAL / RISER ROOM 061	INTAKE	36	70	4	1,2,3
LV-104	RUSKIN	ELF 375DX	ELECTRICAL ROOM 049	INTAKE	72	28	4	1,2,3
LV-105	RUSKIN	ELF 375DX	VEHICLE STORAGE / PROCESSING BAY 048	INTAKE	48	36	4	1,2,3
LV-201	RUSKIN	ELF 375DX	ELECTRICAL ROOM 190	INTAKE	24	16	4	1,2,3
LV-202	ARCHITECTURAL LOUVERS	E2WV	MEZZANINE	INTAKE	156	56	2	1,2,3,4
LV-203	RUSKIN	ELF 375DX	MEZZANINE	EXHAUST	90	36	4	1,2

NOTES:

1. SIZES SHOWN ARE MINIMUM REQUIRED TO MEET SCHEDULED PERFORMANCE, COORDINATE FINAL LOUVER DIMENSIONS WITH ARCHITECT
2. COLOR TO BE SELECTED BY ARCHITECT
3. PROVIDE LOUVER THAT IS RATED FOR HIGH VELOCITY INTAKE TO MAINTAIN RAIN PENETRATION PERFORMANCE
4. PROVIDE LOUVER WITH HIDDEN VERTICAL MULLIONS

A

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NEW POLICE STATION
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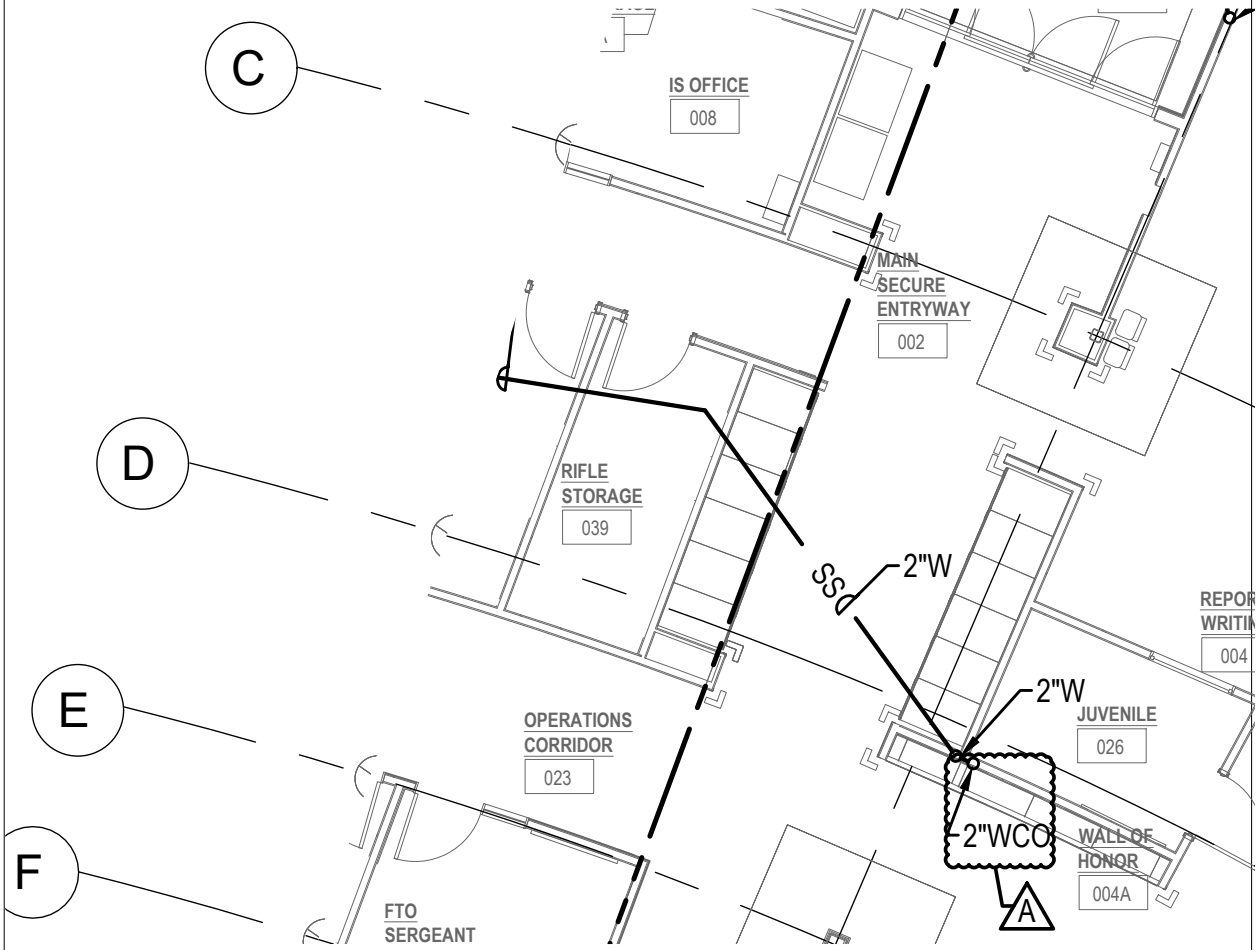
SHEET NO.
M-005-A1
MECHANICAL SCHEDULES IV



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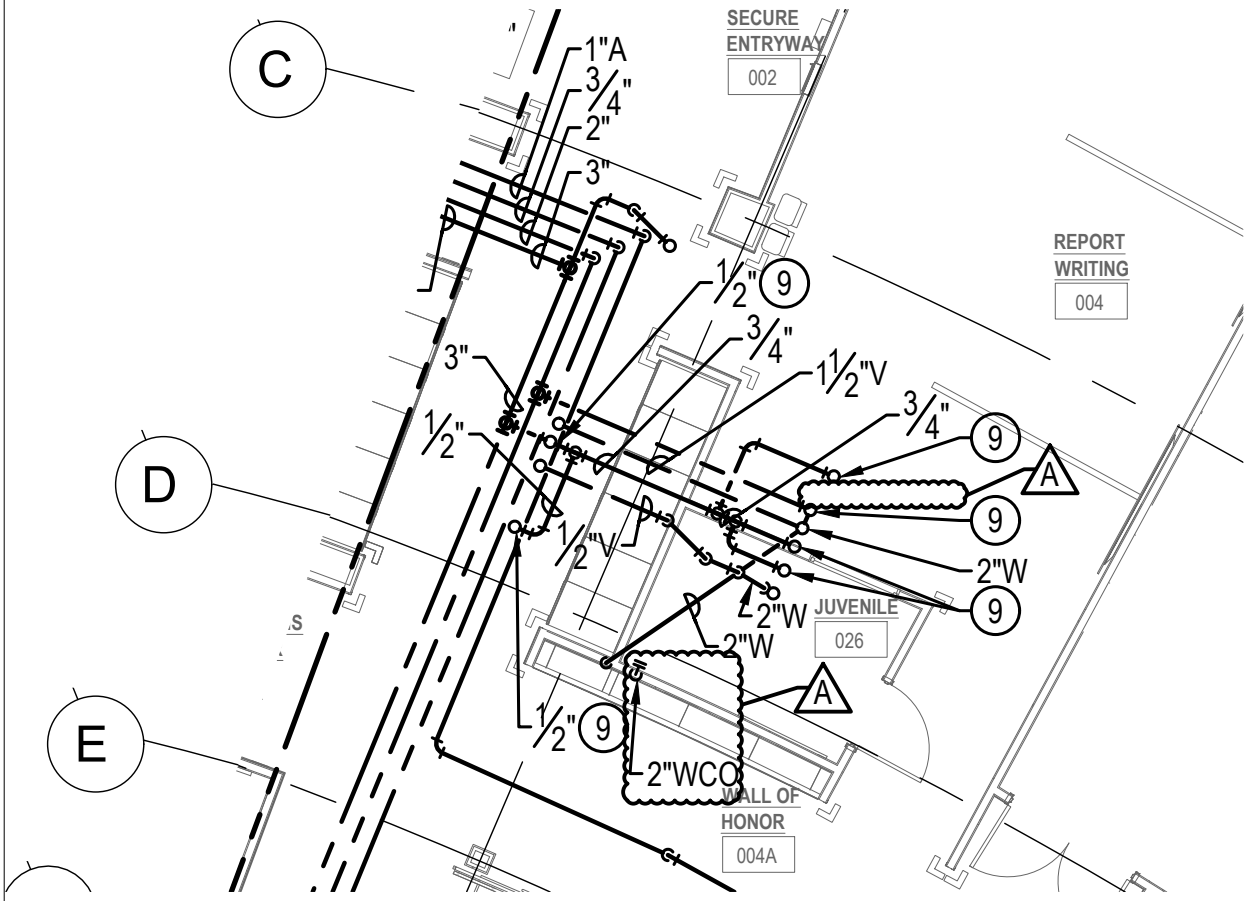
ADDENDUM NO. 01

SHEET NO.
M-102-A1

LOWER LEVEL - FOUNDATION
PLUMBING PLAN - EAST



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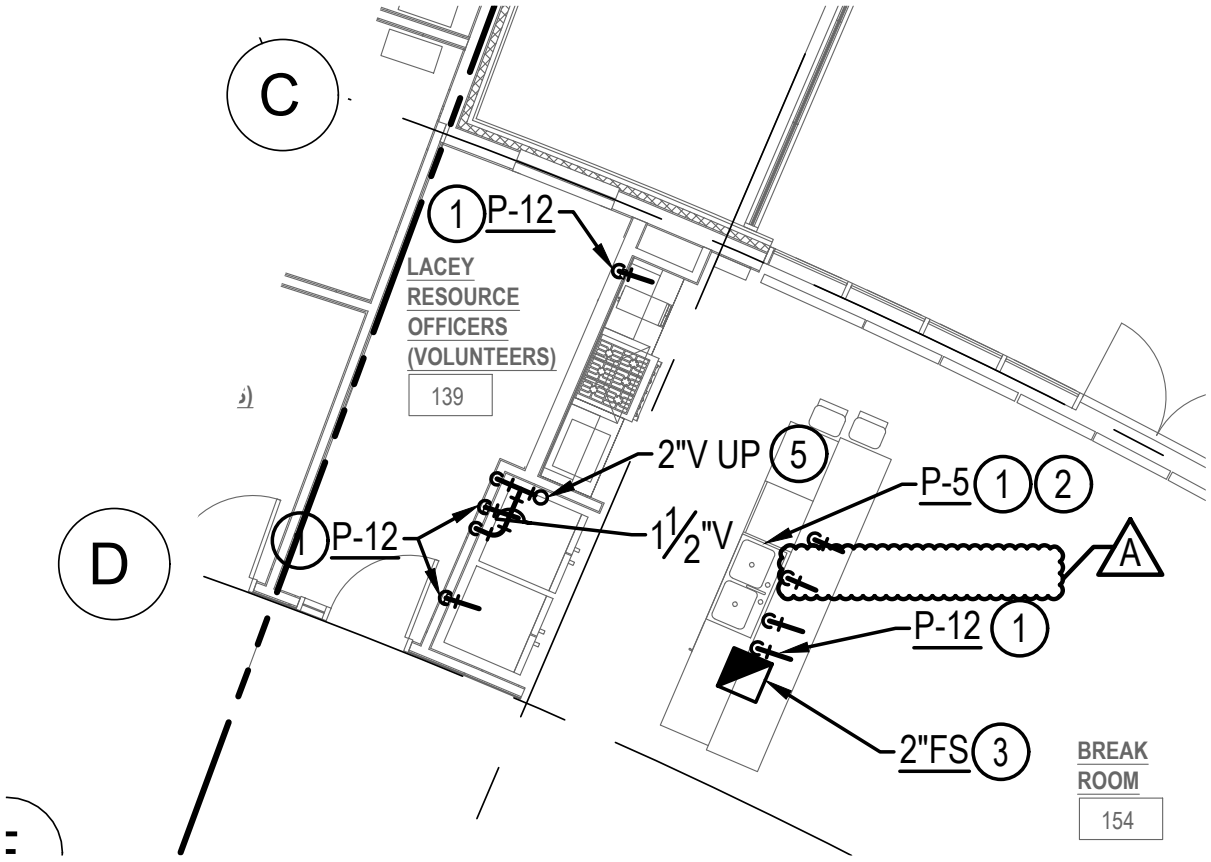
SHEET NO.
M-122-A1

LOWER LEVEL - PLUMBING PLAN - EAST

CONSTRUCTION NOTES

A

1 SERVED FROM FLOOR BELOW. SEE SHEET 5/M-504 FOR INSTALLATION DETAILS.



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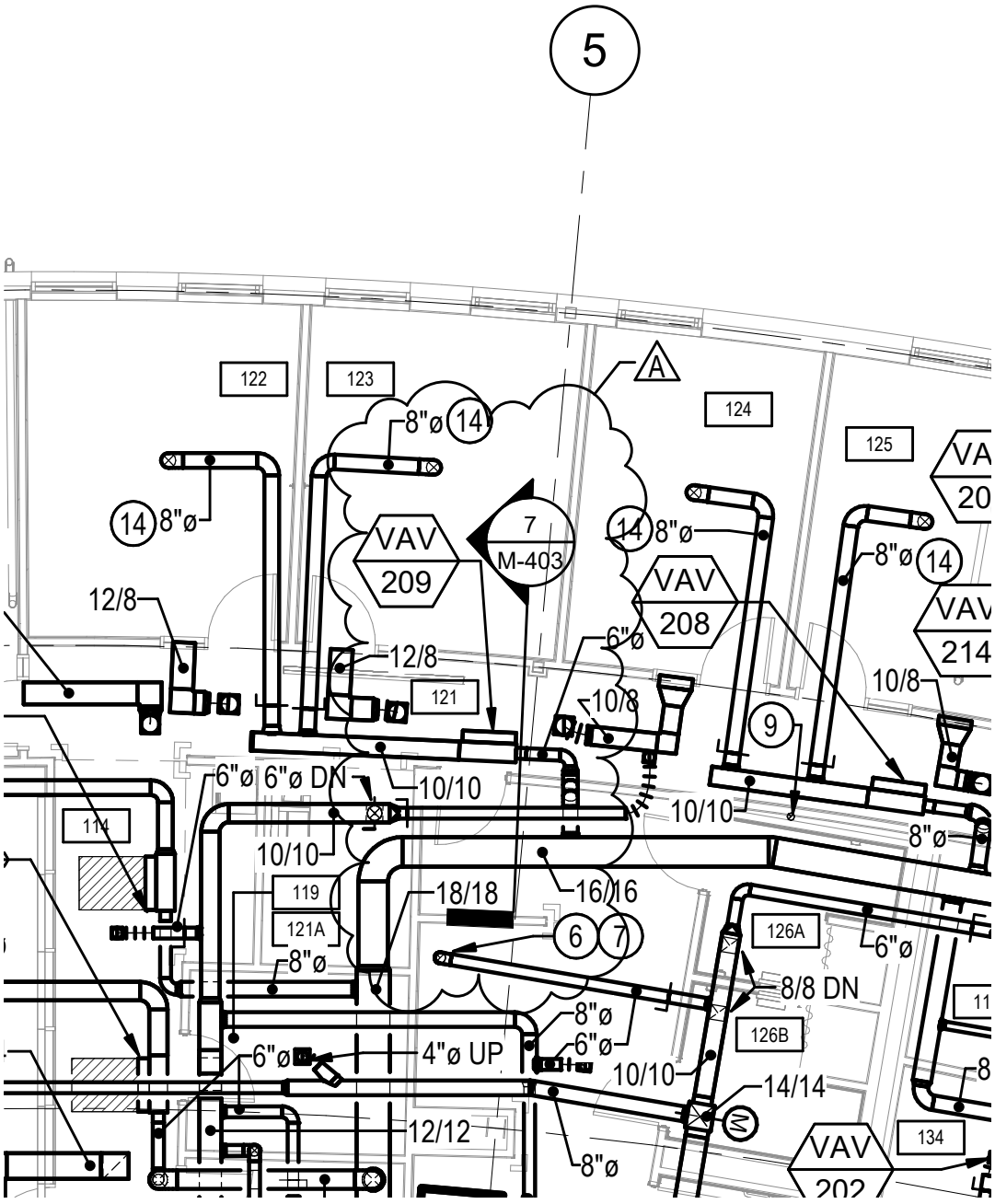
ADDENDUM NO. 01

SHEET NO.
M-124-A1

UPPER LEVEL - PLUMBING PLAN - EAST



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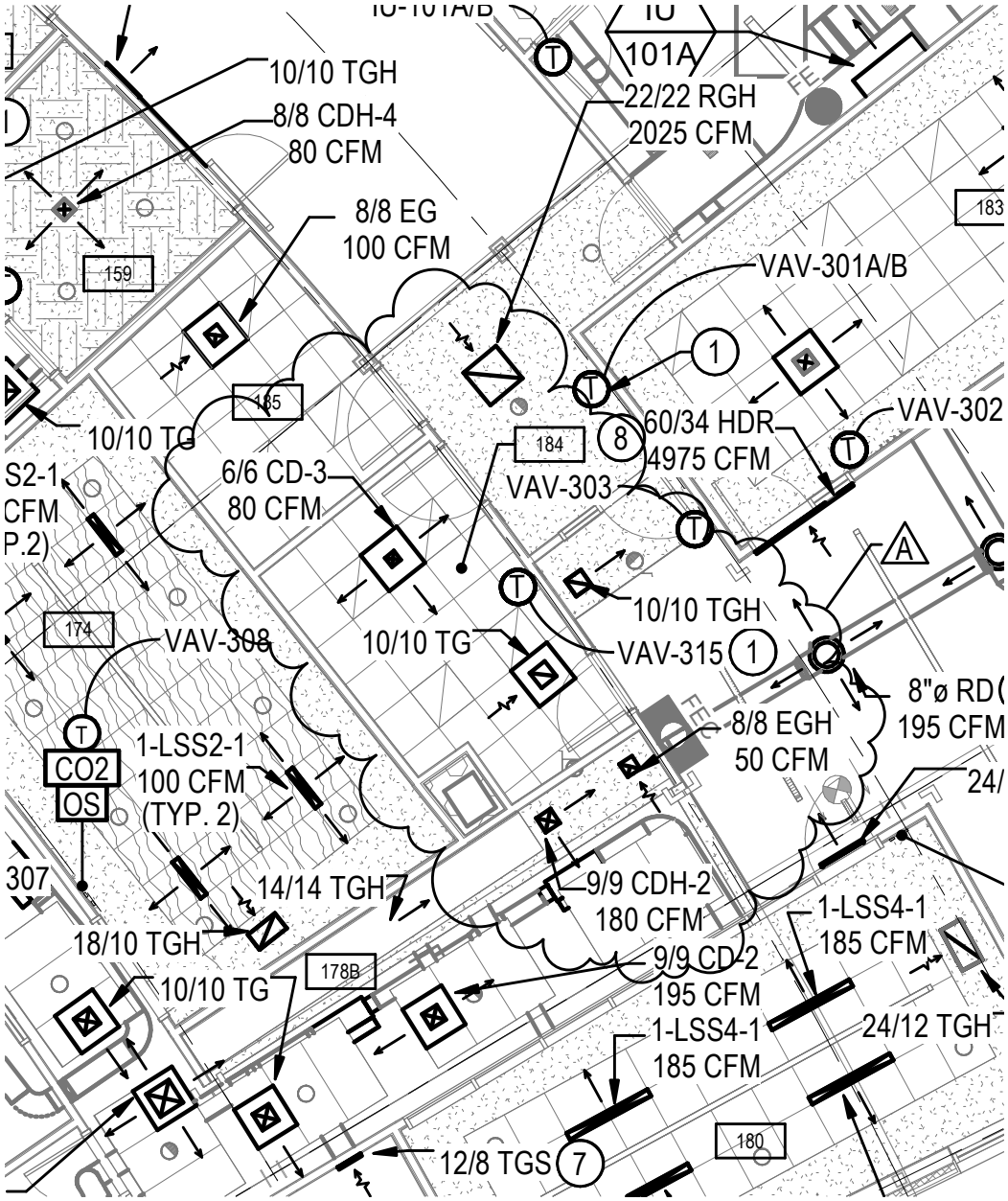
ADDENDUM NO. 01

SHEET NO.
M-133-A1

UPPER LEVEL -
MECHANICAL PLAN -WEST



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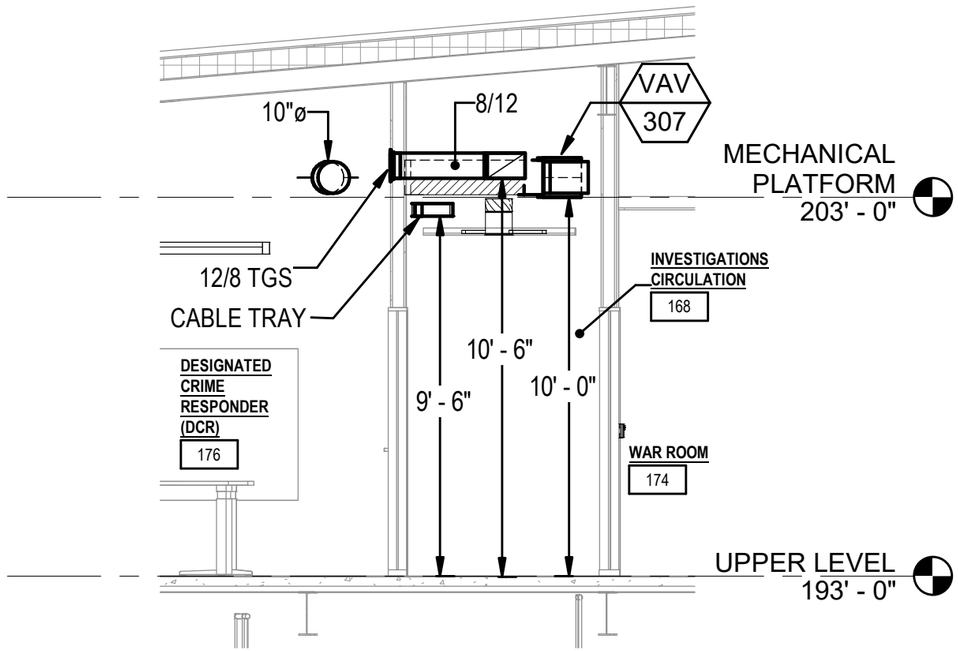
ADDENDUM NO. 01

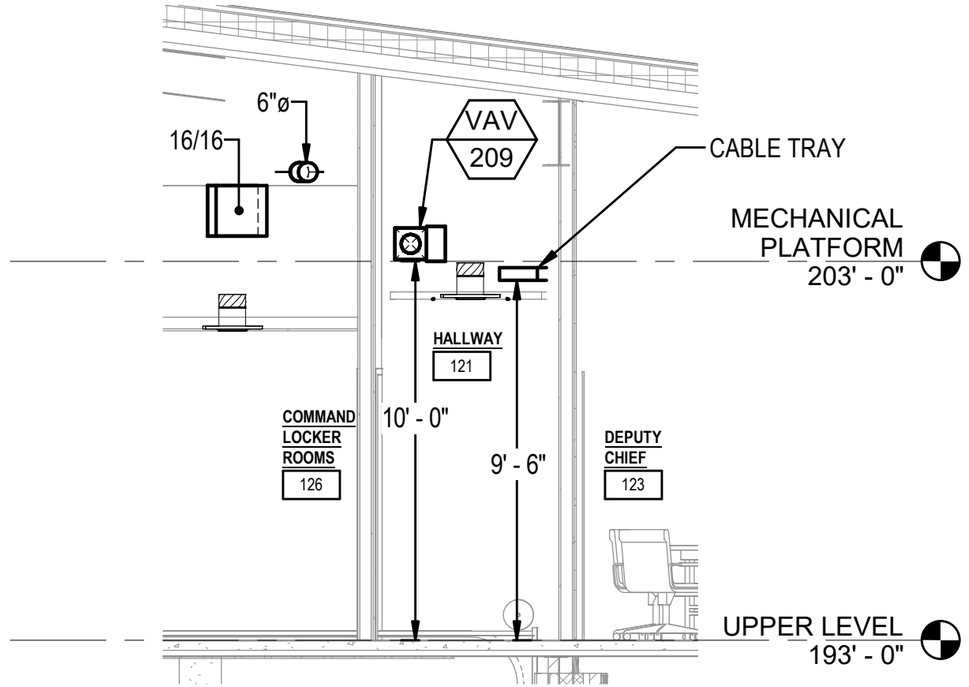
SHEET NO.
M-154-A1

UPPER LEVEL -
MECHANICAL REFLECTED
CEILING PLAN - EAST



6 ROOM 168 AND 176 SECTION

1/4" = 1'-0"



7 HALLWAY 121 SECTION

1/4" = 1'-0"

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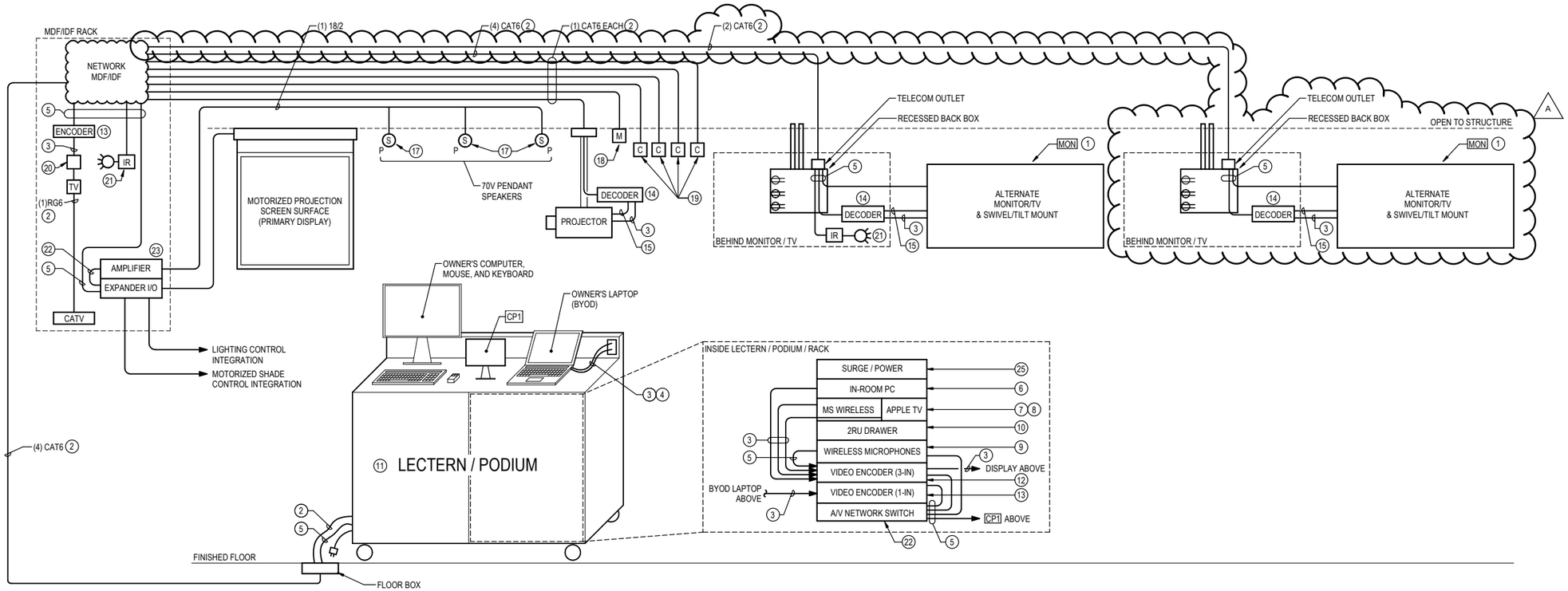
SHEET NO.
M-403-A1
ENLARGED MECHANICAL PLANS



2 COMMUNITY ROOM AV RISER DIAGRAM (ROOM 105)

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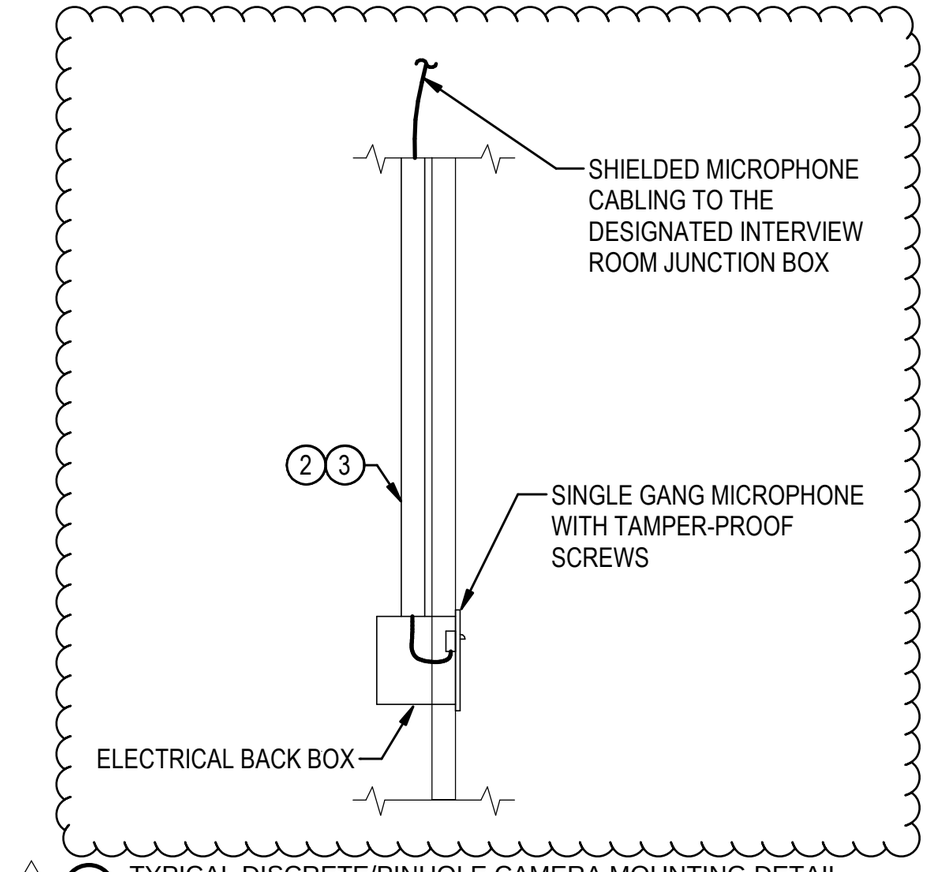
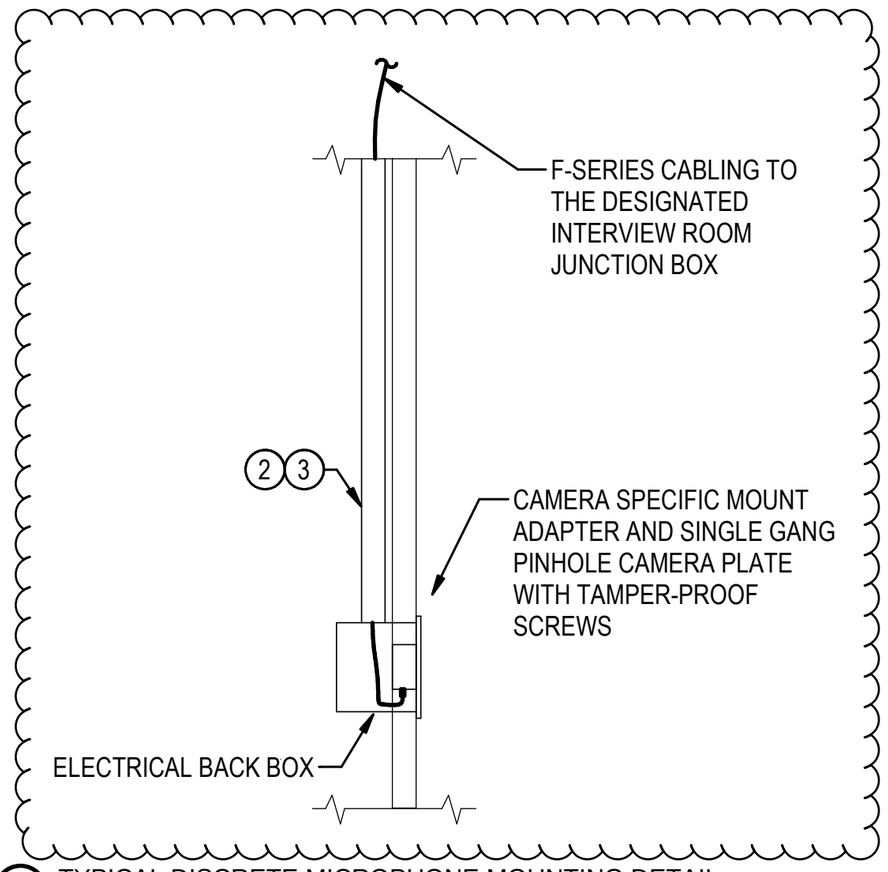
SHEET NO.
E-526-A1

ROOM AUDIO VISUAL RISER DIAGRAMS



A 9 TYPICAL DISCRETE/PINHOLE CAMERA MOUNTING DETAIL



A 10 TYPICAL DISCRETE MICROPHONE MOUNTING DETAIL

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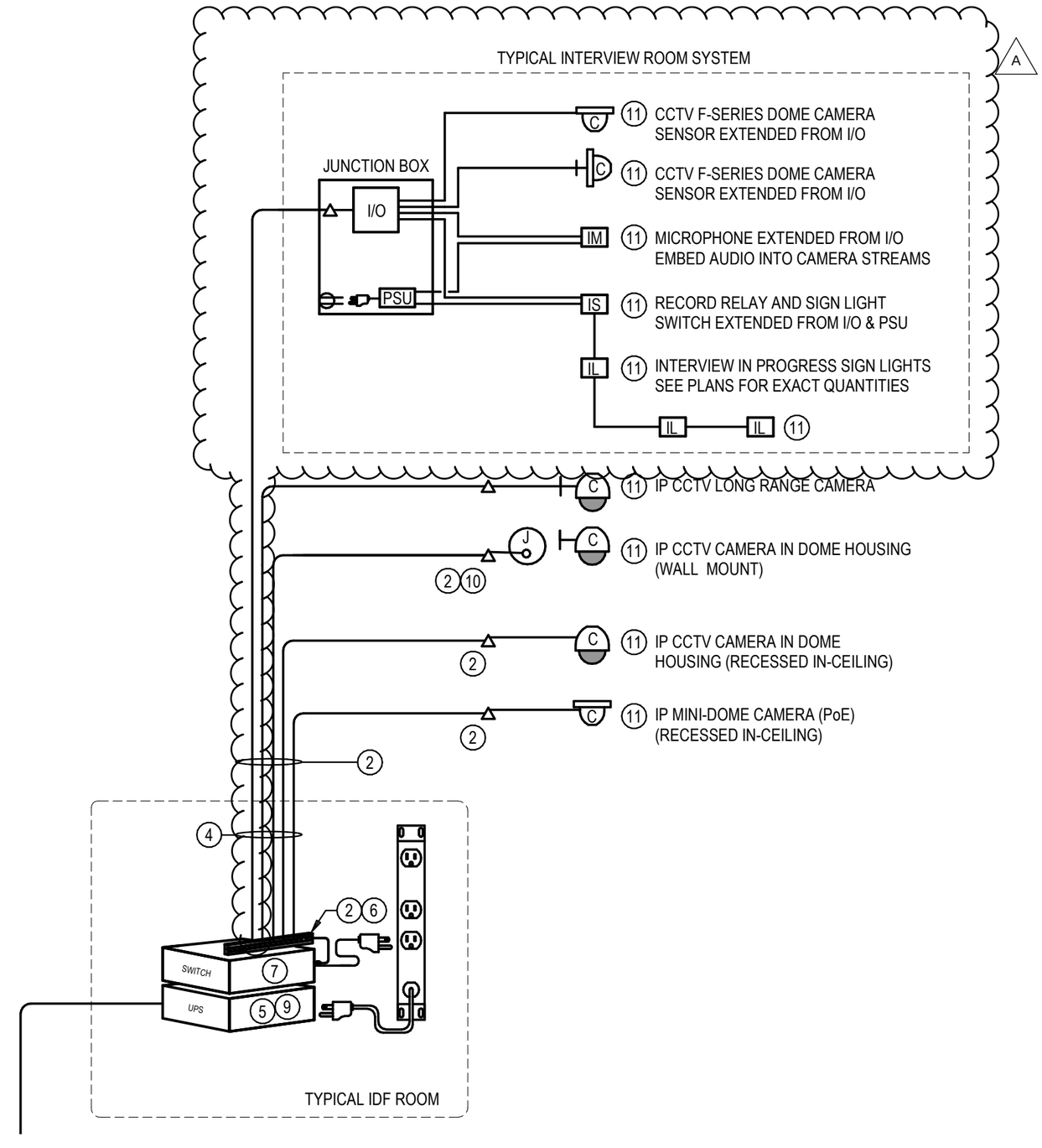
SHEET NO.
E-528-A1
CCTV MOUNTING DETAILS



1 CCTV RISER DIAGRAM

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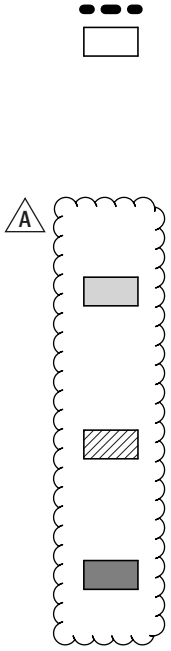
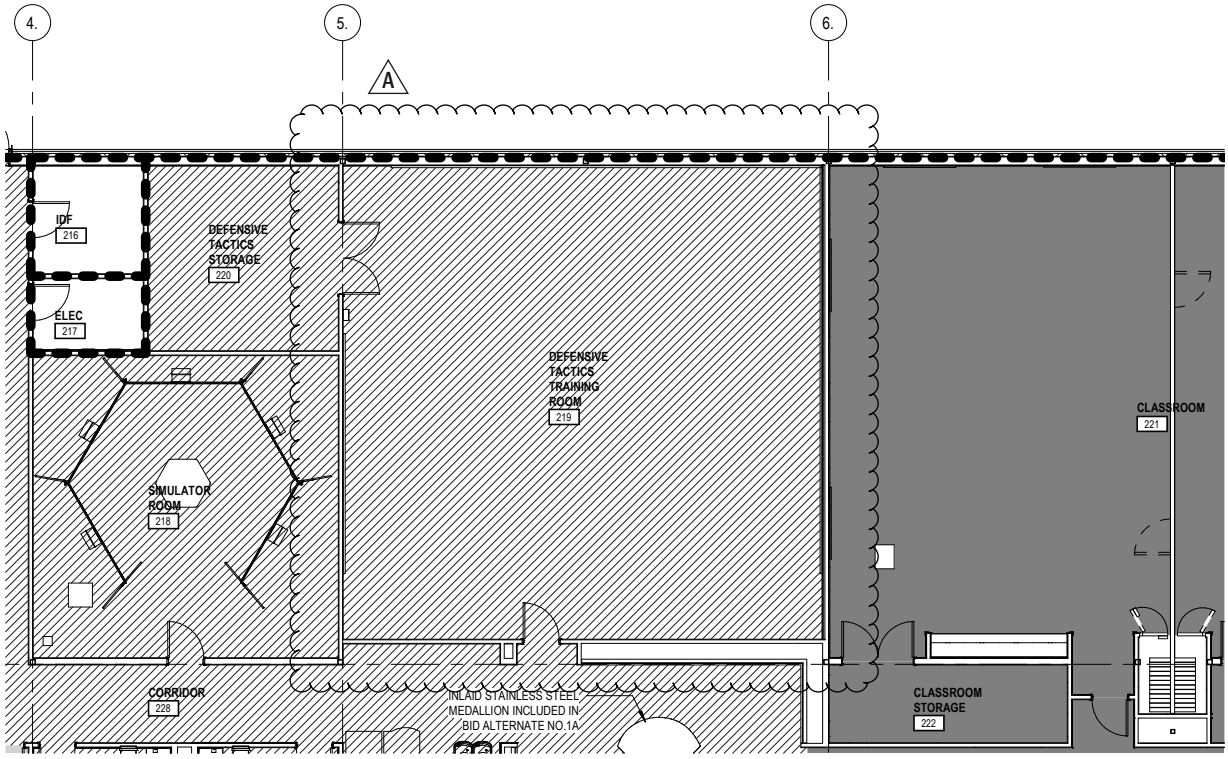
SHEET NO.
E-529-A1
CCTV RISER DIAGRAM

BID ALTERNATES



1. **ADD ALTERNATE NO. 1:** TRAINING BUILDING
   - A. **ADD ALTERNATE NO. 1A:** FIRING RANGE TRAINING BUILDING SHELL & SITE WORK
     1. **BASE BID:** TRAINING BUILDING SITE CLEARED OF TREES AND GRUBBED. SITE TO BE GRADED AND SEEDED.
     2. **ALTERNATE:** TRAINING BUILDING SHELL & SITE WORK:
        - A. UTILITIES EXTENDED INTO TRAINING BUILDING. UTILITIES MARKED AS 'FUTURE' SHALL BE STUBBED TO TRAINING BUILDING SIDE OF DRIVEWAYS AND SIDEWALKS.
        - B. CONSTRUCT BUILDING SHELL PER THE FOLLOWING;
          1. BUILDING ENVELOPE COMPLETE WITH TEMPORARY HEATING.
          2. ROUGH IN FLOOR BOXES (CONDUIT AND BOX ONLY AT FLOOR) AND ROUGH IN WALL OUTLETS.
          3. SHELL BUILDING LIGHTING - STRIP LIGHTS.
          4. PLUMBING STUB UPS ONLY.
          5. IDF, ELECTRICAL AND FIRE RISER ROOMS TO BE CONSTRUCTED IN THIS ALTERNATE 1A.
          6. BIKE AND TRAFFIC STORAGE TO BE CONSTRUCTED IN THIS ALTERNATE 1A.
   - B. **ADD ALTERNATE NO. 1B:** INTERIOR BUILD-OUT OF FIRING RANGE
     1. **BASE BID:** TRAINING BUILDING SITE CLEARED OF TREES AND GRUBBED. SITE TO BE GRADED AND SEEDED. TRAINING BUILDING SHELL AND SITE WORK, BID ALTERNATE NO. 1A, TO OCCUR PRIOR TO THIS ALTERNATE.
     2. **ALTERNATE:** CONSTRUCT FIRING RANGE AND ASSOCIATED ROOMS TO FULL FUNCTION.
        - A. WALLS TO FULL FUNCTION INCLUDE SPACES WITHIN THE FIRING RANGE, PLAN WEST OF GRID LINE 3.
        - B. NO WALLS FOR FUTURE SPACES TO BE CONSTRUCTED IN THIS ALTERNATE 1B
   - C. **ADD ALTERNATE NO. 1C:** INTERIOR BUILD-OUT OF SIMULATOR ROOM AND DEFENSIVE TACTICS.
     1. **BASE BID:** TRAINING BUILDING SITE CLEARED OF TREES AND GRUBBED. SITE TO BE GRADED AND SEEDED. TRAINING BUILDING SHELL AND SITE WORK, BID ALTERNATE NO. 1A AND BID ALTERNATE NO.1B, TO OCCUR PRIOR TO THIS ALTERNATE.
     2. **ALTERNATE:** CONSTRUCT SIMULATOR ROOM, DEFENSIVE TACTICS AND ASSOCIATED ROOMS TO FULL FUNCTION. REFER TO GI401A - TRAINING BUILDING - BID ALTERNATES FOR EXTENTS OF ASSOCIATED SPACES.
   - D. **ADD ALTERNATE NO. 1D:** INTERIOR BUILD-OUT OF TRAINING CLASSROOM
     1. **BASE BID:** TRAINING BUILDING SITE CLEARED OF TREES AND GRUBBED. SITE TO BE GRADED AND SEEDED. TRAINING BUILDING SHELL AND SITE WORK, BID ALTERNATE NO. 1A AND BID ALTERNATE NO.1B, TO OCCUR PRIOR TO THIS ALTERNATE.
     2. **ALTERNATE:** CONSTRUCT TRAINING ROOM AND ASSOCIATED ROOMS TO FULL FUNCTION. REFER TO GI401A - TRAINING BUILDING - BID ALTERNATES FOR EXTENTS OF ASSOCIATED SPACES.



1 / GI401a — TRAINING BUILDING FLOOR PLAN - BID ALTERNATES (PARTIAL)

1/16" = 1'-0"

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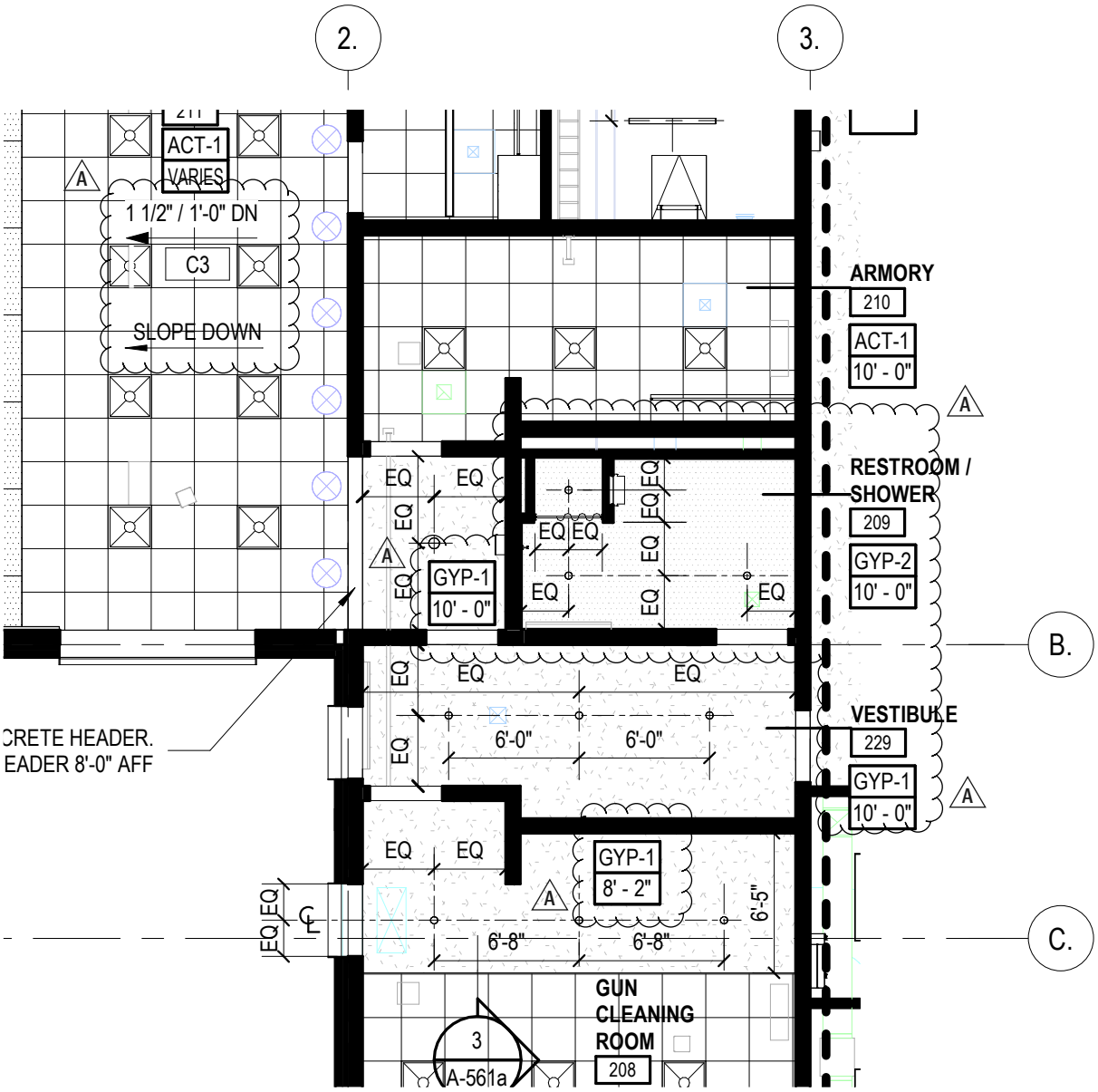
SHEET NO.
GI401a-A1

TRAINING BUILDING - BID ALTERNATES



PROJECT NORTH

TRAINING BUILDING RCP - WEST (PARTIAL)

SCALE: 1/8" = 1'-0"

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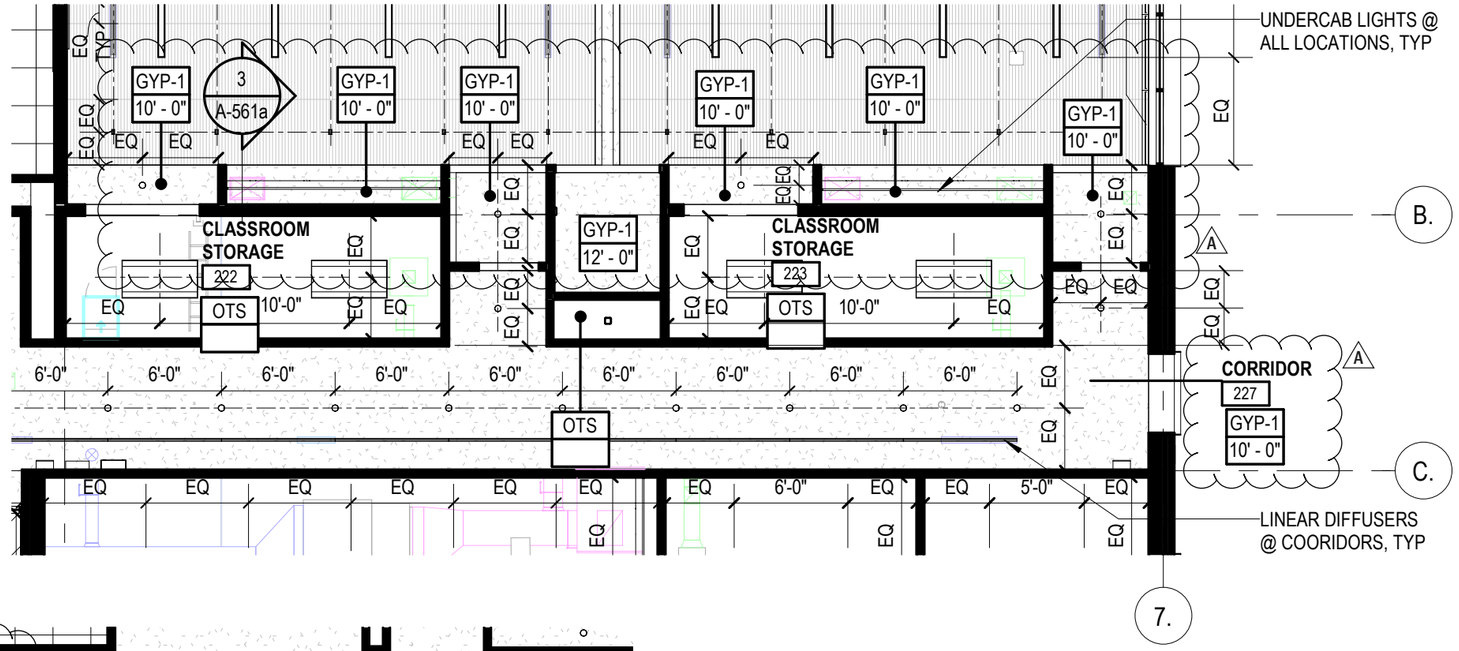
SHEET NO.
A-151a-A1

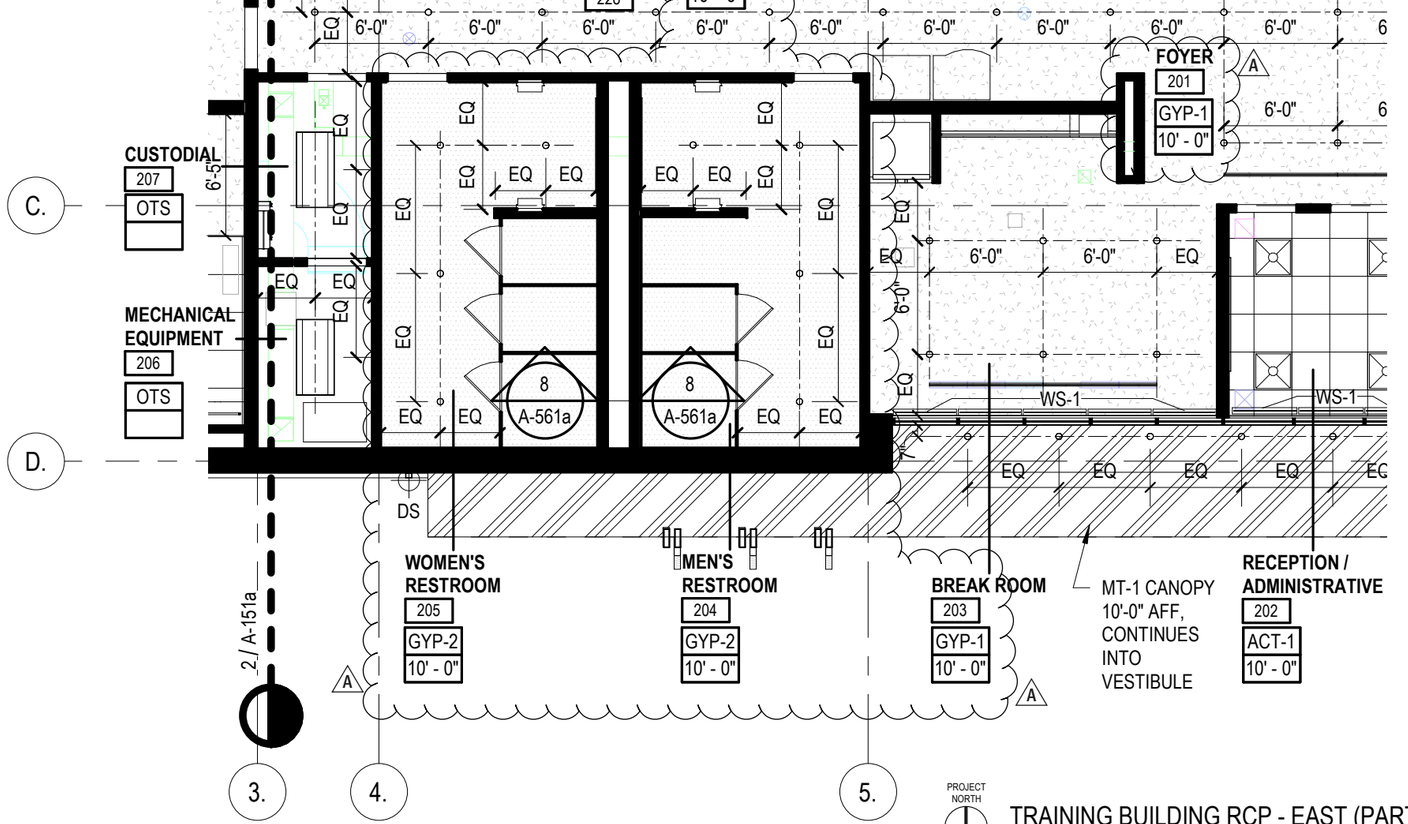
REFLECTED CEILING PLAN - WEST



PROJECT NORTH

TRAINING BUILDING RCP - EAST (PARTIAL)

SCALE: 1/8" = 1'-0"



PROJECT NORTH

TRAINING BUILDING RCP - EAST (PARTIAL)

SCALE: 1/8" = 1'-0"

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KMB Project No. 22022

NEW POLICE STATION
CITY OF LACEY

222 COLLEGE STREET SE, LACEY, WA 98503
CITY PROJECT NO. PW 2022-13

ORIGINAL SHEET SIZE = 11 x 17
HALF SIZE REDUCTIONS = N/A

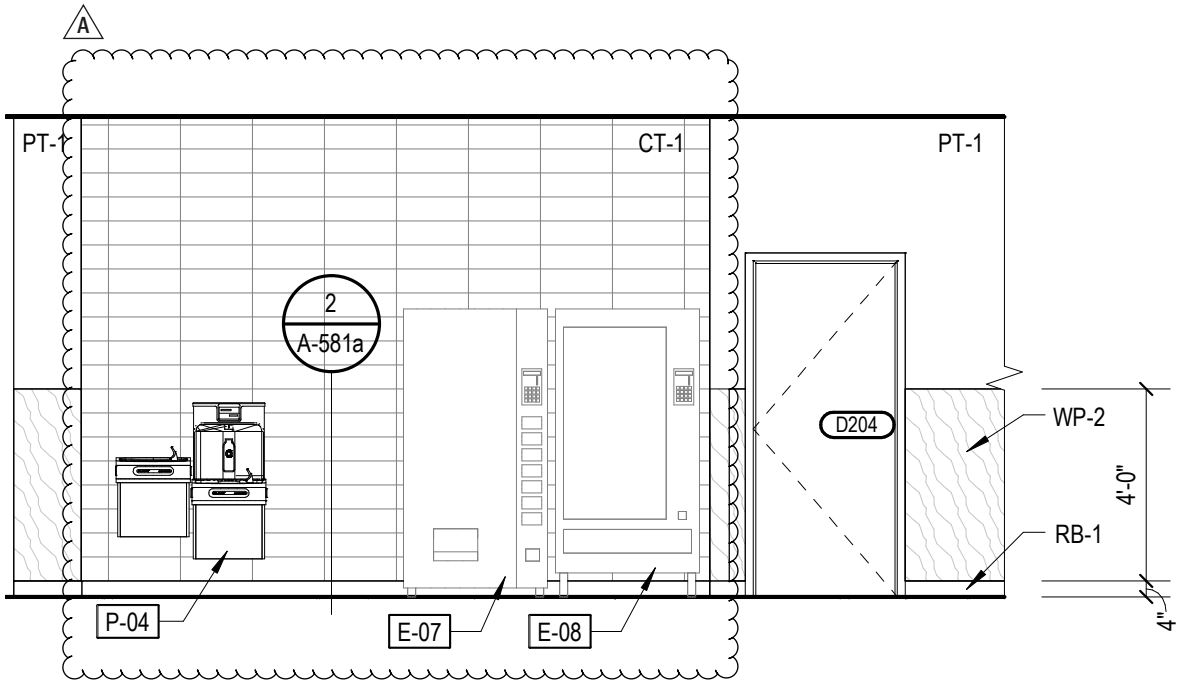
REVISIONS:
A ADDENDUM NO. 01 10.16.2023

DATE: 10.16.2023

ADDENDUM NO. 01

SHEET NO.
A-152a-A1

REFLECTED CEILING PLAN - EAST



11 CORRIDOR 228 - SOUTH
1/4" = 1'-0"

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SHEET NO.
A-251a-A1
INTERIOR ELEVATIONS

LOUVER SCHEDULE

UNIT NO	MANUFACTURER	MODEL	LOCATION	SYSTEM	DIMENSIONS			REMARKS
					W (IN)	H (IN)	D (IN)	
LV-101	RUSKIN	ELF 15J	GUN CLEANING ROOM 208	INTAKE	40	22	4	1,3,4
LV-102	RUSKIN	ELF 375DX	DEFENSIVE TACTICS STORAGE 220	EXHAUST	48	18	4	1,2
LV-103	RUSKIN	ELF 375DX	DEFENSIVE TACTICS TRAINING ROOM 219	INTAKE	48	30	4	1,2,3
LV-104	RUSKIN	ELF 375DX	DEFENSIVE TACTICS TRAINING ROOM 219	INTAKE	48	30	4	1,2,3
LV-105	RUSKIN	ELF 375DX	VEHICLE STORAGE / PROCESSING BAY 048	EXHAUST	48	18	4	1,2

NOTES:

1. SIZES SHOWN ARE MINIMUM REQUIRED TO MEET SCHEDULED PERFORMANCE, COORDINATE FINAL LOUVER DIMENSIONS WITH ARCHITECT
2. COLOR TO BE SELECTED BY ARCHITECT
3. PROVIDE LOUVER THAT IS RATED FOR HIGH VELOCITY INTAKE TO MAINTAIN RAIN PENETRATION PERFORMANCE
4. LOUVER TO BE INSTALLED WITHIN DOOR'S TRANSOM FRAME. COLOR TO MATCH MT-1. SEE ARCHITECTURAL MATERIALS LEGEND FOR REFERENCE.

A

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BCE Project No. 222-055

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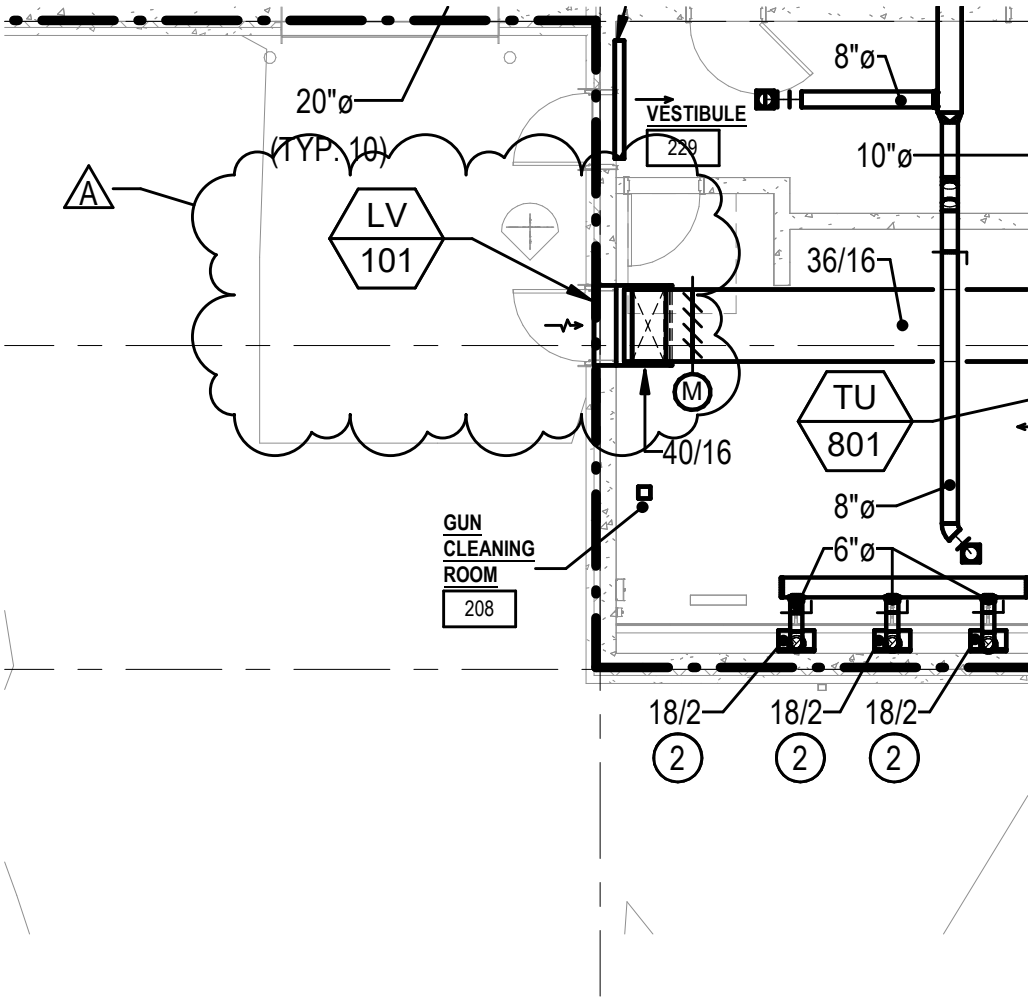
SHEET NO.
M-001a-A1
MECHANICAL LEGEND



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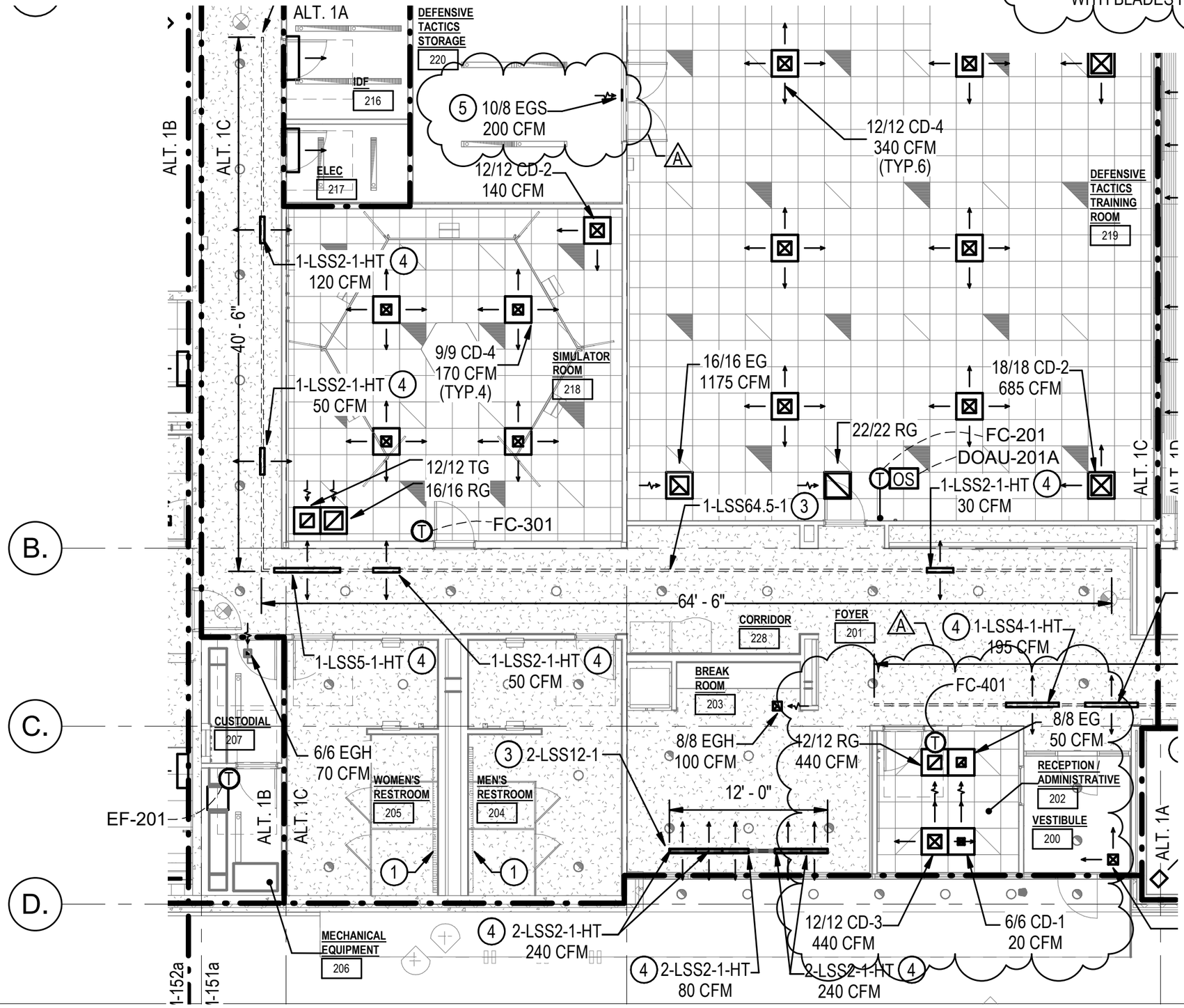
SHEET NO.
M-132a-A1

TRAINING BUILDING
MECHANICAL FLOOR PLAN
- WEST

A 4 ACTIVE PORTION OF LINEAR SLOT DIFFUSER.

5 MOUNT BOTTOM OF GRILLE 14'-0" AFF. INSTALL GRILLE WITH BLADES POINTED UPWARDS.



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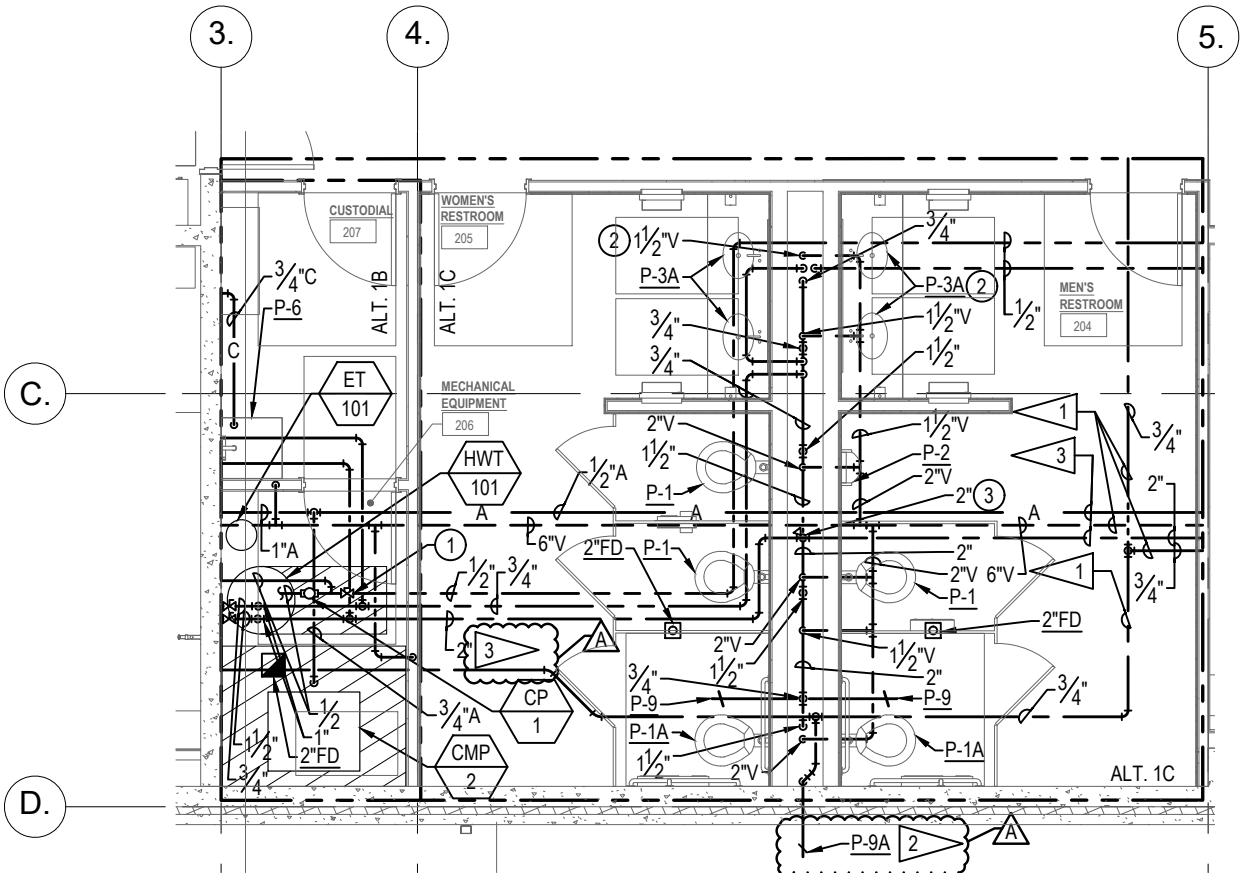
SHEET NO.
M-151a-A1

TRAINING BUILDING
MECHANICAL REFLECTED
CEILING PLAN - EAST

BID ALTERNATE NOTES

1. PROVIDE FULL LENGTH OF PIPING IN BID ALTERNATE 1A.
2. PROVIDE PLUBMING FIXTURE AS PART OF BID ALTERNATE 1A.
3. PROVIDE FULL LENGTH OF PIPING IN BID ALTERNATE 1B.



1 RESTROOM & MECHANCIAL ROOM PLUMBING PLAN

1/4" = 1'-0"

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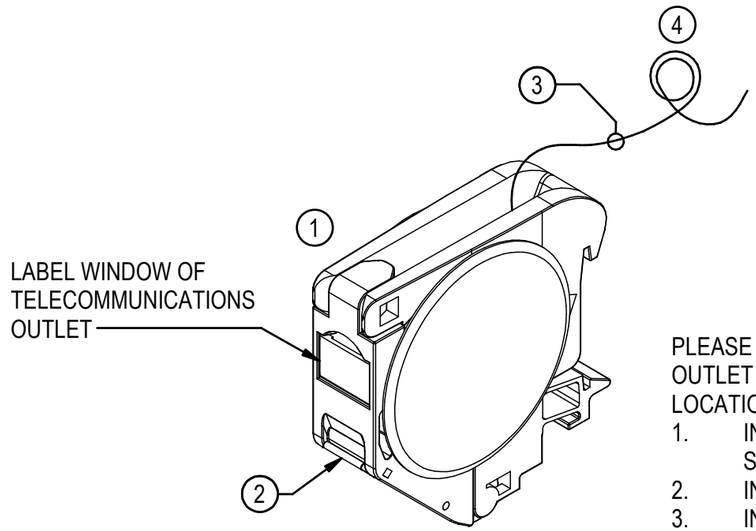
SHEET NO.
M-401a-A1
ENLARGED PLUMBING PLANS



PLEASE NOTE: ONLY INSTALL THIS OUTLET TYPE IN THE FOLLOWING LOCATIONS:

1. IN AN ACCESSIBLE CEILING SPACE.
2. IN A JUNCTION BOX.
3. IN THE MDF ROOM OR DESIGNATED IDF LOCATION.

(#) CONSTRUCTION NOTES

1. PROVIDE TELECOMMUNICATIONS OUTLET TYPE, STYLE, AND COLOR AS SPECIFIED.

2. PROVIDE MODULAR PORT COLOR AS SPECIFIED.

3. PROVIDE (1) CAT6 CABLES FROM THE TELECOMMUNICATION OUTLET TO THE NEAREST TELECOMMUNICATIONS ROOM. PROVIDE THE CAT6 CABLE COLOR AS SPECIFIED.

4. PROVIDE A 15 FOOT SERVICE LOOP IN THE ACCESSIBLE CEILING SPACE, UNLESS OTHERWISE NOTED.

▽1

TYPICAL DIN MOUNTED TELECOMMUNICATIONS OUTLET (1-PORT) INTERVIEW SYSTEM JUNCTION BOX

A 13

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SHEET NO.
E-521a-A1

TELECOM OUTLET DETAILS