NYS Office of General Services
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STATE OF NEW YORK
OFFICE OF GENERAL SERVICES
DESIGN AND CONSTRUCTION GROUP
THE GOVERNOR NELSON A. ROCKEFELLER
EMPIRE STATE PLAZA
ALBANY, NY 12242

ADDENDUM NO. 5 TO PROJECT NO. 45124

CONSTRUCTION WORK, HVAC WORK, PLUMBING WORK, AND ELECTRICAL WORK
ABATE HAZARDOUS MATERIALS
AND RENOVATE BUILDING NO. 4
STATE OFFICE BUILDING CAMPUS
1220 WASHINGTON AVENUE
ALBANY, NY

October 14, 2016

NOTE: This Addendum forms a part of the Contract Documents. Insert it in the Project Manual. Acknowledge receipt of this Addendum in the space provided on the Bid Form.

COMMON DIVISION 0 DOCUMENTS

1. DOCUMENT 003113 PRELIMINARY PROJECT SCHEDULE (including attachment): Discard the Document bound in the Project Manual and substitute the accompanying Document (3 pages) noted "REVISED 10/13/16".

COMMON DIVISION 1 DOCUMENTS

2. Page 011000-3, Paragraph 1.06 B.: Delete this Paragraph in its entirety and replace with the following:
   "B. Submittal No. 2: Submit Preliminary Project Schedule related information noted in 013113 Project Schedule, within 15 days after approval of the Contract by the Comptroller for review by the Director's Representative and OGS Scheduling."

3. SECTION 013113 PROJECT SCHEDULE: Add the attached Section (pages 013113-1 thru 013113-8) to the Project Manual.

4. Page 013119-1, Article 1.02 PROJECT SCHEDULE DEFINITION MEETING: Delete this Article in its entirety and replace with the following:

   "1.03 PROJECT SCHEDULE DEFINITION MEETING

   A. The initial Project Schedule Definition meeting will be held within 15 calendar-days of Project award. The Director's Representative will notify all parties concerned of the time and place of the meeting. The meeting will be conducted by the Director's Representative for the purpose of providing information for the development of the Baseline Project Schedule.

   B. The Baseline Project Schedule will be developed according the requirements in Section 013113 and based on the discussions and mutual agreements reached at the Project Schedule Definition meeting.

1. A monthly Project Schedule meeting will be held to update the Project Schedule. A qualified Contractor's Representative for each Contractor will be required to attend and provide updated information as outlined in Section 013113."

5. SECTION 013200 CONSTRUCTION PROGRESS DOCUMENTATION: Delete this Section in its entirety.

6. SECTION 015123 CONSTRUCTION HEAT AND TEMPORARY HEAT: Discard the Section bound in the Project Manual and any previously issued revised Section, and substitute the accompanying Section (pages 015123-1 thru 015123-3) noted "REVISED 10/13/16".

7. SECTION 015300 TEMPORARY CONSTRUCTION: Discard the Section bound in the Project Manual and any previously issued revised Section, and substitute the accompanying Section (pages 015300-1 thru 015300-4) noted "REVISED 10/13/16".

8. SECTION 015301 TEMPORARY EXTERIOR HOIST: Discard the Section bound in the Project Manual and any previously issued revised Section, and substitute the accompanying Section (pages 015301-1 thru 015301-5) noted "REVISED 10/13/16".

COMMON APPENDIX DOCUMENTS

9. SYSTEM XXI Document: Add the following to the first page of this Document: "TYPE 1 SYSTEMS FURNITURE".

10. DIRTT Installation Guide: Add the following to the first page of this Document "TYPE 2 SEMI-PRIVATE OFFICE WALLS".

CONSTRUCTION WORK SPECIFICATIONS

11. DOCUMENT 000101 TITLE PAGE (COVER): Delete the 100% SUBMISSION Copy Note in its entirety.

12. Page 055000-5, ARTICLE 2.01 MATERIALS: Add the following Paragraphs:

"BB. Aluminum Extrusions: ASTM B 221, Alloy 6063-T5, T-52, or T6."

CC. Aluminum Sheet: ASTM B 209, Alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish."

13. Page 064000-1, Subparagraph 2.01 A. 4.: Delete this subparagraph in its entirety and replace with the following:
"4. PLAM-4: Wilsonart 6296 satin brushed black aluminum".

14. Page 064000-1, Subparagraph 2.01 A. 5.: Delete this subparagraph in its entirety and replace with the following:
"5. PLAM-5: Wilsonart 6256 Brite brushed natural aluminum".

15. Page 064000-1, Paragraph 2.01 A.: Add the following Subparagraphs:
"6. PLAM-6: Panolam S3068 -Sunken Treasure.
7. PLAM-7: Panolam S8001 - Fresh Papaya".

16. SECTION 084223 AUTOMATIC DOOR SYSTEMS: Delete this Section in its entirety.

17. Page 102813-7, Paragraph 2.15 A.: Delete the last sentence in its entirety and replace with the following:
"Mop strip shall be 24" in length".

HVAC WORK SPECIFICATIONS

18. Page 230923-9, ARTICLE 2.09 SENSORS AND MISCELLANEOUS DEVICES: Add the following Pargaraph:

"L. Air Compressor:
1. One (1) Emglo Duplex, or approved equal, single stage air compressor, model 2(K1C)-60C. Compressor shall be mounted on (60) gallon ASME tank, 440 RPM, 10.0 CFM Disp., 5.4 CFM free air at 100psi, 208V, 3phase, 2 HP (1 HP each motor). The following accessories shall be included with the compressor."
   a. Totally enclosed metal belt guard, intake air filter/silencer, start-stop pressure switch control, tank gage, check valve, manual tank drain, safety valve and outlet valve.
   b. Two (2) magnetic starters, one (1) alternator and two (2) unloaders. Contractor shall also provide an oil resistant neoprene absorber pad 1" thick minimum and a flexible metal hose (vibration eliminator) to be installed on the compressor discharge line.
   c. One (1) Hankison, refrigerated compressed air dryer model HPR5-10. Maximum working pressure 250psig, compressor HP 1/8, power requirements 115V, 1phase, 60 HZ, airline connection in and out 3/8" OD tube.
2. The following standard features shall be included:
   a. Lighted on/off switch, 8' grounded 115V/60/1 power cord, condensate float trap and filled with environmentally friendly R-134a refrigeration system.
   b. One-piece air bypass valve and/or filter/regulator package."

19. Page 230993-20, ARTICLE 1.17 UNIT HEATER:
   a. Change "UNIT HEATER" Article Title to read "UNIT HEATER (HOT WATER AND ELECTRICAL)".
   b. Add the following Paragraph:
      "F. The electrical unit heater shall energize when space temperature below the set point, and de-energize when space temperature above the set point."

20. Page 230993-20 ARTICLE 1.19 COMMAND CENTER: Add the following Paragraph:
"G. VRF system zone kit provides individual space control served by one indoor unit. A zone damper shall be linked to the corresponding zone sensor."

21. SECTION 232000 HVAC PIPING:
   a. Page 232000-1, Subparagraph 1.02.B.2: Delete this Subparagraph in its entirety.
   b. Page 232000-5, 2.03 HYDRAULIC PRESS FITTING FOR COPPER TUBING: Delete this Article in its entirety.
   c. Page 232000-13, Paragraph 3.04.F: Delete this Paragraph in its entirety.
   d. Page 232000-14, Paragraph 3.04.I: Delete this Paragraph in its entirety.
   e. Page 232000-16, Subparagraph 3.07.C.2.a: Change "3 inch and less to read "2-1/2 inch and less".
   f. Page 232000-16, Subparagraph 3.07.C.2.b: Change "4 inch and up" to read "3 inch and up"
   g. Page 232000-16, Subparagraph 3.07.C.3.a: Delete "or hydraulic press joints."
   h. Page 232000-16, 3.07.C.6.b: Delete "or hydraulic press joints".

PLUMBING WORK SPECIFICATIONS

22. Page 211200-3,Subparagraphs 2.01 B. 4., 5., and 6.: Delete these Subparagraphs in their entirety.

23. SECTION 220577 FLOOR AND AREA DRAINS: Discard the Section bound in the Project Manual and substitute the accompanying Section (Pages 220577-1 thru 220577-3) noted "REVISED 10/13/16".

ELECTRICAL WORK SPECIFICATIONS

24. SECTION 260510 ELECTRICAL CONNECTIONS TO MODULAR WALLS AND FURNITURE SYSTEMS: Add the accompanying Section (page 260510-1) to the Project Manual.

25. SECTION 260573 OVERCURRENT PROTECTION DEVICE COORDINATION STUDY: Add the accompanying Section (pages 260573-1 thru 260573-8) to the Project Manual.

26. SECTION 261315 SEQUENCE OF OPERATION FOR ELECTRICAL EQUIPMENT: Add the accompanying Section (pages 261315-1 thru 261315-8) to the Project Manual.

27. SECTION 261330 LOAD CENTER UNIT SUBSTATION: Discard the Section bound in the Project Manual and substitute the accompanying Section (Pages 261330-1 thru 261330-11) noted "REVISED 10/13/16".

28. SECTION 261332 MODIFICATIONS TO WEB-ENABLED ADVANCED MONITORING SYSTEM: Add the accompanying Section (pages 261332-1 thru 261332-6) to the Project Manual.

29. SECTION 271524 OPTICAL FIBER CABLES: Delete this Section in its entirety.

30. SECTION 281300 CARD ACCESS CONTROL SYSTEM: Delete this Section in its entirety.

31. SECTION 282305 CCTV SYSTEM: Delete this Section in its entirety.

COMMON DRAWINGS

32. Addendum Drawings:
    a. Drawing No. G-008 noted "ADDENDUM DRAWING 10/13/16" accompanies this Addendum and forms part of the Contract Documents.

CONSTRUCTION WORK DRAWINGS

33. Drawing No. H-100, GENERAL NOTES, Note 5: Delete this Note in its entirety and replace with the following:
    "5. The chopping or drilling of existing floor mudset and concrete shall be performed as asbestos abatement."

34. Drawing No. H-110, ASBESTOS ABATEMENT SECTION: Add the following:

"GENERAL NOTES:

1. Refer to Variance 16-0274 Amendment #2. The critical barriers are on the scaffolding of the entire building, penthouse and bridge, inclusive of plywood, and polyethylene to create a critical barrier between the exterior walls and site. The scaffold and plywood critical barrier shall encompass the building but return into the structure around the stairs and hoist. The stairs and hoist shall remain outside the containment at all times."

35. Drawing No. A-112, FIRST FLOOR CONSTRUCTION PLAN B: Add 2 x 2 ACP-1/ACP-2 ceiling material to Room Nos. 123 and 123A.

36. Drawing No. A-422, Elevation 3 and Elevation 7: Change 1'-0" wall-mounted bench depth to read 1'-8".

37. Drawing No. A-501, DETAILS 4 and 5: Change "ACP-H200" and "ACP-PNL" to read "MWP-4". See Specification Section 074000 for MWP-4.

38. Drawing No. A-601, DOOR SCHEDULE: Change "2 inch" door thickness for Room Nos. 200A thru 224 to read "1-3/4 inch".

39. Drawing No. A-602, DOOR SCHEDULE: Change "2 inch" door thickness for Room Nos. 300A thru 415 to read "1-3/4 inch".

40. Drawing No. A-741, FIRST FLOOR FINISH SCHEDULE, Room 100 Lobby: Change "MCP-3" in Ceiling Finish Column to read "MCP-1".

41. Drawing No. A-741, FINISH LEGEND, Casework:
    a. PLAM-4: Change "Metal Laminate, Blacken Steel" to read "Satin brushed black aluminum".
    b. PLAM-5: Change "TBD" to read "Brite brushed natural aluminum".
    c. PLAM-6: Change "TBD" to read "Panolam Sunken Treasure".
    d. PLAM-7: Change "TBD" to read "Panolam Fresh Papaya".

42. Drawing No. A-742, THIRD FLOOR FINISH SCHEDULE, Room 311 Elec. Room: Delete "ACP-1" in Ceiling Finish Column.

43. Drawing No. A-812, FIRST FLOOR REFLECTED CEILING PLAN B: Add ACP-1 ceiling in area between column lines 10 and 12 and column lines C and D.

44. Drawing No. S-003, KEY PLANS 1: Add the following:
"NOTES
    1. Refer to Reference Drawing No. 60-128 for slab openings at all columns at the perimeter of building as well as all interior column locations. This detail occurs at the Second and Third Floors."

45. Drawing No. S-600, DETAIL 5: Add the following Note: "The welded and bolted steel plate support shown in this Detail pertains only to situations, where the metal deck below floor boxes

has been cut or substantially exposed and damaged. Assume 15% of raceway boxes will require this detail."

46. Revised Drawings:
    a. Drawing No. H-101 noted "REVISED DRAWING 10/13/16" accompanies this Addendum and supersedes the same numbered originally issued Drawing.

HVAC WORK DRAWINGS

47. Drawing No. M-002, GENERAL NOTES, Note 28: Change "FINED" to read "FINNED".

48. Drawing No. M-112, HVAC FIRST FLOOR DUCTWORK PLAN B:
    a. Add 18" x 8" ductwork dimension to FCU-2 return air ductwork throughout to unit.
    b. Change 14" x 8"SA supply air duct note for FCU-2 to read 18" x 8"SA.
    c. Add FCU-1 supply air duct note "18x8 SA".
    d. Add temperature sensor for EH-2, and EH-3.

49. Drawing No. M-122, HVAC SECOND FLOOR DUCTWORK PLAN B: For JC 217 exhaust grille, add following note "EAG-1, 75 cfm".

50. Drawing No. M-133, HVAC THIRD FLOOR DUCTWORK PLAN C:
    a. Add supply ductwork serving conference room 329 perimeter zone "10x8 SA" and "10x6 SA".
    b. Delete 22 outside air motorized dampers, and replace with manual volume control dampers. Keep outside air motorized damper serving AC-C-2, AC-C-6, AC-C-7.

51. Drawing M-212, HVAC FIRST FLOOR HW PIPING PLAN B:
    a. Add temperature sensor for AHU-4.
    b. Add temperature sensor for EH-4.
    c. Add piping size 3/4"ø HWSR and 3/4"ø HWR to FCU-1, and 2.

52. Drawing No. M-401, SECTION 4/M-401: Change the Note, 6" SCHWR IN and 6" SCHWR OUT, to read 8" SCHWR IN and 6" SCHWR OUT.

53. Drawing No. M-504, DETAILS 4 and 6: Delete these Details in their entirety.

54. Drawing No. M-141, HVAC PENTHOUSE DUCTWORK PLAN: Remove one of the duplicate smoke detectors located in return ductwork connecting to AHU-1, 2, and 3. One for each unit to remain.

55. Drawing No. M-806, AIR SEPARATOR SCHEDULE: Delete AS-2 in its entirety.

56. Revised Drawings:
    a. Drawing Nos. M-401, and M-801 noted "REVISED DRAWING 10/13/16" accompany this Addendum and supersede the same numbered originally issued Drawings.

PLUMBING WORK DRAWINGS

57. Drawing No. P-002, DRAIN SCHEDULE, TD-A: Delete the remark in its entirety and replace with the following:

"Provide trap primer and associated piping and connect to trench drain provided by the Construction Work Contractor.

58. Drawing Nos. P-111, P-112, and P-113, KEYNOTES, Note 3: Delete this Note in its entirety and replace with the following:
"3. Exist bell outlet/CODP to be extended below raised floor and capped. See Detail 6 on P-503 drawing where the cleanout is located away from the new exterior wall or radiators. See Detail 2 on P-504 drawing where the cleanout is located under the new exterior wall or radiators."

ELECTRICAL WORK DRAWINGS

59. Drawing No. E-001, ELECTRICAL GENERAL NOTES:
a. Note 14: Delete this Note in its entirety, and replace with the following:
"14. Provide 3/4 inch EMT above ceilings with pull strings to locations of card access junction boxes and CCTV camera junction box as shown on Electrical Work Drawings. CCTV and Card Reader Access Systems will be provided by the State."
b. Add the following Note:
"15. Provide a grounding grid for the raised access flooring system in all areas of the building other than in rooms: XXX, YYY, etc. The grid shall be comprised of bare stranded #6 copper conductors arranged in a grid pattern below the tiles of the raised floor system, with each square of the grid being 10' x 10'. The grid shall extend in all directions up to the hard vertical partition of each individual space or room. At the intersection of #6 conductors bond them together with clamps. The intersections of the conductors shall be located adjacent to pedestals from the flooring system and they shall be bonded to the pedestals with the same clamp that bonds the intersecting conductors together that make up the grounding grid. Provide a #6 copper conductor in ¾" conduit from within each separate grounding grid area (created by hard vertical partitions) to the nearest electrical room ground bar."

60. Drawing No. E-342, FIRE ALARM PENTHOUSE PLAN B: Delete one of the two return duct smoke detectors for AHU-1, 2, and 3.

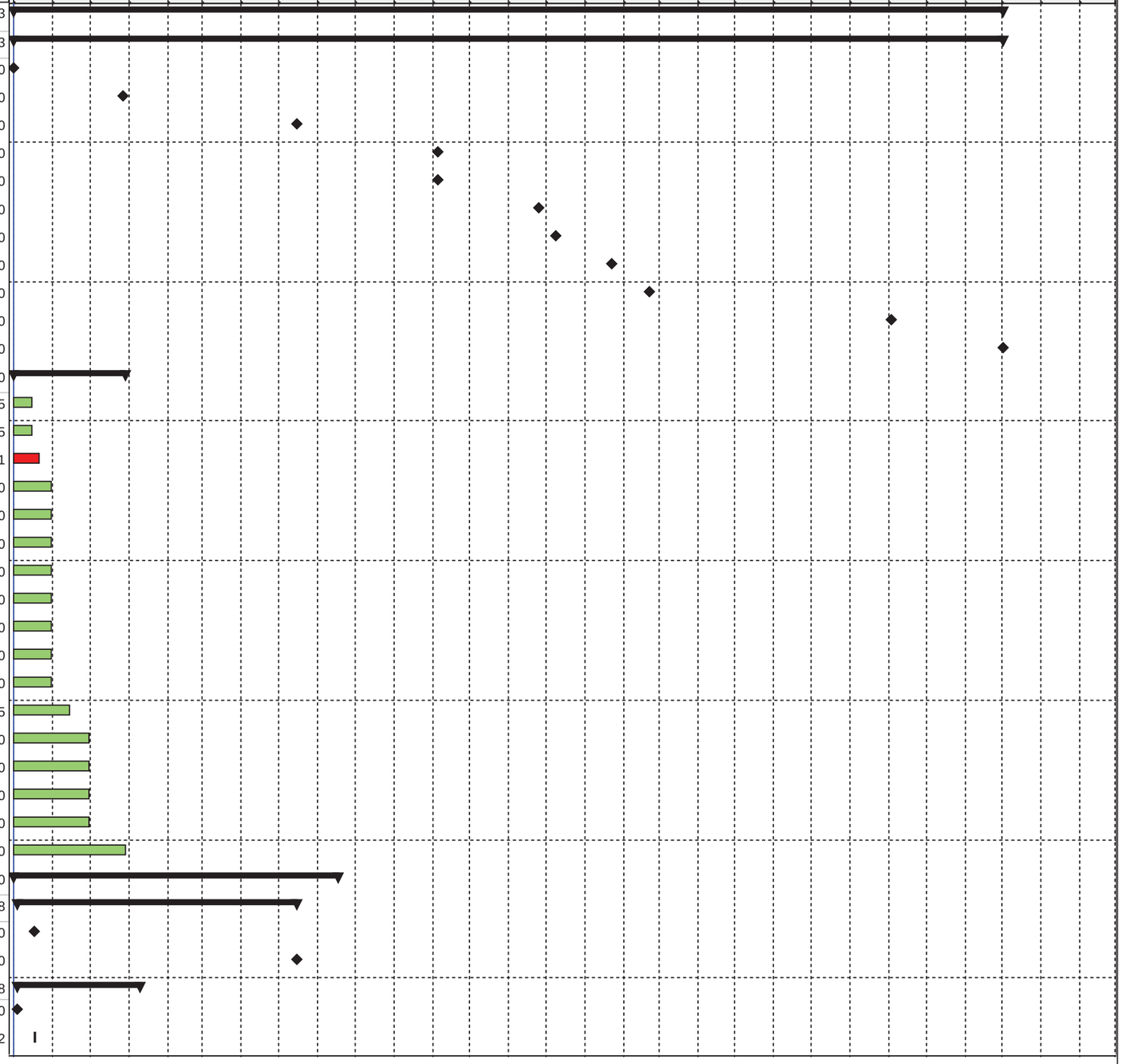
61. Revised Drawings:
a. Drawing Nos. E-501, and E-701 noted "REVISED DRAWING 10/13/16" accompany this Addendum and supersede the same numbered originally issued Drawings.

END OF ADDENDUM

Margaret F. Larkin
Executive Director
Design and Construction

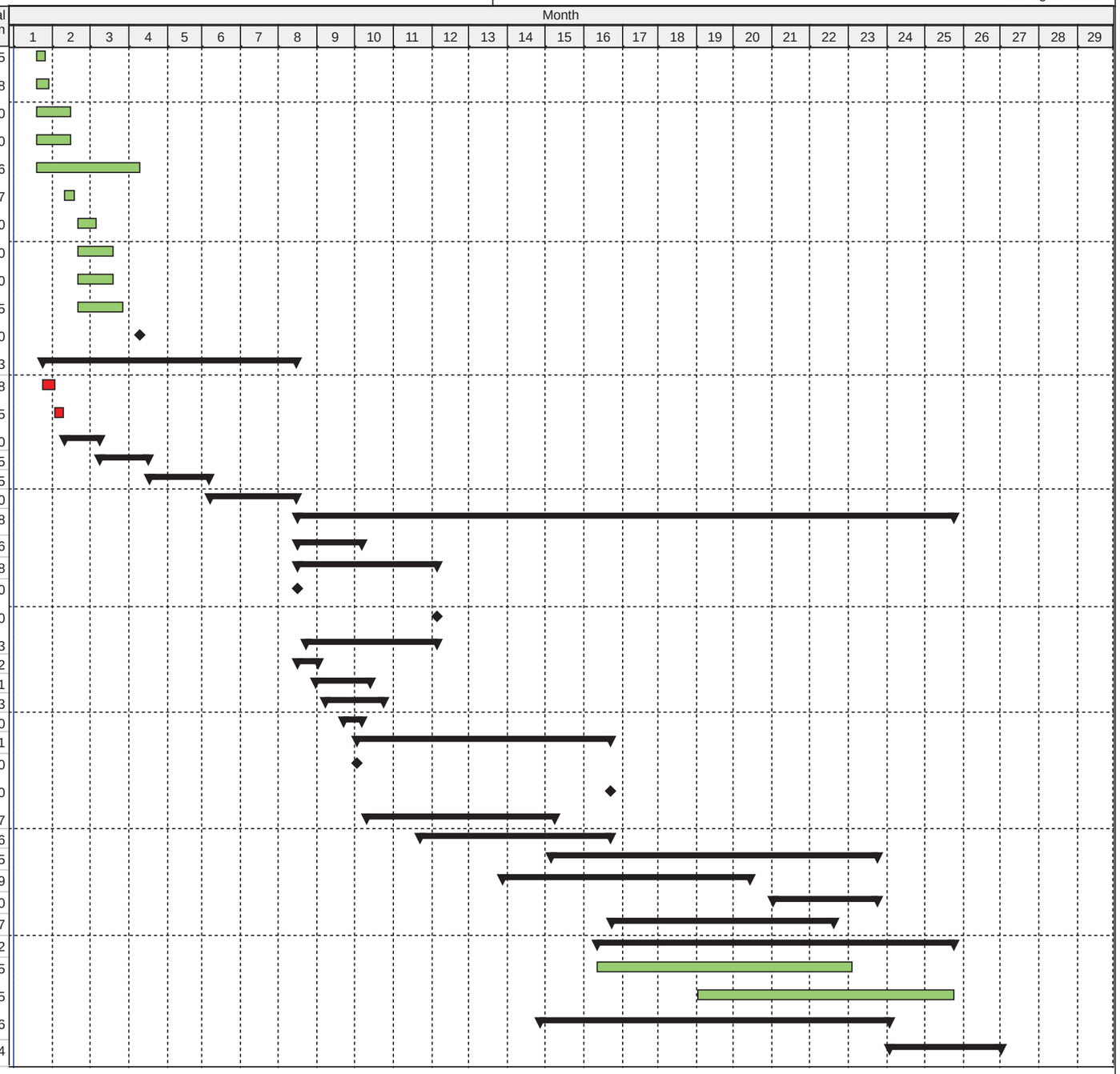
JRC:jc

Activity Name	Original Duration
ABATE HAZARDOUS MATERIALS AND RENOVATE BUILDING NO. 4	553
MILESTONES	553
CONTRACT AWARD	0
BUILDING PERIMETER TEMPORARY SCAFFOLD/CRITICAL BARRIER/STAIRS/HOIST/LOADING BAYS	0
HAZARDOUS MATERIALS & DEMOLITION COMPLETE	0
STAIRS ABC COMPLETE FOR ACCESS	0
ROOF SCREEN/TRELLIS COMPLETE	0
SET MECH ROOF TOP EQUIPMENT	0
NEW ROOFING PENTHOUSE/MAIN BUILDING COMPLETE	0
EXTERIOR CURTAIN WALL COMPLETE	0
ELECTRIC MAIN SUB STATION START UP	0
SUBSTANTIAL COMPLETION	0
PHYSICAL COMPLETION	0
CONTRACT AWARD SUBMITTALS/PROCUREMENTS	90
CONTRACTORS LIST OF SUBCONTRACTORS/SUPPLIERS - 013000	15
PRELIMINARY PROJECT SCHEDULE	15
HAZARDOUS MATERIALS WORK PLAN - 028213	21
TEMPORARY STAIRS WITH BUILDING OPENINGS - 015300	30
TEMPORARY HOIST WITH BUILDING OPENINGS - 015301	30
UNIT SUBSTATION AND CONTROLS - 261330	30
EMERGENCY GENERATOR - 263214	30
TEMP HEATING EQUIPMENT - 015123	30
TEMP PERIMETER SCAFFOLD W/CRITICAL BARRIER FOR EXT. WALL REMOVALS - 015000	30
TEMP SCAFFOLD FOR PH EXT WALL REMOVAL - 015000	30
STRUCTURAL STEEL SHOP DRAWINGS/ SHORING - 051200	30
ELEVATOR - 140120	45
ALUMINIUM WINDOW WALL - 084413	60
AIR HANDLING UNITS - 237313	60
WALL PANEL SYSTEM - 074113	60
ALUMINUM STOREFRONT - 084413	60
COORDINATION DUCTWORK DRAWINGS - 233113	90
CONSTRUCTION: SUBMITTALS, APPROVAL, FABRICATION	260
GENERAL CONDITIONS/ HAZARDOUS MATERIAL REMOVALS/DEMO	158
MSS GENERAL CONDITIONS/HAZ MAT REMOVALS/DEMO	0
MSF GENERAL CONDITIONS/HAZ MAT REMOVALS/DEMO	0
GENERAL CONDITIONS	68
MSS GENERAL CONDITIONS	0
SITE FENCE/STABILZED AREAS - INSTALL	2



Actual Level of Effort | Actual Work | Remaining Work | Critical Remaining Work | Milestone | summary

Activity Name	Original Duration
TEMPORARY WATER SERVICE	5
TEMPORARY POWER	8
PROVIDE PEDESTRIAN WALKWAYS	20
TEMPORARY STAND PIPE PROVISIONS	20
TEMPORARY HEATING SYSTEM AVAILABLITY	56
SELECTIVE HAZARDOUS REMOVALS/DEMO	7
MATERIAL HOIST & LOADING BAYS	10
SITE OFFICE-SETUP	20
TEMPORARY STAIRS W/BUILDING OPENINGS/ENCLOSURES	20
SCAFFOLD & CRITICAL BARRIERS @ BUILDING PERIMETER	25
MSF GENERAL CONDITIONS	0
HAZARDOUS MATERIAL REMOVALS & DEMO	143
NOTIFICATION & POSTING	8
DECONTAMINATION/ NAU INSTALL	5
PENTHOUSE	20
3RD FLOOR	25
2ND FLOOR & BLDG # 5 BRIDGE	35
1ST FLOOR	50
CONSTRUCTION	368
FOUNDATION/CONCRETE TOPPING/CURBS/FIRST FLOOR	36
STRUCTURE/STAIRS	78
MSS STRUCTURE	0
MSF STRUCTURE	0
ROOF	73
PENTHOUSE	12
3RD FLOOR	31
2ND FLOOR	33
1ST FLOOR	10
BUILDING ENCLOSURE/WINDOW WALL PANELS/ROOF	141
MSS BUILDING ENCLOSURE	0
MSF BUILDING ENCLOSURE	0
ROOFING	107
FACADE	106
BUILDING INTERIOR	185
BUILDING SYSTEMS	139
FURNITURE, FIXTURES & EQUIPMENT	60
SITEWORK/CANOPY	127
CONCURRENT PROJECTS	202
CBVA STORE RM 123 TENANT FIT-OUT	145
PARKING LOT MODIFICATIONS	145
INSPECTION/COMMISSIONING	196
CLOSE-OUT	64



Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
Milestone
summary

DOCUMENT 003113

PRELIMINARY PROJECT SCHEDULE

A Preliminary Project Schedule has been prepared for this project in CPM network format utilizing the Precedence Diagram Method. Bid Milestones are presented on the following pages, which encompass the anticipated durations of Work related to the Project. The detailed Preliminary Project Schedule will be made available for review by the Contractors after award of the Contract to further assist in final CPM Baseline Project Schedule preparation in accordance with Sections 013113 and 013119.

After execution of the CMU-01 Agreement (blank included on last page of document 013113), the Project Schedule will become the basis for coordinating the work activities, measuring progress, and approving progress payments.

NOTE: The Bid Milestones summarizing the Preliminary Project Schedule included in this Document are to be used as reference in preparing a bid response. It is not intended that these examples limit the Contractor in anyway in preparation of a bid response.

SECTION 013113

PROJECT SCHEDULE

PART 1 GENERAL

1.01 RELATED REQUIREMENTS AND INFORMATION SPECIFIED ELSEWHERE

A. Summary of Work: Section 011000.

B. Administrative Requirements: Section 013000.

C. Project Meetings: Section 013119.

1.02 SUMMARY

A. Section includes administrative and procedural requirements to plan, schedule, and document the progress of the Project, and predict and prevent delays to established activities and milestones during performance of the Work.

1.03 SUBMITTALS

A. Waiver of Submittals: The "Waiver of Certain Submittal Requirements" in Section 013300 does not apply to this Section.

B. Schedule Submittals:
   1. CMU 01 Agreement Form

1.04 DEFINITIONS

A. Project: Work to be performed as part of one or more Contracts.

B. Project Team: Persons acting on behalf of the State and/or Contractors in an effort to successfully plan, schedule, and coordinate the Work of the Project.

C. Project Work Plan: A comprehensive list of Contractor tasks, predecessors, durations, resources, budgeted cost, etc. used to develop the Project Schedule.

D. Schedule: A comprehensive leveling of necessary procedural tasks, task sequencing, projected start and finish dates, and resource allocation required to successfully complete the Work by the Project completion date.

E. Activity: A task or grouping of tasks containing an anticipated start-date and corresponding duration, comprising a generalized portion of the Work, that can be identified and measured for planning, coordinating, monitoring, and controlling the project.

F. Milestone: A significant start or finish to Work on a given set of activities on the Project defined by both the Director's Representative and the Contractors.

G. Bid Milestones: Milestones or phases identified and included in the Contract Documents to be utilized by the Contractors and Project Team in developing the Baseline Project Schedule.

H. OGS Project Management System (OGS PMS): The collaborative online system is provided by OGS for Contractors to establish their Project Work Plan activities, duration, predecessors, resources and budgeted cost for Work of the Project.

I. Baseline Project Schedule: Derived from the Contractors' Project Work Plan activities and their prescribed durations, predecessors, etc. recognizing the completion of the Work of the Project in accordance with the Contract duration and approved by the Director's Representative and Contractors.
   1. The OGS Scheduling will build a Baseline Project Schedule from the Contractors' Baseline Project Work plan to determine projected start and finish dates.
   2. Updates to the Baseline Project Schedule, including but not limited to projected starts, finishes, and activity remaining duration, as agreed upon at the Project Schedule meeting by the Contractors and the Director's Representative, shall be defined as the Project Schedule.
   3. The Baseline Project Schedule will remain unaltered as a tool to measure progress outlined and anticipated during the initial Project Schedule meeting.

J. Float: The measure of latitude in starting and/or completing an activity without impeding on the successful realization of Project milestones.
   1. Float time is not for the exclusive use or benefit of either the State or the Contractors, but is a jointly owned expiring Project resource; float is available as needed to meet scheduled milestones and Project completion.
   2. Recognizing float within an activity, or chain of activities, does not permit the Contractors to disrupt progress or delay completion of an activity.

K. Resource: Any labor, material, or equipment, shared or exclusive, required for the completion of an Activity or the Work, which recognizes an associated cost.

L. OGS Scheduling: A member of the OGS Scheduling Department responsible for assisting with reviewing and interpretation of Contractor Project Work Plans related information.

1.05 DEVELOPMENT OF THE PROJECT WORK PLAN

A. The OGS PMS is the online environment where the Contractors will build and develop the Baseline Project Work Plan.

B. Contractors will input information on the OGS PMS relating to activity naming, duration, predecessors, resources and budgeted cost. The Director's Representative and OGS Scheduling will review prior to the initial Project Schedule meeting.

C. The Director's Representative will schedule the initial Project Schedule meeting within 15 calendar-days of Project Award. The meeting will include members of the Project Team and will be conducted by OGS Scheduling for the purpose of reviewing the Contractors' initial Project Work Plan, defining the intent of the specification, and realizing a Project Work Plan management strategy for all required iterations and reporting. The mutual agreements reached at this and subsequent meetings form the basis for the Baseline Project Schedule, and will be used for coordinating, scheduling, and monitoring the Work of all related contracts.

1. OGS Scheduling will work with other members of the Project Team to review and discuss activities, task summaries, contractual or Project milestones, intermediate and critical milestones, and testing, inspection, or commissioning periods to assist in planning or coordination.

D. The Contractor will sign the CMU 01 Agreement form (blank included in Document 013113) within five (5) calendar-days of final Baseline Project Schedule review and approval by the Director's Representative. Failure to develop the Baseline Project Work Plan, and sign the CMU 01 Agreement form will not absolve the Contractors of the Project Work Plan requirements. The Contractors will be required to provide the necessary resources, at no additional charge to the State, to complete the Project in the manner defined by the Director's Representative.

1. The Baseline Project Schedule and CMU 01 agreement are to be completed within 45 days of Project Award. Failure by the Contractors to provide the required or requested information will results in the withholding of progress payments.

E. Bid Milestones are to be incorporated into the Project Work Plan.

1.06 UPDATING THE PROJECT WORK PLAN

A. Monthly Project Schedule meetings will be held to review Contractors' updates to the actual starts, actual finishes, and remaining duration of in-progress activities, and consider logic changes, predecessor alterations, duration amendments, time impact events, and scope changes, for the purpose of determining the status of construction progress for the updated Project Schedule.

1. During the progress of Work on the Project, the Contractors are required to document actual start, actual finish, and remaining duration on a daily basis. Information will be posted by the Contractors to the OGS PMS and as defined during the Initial Project Schedule meeting.
2. Contractors must update the status of all their activities two (2) days prior to the Project Schedule Meeting. The Contractors will notify the Director's Representative and OGS Scheduling when their information is complete.
    a. Any variation of 5 days (+/-) in the start or finish date for each activity must be explained and posted.
3. At the Progress Schedule Meeting, the Contractor, Director's Representative, and OGS Scheduling will review the documented progress and planned work.

4. Any Contractor failing to progress their Work as outlined in the updated Project Work Plan will be informed of their deficiencies and, if required, be requested to provide a recovery option.

B. The Contractors will furnish all Project Work Plan information requested by the Director's Representative**.** Any Contractor who fails to furnish accurate information two days prior to the Project Schedule meeting will be required to provide all resources necessary to execute the updated Project Work Plan based on progress information documented and recorded by the Director's Representative.

1.07 MAINTAINING SCHEDULE

A. Perform the Work in accordance with the Project Schedule and providing resources necessary to maintain the progress of activities as scheduled so that no delays are caused to other Contractors engaged in the Work.
   1. Should any Contractor fail to maintain progress according to the Project Schedule, or cause delay to another Contractor, that Contractor shall provide such additional manpower, equipment, additional shifts, or other measures, at their own cost, to bring their operations back on schedule.
   2. Performing Work out of sequence with the Project Schedule is not permitted unless written approval is obtained from the Director's Representative prior to commencement.

1.08 RECOVERY WORK PLAN

A. Recovery Work Plan: When periodic updates indicate the Work is 15 or more work days behind the approved Baseline Project Schedule's Substantial Completion dates, the Contractors will present recovery options to the Director's Representative to be incorporated into an updated Project Schedule; these include, but are not limited to, allocating additional resources for activity duration reduction or modifying activity sequencing,

B. Any Contractor failing to furnish recovery options to the Director's Representative for a Recovery Work Plan within 10 calendar-days subsequent to the monthly Project Schedule update will be required to provide all resources necessary to execute an updated Project Work Plan defined by the Director's Representative.

C. Alterations to the Project Schedule by a Recovery Work Plan will require the approval of the Contractors and the Director's Representative.

D. Approved alterations to the Project Schedule by a Recovery Work Plan, will constitute the updated Project Schedule.
   1. The updated Project Schedule following the implemented Recovery Work Plan will be recognized as the primary baseline schedule for reporting. The Baseline Project Schedule will be retained as a secondary baseline schedule and will be utilized to measure progress against the alterations.

E. Recovery Work Plans recognizing early completion will be reviewed by the Director's Representative prior to acceptance of the Project Schedule update.

1.09 RESOURCE ASSIGNMENTS

A. Resources recognizing the budgeted cost associated with all efforts necessary for the completion of a unique activity within the schedule, and the total cumulative cost of the Work of the Project, are to be assigned by the Contractors. All Contractors are responsible for providing the information necessary for assigning resources for the Baseline Project Work Plan; all Contractors are responsible for reviewing the information.

B. Resources recognizing the total Labor/Manpower and specialized equipment associated with all efforts necessary for the completion of a unique activity within the Project Work Plan, and the cumulative curve associated with the Work of the Project, are to be assigned concordant with the intended means and methods proposed by the Contractors. All Contractors are responsible for providing the information necessary for assigning resources for the Baseline Project Work Plan; all Contractors are responsible for reviewing the information prior to approval.

PART 2 PRODUCTS

2.01 PROJECT WORK PLAN SOFTWARE

A. Project Work Plan Software: Project Work Plan software is provided by OGS through the OGS PMS.

B. Contractors are required to have Internet access to utilize the OGS PMS for all parts of this section.

C. OGS will provide training for access and use of the OGS PMS. Training will be one hour at a minimum; additional support is available by OGS Scheduling.

PART 3 EXECUTION

3.01 PROJECT WORK PLAN

A. The Director's Representative and OGS Scheduling will contact the Contractors and setup access to the OGS PMS. Training will be provided once access is setup by OGS Scheduling.

B. Contractor will develop their Project Work Plan activities and provide information relating to activity naming, duration, predecessors, resources, and budgeted cost on the OGS PMS.

C. The Contractors Project Work Plan will determine and define activities applicable to the Work of their Contract and the scope of the Project. Activities are to be appropriately placed within the OGS PMS.

D. Within 15 calendar-days of Project Award, the Contractor's will provide a summary level Baseline Project work plan on the OGS PMS, encompassing the Work of the Project from Project Award through Substantial Completion.
   1. Contractors need to complete their summary Project Work Plan two (2) days prior to the initial meeting, in a manner appropriate to the development of the Baseline Project Work Plan. The Contractors will notify the Director's Representative and OGS Scheduling when their information is complete.
   2. Contractors will complete remainder of baseline Project Work Plan compliant to the summary level baseline Project Work Plan.

E. The Project Team will review the Contractors initial Project Work Plan submissions at the Initial Project Schedule meeting and complete the Baseline Project Schedule.
   1. The Project Team will recommend tasks or summaries appropriate to planning, scheduling and coordinating, including but not limited to: establishing a focused work breakdown structure (WBS) that aligns with the Contract Documents, phasing requirements, identifying logical connections critical to Substantial completion, accounting for critical submittals or submission, fabrication, and delivery of long-lead materials, products, specialized equipment, or services, and recognizing critical testing, inspection, or commissioning durations for coordination and tracking.

F. The Baseline Project Schedule is to be approved and the CMU 01 Agreement Form signed within 45 calendar-days of Project Award. Failure to complete the Project Work Plan and sign the CMU 01 Agreement Form will result in non-payment for Work progressing beyond 30 calendar-days subsequent to Project Award.

G. Updates to the Project Work Plan will be performed concurrent with Project Schedule meetings.

3.02 ACTIVITIES

A. The Contractors are to provide activities, which adequately represent the coordinating needs of the Project and scope of the Work.
   1. Each activity will identify the Contractors' anticipated duration for the activity defined in workdays, and the budgeted cost of the activity.

B. The Contractors will identify each activity with a unique Activity Name. No Activity Name or Activity ID will be altered after the Baseline Project Schedule has been approved by the Director's Representative.

C. The Project Team will identify milestones, activities, or summary activities for incorporation into the Baseline or Project Schedule to assist in planning, scheduling, and coordinating the Project.

D. The calendar utilized by the Baseline and Project Schedule for each activity will be per the direction of OGS Scheduling to accurately reflect anticipated State and Federal holidays as well as work being performed off-hours as defined in the Contract Documents.

3.03 BASELINES

A. OGS Scheduling will maintain the CMU approved Baseline Project Schedule as the assigned project baseline schedule.

3.04 TIME IMPACT AND TIME IMPACT ANALYSIS

A. Contractors will represent Time Impact to the Project Work Plan utilizing, at a minimum, a milestone event, an activity for resolution, and related work associated with the impact to the as-updated Work of the Project.
   1. Contractors and the Project Team will use the most current Project Work Plan update to prepare the Time Impact representation.
   2. If Project Work Plans have not been updated in accordance with this specification, an update must be generated which includes an accurate realization of the Work performed and progressed up to the Time Impact event. Failure to maintain Project Work Plan updates in accordance with this or related specifications will not absolve the Contractors of the responsibility to identify Time Impact as defined at a minimum by this article or the General Conditions.
   3. A Request for Time Extension will require Time Impact recognition within the CPM schedule.
   4. Time Impact events will be reviewed for accuracy and are to be updated in accordance with relevant new information regarding time for resolution and impact to remaining work on the Project.

END OF SECTION

PROJECT NO. _____

PROJECT NAME: _____

REPORT DATE: _____

REPORT NAME(S): _____

_____

_____

_____

It is agreed that the Baseline Project Schedule defined by the above listed computer reports has been reviewed and is accepted for use in coordinating, scheduling, and monitoring the work of all related contracts.

FOR CONSTRUCTION WORK CONTRACTOR: _____ DATE: _____

FOR HVAC WORK CONTRACTOR: _____ DATE: _____

FOR PLUMBING WORK CONTRACTOR: _____ DATE: _____

FOR ELECTRICALWORK CONTRACTOR: _____ DATE: _____

FOR DIRECTOR'S REPRESENTATIVE: _____ DATE: _____

SECTION 015123

CONSTRUCTION HEAT AND TEMPORARY HEAT

PART 1 GENERAL

1.01 TEMPORARY HEAT - BUILDING ENCLOSED

A. Construction Work Contract:

1. Pprovide temporary weather tight closures whenever and wherever wall or roof are not enclosed.
2. Temporary heat shall be provided under the HVAC Work Contract for all Contracts related to the Project.
3. The HVAC Work Contract shall provide temporary heat for 24hrs per day starting on January 1, 2017 and ending on April 15, 2018. The temporary heat shall be evenly distributed throughout the building. Coordinate and modify the temporary heating system so as not to impact the activities of the other contracts related to the project.
   a. The actual number of days required for temporary heat shall be as determined by the Director's Representative.
   b. In the event such determination results in more or less than the specified time period, the contract sum will be adjusted by Order on Contract.
4. The temporary heating system shall utilize the building service utilities (i.e. Campus steam, condensate and power). The Contractor will not be allowed to provide fuel sources which are not supplied by the Campus. Coordinate the shutdowns with all contractors including asbestos abatement activities.
5. The contractor shall complete the work associated with the steam to hot water heat exchangers, heating hot water pumps and heating hot water piping as required for use during the period of temporary heat. The contract includes valves on each floor identified on the drawings for temporary heating system connections. The Contractor shall provide temporary piping connecting to the valves identified and provide distribution to and from those valves. The contractor shall select and locate temporary hot water heaters as required to meet the performance requirements specified for the temporary heating system. Provide temporary electrical connections by a Licensed Electrician.
6. Temporary heat system shall consist of, but is not limited to, the following:
   a. Furnishing and operating a sufficient number of temporary heating units to maintain required temperatures.
   b. Do not use electric heaters.
   c. Maintaining building temperature between 45 and 55 degrees F, unless higher temperatures are required for the installation of specified materials.
   d. Moving, relocating, and adjusting heating units as required or directed, to protect the Work of all Contracts.

7. Provide Temperature and Recording as follows:
   a. Provide and maintain eight inch scale direct reading thermometers as directed. Provide (4) thermometers on each floor (ground through sixth) plus one in the penthouse. Coordinate exact locations with the Director's Representative.
   b. Provide seven day, self contained recording thermometers, for the purpose of recording air temperatures in the building. Provide (2) per floor (ground through sixth, one on east end and one on west end) plus one in penthouse. Coordinate exact locations with the Director's Representative.
   c. Thermometers shall be Bacharach Instrument Co. Code No. 14-1010.
   d. Charts: Furnish and deliver to the Director's Representative at the site, a supply of charts and ink, in quantity as required for the duration of temporary heat. Furnish charts of the 24 hour type, designed for working temperatures from -30 degrees F to +120 degrees F.
   e. The Director's Representative will maintain operation of the thermometers.
   f. Recording thermometers and charts shall become the property of the State.

1.02 RESPONSIBILITY

A. Construction Work Contract:
   1. Assume responsibility for damage due to frost and freezing during the period when temporary heat is required to be provided. Repair damage due to improper equipment, such as stains, smudges, soot or fire.

B. All Contracts:
   1. Progress the Work so that temporary heat can be provided as and when specified, and directed.

1.03 TEMPORARY HEAT - OPERATION BY STATE PERSONNEL

A. When, in the opinion of the Director's Representative, the permanent heating system is completed, the Director's Representative will arrange for operation of the heating system in accordance with the provisions of Article 20 of the General Conditions concerning State occupation and operation. At such time, Contractor will be relieved of responsibility for temporary heat. Disconnect all systems and remove from site upon direction from Director's Representative.

B. Waiver of Submittals: The "Waiver of Certain Submittal Requirements" in Section 01330 does not apply to this Section.

C. Submittals Package: Submit the shop drawings, product data, and quality control submittals specified below at the same time as a package.

D. Shop Drawings - NYS PE reviewed and stamped drawings:
   1. Show installation details.

E. Product Data:
   1. Catalog sheets, specifications, and installation instructions.
   2. Name, address, and telephone number of nearest fully equipped service organization.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 015300

TEMPORARY CONSTRUCTION

PART 1 GENERAL

1.01 REFERENCES

A. AISC Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.

B. AWS D1.1, Code for Welding in Building Construction.

C. OSHA and NYSDOL requirements pertaining to operation of temporary construction scaffolding and stairways.

1.02 DESCRIPTION

A. Construction Work Contractor:
   1. Provides two temporary exterior stairway systems to provide access to the roof level as necessary for the Work, unless otherwise specified.
   2. Maintains temporary exterior stairway systems operational for the work of all related contracts at all times Work is being performed by any and all Contractors including after hours and weekends.
   3. Provide the exterior building scaffold system, stairway system, and the support structure.
   4. Provide all necessary toe boards, guard rails, handrails, and screening on common platforms, ramps, and provide protection of all openings and penetrations. Include screening of machines, kickers, and tie downs. All enclosures are to meet any and all safety requirements of OSHA, the State of New York.

B. HVAC Work, Plumbing Work, Electrical Work Contractors:
   1. Any Contractors requiring additions to the temporary exterior stairway systems shall provide and maintain them. Coordinate additions to stairway systems with the Construction Work Contractor.
   2. Provide and operate any additional hoists, scaffolding, swing staging, lifts or cranes along with any other miscellaneous equipment required to perform the Work.

1.03 SUBMITTALS

A. Waiver of Submittals: The "Waiver of Certain Submittal Requirements" in Section 01330 does not apply to this Section.

B. Submittals Package: Submit the shop drawings, product data, and quality control submittals specified below at the same time as a package.

C. Shop Drawings- NYS PE reviewed and stamped drawings:
   1. Show the construction details of the exterior building scaffold system, stairway system, and the support structure. Show all raised platforms with railing systems. Show all shoring as required to impose platform loads onto the building structural and foundations. Show all building tie in details.
   2. Show the electric wiring and control system for lighting and security gates.
   3 Show installation details.

D. Product Data:
   1. Catalog sheets, specifications, and installation instructions.
   2. Name, address, and telephone number of nearest fully equipped service organization.

E. Quality Control Submittals:
   1. Design data, including safety factor of materials.
   2. Test report of stairway system.
   3. Certificate required under Quality Assurance.

1.04 QUALITY ASSURANCE

A. Company Field Advisor: Secure the services of a Company Field Advisor as needed hours for the following:
   1. Render advice regarding installation of the stairway system.
   2. Witness final system test and then certify with an affidavit that the stairway system is installed in accordance with the contract requirements and is operating and being maintained properly.
   3. Provide a complete and thorough safety inspection at least once per month or more frequently if required by the local authority and immediately after heavy rains, snow, wind and severe cold. At a minimum inspect all ties, brackets, bracing, connection cables, tower members, electrical components, safeties, platforms, ramps, doors, etc. Submit a complete written report to the Director's Representative within 3 days after inspection. This subcontractor must be at the site for emergency calls within 2 hours of notification. Stock spare parts so as to complete major repairs within 12 hours of notification.
   4. Obtain all permits and approvals as required by the City of Albany and any other authorities. Furnish copies of all permits and approvals prior to installation.

PART 2 PRODUCTS

2.01 EXTERIOR OPENINGS, STAIRWAY, AND SCAFFOLDING SYSTEM (Construction Work Contract)

A. Loading Areas:
   1. Provide watertight exterior wall system openings for building loading access for all contracts. Coordinate location with Director's Representative. One opening to be for Penthouse access and shall be the full penthouse height on the North side of building. Coordinate opening size requirements with other Contracts with minimum opening to be the width of the column bay. The second opening is to be on the South side of the building and should span from first through third floors. Again, coordinate opening size requirements with other Contracts with minimum opening to be the width of the column bay. Include additional mobilizations as required to finish exterior wall systems at a later date for these openings. Provide and maintain all temporary lighting.

B. Stair Towers:
   1. Provide manufactured scaffold system for two (2) temporary stair towers to provide access to the roof level for use by all contracts until permanent stairs are available. Coordinate location with Director's Representative. Permanent stairs will not be available until the building is enclosed and final steel connections can be made at shear walls and temporary bracing removed. Provide and maintain all temporary lighting.

C. Exterior Building Scaffold System:
1. Provide manufactured scaffold system for the building perimeter scaffold system to provide access for exterior abatement, façade removal and new façade installation. Coordinate location with Director's Representative.
   a. Provide and maintain all temporary lighting.
   b. Provide and maintain a water/weather tight enclosure for abatement, demolition, and construction of new façade/perimeter wall system. Including connection at roof systems.
   c. Refer to Variance 16-0274 Amendment #2. The critical barriers are on the scaffolding of the entire building, penthouse and bridge, inclusive of plywood, and polyethylene to create a critical barrier between the exterior walls and site. The scaffold and plywood critical barrier shall encompass the building but return into the structure around the stairs and hoist. The stairs and hoist shall remain outside the containment at all times."

2.02 DESIGN REQUIREMENTS

A. System Requirements:
1. Size: Inside clear dimensions at gates/doors to allow materials to pass are: 12'-2" length X 7'-0" high X 4'-11" wide.
2. Temporary electrical requirements: All wiring including temporary lighting shall be provided by the Construction Contractor as necessary to complete the work. Electrical usage charges will be paid for by the

PART 3 EXECUTION

3.01 INSTALLATION

A. Install the Work in this Section in accordance with the manufacturer's printed installation instructions, shop drawings, and directions of the Company Field Advisor.

B. Provide all supplemental steel and supports as required at the stair tower and platforms as needed to provide the designed building tie in reaction.

C. Provide all necessary toe boards, guard rails, handrails, and screening on common platforms and ramps. Include screening of machines, kickers, and tie downs. All enclosures are to meet any and all safety requirements of OSHA, the State of New York.

D. Common platforms and ramps to extend to the building line from the platform. Ramps shall be installed so that it does not interfere with final concrete pours on each floor. Provide ramps from the building line to the platform in order that materials can be delivered on a rolling dolly or cart.

E. All planks, door lumber and hardware are to be new. Replace all weathered materials as required or directed.

F. Insure that all protection, bracing, planking conform to all applicable OSHA, NYS and local regulations. Albany Fire Department will need access to stair tower for firefighting capability, provide appropriate Knox box entry system at base of tower for AFD use as required for on and off hours.

G. Provide all maintenance and repairs on overtime at no additional cost if required. This shall include snow/ ice removal. Maintain free from snow/ ice at all times.

H. Provide for all weather proofing and flashing of all building structural connections for the hoists and platforms for the life of the project. When stair towers are removed, properly complete the wall openings in accordance with Contract Documents.

I. Provide 12" of type 2 stone with filter fabric at base of stairs and all loading area locations. Compact to 95% compaction.

J. Provide and maintain all temporary lighting within scaffold system, temporary stair towers, and loading areas at construction hoist.

END OF SECTION

SECTION 015301

TEMPORARY EXTERIOR HOIST

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Asbestos Abatement: Section 028213.

1.02 REFERENCES

A. AISC Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.

B. ASME HST-4M, Performance Standard for Overhead Electric Wire Rope Hoists.

C. AWS D1.1, Code for Welding in Building Construction.

D. Hoist Manufacturer's Institute Standard Specification for Electric Wire Rope Hoists.

E. ANSI/NFPA 70 National Electric Code, Article 610, Cranes and Hoists.

F. OSHA and NYSDOL requirements pertaining to operation of temporary construction hoists.

1.03 DESCRIPTION

A. Construction Work Contractor:
   1. Provides temporary exterior hoist system necessary for the Work, unless otherwise specified.
   2. Maintains temporary exterior hoist system operational for the work of all related contracts at all times Work is being performed.
      a. Provide 14 months of hoist rental including cost of operators for the hoist commencing within 12 weeks of contract award.
      b. Provide all labor necessary to provide operation of the exterior hoist system for 8 hours a day for all work days, Monday - Friday.
   3. Provide and operate any additional hoists, scaffolding, swing staging, lifts or cranes along with any other miscellaneous equipment required to perform the Work.
   4. Provide all labor necessary to provide operation of the exterior hoist system for use by all related contracts for 8 hours a day for all workdays, Monday – Friday during the required 14 month period.
   5. Provide operation for any additional hours and shift work related to the C contract and C contract approved sub-contractors, at no additional cost to the State.
   6. Coordinate hoist availability to execute the Work of all contracts.

B. HVAC Work, Plumbing Work, and Electrical Work Contractors:
   1. Any Work requiring a hoist operator outside of normal working hours as stated above in Subparagraph 1.03 A.$. shall be at the cost of the Contractor performing the Work. Pay the Construction Work Contractor the hourly wage for the hoist operator for the duration of the Work performed outside of normal working hours.
   2. Notify the Construction Work Contractor a minimum of 24 hours in advance when a hoist operator is required for the Work being performed outside of the normal working hours.
   3. Plan the Work accordingly to stage delivery during the day operation provided in the Contract.
   4. Utilize the access landing points, forklift/lull or other means and methods as required.
   5. Provide and operate any additional hoists, scaffolding, swing staging, lifts, or cranes along with any other miscellaneous equipment required to perform the Work.

1.03 SUBMITTALS

A. Waiver of Submittals: The "Waiver of Certain Submittal Requirements" in Section 01330 does not apply to this Section.

B. Submittals Package: Submit the shop drawings, product data, and quality control submittals specified below at the same time as a package.

C. Shop Drawings- NYS PE reviewed and stamped drawings:
   1. Show the construction details of the hoist system and the support structure. Show all raised platforms with railing systems. Show all shoring as required to impose platform loads onto the building structural and foundations. Show all building tie in details.
   2. Provide a site layout drawing to coordinate with loading bays, exterior stairs, and temp electric items. Include temporary lighting provisions.
   3. Show the electric wiring and control system.
   4. Show installation details.

D. Product Data:
   1. Catalog sheets, specifications, and installation instructions.
   2. Name, address, and telephone number of nearest fully equipped service organization.

E. Quality Control Submittals:
   1. Design data, including safety factor of materials.
   2. Test report of hoist and crane system.
   3. Certificate required under Quality Assurance.

F. Contract Closeout Submittals:
   1. Operation and maintenance data.
   2. Warranty.
   3. Test reports of the completed hoist system.

1.04 QUALITY ASSURANCE

A. Company Field Advisor: Secure the services of a Company Field Advisor for a minimum of 24 hours for the following:
   1. Render advice regarding installation of the hoist system.
   2. Witness final system test and then certify with an affidavit that the hoist system is installed in accordance with the contract requirements and is operating properly.
   3. Provide a complete and thorough safety inspection at least once per month or more frequently if required by the local authority and immediately after heavy rains, snow, wind and severe cold. At a minimum inspect all ties, brackets, bracing, connection cables, tower members, hoisting motor, electrical components, safeties, platforms, ramps, doors, etc. Replace nylon rollers on rack & pinion as necessary. Submit a complete written report to the Director's Representative within 3 days after inspection.
   4. Furnish copies of all permits and approvals prior to installation.

PART 2 PRODUCTS

2.01 HOIST SYSTEM

A. Hoist System: The system specified will consist of one temporary construction hoist with ramped platforms that connect the car to the building from the hoist tower and platform supports. Hoist will provide a single car that serves from the exterior grade level to the roof level. Include the following as needed for the operation of this system:
   1. Dual rack & pinion service from 1st floor to the roof.
   2. Common raised platforms for all floors. Provide a continuous apron around the raised platforms. Provide an at grade level platform in order to level the cars to the 1st floor level approximately 10' by 10' in dimension, coordinate the platform with the larger site platform as noted on the site plan.
   3. Include 14 months of rental and operators for the hoist beginning within 12 weeks of contract award.
   4. Include exterior doors and plywood panels located at the building line. Panels to totally enclose openings in a watertight condition. Doors are to swing into the building from the 1st floor to roof level. Access to hoist from the outside shall be at grade and at roof level.
   5. Include operable doors on two sides of car (on each end of the car).
   6. Include all necessary concrete slab/pads, dunnage and buffer springs and temporary power connections.
   7. Provide Floor Identification Signage at each landing. There will be 4 landings, one at each of the following: 1st Floor, 2nd Floor, 3rd Floor, and Roof.
   8. Provide for call buttons at each landing.
   9. Provide temporary protection of existing roof including dunnage which is held down and will not blow off roof during windy conditions.
   10. Provide 12" of type 2 stone with filter fabric at base of tower. Compact to 95% compaction.

2.02 DESIGN REQUIREMENTS

A. System Requirements:
   1. Minimum Capacity: 6000#.
   2. Size: Inside clear dimensions at gates/doors to allow materials to pass are: 12'-2" length X 7'-0" high X 4'-11" wide.
   3. Temporary Electrical Requirements: 208V/480V, 3 Phase. All wiring will provided by the Contractor as necessary to complete the work. Electrical usage charges will be paid for by the State. Tie into the temporary power near the main entrance of the building, location as noted on drawings. Electrical connection to temporary power must be performed by a licensed electrician.

B. Hoist: Electric wire rope hoist as manufactured by Alimak or Champion, with all parts and accessories necessary to meet the following requirements:
   1. Minimum Lifting Capacity: 6000#.
   2. Lifting Speed: 0 to 300 feet per minute.
   3. Electrical: 480 Volt/3 Phase/100 Amp.
   4. Car Size (inside car dimension): 12'-2" length X 7'-0" high X 4'-11" wide.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install the Work in this Section in accordance with the manufacturer's printed installation instructions, shop drawings, and directions of the Company Field Advisor.

B. Rack & pinion **car** to include brackets or carriage system for traveling to maintain cable during high winds.

C. Provide all supplemental steel and supports as required at the hoist tower and platforms as needed to provide the designed building tie in reaction. Refer to Specification Section 028213 for abatement at building exterior tie in points.

D. Provide all necessary toe boards, guard rails, handrails, and screening on common platforms and ramps. Include screening of machines, kickers, and tie downs. All enclosures are to meet any and all safety requirements of OSHA, the State of New York, and the City of Albany.

E. Common platforms and ramps to extend to the building line from the car. Ramps shall be installed so that it does not interfere with Work on each floor. The hoist stop will align with the window sill height at each floor level- provide ramps from the building line to the platform in order that materials can be delivered or removed on a rolling dolly or cart.

F. Provide for snow and ice removal. Provide winterizing of all rack & pinion hoist cars. This will include Plexiglas surrounds at the car. Maintain platforms etc. free from snow and ice.

G. All cables, planks, door lumber and hardware are to be new. Replace all weathered materials as required or directed.

H. Provide wire swing gates on each platform in front of each rack & pinion car. Doors/gates at the building are to be constructed of wood with a vision cutout (1' X 1' min.) with wire mesh screen. Include wire swing gates on each common platform in front of each material hoist.

I. Insure that all protection, cables, bracing, gauges and safety controls conform to all applicable OSHA, NYS and local regulations. Confirm Albany Fire Department approval of cars and make accommodations for AFD use as required for on and off hours.

J. Include all necessary inspections and certifications for hoist system to be operational.

K. Provide plank and weather protection on the tops of the rack & pinion car.

L. Provide for all factor of safety requirements per applicable codes for the design and construction of the hoists.

M. Provide all hoist maintenance and repairs at no additional cost if required. All hoist component parts shall arrive painted and be maintained like new for the duration of the job. Hoists are to be greased weekly and/or after heavy rains whichever is more frequent.

N. Provide for all weather proofing and flashing of all building structural connections for the hoists and platforms for the life of the project.

END OF SECTION

SECTION 220577

FLOOR AND AREA DRAINS

PART 1 GENERAL

1.01 REFERENCES

A. Unless otherwise specified, the Work of this section shall meet the applicable requirements of FS WW-P-541 - Plumbing Fixtures, and ASME A112.21.1M - Floor Drains.

1.02 SUBMITTALS

A. Product Data: Catalog sheets, specifications and installation instructions for each type drain specified.

1.03 MAINTENANCE

A. Special Tools: Deliver to the Director's Representative.
   1. Tools for Vandal Resistant Fasteners: One for each type and size.

PART 2 PRODUCTS

2.01 TYPE A FLOOR DRAIN. FD-A (OGS cleaner's room)

A. Drain Body: Coated cast iron, two-piece body with reversible flashing clamp, minimum 9 inch dia drainage flange, corrosion resistant bolts, weep holes, bottom outlet, and connection to match piping option selected. Provide with trap primer connection.

B. Strainer Head: Square, minimum 7 inch dia, nickel bronze with threaded shank for height adjustment. Square, 5 inch dia, nickel bronze with threaded shank for height adjustment for toilet rooms with trench drains.

C. Strainer Grate: Polished nickel bronze, heel proof; secured with stainless steel vandal resistant fasteners.

D. Acceptable Drain Series: Josam 30000A, Smith 2010A, Wade W1100, and Zurn Z415.

2.02 FLOOR DRAIN FD-H (boiler room, mechanical rooms)

A. Drain Body: Coated cast iron, two-piece body with flashing clamp, minimum 15 inch dia drainage flange, corrosion resistant bolts, weep holes, bottom outlet, and connection to match piping option selected. Provide with trap primer connection.

B. Strainer Head: Round, minimum 12 inch dia, coated cast iron, height adjustable, with loose setting cast iron sediment bucket.

C. Strainer Grate: Cast iron, loose setting, anti-tilt, deep flange grate.
1. Grate cannot be installed until sediment bucket set in position.

D. Acceptable Drain Series: Josam 31220, Smith 2360, Wade W1240TD, and Zurn Z521.

2.03 FASTENERS

A. Corrosion Resistant Fasteners: Brass, bronze, or Type 302 or 304 or stainless steel bolts.

B. Vandal Resistant Fasteners: Torx head with center pin.

2.04 FREE AREA OF GRATE

A. Minimum strainer grate free area listed below for each connecting pipe size:

CONNECTING PIPE SIZE (Inches Nominal)	INTERIOR DRAINS FREE AREA (Square Inches)
1-1/2	3.06
2	4.71
3	10.59
4	18.90
5	29.40
6	42.45
8	75.38

PART 3 EXECUTION

3.01 INSTALLATION

A. Install the Work of this section in accordance with the manufacturer's printed installation instructions, unless otherwise specified.

B. Protect weep holes from plugging during installation. Rod out weep holes after installation to remove obstructions.

C. Set drainage flange flush with top of structural floor slab, or at elevation otherwise indicated.

D. After membrane waterproofing installed and cured, secure clamping ring.

E. Adjust strainer head to height indicated. If height not indicated, set at 1/2 inch below finished floor elevation.

F. Secure external components in place with vandal resistant fasteners or devices which cannot be removed without special tools.

END OF SECTION

SECTION 260519

ELECTRICAL CONNECTIONS TO MODULAR WALLS AND FURNITURE SYSTEMS

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Type 1 Systems Furniture Installation Instructions: Appendix.

B. Type 2 Systems Semi-Private Solid Wall Installation Instructions: Appendix.

1.02 QUALITY ASSURANCE

A. Qualifications: The persons performing the Work of this Section and their supervisor shall be personally experienced in electrical work and shall have been regularly performing such work for a minimum of 3 years.

B. UL Listing: Equipment and materials for which Underwriters' Laboratories, Inc. (UL) provides product listing service shall be listed and bear the listing mark.

C. Underwriter's Certificate: A New York Board of Fire Underwriters inspection or certificate is not required.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.01 INSTALLATION

A. Provide final electrical connections to Type 1 Systems Furniture and Type 2 Semi-Private Office walls furnished by the State and installed by the Construction Work Contractor.

END OF SECTION

JRC:jc

SECTION 260573

OVERCURRENT PROTECTIVE DEVICE SHORT-CIRCUIT STUDY

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section includes a computer-based, fault-current study to determine the minimum interrupting capacity of circuit protective devices.

1.03 ACTION SUBMITTALS

A. Product Data: For computer software program to be used for studies.

B. Other Action Submittals: Submit the following after the approval of system protective devices submittals. Submittals shall be in digital form and shall be submitted prior to approval or procurement of the switchgear, switchboard or the panelboards, so that the breaker trip settings can be coordinated with the result of this study.

1. Short-circuit study input data, including completed computer program input data sheets.
2. Short-circuit study and equipment evaluation report; prepared by a qualified professional engineer.
    a. Submit study report for action prior to receiving final approval of the distribution equipment submittals. If formal completion of studies will cause delay in equipment manufacturing, obtain approval from the Architect for preliminary submittal of sufficient study data to ensure that the selection of trip settings and associated characteristics is satisfactory.
    b. Revised single-line diagram, reflecting results of short-circuit study.

1.04 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Short-Circuit Study Specialist

B. Product Certificates: For short-circuit study software, certifying compliance with IEEE 399.

1.05 QUALITY ASSURANCE

A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with requirements of standards and guides specified in this Section. Manual calculations are unacceptable.

B. Short-Circuit Study Specialist Qualifications: This study shall be performed by qualified engineer, unless required otherwise by the owners. All elements of the study shall be performed under the direct supervision and control of this professional engineer.

C. Field Adjusting Agency Qualifications: An independent agency, with the experience and capability to adjust overcurrent devices and to conduct the testing indicated, that is a member company of the Inter-National Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

D. Comply with IEEE 242 for short-circuit currents and coordination time intervals.

E. Comply with IEEE 399 and IEEE 1584 for general study procedure.

PART 2 - PRODUCTS

2.01 COMPUTER SOFTWARE

A. Software Developers: Subject to compliance with requirements, provide software by the following:
   1. SKM Systems Analysis, Inc.
   2. ESA Inc
   3. Operation Technology, Inc.
   4. Power Analytics, Corporation.

B. Comply with IEEE 399 and IEEE 551.

C. Analytical features of fault-current-study computer software program shall have the capability to calculate mandatory features as listed in IEEE 399.

D. Computer software program shall be capable of plotting and diagramming time-current-characteristic curves as part of its output. Computer software program shall report device settings and ratings of all overcurrent protective devices and shall demonstrate selective coordination by computer-generated, time-current coordinated plots.
   1. Optional Features:
      a. Arcing Faults
      b. Simultaneous Faults

2.02 SHORT-CIRCUIT STUDY REPORT CONTENTS

A. Executive summary.

B. Study descriptions, purpose, basis, and scope. Include case descriptions, definition of terms, and guide for interpretation of the computer printout.

C. One-line diagram, showing the following:
   1. Protective device designations and ampere ratings.
   2. Cable size and lengths.
   3. Transformer kilovolt ampere (kVA) and voltage ratings.
   4. Motor and generator designations and kVA ratings.
   5. Switchboard and panelboard designations.

D. Comments and recommendations for system improvements, where needed.

E. Protective Device Evaluation:

1. Evaluate equipment and protective devices and compare to short-circuit ratings.
2. Tabulations of circuit breaker, fuse, and other protective device ratings versus calculated short-circuit duties.
3. For 600-V overcurrent protective devices, ensure that interrupting ratings are equal to or higher than calculated 1/2-cycle symmetrical fault current.
4. For devices and equipment rated for asymmetrical fault current, apply multiplication factors listed in the standards to 1/2-cycle symmetrical fault current.

F. Short-Circuit Study Input Data: As described in "Power System Data" Article in the Evaluations.

G. Short-Circuit Study Output:
1. Low-Voltage Fault Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:
   a. Voltage.
   b. Calculated fault-current magnitude and angle.
   c. Fault-point X/R ratio.
   d. Equivalent impedance.
2. Momentary Duty Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:
   a. Voltage.
   b. Calculated symmetrical fault-current magnitude and angle.
   c. Fault-point X/R ratio.
   d. Calculated asymmetrical fault currents:
      1) Based on fault-point X/R ratio.
      2) Based on calculated symmetrical value multiplied by 1.6.
      3) Based on calculated symmetrical value multiplied by 2.7.
3. Interrupting Duty Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:
   a. Voltage.
   b. Calculated symmetrical fault-current magnitude and angle.
   c. Fault-point X/R ratio.
   d. No AC Decrement (NACD) ratio.
   e. Equivalent impedance.
   f. Multiplying factors for 2-, 3-, 5- and 8-cycle circuit breakers rated on a symmetrical basis.
   g. Multiplying factors for 2-, 3-, 5- and 8-cycle circuit breakers rated on a total basis.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Obtain all data necessary for the conduct of the study.
1. Verify completeness of data supplied on the one-line diagram. Call any discrepancies to the attention of the Director.
2. For equipment provided under this Project, use characteristics submitted under the provisions of action submittals and information submittals for this Project.

3.02 POWER SYSTEM DATA

A. Gather and tabulate the following input data to support the short-circuit study:
   1. Product Data for Project's overcurrent protective devices involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.
   2. Obtain incoming service/utility impedance at the service entrance
   3. Incoming service's sources and related overcurrent protective devices.
   4. For transformers, include kVA, primary and secondary voltages, connection type, impedance, X/R ratio, taps measured in percent, and phase shift, along with the primary protective devices.
   5. Generator kilovolt amperes, size, voltage and source impedance.
   6. For circuit breakers, provide manufacturer and model designation. List type of breaker, type of trip, SCCR, current rating, and breaker settings.
   7. Panel manufacturer and model designation, current rating, impedance, lengths, and conductor material.
   8. Motor horsepower and NEMA MG 1 code letter designation.
   9. Cable sizes, lengths, number, conductor material and conduit material (magnetic or nonmagnetic).
   10. Special load considerations, including starting inrush currents and frequent starting and stopping.

3.03 SHORT-CIRCUIT STUDY

A. Perform study following the general study procedures contained in IEEE 399.

B. Calculate maximum available short-circuit currents in amperes rms symmetrical at the main switchgear and at each draw out breakers in the switchgear, according to IEEE 551.

C. Base study on the device characteristics supplied by device manufacturer.

D. The extent of the electrical power system to include entire electrical distribution system as shown on the power riser diagram.

E. Begin short-circuit current analysis at the service, extending down to the system overcurrent protective devices as follows:
   1. To normal system low-voltage load buses where fault current is 10 kA or less.
   2. Exclude equipment rated 240-V ac or less when supplied by a single transformer rated less than 125 kVA.

F. Study electrical distribution system from normal and alternate power sources throughout electrical distribution system for Project. Study all cases of system-switching configurations and alternate operations that could result in maximum fault conditions.

G. The calculations shall include the ac fault-current decay from induction motors. The calculations shall also account for the fault-current dc decrement, to address the asymmetrical requirements of the interrupting equipment.
   1. For grounded systems, provide a bolted line-to-ground fault-current study for areas as defined for the three-phase bolted fault short-circuit study.

H. Calculate short-circuit momentary and interrupting duties for a three-phase bolted fault at each of the following:
   1. Electric power supply termination point.
   2. Main switchgear and switchboards.
   3. All branch circuit panelboards.
   4. Disconnect switches.

3.04 COORDINATION STUDY

A. Perform coordination study using approved computer software program. Prepare a written report using results of fault-current study. Comply with IEEE 399.
   1. Calculate the maximum and minimum 1/2-cycle short-circuit currents.
   2. Calculate the maximum and minimum ground-fault currents.

B. Comply with IEEE 242 recommendations for fault currents and time intervals.

C. Transformer Primary Overcurrent Protective Devices:
   1. Device shall not operate in response to the following:
      a. Inrush current when first energized.
      b. Self-cooled, full-load current or forced-air-cooled, full-load current, whichever is specified for that transformer.
      c. Permissible transformer overloads according to IEEE C57.96 if required by unusual loading or emergency conditions.
   2. Device settings shall protect transformers according to IEEE C57.12.00, for fault currents.

D. Conductor Protection: Protect cables against damage from fault currents according to ICEA P-32-382, ICEA P-45-482, and conductor melting curves in IEEE 242. Demonstrate that equipment withstands the maximum short-circuit current for a time equivalent to the tripping time of the primary relay protection or total clearing time of the fuse. To determine temperatures that damage insulation, use curves from cable manufacturers or from listed standards indicating conductor size and short-circuit current.

E. Coordination-Study Report: Prepare a written report indicating the following results of coordination study:
   1. Tabular Format of Settings Selected for Overcurrent Protective Devices:
      a. Device tag.
      b. Relay-current transformer ratios; and tap, time-dial, and instantaneous-pickup values.
      c. Circuit-breaker sensor rating; and long-time, short-time, and instantaneous settings.
      d. Ground-fault relay-pickup and time-delay settings.
   2. Coordination Curves: Prepared to determine settings of overcurrent protective devices to achieve selective coordination. Graphically illustrate that adequate time separation exists between devices installed in series, including power utility company's upstream devices. Prepare separate sets of curves for the switching schemes and for emergency periods where the power source is local generation. Show the following information:
      a. Device tag.
      b. Voltage and current ratio for curves.
      c. Three-phase and single-phase damage points for each transformer.

d. No damage, melting, and clearing curves for fuses.
e. Cable damage curves.
f. Transformer inrush points.
g. Maximum fault-current cutoff point.

F. Completed data sheets for setting of overcurrent protective devices.

3.05 ARC FLASH HAZARD ANALYSIS

A. The arch flash hazard analysis shall be performed according to the IEEE 1584 equations that are presented in NFPA 70E, Annex D.

B. The flash protection boundary and the incident energy shall be calculated at all significant locations in the entire electrical power distribution system (main switchgear, switchboards, panelboards, and major electrical equipment etc.) where work could be performed on energized parts.

C. The Arc-Flash Hazard Analysis shall also include all significant locations in 208 volt power distribution systems fed from transformers equal or greater than 30 KVA where work could be performed on energized parts.

D. Safe working distances shall be based upon the calculated arc flash boundary considering an incident energy of 1.2 cal/sq. cm.

E. When appropriate, the short-circuit calculations and the clearing times of the phase overcurrent devices will be retrieved from the short-circuit and coordination study model. Ground overcurrent relays should not be taken into consideration when determining the clearing time when performing incident energy calculations.

F. The short-circuit calculations and corresponding incident energy calculations for multiple system scenarios must be compared and the greatest incident energy must be uniquely reported for each equipment location. Calculations must be performed to represent the maximum and minimum contributions of fault current magnitude for all normal and emergency operating conditions. The minimum calculation will assume a minimum motor contribution (all motor off). Conversely, the maximum calculation will assume a maximum contribution from the utility and will assume the maximum amount of motors to be operating. Calculations shall take into consideration the operation of generator with the electric utility, where applicable.

G. The incident energy calculations must consider the accumulation of energy overtime when performing arc flash calculations on buses with multiple sources. Iterative calculations must take into account the changing current contributions, as the sources are interrupted or decremented with time. Fault contribution from motors and generators decremented as follows:
1. Fault contribution from induction motors should not be considered beyond 3-5 cycles.
2. Fault contribution from synchronous motors and generators should be decayed to match the actual decrement of each as closely as possible.

H. For each equipment location with a sparsely enclosed main device (where there is adequate separation between the line side terminals of the main protective device and the

work location), calculations for incident energy and flash protection boundary shall include both the line and load side of the main breaker.

I. When performing incident energy calculations on the line side of a main breaker (as required per above), the line side and load side contributions must be included in the fault calculation.

J. Mis-coordination should be checked amongst all devices within the branch containing the immediate protective device upstream of the calculation location and the calculation should utilize the fastest device to compute the incident energy for the corresponding location.

K. Arc Flash calculations shall be based on actual overcurrent protective device clearing time. Maximum clearing time will be capped at 2 seconds based on IEEE 1584. Where it is not physically possible to move outside of the flash protection boundary in less than 2 seconds during an arc flash event, a maximum clearing time based on the specific location shall be utilized.

L. Incident energy and flash protection boundary calculations shall include:
1. Arcing fault magnitude
2. Protective device clearing time
3. Duration of arc
4. Arc flash boundary
5. Working distance
6. Incident energy
7. Hazard Risk Category
8. Recommendations for arc flash energy reduction

3.06 ARC FLASH WARNING LABELS

A. The contractor of the arc flash hazard analysis shall provide a 3.5 in. x 5 in. thermal transfer type label of high adhesion polyester for each work location analyzed.

B. All labels will be based on recommended overcurrent device settings and will be provided after the results of the analysis have been presented to the owner and after any system changes, upgrades or modifications have been incorporated in the system.

C. The label shall include the following information, at a minimum:
1. Location designation
2. Nominal voltage
3. Flash protection boundary
4. Hazard risk category
5. Incident energy
6. Working distance
7. Engineering report number, revision number and issue date.

D. Labels shall be machined printed, with no field markings.

E. Arc flash labels shall be provided in the following manner and all labels shall be based on recommended overcurrent device settings.
1. For each 480 and 208 volt panelboard, arc flash label shall be provided.

2. For each main switchboard arc flash label shall be provided.
3. For each main switchgear arc flash label shall be provided

F. Labels shall be field installed by the engineering service division of the equipment manufacturer under the startup and acceptance testing contract portion

3.07 ADJUSTING

A. Make necessary field modifications and adjust the trip settings of all the breakers in the switchboard, based on the results of the short circuit protection and coordination study, so that the entire system provides a well coordinated fault protection.

END OF SECTION

SECTION 261315

SEQUENCE OF OPERATION FOR ELECTRICAL EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes control sequences and acceptance testing criteria for the 15 kV and 480/277 Volt electrical systems, which are composed of the following sub-systems, as identified under the single-line diagram on the contract documents:
   1. 13.2 kV Main Sub-Station/Switchgear (13.2 kV SWGR)
   2. Two 480/277 V Main Switchgear Lineups
   3. 500 kW Diesel Fired Generator
   4. Related Sections include the following:
   5. Section 261313 "Load Center-Unit Substation"

B. System Description: The following sequence of operations shall be implemented and designed by the Medium Voltage Switchgear manufacturer via PLC based control and HMI screens located in the Switchgear. Both the Medium Voltage and Low Voltage Switchgear line-ups (assembly) shall be provided by the same manufacturer and have a fully integrated control system. In general, the control system shall accommodate the following functionality:
   1. Automatic source transfer at the 13.2 kV and 480/277 V level.
   2. Load shedding capability on all 480/277 V feeder breakers.
   3. Bus isolation for maintenance purposes.
   4. Remote operation and monitoring of all circuit breakers.

1.03 DEFINITIONS AND ABBREVIATIONS

A. CB: Circuit Breaker

B. HMI: Human Machine Interface.

C. Loss of Voltage: Voltage level below an adjustable minimum level (50% to 100% Nominal Voltage) for an adjustable time period.

D. MOC: Mechanism Operated Contacts used to indicate circuit breaker position.

E. MOC-a = contact open when breaker open, MOC-b = contact closed when breaker open.

F. Normal Power: Served by the utility (campus) power source, but with standby generator backup.

G. Operator: the control system user.

H. Overvoltage: Voltage level above an adjustable minimum level (100% to 120% Nominal Voltage) for an adjustable time period.

I. PLC: Programmable Logic Controller

J. PT: Potential Transformer

K. System Control Screen: The control screen currently being accessed by the Operator, either an HMI screen at the switchgear, or a PC screen in the Central Plant control room.

L. Stable Voltage: Voltage level above an adjustable minimum level for an adjustable time period.

M. Switchgear Control System: The system of PLC's, input/output devices, communication devices, etc. used to control 13.2 kV Switchgear and 480/277 Switchgear Sections.

N. Truck Operated Contacts (TOC) used to indicate breaker racked-in status. TOC-a contact closed, when breaker is racked in, TOC-b contact open, when breaker is racked in.

O. Breaker Designations listed below are for generic references only and refers to the position of the circuit breakers:
   1. M1: Main Circuit Breaker in 13.2 kV SWGR – Utility or Incoming Feeder A (E-1 side)
   2. M2: Main Circuit Breaker in 13.2 kV SWGR – Utility or Incoming Feeder B (E-1 side)
   3. M3: Main Circuit Breaker in 13.2 kV SWGR – Utility or Incoming Feeder A (E-2 side)
   4. M4: Main Circuit Breaker in 13.2 kV SWGR – Utility or Incoming Feeder B (E-2 side)
   5. LT1: Circuit Breaker in 480/277 V SWGR connecting to 480/277 V distribution sections (E-1 side)
   6. LT2: Circuit Breaker in 480/277 V SWGR connecting to 480/277 V distribution sections (E-2 side)

7. T1: Tie Circuit Breaker connecting the E-1 and E-2 side of the 480/277 V SWGR

P. Utility Designations:
1. Utility 1: Incoming Feeder A
2. Utility 2: Incoming Feeder B

Q. Initial Circuit Breaker Positions:
1. M1: Closed (Feeder A Powered Breaker – E1 side)
2. M2: Open (Feeder B Powered Breaker – E1 side)
3. M3: Closed (Feeder A Powered Breaker – E2 side)
4. M4: Open (Feeder B Powered Breaker – E2 side)
5. LT1: Closed (Transformer E-1 Side Powered)
6. LT2: Closed (Transformer E-2 Side Powered)
7. T1: Open (Tie Breaker)

R. Initial Bus Conditions:
1. 13.2 kV SWGR 1 Bus 1: E-1 side Energized
2. 13.2 kV SWGR 1 Bus 2: E-2 side Energized
3. 480/277 V SWGR (E-1) Bus1: E-1 side Energized
4. 480V/277 V SWGR (E-2) Bus2: E-2 side Energized

S. Utility 1 or Power Source Feeder A Side failure
1. When the utility/power source from Feeder A side voltage or frequency falls out of tolerance as detected by the PLC from the line PTs in the 13.2 kV SWGR, the Utility Failure timer in the PLC starts. When this timer expires, the building loads shall automatically transfer to the alternate utility or power source Feeder B side.
2. Refer to other paragraph for initial Bus and Circuit Breaker conditions.
3. Sequence: Utility out of tolerance.
4. Utility Failure timer starts.
5. If the utility returns before timer expires, system remains in initial state. Timer will be adjustable and initially set at 3 seconds.
6. Utility Failure timer expires.
   a. M1 and M3 Main Breakers shall open and M2 and M4 shall close.
   b. If M1and/or M3 fails to open: Initiate Bus Failure sequence.
   c. The remainder Breakers of the system shall remain as is,
7. Final Bus and Circuit Breaker Conditions/Position:
   a. M1: Open
   b. M2: Closed
   c. M3: Open
   d. M4: Closed
   e. T1: Open
   f. LT1: Closed
   g. LT2: Closed

8. Final Bus Conditions:
   a. 13.2 kV SWGR E1 side Bus : Energized
   b. 13.2 kV SWGR E2 side Bus : Energized
   c. 480/277 V SWGR E1 side Bus: Energized
   d. 480/277 V SWGR E2 side Bus : Energized

T. Utility 2 or Power Source Feeder B Side failure
   1. When the utility power source from Feeder B side voltage or frequency falls out of tolerance as detected by the PLC from the line PTs in the 13.2 kV SWGR, the Utility Failure timer in the PLC starts. When this timer expires, the building loads shall automatically transfer to the alternate utility or power source Feeder A side.
   2. Refer to other paragraph for initial Bus and Circuit Breaker conditions.
   3. Sequence: Utility out of tolerance.
   4. Utility Failure timer starts.
   5. If the utility returns before timer expires, system remains in initial state.
      a. Timer will be adjustable and initially set at 3 seconds.
   6. Utility Failure timer expires.
      a. M2 and M4 Main Breakers shall open and M1 and M3 shall close.
      b. T1 Breaker shall open.
   7. If M1 and/or M3 breakers fail to Open: initiate Bus failure sequence:
      a. The remainder Breakers of the system shall remain as is,
      b. Final Bus and Circuit Breaker Conditions/Position:
         1) M2: Closed
         2) M1: Open
         3) M4: Closed
         4) M3: Open
         5) T1: Open
         6) LT1: Closed
         7) LT2: Closed
   8. Final Bus Conditions:
      a. 13.2 kV SWGR E1 side Bus : Energized
      b. 13.2 kV SWGR E2 side Bus : Energized
      c. 480/277 V SWGR E1 side Bus: Energized
      d. 480/277 V SWGR E2 side Bus: Energized

U. Utility 1 & 2 (Power Source Feeders A And B Side) failure
   1. When both the power source feeders A and B utility voltage or frequency falls out of tolerance as detected by the PLC from the line PTs in the 13.2 kV SWGR, the Utilities Failure timer in the PLC starts. When this timer expires, the building loads shall automatically transfer to the GEN power.
   2. Refer to other section for initial Bus and Circuit Breaker conditions.
   3. Sequence: Utility out of tolerance.
   4. Utility Failure timer starts.
   5. If the utility returns before timer expires, system remains in initial state.
   6. Timer will be adjustable and initially set at 3 seconds.
   7. Utility Failure timer expires for both Utility 1 and Utility 2.

a. M1, M2, M3, M4 shall open.
b. LM1and LM2 circuit breakers shall remain close.
c. Tie breaker T1 shall close:

8. Final Bus and Circuit Breaker Conditions/Position:
a. M1: Open
b. M2: Open
c. M3: Open
d. M4: Open
e. T1: Closed
f. LT1: Closed
g. LT2: Closed

9. Final Bus Conditions:
a. 13.2 kV SWGR 1 E1 side Bus 1: De-energized
b. 13.2 kV SWGR 1 E2 side Bus 2: De-energized
c. 480/277 V (E-1 side) SWGR Bus: Energized and shall only feed the selected Emergency and essential load from the generator power
d. 480/277 V SWGR (E-2 side) Bus: Energized and shall only feed the selected Emergency and essential load from the generator power

1.04 RETURN OF UTILITY 1

A. When the power source from only Feeder A side utility voltage and frequency return within tolerance, the Utility 1 power source Stable timer in the PLC starts if the Return Control switch is in Auto. When the timer expires, the 13.2 KV Bus loads shall automatically transfer from the generator power back to the Utility 1 power.

B. Refer to other paragraph for initial Bus and Circuit Breaker conditions.

C. Sequence: Utility is within tolerance as monitored from the Line PTs in the 13.2 kV SWGR.
1. Utility Stable timer starts.
2. If utility is lost before timer expires, system remains on generator power.
3. Utility Stable timer expires.
4. Tie Breaker T1 Opens
5. Generator power shall get disconnected
6. Live/Live Transfer timer starts.
7. Live/Live Transfer timer expires.
8. Main breaker M1 and M3 closes, and M2 and M4 remain open.

D. If circuit breaker M1 and M3 fails to close and Feeder B is not available, then Tie breaker T1 shall close.
1. The facility operates on the alternate utility power source or generator power.
2. Generator shall start after synchronization with the utility power source.
3. Main Breakers M2 and M4 shall remain open.

4. Refer to other paragraph for final Bus and Circuit Breaker conditions.

1.05 RETURN OF UTILITY 2

A. When the power source from only Feeder B side utility voltage and frequency return within tolerance, the Utility 2 power source Stable timer in the PLC starts if the Return Control switch is in Auto. When the timer expires, the 13.2 KV Bus loads shall automatically transfer from the generator power back to the Utility 2 power.

B. Refer to Section 1.06 – D for initial Bus and Circuit Breaker conditions.

C. Sequence: Utility is within tolerance as monitored from the Line PTs in the 13.2 KV SWGR.
   1. Utility Stable timer starts.
   2. If utility is lost before timer expires, system remains on generator power.
   3. Utility Stable timer expires.
   4. Tie Breaker T1 Opens
   5. Generator power shall get disconnected
   6. Live/Live Transfer timer starts
   7. Live/Live Transfer timer expires
   8. Main breaker M2 and M4 closes, and M1 and M3 remain open.

D. If circuit breaker M2 and M4 fails to close, and Feeder A is not available, then close tie breaker T1.
   1. Generator shall start after synchronization with utility power source.
   2. Main Breakers M1 and M3 shall remain open

E. Refer to other paragraph for final Bus and Circuit Breaker conditions.

1.06 RETURN OF BOTH UTILITY 1 & 2 POWER SOURCES

A. When both the power source from Feeders A and B side utility voltage and frequency return within tolerance, the Utilities Stable timer in the PLC starts if the Return Control switch is in Auto. When the timer expires, the building loads shall automatically transfer to the Primary or Feeder A side Utility power. When the closed transition method is utilized for the power transfer there will be not be any loss of power to the facility loads during the transfer time delay.

B. Refer to other paragraph for initial Bus and Circuit Breaker conditions.

C. Sequence: Utility is within tolerance as monitored from the Line PTs in the 13.2 KV SWGR.
   1. Utility Stable timer starts.
   2. If utility is lost before timer expires, system remains on generator power.

3. Utility Stable timer expires.
4. Generator shall get disconnected:
5. Circuit Breakers M1 & M3 shall close, while Breakers M2 and M4 shall remain open and Tie breaker T1 shall Open

D. If circuit breakers M1 and M3 fail to close, then Breakers M2 and M4 shall close and serve the building, while Breakers M1 and M3 shall remain open and again Tie breakers T1 shall Open. The facility operates on the utility power source.

E. Refer to other paragraph for final Bus and Circuit Breaker conditions.

1.07 MAINTENANCE MODE

A. Maintenance mode shall allow the user to indicate which bus is to be maintained and isolate power to this bus accordingly.

B. Refer to other paragraph for initial Bus and Circuit Breaker conditions.

C. Sequence: Maintenance mode -13.2 KV SWGR E1 side Bus :
1. Service is initiated by pressing E1 side Bus Maintenance start button on the HMI.
2. Sequence: E1 side Bus Maintenance Mode:
3. Open M1 and M3 Main breakers.
4. Close M2 and M4 Main breakers and feed the building
5. Tie breaker T1 shall remain open
6. LT1 Circuit breaker shall remain close.
7. If E1 side Bus breaker in maintenance mode fail to operate, Maintenance sequence shall be aborted.

D. Once the maintenance procedure is completed, press the system resume button on the HMI to restore normal operating conditions as follows:
1. Close M1 and M3 Main breakers.
2. Open M2 and M4 Main breakers.
3. Open Tie breaker T1

E. Sequence: Maintenance Mode -13.2 kV SWGR E2 side Bus :
1. Service is initiated by pressing E2 side Bus Maintenance start button on the HMI.
2. Sequence: E2 side Bus Maintenance Mode:
3. Close M2 and M4 Main breakers.
4. Open M1 and M3 Main breakers and feed the building
5. If E2 side Bus breaker- in maintenance mode fail to operate, Maintenance sequence shall be aborted.

F. Once the maintenance procedure is completed, press the system resume button on the HMI to restore normal operating conditions as follows:
   1. Open M1 and M3 Main breakers.
   2. Close M2 and M4 Main breakers.

G. E1 Side BUS or E2 side Bus FAILURE MODE
   1. Failure sequence shall be in response to breaker operation failure on any 13.2 KV main E1 or E2 side Bus circuit breaker. The time for the respective side Bus failure mode shall be set by the manufacturer. The PLC will attempt to close a breaker several times and if this fails to happen, failure mode will be initiated. In addition, this sequence shall initiate for any operation device trip on 13.2 KV Bus 1, contingent on utility availability.

1.08 MANUAL MODE

A. An Auto-Manual control switch shall be added to the HMI interface to allow for manual remote operation of all circuit breakers. When the system is in "Manual", no automatic breaker operations shall occur and a visible indicator on the HMI screen shall indicate that the system is "Not in Auto".

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 261330

LOAD CENTER UNIT SUBSTATION

PART 1 GENERAL

1.01 REFERENCES

A. NEMA, ANSI/IEEE, UL.

1.02 SUBMITTALS

A. Waiver of Submittals: The "Waiver of Certain Submittal Requirements" in Section 013300 does not apply to this Section.

B. Submittals Package: Submit the product data, shop drawings, and quality control submittals (except transformer certified test report required for final approval) specified below all at the same time as a package.

C. Manufacturer Seismic Qualification Certification: Submit certification that completely assembled load center unit substation will withstand seismic forces for Zone 2A requirements... Indicate if the withstand certification is based on actual test of assembled components or on calculation.
   1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

D. Shop Drawings; include:
   1. Front and plan view with overall dimensions.
   2. Details showing type of construction and available conduit space.
   3. High voltage section cubicle enumeration.
   4. For the low voltage section:
      a. Voltage rating and continuous current rating of the through bus and distribution sections.
      b. Voltage rating, continuous current rating, and thermal rating of the horizontal and vertical bus.
      c. Short-circuit current rating.
      d. Enumeration of each circuit breaker including frame size, ATE, number of poles, and interrupting capacity.
      e. A statement indicating if the low voltage section will, or will not, bear a UL label. If a section cannot bear a UL label, state the specific reasons why it is not qualified to bear the UL label.
   5. Wiring and schematic diagrams.
   6. A coordinated selective scheme based on a complete short circuit and coordination study, between the high voltage power fuses, main breaker and feeder breakers so that under fault conditions the feeder device clears the fault in a most efficient manner while the main device remains closed.

E. Product Data:
   1. Catalog sheets, specifications and installation instructions.
      a. For circuit breakers equipped with ground fault protection, include information sheets describing system testing instructions and a test form.
   2. Proof that enclosure integrity and finish meets latest ANSI C57.12.28, or C57.12.29 (as specified).
   3. Bill of materials.
   4. Name, address, and telephone number of nearest fully equipped service organization.

F. Quality Control Submittals:
   1. Transformer Certified Test Reports:
      a. Preliminary Data: Submit certified report of the Company's standard tests for the transformer. Test report format shall be NEMA "Transformer Test Report".
      b. Final Approval: After approval of preliminary data and after construction of transformer, make routine commercial ANSI/IEEE tests at the factory on the actual transformer and submit certified test report. Test report format shall be NEMA "Transformer Test Report".
   2. Company Field Advisor Data: Include:
      a. Name, business address and telephone number of Company Field Advisor secured for the required services.
      b. Certified statement from the Company listing the qualifications of the Company Field Advisor.
      c. Services and each product for which authorization is given by the Company listed specifically for this project.

G Contract Closeout Submittals:
   1. Test Report: System acceptance test report.
   2. Certificate: Affidavit, signed by the Company Field Advisor and notarized, certifying that the system meets the Contract requirements and is operating properly.
   3. Operation and Maintenance Data: Deliver two copies, covering the installed products to the Director's Representative. Include name, address and telephone number of nearest fully equipped service organization.
   4. Photographs:
      a. After completion of the work take color photographs of the completed Work of this Section, as follows:
         1) 3 of the load center unit substation from different positions.
         2) 1 overall view of load center unit substation.
         3) Nameplate(s)
      b. Use a digital camera. Use wide angle lens for overall view. Use electronic flash capable of supplying sufficient light to evenly illuminate the overall subject.
      c. Minimum digital requirements:
         1) Format shall be .jpg or .tif
         2) The resolution shall be 12 Megapixels or greater.

d. Submit photographs to electronic submittal website for approval and record.

1.03 QUALITY ASSURANCE

A. Equipment Qualifications For Products Other Than Those Specified:

1. Prior to bidding, inquire with the Director, whether or not the permission will be granted for substituted product. If permission is granted, then at the time of submission, provide written notice to the Director of the intent to propose an "or equal" for products other than those specified. Make the "or equal" submission in a timely manner to allow the Director sufficient time to review the proposed product, perform inspections and witness test demonstrations.
2. If products other than those specified are proposed for use furnish the name, address, and telephone numbers of at least 5 comparable installations that can prove the proposed products have performed satisfactorily for 3 years. Certify in writing that the owners of the 5 comparable installations will allow inspection of their installation by the Director's Representative and the Company Field Advisor.
    a. Make arrangements with the owners of 2 installations (selected by the Director) for inspection of the installations by the Director's Representative. Also obtain the services of the Company Field Advisor for the proposed products to be present. Notify the Director a minimum of 3 weeks prior to the availability of the installations for the inspection, and provide at least one alternative date for each inspection.
    b. Only references from the actual owner or owner's representative (Security Supervisor, Maintenance Supervisor, etc.) will be accepted. References from dealers, system installers or others, who are not the actual owners of the proposed products, are not acceptable.
        1) Verify the accuracy of all references submitted prior to submission and certify in writing that the accuracy of the information has been confirmed.
3. The product manufacturer shall have test facilities available that can demonstrate that the proposed products meet the contract requirements.
    a. Make arrangements with the test facility for the Director's Representative to witness test demonstrations. Also obtain the services of the Company Field Advisor for the proposed product to be present at the test facility. Notify the Director a minimum of 3 weeks prior to the availability of the test facility, and provide at least one alternative date for the testing.
4. Provide written certification from the manufacturer that the proposed products comply with all the technical aspects of the project, and is totally compatible for use with all other equipment proposed for use for this system and meet any and all the contract requirements.

B. Company Field Advisor: Secure the services of a Company Field Advisor for a minimum of 16 working hours for the following:

1. Render advice regarding the load center unit substation installation, and final adjustment and testing of the load center unit substation devices, including related control and programming systems.
2. Witness final system test and then certify with an affidavit that the load center unit substation is installed in accordance with the contract documents and is operating properly.
3. Train facility personnel on the operation and maintenance of the load center unit substation devices (minimum of four (4) four sessions).
4. Explain available service programs to facility supervisory personnel for their consideration.

C. Service Availability: A fully equipped service organization shall be available to service the completed Work.

1.04 DELIVERY, STORAGE AND HANDLING

A. Protection: Provide supplemental heating devices, such as incandescent lamps or low wattage heaters within the enclosure or under a protective cover to control dampness. Maintain this protection from the time equipment is delivered to the site until it is energized.

PART 2 PRODUCTS

2.01 GENERAL

A. The complete double-ended Indoor Unit Substation/switchgear assembly shall be manufactured by either Eaton, Square D, S & C Electric Co. or General Electric and each end (side) shall consist of the following:
1. Medium voltage (15 KV) rated vacuum breakers. Two breakers on each side of the main switchgear
   a. Separate breaker for each of the two (2) incoming feeders
2. Step down Transformers - one for each of the single set of incoming service feeders
3. Low voltage switchgear in compliance with UL 1558
   a. Switchgear shall be connected via a separate section containing a tie-in breaker.

B. Number of Cubicles:
1. Determine from the manufacturer, the exact number of cubicles required to feed all the major loads that carry out all the functions of the substation.
2. The number of cubicles indicated on the drawings is the minimum number to be provided.
3. Provide additional cubicles as indicated on the drawings or at least 25% spares and/or spaces, whichever is greater.

C. Indoor type enclosures (general purpose, ventilated).
1. Arrange equipment per the drawings and electrical plan view.
2. The manufacturer shall provide all power conductors to connect the primary to the transformer and the transformer to the switchgear

3. The entire sub-station including all internal equipment such as switches, transformers, main and feeder breakers, control devices, etc. shall be provided by the same manufacturer and said manufacturer shall have a Service Organization offering 24/7 emergency response and Startup and Commissioning to the jobsite..

2.02 HIGH VOLTAGE SECTION

A. Draw out power circuit breakers shall be equal to Eaton, Square D, S & C Electric Co. or General Electric Co.
   1. Individually mounted, Quick-make, quick-break, stored energy, vacuum breaker operating mechanism.
   2. Breaker assembly ratings of 15 KV and 95KV BIL.
   3. Continuous current rating 1200A, 25kA Short time 2 Second rating and momentary rating (10 cycle) minimum of 40 kA (asym).
   4. Doors allowing access to power circuit breakers key interlocked to prevent:
      a. Opening the door if the interrupter power circuit breaker is closed.
      b. Closing the interrupter power circuit breaker if the door is open.
   5. Key interlocks, flush mounted in the doors. Padlock type key interlocks not acceptable.
   6. Power circuit breaker operating mechanisms mechanically interlocked, to prevent the door of the enclosure from being opened while the vacuum breaker is in the closed position.
   7. Door interlock to prevent the power circuit breaker from being closed while the door of the enclosure is open.
   8. Momentary rating of ground studs equal or greater than the short circuit rating of the breaker.
      a. Ground studs at ground pads in bus compartments.
   9. Bolted inner barrier panels or sections, which require special procedure to gain access to exposed live parts.
   10. Steel compartmented base spacer to match enclosure, of height required to provide adequate space for cable terminations.
   11. Designed and built to meet or exceed ANSI C37.20.2, and UL listed.
   12. Electrical interlocking between power circuit breaker mechanisms supplied by 2 primary feeders, so that only one power circuit breaker can be in the closed position, unless through the closed transition.
   13. Motorized operation of power circuit breaker mechanism to both the open and closed positions.
      a. Power circuit breaker shall be able to be manually operated without the use of any electrical circuitry.
   14. Transfer control system integrating motor operators, sensing relays, instrument transformers and control components to interface with the PLC system
   15. Provide controller and panel to allow monitoring and control of power circuit breaker. Mount Graphic User Interface (GUI) panel on the switchgear, while PLC would be inside, unless instructed otherwise by the director. Include all required control and monitoring devices and cables. Obtain control power from the low-voltage transformer provided

inside the switchgear. Provide back-up power via adequately sized battery system or UPS system for the PLC power.

16. Instrument Transformers
    a. Current transformers: Each breaker compartment shall have provision for front-accessible mounting of up to four current transformers per phase* (ANSI standard relay accuracy), two on bus side and two on cable side of circuit breaker. The current transformer assembly shall be insulated for the full voltage rating of the switchgear. The current transformers wiring shall be Type SIS #12 AWG. Relaying and metering accuracy shall conform to ANSI Standards.
    b. Voltage transformers are draw out mounted with primary current-limiting fuses and shall have ratio as indicated. The transformers shall have mechanical rating equal to the momentary rating of the circuit breakers and shall have metering accuracy per ANSI Standards.
    * High accuracy and/or ratios below 150:5, two per phase.
17. Communications software and Ethernet port to allow controller to be monitored by any networked CPU.
18. Listed for use as service entrance equipment in accordance with the NEC guidelines.
19. Equip the main switchgear with draw out breaker-trolley-lifts at top of the enclosure along with related accessories and components.
20. The circuit breaker control voltage shall be: 120 volts ac - provide one capacitor trip unit for each circuit breaker when ac control power is required.

B. Protective Relays
1. The Protection and Control Unit shall contain all the necessary protection functions for the specific application. The protective relays shall be approved equal to SEL Model 751A or Square D or Eaton or General Electric.
    a. Substation/Feeder protection: (50/51) Three Phase overcurrent, (50N/51N) Ground fault (or neutral) with selectable second harmonic restraint, (46) Unbalance / negative sequence overcurrent, and (79) Recloser (4 steps);
    b. Transformer protection: (50/51) Three Phase overcurrent, (50N/51N) Ground fault (or neutral) with selectable second harmonic restraint, (46) Unbalance / negative sequence overcurrent, (49 RMS) thermal overload, (49/63)Thermostat / Buchholz (gas detection/pressure), and optional (49)Temperature (RTD) monitoring;;
    c. Voltage network protection (busbar): (27D/47) Positive sequence undervoltage, (27R) Remnant undervoltage, (27) Phase to Phase undervoltage, (27S) Phase to Neutral undervoltage, (59) Phase-to-Phase overvoltage, (59N) neutral voltage displacement, (81H) Over frequency, (81L) Under frequency.
    d. Loss of mains protection (busbar): same voltage and frequency elements as Voltage network protection (busbar) plus (81R) Rate of Change of frequency

2. Each overcurrent protection device shall have a wide range of time overcurrent protection curve settings, providing a choice of curve types:
   a. IEEE Moderately/Very/Extremely Inverse time;
   b. IEC Standard (SIT))/Very (VIT)/Long Time(LTI)/Extremely (EIT) Inverse Time;
   c. IAC Inverse(I)/ Very Inverse (VI)/ Extremely Inverse (EI) time;
   d. Standard (SIT)/Very (VIT)/Long Time (LTI)/Extremely (EIT) /Rapid (RI) Inverse time.
   e. Ultra-Inverse Time (UIT) – for better fuse co-ordination; and
3. Definite time (DT) with time delay settings from Instantaneous (50 ms) to 300 s. Overload protection shall use true RMS current value (up to a minimum 13th harmonic) and will compensate for changes in ambient temperature (optional). Alternative overload setting groups will be selectable by logical conditions to adapt operating mode change. Adjustment of the overload tripping curves will be possible to exactly fit the motor characteristics.
4. Overcurrent setting shall be made by the direct input of actual primary current values.
5. Phase overcurrent and ground fault protection shall have an adjustable timer hold (time delay reset) to allow recurring faults detection. The protection shall also allow a current-dependent time reset to emulate e/m relays.
6. Ground fault protection shall integrate a second harmonic restraint, which can be inhibited or activated via software.
7. The unit shall allow for the use of zone-selective protection via logic I/O and settings.
8. The relay shall allow fast change in protection scheme: 2 groups of 50/51 and 50N/51N settings shall be available with provision for shifting from one group of settings to the other by a digital input, UMI, and communications.

2.02 TRANSFORMER SECTION

A. Each transformer section shall be part of the overall main switchgear assembly and shall be manufactured by either Eaton, or Square D or ABB Power T & D Company or General Electric Co.:
   1. Low Voltage Rating: 480/277 volts, 3 phase wye, 60 Hz, insulation class 1.2KV, 10KV BIL.
   2. High Voltage Rating: 13,800 volts, 3 phase delta, 60 Hz, insulation class 15KV, 95KV BIL.
   3. KVA Rating: 1500 KVA, self-cooled to 80 degrees C. average winding temperature rise
   4. Transformer shall be Cast Coil Dry type with copper windings, adjustable primary taps (two 2.5% taps above and two 2.5% taps below the normal full rating) in a NEMA 1 indoor enclosure and shall be DOE 2016 efficiency compliant.
   5. Class 185 degree C insulation
   6. 80 degree C temperature rise over 40 degree maximum ambient, 30 degree C average over 24 hours
   7. Impedance: 5.75% +/- 0.075%.
   8. Maximum Sound level: 65 dBA or lower per NEMA ST-20 standard

9. Connection to the high voltage and low voltage substation sections shall be provide by the transformer manufacturer.

B. Bending of high-voltage cables should be avoided or minimized. All necessary bends should meet at least the minimum radii specified by the cable manufacturer.

2.04 LOW VOLTAGE SECTIONS - UL1558 METAL ENCLOSED SWITCHGEAR

All low-voltage sections shall be part of the overall main switchgear assembly and shall be manufactured by either Eaton or Square D or ABB Power T & D Company or General Electric Co.

A. Low voltage substation sections shall be as shown on the contract drawings.

B. Ratings as indicated on drawings

C. Air Power Breaker Front accessibility, draw-out construction with rear access for cable connections.

D. All sections shall be aligned flush at the front side of the switchgear and in the rear, where permissible. .

E. Main device: Draw out circuit breakers, mounted in an individual section (see circuit breaker paragraph for additional requirements).
   1. Power operated ground fault type with adjustable trip, LSIG, type and equipped for the remote operation.
   2. Provide a unit sub-station secondary mounted upon the switchgear, mounted full length rack with manual winch for removal of the draw out breakers.

F. Prior to fabrication of the switchgear, the Director's representative shall furnish the existing WEAM (Ion) Power Meters to the contractor to get it installed and internally wired in the new switchgear at the factory. Work shall be carried out only if it's approved by the switchgear manufacturer and provided it will not compromise the integrity of the UL label or manufacturer's warranty or switchgear's operational reliabilities.

G. Fully or 100% rated copper bus bars.
   1. Ampere rating of through bus not less than frame size of main device.

H. Full length copper ground bus.

I. Fully or 100% rated copper neutral bus.

J. Sections that are designated as "space" or "provision for future breaker" shall be equipped with all bus bar extension and mounting hardware and control and monitoring accessories required to accept a future circuit breaker without any medication or alteration to the cubicle or distribution section.

K. For each Main, Tie or Feeder circuit breaker, provide a Maintenance OFF ON selector switch on the compartment door to switch the circuit breaker

instantaneous tripping characteristics to an alternate setting temporarily during maintenance activity. All main and feeder breakers shall have adjustable LSIG protection and communications via a sub-network The ERMS (Energy Reduction Maintenance Reduction Switch) function shall be on the trip unit and allow for setting values of the trip unit functions that reduced the arc flash energy of a downstream fault.

L. Circuit Breakers:

1. Mounting: All breakers shall be either individually mounted.
2. All breakers shall be digital electronic trip and LSIG type.
3. Style: Electrically Operated Power operated circuit breakers, as required to accommodate the circuit breaker components. Furnish and install 4 NO and 4 NC auxiliary contacts with each breaker. Furnish each breaker with LED indicating lights, red for closed and green for open.
4. Trip Device: Programmable solid state and fully equipped for remote monitoring and operation from the Building Engineer's office in the building, unless the director advises another location. Include all required control and monitoring devices and cables.

5 Interrupting Capacity: Equal to, or greater than, the short circuit rating required for the switchgear, but not less than 65,000 AIC rating at 480 volt ac. However, the final AIC rating as well as the final trip settings of all the adjustable circuit breakers shall be based on the final result of the Arc Flash and Short Circuit Coordination and Protection study, performed at no additional cost to the government. Prepare the Arc Flash and Short Circuit Coordination and Protection study as per the Specification Section 260573.

6. Component Description: See contract drawings and main switchgear schedule for exact rating of the individual feeder breakers and related information. Equip each feeder circuit breaker with additional components as required to achieve a fully coordinated selective scheme between the main breakers and associated feeder breakers. The final trip settings shall be based on the final result of the Short Circuit Coordination and Protection Study, at no additional cost to the Government.

M. Bus Tie Interlocking: Electrically interlock all main and bus tie circuit breakers in double ended load center unit substation. Install in accordance with manufacturer's instructions, applicable requirements of the NEC and in accordance with recognized industry practices.

N. Remote section with interface to allow programming of transfer sequence and to allow remote operation (open and close) of main and bus tie breakers in closed transition sequence of operation.

O. Utility Energy Metering: Prior to the switchgear fabrication, the director's representative shall provide the existing WEAM Energy meter to the contractor to get it installed in the new substation at the site, provided it's approved by the switchgear manufacturer and it will not compromise the integrity of the UL label or it's warranty or operational reliabilities. If the switchgear manufacturer does not approve such field installation, then the manufacturer shall provide similar

type meter after receiving pre-approval by the director. WEAM meter shall be installed and wired either by the manufacturer or by the contractor at no additional cost to the government, so that the meter operates accurately and reliably and records/displays the true energy consumption. Refer to Section 261332 for the additional requirements.

P. Perform Arc Flash and Short Circuit Coordination and Protection study as per the requirement of the Section 260573, prior to ordering, fabrication or installation of the main switchgear. All breakers' trip settings shall be set based on the final result of the study. Provide Arc Flash labels as required by the NFPA 70E 2015.

Q. Equip the main switchgear with draw out breaker-trolley-lifts at top of the enclosure along with related accessories and components.

R. Provide internal or external mounted surge protection devices for the switchgear. If external mounted SPDs are used, they shall be mounted in NEMA 4X enclosure, and mounted on the housing and as close to the main breaker section as the actual switchgear configuration permits.

S. Provide mimic bus on the entire switchgear housing.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install the Work of this Section in accordance with the manufacturer's printed instructions and recommendations.
   1. Comply with applicable portions of NECA 430
   2. Install foundation channels for anchoring and leveling of the load center unit substation. Anchor switchgear assembly to 4-inch, channel-iron floor sill embedded in concrete base and attach by bolting.
   3. Sills: Select to suit switchgear; level and grout flush into concrete base.
   4. Concrete Bases: 4 inches high, reinforced, with chamfered edges. Extend base no more than 6 inches in all directions beyond the maximum outer dimensions of switchgear unless the structural engineer has more stringent requirements to comply with the seismic requirements. Submit the mounting details prepared by the registered structural engineer for approval, prior to start of the concrete base or unit substation installation.
   5. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, brackets, and temporary blocking of moving parts from switchgear units and components

B. Set and program the load center unit substation devices in accordance with the approved final Short Circuit Coordination and Selective Protection Study

C. Identification:
   1. Install on the front of each circuit breaker, a phenolic nameplate indicating load served by circuit breaker.
   2. Stencil on front the load center unit substation with white paint in l/2 inch lettering", "LOAD CENTER UNIT SUBSTATION", etc.

corresponding to load center unit substation designations on the drawings, and electrical parameters (phase, wire, voltage).

3. Provide code required clearly visible "Warning Signs"

3.02 SEQUENCE OF OPERATION

A. Sequence of operation shall be as outlined under the Section 261315 .

3.03 FIELD QUALITY CONTROL

A. Preliminary System Test:
   1. Preparation: Have the Company Field Advisor adjust the completed load center unit substation devices and then operate them long enough to assure that they are performing properly.
   2. Run a preliminary test for the purpose of:
      a. Determining whether the load center unit substation is in a suitable condition to conduct an acceptance test.
      b. Checking instruments and equipment.
      c. Training facility personnel.

B. System Acceptance Test:
   1. Preparation: Notify the Director's Representative at least 3 working days prior to the test so arrangements can be made prior to the test to have a Facility Representative witness the test.
   2. Make the following tests:
      a. Test devices that have ground fault protection in accordance with the approved information sheets and test form.
      b. Test programmable solid state trip devices in accordance with the manufacturer's recommendations.
   3. Supply all equipment necessary for system adjustment and testing.
   4. Submit written report of test results signed by the Company Field Advisor and the Director's Representative. Mount a copy of the final report in a Plexiglas enclosed frame assembly in a conspicuous location on the load center unit substation.

END OF SECTION

SECTION 261332

MODIFICATIONS TO WEB-ENABLED ADVANCED MONITORING SYSTEM

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Section 261330: Load Center-Unit Substation

B. Section 262413: Switchboard-Front Accessible

1.02 REFERENCES

A. ANSI, NEMA, UL

1.03 DESCRIPTION OF EXISTING SYSTEM (BEFORE CHANGES)

A. The existing Web-Enabled Advanced Monitoring (WEAM) System monitors the energy usage at Building No. 4 at Harriman State Office Building Campus and selected buildings throughout New York State.

B. Existing ION Model 7500 RTU Data Loggers, 8000 Series Socket Power Meters, Model 7550 Power Meters, Model 7600 Power Meters and Model 7650 Power Meters connected to existing data and web servers via an existing secure, password protected, copper wire Ethernet network, monitor and log energy data.

C. The existing ION Enterprise System software collects energy usage data with an existing ION Enterprise Server and saves the data to an existing MicroSoft SQL 2000 data warehouse.

E. An existing backup server maintains backup database information from the ION Enterprise and warehouse servers. The backup server is in turn backed up by a tape backup system.

F. The existing ION Enterprise System software displays real time energy data and waveforms (From ION devices). Data may also be viewed in tabular and graphical form.

G. Existing work stations, connected to the existing network, allow system operators to display and export:

1. Real time energy data and waveforms.
2. Power quality summaries and reports.
3. Event reports.
4. Waveform reports.
5. Peak demand report.
6. "Ad-hoc Reports".
7. Aggregate energy and demand reports.
8. Aggregate load profiles.
9. Time of use multiple site comparisons.
10. Weather versus demand trends and tables.

11. Calendar profile demand reports.
12. Benchmarking reports.
13. Utility billing, cost allocation and validation reports.
14. Billing reports utilizing virtual meters to perform complex differential billing.

H. The existing ION Enterprise System software generates "Ad-hoc Reports", including:
1. Summary of electrical demand and energy uses in all buildings
2. Thirty-one day summaries of electrical demand and energy usage in a building.
3. Basic profile of electrical demand and energy usage in a time-trend plot or grid format.
4. Summary of electrical demand and energy usage at a network node.
5. Electrical demand and energy usages versus temperature.

I. The one-line power diagrams and elevations of existing electrical distribution equipment are displayed on graphical screens.

J. Out of range data values cause annunciation of alarms and sends automatic e-mail messages to selected addresses.

1.04 MODIFICATIONS TO THE EXISTING SYSTEM

A. Remove existing Ion Power Meters from the existing switchgear that is designated to be disconnected and removed completely.

B. Provide new switchgear with provisions for the power

meters.

C. Install existing Ion Power Meters mounted in both sides of the new switchgear. Use one of the following methods of gathering voltage and current data:
a. Provide three current transformers with connections to the power meter voltage and current inputs via an isolation/shunting switch to the appropriate voltage and current sources.

D. Reprogram for the new switchgear A and B, using the existing ION Enterprise software system to:
a. Display one-line diagrams and elevation of the new 13.2 kV Switchgear, and both sides of 480/277 Volt Switchgear Distribution Sections.
b. Display real time energy data, waveforms as described in Paragraph 1.03 "DESCRIPTION OF EXISTING SYSTEM (BEFORE CHANGES)".
c. Display and export reports as described in Paragraph 1.03 "DESCRIPTION OF EXISTING SYSTEM (BEFORE CHANGES)".

1.05 DESCRIPTION OF EXISTING SYSTEM (AFTER CHANGES)

A. The existing Web-Enabled Advanced Monitoring (WEAM) System continues to monitor the energy use as described in "DESCRIPTION OF EXISTING SYSTEM (BEFORE CHANGES).

1.06 SOFTWARE SYSTEMS INTEGRATORS

A. The following software engineering companies have experience installing and programming the ION Enterprise software and system. Contact one of these companies for programming services.

1. Ameresco
   9 Cornell Road
   Latham, NY 12110
   Telephone: (518) 220-0500
   www.ameresco.com
2. Square D/Power logic
   Engineering Services
   295 Tech Park Drive
   La Vergne, TN 37086
   Telephone: (866) 466-7627 ext. 7847 www.powerlogic.com
3. Steam Plant Systems, Inc.
   Power Plant and I & C Engineers
   900 Commerce Drive
   Clifton Park, NY 12065
   Telephone: (518) 877-8805
   www.steamplantsystems.com

1.07 SUBMITTALS

A. Waiver of Submittals: The "Waiver of Certain Submittal Requirements" in Section 01330 does not apply to this Section.

B. Submittals Package: Submit the Submittals Package for Specifications Sections 261332 and 261330, including shop drawings, product data, and quality control submittals at the same time as a package. No action will be taken on incomplete packages.

1. Company Field Advisor Letter: With the submittals package include a letter from the
   Company Field Advisor stating that he/she has reviewed the Submittals Package for accuracy and completeness, and approves all materials and installation methods included in the Submittals Package.

C. Data from the software systems integrator: Include:

1. Resume of the software systems integrator listing experience installing and programming ION Enterprise software and systems.
   a. Furnish the name, address, and telephone numbers of at least 5 clients that the Company has performed installation and programming of an ION Enterprise system within the last 3 years.
2. Name, business address and telephone number of Company Field Advisor secured for the required services.

3. Certified statement from the Company listing the qualifications of the Company Field Advisor.
4. Services and each product for which authorization is given by the Company, listed specifically for this project.

D. Contract Closeout Submittals:
1. Test Report: System acceptance test report.
2. Certificate: Affidavits, signed by the Company Field Advisor and notarized, certifying that the system meets the Contract requirements and is operating properly.
3. Operation and Maintenance Data: Deliver 2 copies, covering the installed products, to the Director's Representative.
4. Factory certified as built, point-to-point control wiring diagrams.

1.08 QUALITY ASSURANCE

A. Company Field Advisor: Secure the services of a Company Field Advisor for the existing Web-Enabled Advanced Monitoring (WEAM) System for a minimum of 16 working hours for the following:
1. Assist in preparation of submittals. Check that submittals are accurate and complete.
2. Witness final tests then certify with an affidavit that modifications to the existing system are installed in accordance with the Contract Documents and the modified
WEAM System is operating properly.
3. Train facility maintenance personnel on the operation, programming and routine maintenance of the power meter.

PART 2 PRODUCTS

2.01 POWER METERS

A. Existing Ion Power Meter

2.02 CURRENT TRANSFORMERS

A. Provided by the Switchgear manufacturer.

2.03 VOLTAGE AND CURRENT SWITCH ASSEMBLY

A. Voltage Disconnect and Current Transformer Shunt (if required): suitable for use on three phase circuits, with:
1. Voltage isolation switches.
2. Current transformer shunt switches.
3. Clear cover.

2.04 NETWORK JUMPER CABLES

A. Copper Horizontal Cable: TIA/EIA-568 Category 6a solid conductor unshielded twisted pair (UTP), 24 AWG, 100 ohm; 4 individually twisted pairs; covered with gray jacket and complying with all relevant parts of and addenda to latest edition of TIA/EIA-568 and UL 444. Shall support gigabit Ethernet and voice over IP.
   1. Provide NFPA 70 type CMP plenum-rated cable.

B. Copper Cable Terminations: Insulation displacement connection (IDC) type using appropriate tool; use screw connections only where specifically indicated.

C. Jacks and Connectors: RJ-45 (data) and RJ-11 (voice), non-keyed, terminated with 110- style insulation displacement connectors; high impact thermoplastic housing; complying with same standard as specified horizontal cable and UL 1863.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

A. Test of Existing Web-Enabled Advanced Metering System:
   1. Prior to making changes the existing system, make the following tests to ascertain the operating condition of the existing system:
      a. Test all functions of both of the existing power meters.
   2. Prepare a written report for the Director's Representative indicating the repairs required, if any, to make the existing system function properly.
   3. Repairs to the existing system are not included in the Work unless requested by Order on Contract.

3.02 INSTALLATION

A. Install an ION 7650 Power Meter in each side of the main switchgear as per the switchgear manufacturer’s requirements and recommendations as well as per the requirement of the Director.
   1. If current transformers are used:
      a. Provide voltage disconnect and current transformer shunt between voltage sources and current transformers.
      b. Connect power meter to appropriate voltage and current sources.
   2. If digital connection to main circuit breaker is used:
      a. Provide a RS-485 jumper connection from the power meter to the main circuit breaker.
   3. Connect the Ethernet port of the ION 7650 Power Meter to the existing WEAMS Network switch.

3.03 FIELD QUALITY CONTROL

A. Preliminary System Tests:
   1. The Contractor, under the supervision of the Company Field Advisor and before the preliminary system test, shall:

a. If current transformers are used:
   1) Verify current transformer ratio.
   2) Verify voltage and current phasing and polarities are correct.
b. If digital connection to main circuit breakers is used: Verify the power meter communicates with the main circuit breaker.
c. Verify the power meter is communicating with existing data collection and data warehouse servers.

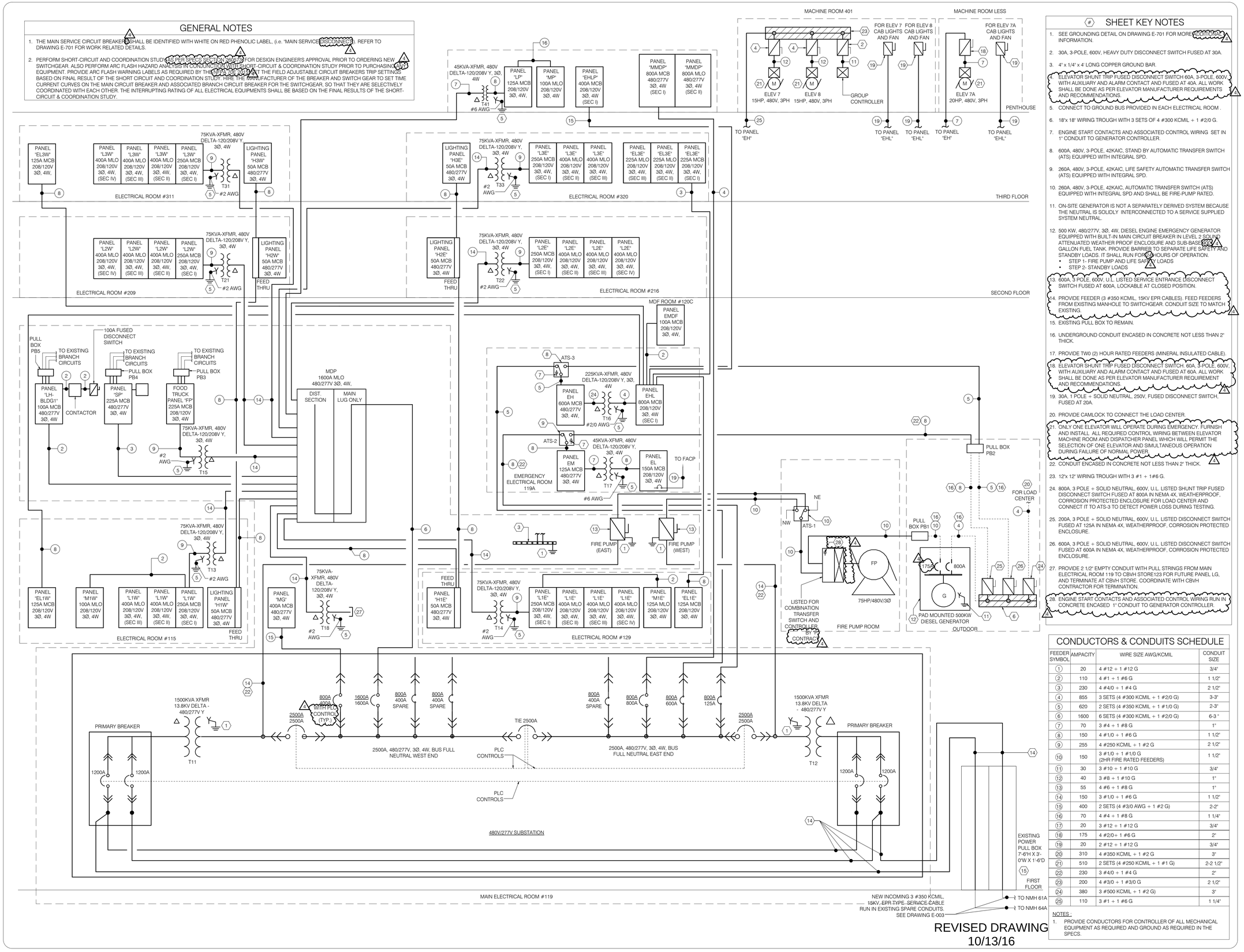
2. Preparation: Have the Company Field Advisor adjust the completed system and then operate it long enough to assure that it is performing properly.
3. Run a preliminary test for the purpose of:
   a. Determining whether the system is in a suitable condition to conduct the acceptance test.
   b. Checking the adjusting equipment.
   c. Training Facility personnel.

B. System Acceptance Test:
1. Preparation: Notify the Director's Representative at least 3 working days prior to the test so arrangements can be made to have a Facility Representative witness the test.
2. Make the following tests of the existing power meter:
   a. Verify existing system monitors and logs real time energy usage data.
   b. Verify existing system displays and exports reports using the real time energy usage data.
3. Supply equipment necessary for system adjustment and testing.
4. Submit a typewritten report of the test results, signed by the Company Field Advisor, the system integrator and the Director's Representative. Enclose a copy of the report in plastic envelope and include in the frame assembly provided under Sections 261330.

END OF SECTION

GENERAL NOTES

1. THE MAIN SERVICE CIRCUIT BREAKER SHALL BE IDENTIFIED WITH WHITE ON RED PHENOLIC LABEL, (i.e. "MAIN SERVICE 2000A/1600A"). REFER TO DRAWING E-701 FOR WORK RELATED DETAILS.
2. PERFORM SHORT-CIRCUIT AND COORDINATION STUDY AS PER SECTION 26 05 73 FOR DESIGN ENGINEER'S APPROVAL PRIOR TO ORDERING NEW SWITCHGEAR. ALSO PERFORM ARC FLASH HAZARD ANALYSIS IN CONJUNCTION WITH SHORT-CIRCUIT & COORDINATION STUDY PRIOR TO PURCHASING NEW EQUIPMENT. PROVIDE ARC FLASH WARNING LABELS AS REQUIRED BY THE NFPA AND NEC. SET THE FIELD ADJUSTABLE CIRCUIT BREAKERS TRIP SETTINGS BASED ON FINAL RESULT OF THE SHORT CIRCUIT AND COORDINATION STUDY. HIRE THE MANUFACTURER OF THE BREAKER AND SWITCH GEAR TO SET TIME CURRENT CURVES ON THE MAIN CIRCUIT BREAKER AND ASSOCIATED BRANCH CIRCUIT BREAKER FOR THE SWITCHGEAR, SO THAT THEY ARE SELECTIVELY COORDINATED WITH EACH OTHER. THE INTERRUPTING RATING OF ALL ELECTRICAL EQUIPMENTS SHALL BE BASED ON THE FINAL RESULTS OF THE SHORT-CIRCUIT & COORDINATION STUDY.



SHEET KEY NOTES

1. SEE GROUNDING DETAIL ON DRAWING E-701 FOR MORE INFORMATION.
2. 30A, 3-POLE, 600V, HEAVY DUTY DISCONNECT SWITCH FUSED AT 30A.
3. 4" x 1/4" x 4' LONG COPPER GROUND BAR.
4. ELEVATOR SHUNT TRIP FUSED DISCONNECT SWITCH 60A, 3-POLE, 600V, WITH AUXILIARY AND ALARM CONTACT AND FUSED AT 40A. ALL WORK SHALL BE DONE AS PER ELEVATOR MANUFACTURER REQUIREMENTS AND RECOMMENDATIONS.
5. CONNECT TO GROUND BUS PROVIDED IN EACH ELECTRICAL ROOM .
6. 18"x 18" WIRING TROUGH WITH 3 SETS OF 4 #300 KCMIL + 1 #2/0 G.
7. ENGINE START CONTACTS AND ASSOCIATED CONTROL WIRING SET IN 1" CONDUIT TO GENERATOR CONTROLLER.
8. 600A, 480V, 3-POLE, 42KAIC, STAND BY AUTOMATIC TRANSFER SWITCH (ATS) EQUIPPED WITH INTEGRAL SPD.
9. 260A, 480V, 3-POLE, 42KAIC, LIFE SAFETY AUTOMATIC TRANSFER SWITCH (ATS) EQUIPPED WITH INTEGRAL SPD.
10. 260A, 480V, 3-POLE, 42KAIC, AUTOMATIC TRANSFER SWITCH (ATS) EQUIPPED WITH INTEGRAL SPD AND SHALL BE FIRE-PUMP RATED.
11. ON-SITE GENERATOR IS NOT A SEPARATELY DERIVED SYSTEM BECAUSE THE NEUTRAL IS SOLIDLY INTERCONNECTED TO A SERVICE SUPPLIED SYSTEM NEUTRAL.
12. 500 KW, 480/277V, 3Ø, 4W, DIESEL ENGINE EMERGENCY GENERATOR EQUIPPED WITH BUILT-IN MAIN CIRCUIT BREAKER IN LEVEL 2 SOUND ATTENUATED WEATHER PROOF ENCLOSURE AND SUB-BASE 600 GALLON FUEL TANK. PROVIDE BARRIER TO SEPARATE LIFE SAFETY AND STANDBY LOADS. IT SHALL RUN FOR 96 HOURS OF OPERATION.
    - STEP 1- FIRE PUMP AND LIFE SAFETY LOADS
    - STEP 2- STANDBY LOADS.
13. 600A, 3 POLE, 600V, U.L. LISTED SERVICE ENTRANCE DISCONNECT SWITCH FUSED AT 600A, LOCKABLE AT CLOSED POSITION.
14. PROVIDE FEEDER (3 #350 KCMIL, 15KV EPR CABLES). FEED FEEDERS FROM EXISTING MANHOLE TO SWITCHGEAR. CONDUIT SIZE TO MATCH EXISTING.
15. EXISTING PULL BOX TO REMAIN.
16. UNDERGROUND CONDUIT ENCASED IN CONCRETE NOT LESS THAN 2" THICK.
17. PROVIDE TWO (2) HOUR RATED FEEDERS (MINERAL INSULATED CABLE).
18. ELEVATOR SHUNT TRIP FUSED DISCONNECT SWITCH, 60A, 3-POLE, 600V, WITH AUXILIARY AND ALARM CONTACT AND FUSED AT 60A. ALL WORK SHALL BE DONE AS PER ELEVATOR MANUFACTURER REQUIREMENT AND RECOMMENDATIONS.
19. 30A, 1 POLE + SOLID NEUTRAL, 250V, FUSED DISCONNECT SWITCH, FUSED AT 20A.
20. PROVIDE CAMLOCK TO CONNECT THE LOAD CENTER.
21. ONLY ONE ELEVATOR WILL OPERATE DURING EMERGENCY. FURNISH AND INSTALL ALL REQUIRED CONTROL WIRING BETWEEN ELEVATOR MACHINE ROOM AND DISPATCHER PANEL WHICH WILL PERMIT THE SELECTION OF ONE ELEVATOR AND SIMULTANEOUS OPERATION DURING FAILURE OF NORMAL POWER.
22. CONDUIT ENCASED IN CONCRETE NOT LESS THAN 2" THICK.
23. 12"x 12" WIRING TROUGH WITH 3 #1 + 1#6 G.
24. 800A, 3 POLE + SOLID NEUTRAL, 600V, U.L. LISTED SHUNT TRIP FUSED DISCONNECT SWITCH FUSED AT 800A IN NEMA 4X, WEATHERPROOF, CORROSION PROTECTED ENCLOSURE FOR LOAD CENTER AND CONNECT IT TO ATS-3 TO DETECT POWER LOSS DURING TESTING.
25. 200A, 3 POLE + SOLID NEUTRAL, 600V, U.L. LISTED DISCONNECT SWITCH FUSED AT 125A IN NEMA 4X, WEATHERPROOF, CORROSION PROTECTED ENCLOSURE.
26. 600A, 3 POLE + SOLID NEUTRAL, 600V, U.L. LISTED DISCONNECT SWITCH FUSED AT 600A IN NEMA 4X, WEATHERPROOF, CORROSION PROTECTED ENCLOSURE.
27. PROVIDE 2 1/2" EMPTY CONDUIT WITH PULL STRINGS FROM MAIN ELECTRICAL ROOM 119 TO CBVH STORE123 FOR FUTURE PANEL LLG, AND TERMINATE AT CBVH STORE. COORDINATE WITH CBVH CONTRACTOR FOR TERMINATION.
28. ENGINE START CONTACTS AND ASSOCIATED CONTROL WIRING RUN IN CONCRETE ENCASED 1" CONDUIT TO GENERATOR CONTROLLER.

CONDUCTORS & CONDUITS SCHEDULE

FEEDER SYMBOL	AMPACITY	WIRE SIZE AWG/KCMIL	CONDUIT SIZE
1	20	4 #12 + 1 #12 G	3/4"
2	110	4 #1 + 1 #6 G	1 1/2"
3	230	4 #4/0 + 1 #4 G	2 1/2"
4	855	3 SETS (4 #300 KCMIL + 1 #2/0 G)	3-3"
5	620	2 SETS (4 #350 KCMIL + 1 #1/0 G)	2-3"
6	1600	6 SETS (4 #300 KCMIL + 1 #2/0 G)	6-3 "
7	70	3 #4 + 1 #8 G	1"
8	150	4 #1/0 + 1 #6 G	1 1/2"
9	255	4 #250 KCMIL + 1 #2 G	2 1/2"
10	150	3 #1/0 + 1 #1/0 G (2HR FIRE RATED FEEDERS)	1 1/2"
11	30	3 #10 + 1 #10 G	3/4"
12	40	3 #8 + 1 #10 G	1"
13	55	4 #6 + 1 #8 G	1"
14	150	3 #1/0 + 1 #6 G	1 1/2"
15	400	2 SETS (4 #3/0 AWG + 1 #2 G)	2-2"
16	70	4 #4 + 1 #8 G	1 1/4"
17	20	3 #12 + 1 #12 G	3/4"
18	175	4 #2/0+ 1 #6 G	2"
19	20	2 #12 + 1 #12 G	3/4"
20	310	4 #350 KCMIL + 1 #2 G	3"
21	510	2 SETS (4 #250 KCMIL + 1 #1 G)	2-2 1/2"
22	230	3 #4/0 + 1 #4 G	2"
23	200	4 #3/0 + 1 #3/0 G	2 1/2"
24	380	3 #500 KCMIL + 1 #2 G)	3"
25	110	3 #1 + 1 #6 G	1 1/4"

NOTES :

1. PROVIDE CONDUCTORS FOR CONTROLLER OF ALL MECHANICAL EQUIPMENT AS REQUIRED AND GROUND AS REQUIRED IN THE SPECS.

REVISED DRAWING 10/13/16

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36x24 PLOT SHEET

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

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SETTY

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THE ALTERATION OF THIS MATERIAL IN ANY WAY, UNLESS DONE UNDER THE DIRECTION OF A COMPARABLE PROFESSIONAL, I.E. ARCHITECT FOR AN ARCHITECT, ENGINEER FOR AN ENGINEER, OR LANDSCAPE ARCHITECT FOR A LANDSCAPE ARCHITECT, IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW AND/OR REGULATIONS AND IS A CLASS 'A' MISDEMEANOR.

N

STATE OF NEW YORK CONRAD D DELA CRUZ LICENSED PROFESSIONAL ENGINEER 076759 10/13/2016

CONTRACT: ELECTRICAL

TITLE: ABATE HAZARDOUS MATERIALS & RENOVATE BUILDING 4

LOCATION: STATE OFFICE BUILDING CAMPUS 1220 WASHINGTON AVE. ALBANY, NY 12226

CLIENT: OFFICE OF GENERAL SERVICES

KEY PLAN:

MARK	DATE	DESCRIPTION
4	10/13/16	ADDENDUM 4
3	07/11/16	BID DOCUMENTS
2	06/10/16	FINAL COMPLIANCE
1	03/21/16	FINAL FOR REVIEW

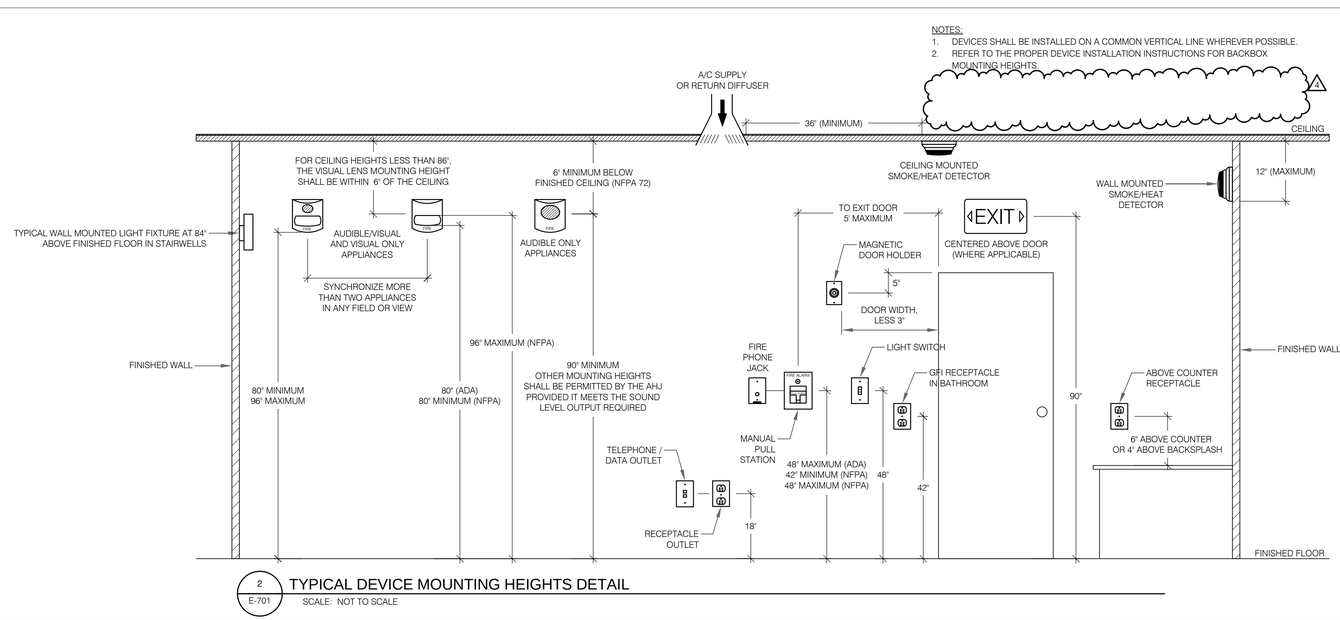
PROJECT NUMBER:	45124 - E
DESIGNED BY:	VL/SM
DRAWN BY:	DAT
FIELD CHECK:	CD
APPROVED:	CD
SCALE:	NOT TO SCALE

SHEET TITLE:

ELECTRICAL POWER RISER DIAGRAM

DRAWING NUMBER: E-501

SHEET 40 OF 56



2 / E-701 TYPICAL DEVICE MOUNTING HEIGHTS DETAIL

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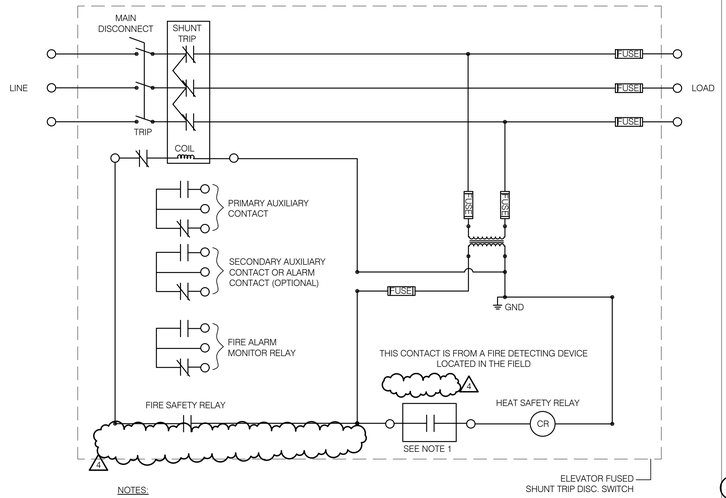
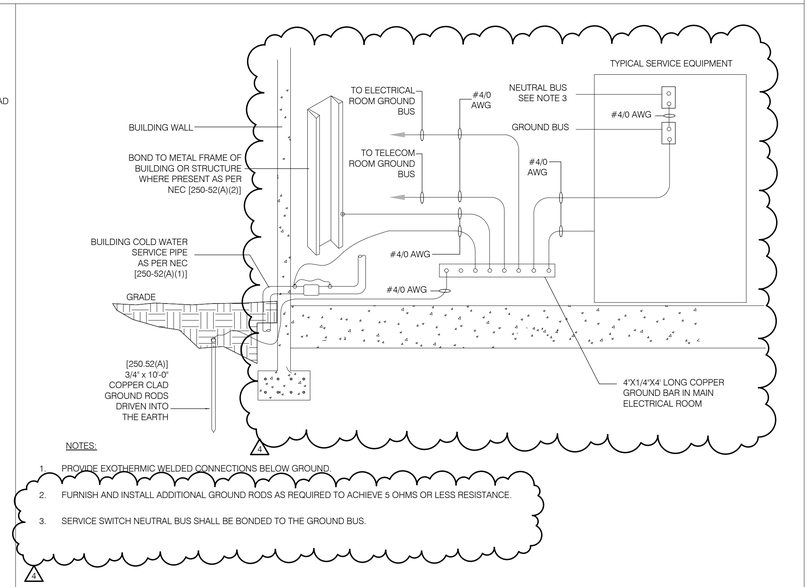


NOTES:

1. PLACE THE HEAT DETECTORS IN THE MACHINE ROOM. THE DETECTORS WILL BE CONNECTED DIRECTLY TO THE SHUNT TRIP DISCONNECT TO THE AFFECTED ELEVATOR. ACTIVATION OF THESE HEAT DETECTORS DISCONNECTS POWER TO THE AFFECTED ELEVATORS. (PER NEC620-51)
2. MOUNT HEAT DETECTORS 24" OF THE SPRINKLER HEAD.

5 / E-701 ELEVATOR FIRE SERVICE DISCONNECT WIRING DIAGRAM DETAIL

SCALE: NOT TO SCALE

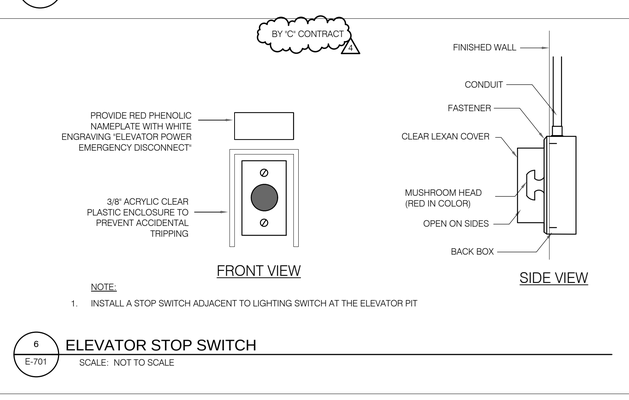


NOTES:

1. PROVIDE EXOTHERMIC WELDED CONNECTIONS BELOW GROUND.
2. FURNISH AND INSTALL ADDITIONAL GROUND RODS AS REQUIRED TO ACHIEVE 5 OHMS OR LESS RESISTANCE.
3. SERVICE SWITCH NEUTRAL BUS SHALL BE BONDED TO THE GROUND BUS.

3 / E-701 BUILDING GROUNDING SYSTEM DETAIL

SCALE: NOT TO SCALE

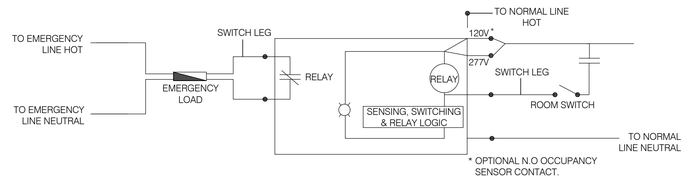


NOTE:

1. INSTALL A STOP SWITCH ADJACENT TO LIGHTING SWITCH AT THE ELEVATOR PIT

6 / E-701 ELEVATOR STOP SWITCH

SCALE: NOT TO SCALE

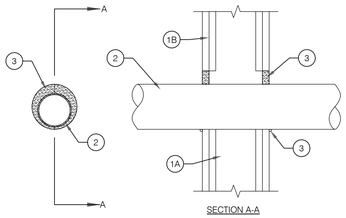


NOTES:

1. THE ABOVE DETAIL IS A REPRESENTATION OF A TYPICAL WIRING DIAGRAM FOR STANDARD APPLICATION OF SINGLE-SHUNT RELAY UNIT INSTALLATIONS AND WIRING. CONTRACTOR SHALL COORDINATE AND PROVIDE ADDITIONAL SHUNT RELAY UNITS WHICH ARE TO BE INSTALLED FOR MULTI-BALLAST FIXTURES, AS WELL AS OTHER ATYPICAL SITUATIONS. ENSURE THAT THE SHUNT RELAY IS COMPATIBLE WITH ALL CONNECTED FIXTURES AND SWITCHING CONTROLS.

4 / E-701 TYPICAL EMERGENCY SHUNT RELAY WIRING DIAGRAM

SCALE: NOT TO SCALE



GYPSUM WALLBOARD

F RATINGS - 1 AND 2 HR
T RATING - 0 HR

L RATING AT AMBIENT - LESS THAN 1 CFM SQ FT

L RATING AT 400 F. LESS THAN 1 CFM SQ FT

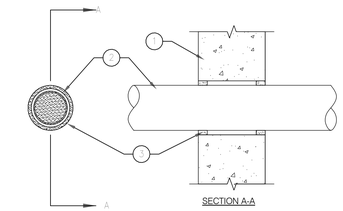
NOTES:

1. WALL ASSEMBLY - THE FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES WALL AND PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
A. STUDS - WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. OC. STEEL STUDS TO BE MIN 3-5/8 IN. WIDE AND SPACED MAX 24 IN. OC.
B. GYPSUM BOARD* - THICKNESS, TYPE, NUMBER OF LAYERS AND FASTENERS AS REQUIRED IN THE INDIVIDUAL WALL AND PARTITION DESIGN. MAX DIAM OF OPENING IN WOOD STUD WALLS IS 8 IN. MAX DIAM OF OPENING IN STEEL STUD WALLS IS 14 IN.
THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS EQUAL TO THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED.

2. THROUGH PENETRANTS - ONE METALLIC PIPE, CONDUIT OR TUBING TO BE INSTALLED WITHIN THE FIRESTOP SYSTEM. THE SPACE BETWEEN PIPE, CONDUIT OR TUBING AND PERIPHERY OF OPENING SHALL BE A MIN 0 IN. (POINT CONTACT) TO A MAX 2 IN. PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:
A. STEEL PIPE - NOM 12 IN. DIAM (OR SMALLER) SCHEDULE 5 (OR HEAVIER STEEL PIPE.
B. IRON PIPE - NOM 12 IN. DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
C. CONDUIT - NOM 4 IN. DIAM (OR SMALLER) ELECTRICAL METALLIC TUBING, NOM 6 IN. DIAM (OR SMALLER) STEEL CONDUIT OR NOM 1 IN. DIAM (OR SMALLER) FLEXIBLE STEEL CONDUIT.
D. COPPER TUBING - NOM 6 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
E. COPPER PIPE - NOM 6 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

3. FILL, VOID OR CAVITY MATERIAL* - CAULK - MIN 5/8 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH BOTH SURFACES OF WALL. MIN 3/8 IN. DIAM BEAD OF FILL MATERIAL APPLIED AT POINT CONTACT LOCATION AT THE PENETRANT/GYPSUM BOARD INTERFACE ON BOTH SIDES OF WALL.

PENETRATIONS THROUGH STRUCTURE SHALL MAINTAIN FIRE RESISTANCE AND COMPLY WITH SECTION 713.4 OF THE IBC 2009. ALL ANNULAR SPACES BETWEEN RATED STRUCTURE/ENCLOSURE SHALL BE FILLED WITH APPROVED MATERIAL COMPLYING WITH REQUIREMENTS OF UL 1479.



REINFORCED CONCRETE

F RATINGS - 2 HR
T RATING - 0 HR

NOTES:

1. WHERE CONDUITS PASS THROUGH MASONRY OR CONCRETE WALLS OR FLOORS, PROVIDE AND SET INDIVIDUAL GRC SLEEVES FOR EACH CONDUIT AND ALL OTHER WORK UNDER HIS CHARGE, AS NECESSARY FOR PASSAGE OF ALL RACEWAYS. SLEEVES SHALL BE OF SUFFICIENT SIZE TO PROVIDE 1/2" ANNULAR SPACE AROUND THE CONDUIT PASSING THROUGH THE FLOOR OR WALLS. ALL OPENINGS SHALL BE SEALED, MADE SMOKE RESISTANT, AND TIGHT BY JHH. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE EXACT LOCATION OF SLEEVES PROVIDED UNDER THIS CONTRACT AND SHALL COORDINATE ALL REQUIREMENTS FOR RACEWAY SLEEVES.

2. WALL ASSEMBLY - MIN 6 IN. (152 MM) THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF OR 1600-2400 KG/M3) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAM OF OPENING IS 25 IN. (635 MM).
SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR THE NAMES OF MANUFACTURERS.

3. THROUGH PENETRANT - ONE METALLIC PIPE, TUBING OR CONDUIT TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN PIPES, TUBING OR CONDUITS AND PERIPHERY OF OPENING IS DEPENDENT UPON THE TYPE AND MAX DIAM OF THE THROUGH PENETRANT AS TABULATED BELOW.

PIPE, TUBING OR CONDUIT TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, TUBING OR CONDUITS MAY BE USED:
A. STEEL PIPE - NOM 24 IN. (610 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
B. IRON PIPE - NOM 24 IN. (610 MM) DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
C. COPPER TUBING - NOM 6 IN. (152 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
D. COPPER PIPE - NOM 6 IN. (152 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
E. CONDUIT - NOM 4 IN. (102 MM) DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING, NOM 6 IN. (152 MM) DIAM GALV STEEL CONDUIT OR NOM 1 IN. DIAM FLEXIBLE STEEL CONDUIT.

TYPE OF THROUGH PENETRANT	MAX DIAM OF THROUGH PENETRANT, IN. (MM)	ANNULAR SPACE, IN.
STEEL OR IRON PIPE	4 (102)	AS MENTIONED IN NOTE #1 ABOVE
STEEL TUBING OR CONDUIT	4 (102)	AS MENTIONED IN NOTE #1 ABOVE
STEEL CONDUIT	6 (152)	AS MENTIONED IN NOTE #1 ABOVE
STEEL OR IRON PIPE	24 (610)	AS MENTIONED IN NOTE #1 ABOVE
COPPER TUBING OR PIPE	6 (152)	AS MENTIONED IN NOTE #1 ABOVE

4. FILL, VOID OR CAVITY MATERIAL* - SEALANT - MIN 5/8 IN. (16 MM) THICKNESS OF FILL MATERIAL APPLIED WITHIN ANNULUS, FLUSH WITH BOTH SURFACES OF WALL. AT THE POINT CONTACT LOCATION BETWEEN THROUGH PENETRANT AND CONCRETE, A MIN 1/2 IN. DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE CONCRETE/THROUGH PENETRANT INTERFACE ON BOTH SURFACES OF WALL.

PENETRATIONS THROUGH STRUCTURE SHALL MAINTAIN FIRE RESISTANCE AND COMPLY WITH SECTION 713.4 OF THE IBC 2009. ALL ANNULAR SPACES BETWEEN RATED STRUCTURE/ENCLOSURE SHALL BE FILLED WITH APPROVED MATERIAL COMPLYING WITH REQUIREMENTS OF UL 1479.

REVISED DRAWING 10/13/16

1 / E-701 THROUGH-PENETRATION FIRESTOP DETAIL

SCALE: NOT TO SCALE

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANT

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N

STATE OF NEW YORK CONRAD D DELA CRUZ LICENSED PROFESSIONAL ENGINEER 076769

CONTRACT: ELECTRICAL

TITLE: ABATE HAZARDOUS MATERIALS & RENOVATE BUILDING 4

LOCATION: STATE OFFICE BUILDING CAMPUS 1220 WASHINGTON AVE. ALBANY, NY 12226

CLIENT: OFFICE OF GENERAL SERVICES

KEY PLAN:

MARK	DATE	DESCRIPTION
4	10/13/16	ADDENDUM 4
3	07/11/16	BID DOCUMENTS
2	06/10/16	FINAL COMPLIANCE
1	03/21/16	FINAL FOR REVIEW

PROJECT NUMBER:	45124 - E
DESIGNED BY:	VL/SM
DRAWN BY:	DAT
FIELD CHECK:	CD
APPROVED:	CD
SCALE:	NOT TO SCALE

SHEET TITLE: ELECTRICAL DETAILS

DRAWING NUMBER: E-701

SHEET 53 OF 56

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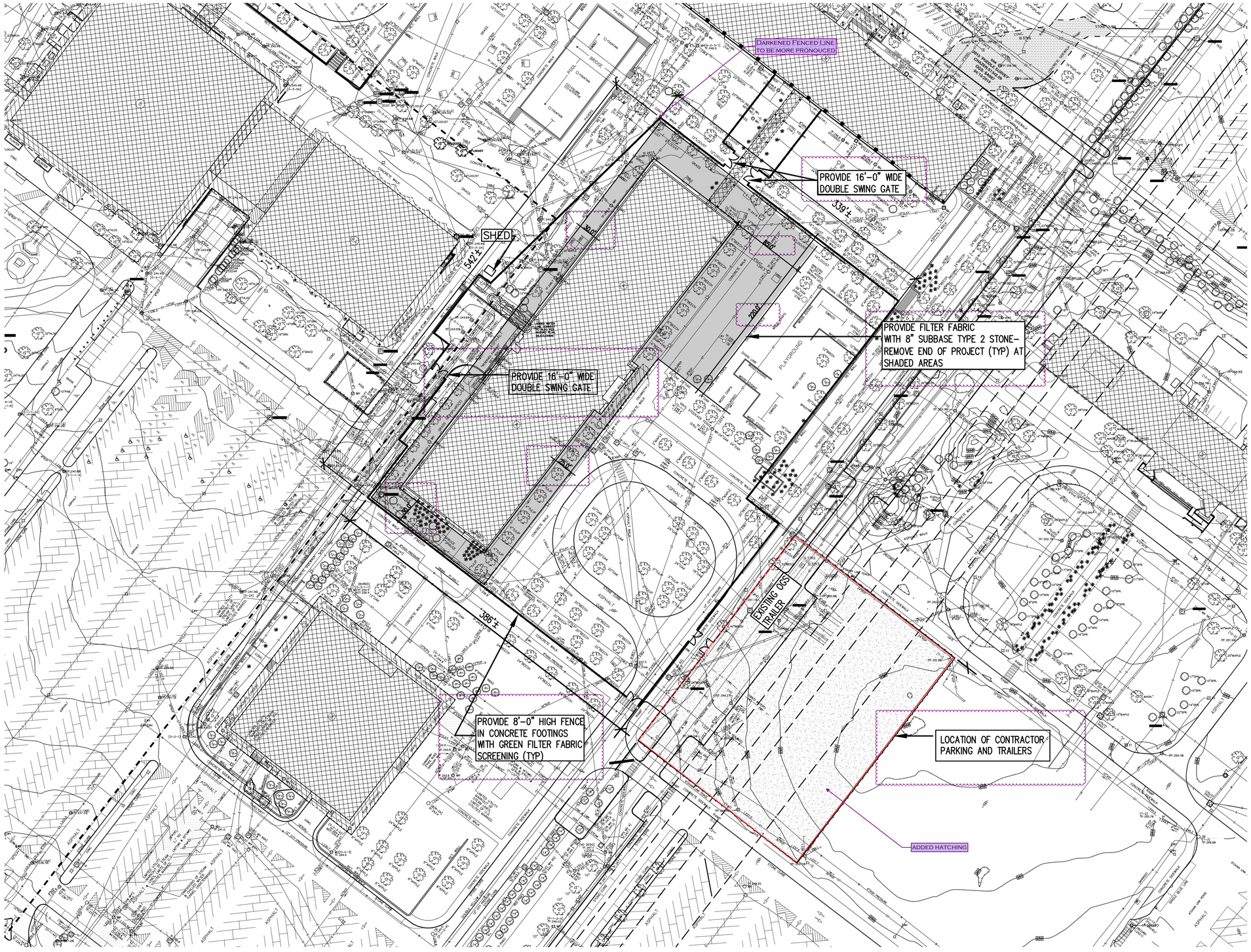

1 FENCE
NOT TO SCALE

1. ALL WORK SHOWN IS BY CONSTRUCTION WORK CONTRACT. PROVIDE GATES AS SHOWN

ADDENDUM DRAWING
10/13/16

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANT

WARNING:

THE ALTERATION OF THIS MATERIAL IN ANY WAY, UNLESS DONE UNDER THE DIRECTION OF A COMPARABLE PROFESSIONAL, I.E. ARCHITECT FOR AN ARCHITECT, ENGINEER FOR AN ENGINEER OR LANDSCAPE ARCHITECT FOR A LANDSCAPE ARCHITECT, IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW AND/OR REGULATIONS AND IS A CLASS 'A' MISDEMEANOR.

CONTRACT:
CONSTRUCTION, HVAC, PLUMBING, ELECTRIC

TITLE:
ABATE HAZARDOUS MATERIALS & RENOVATE CAMPUS

LOCATION:
STATE OFFICE BUILDING
ALBANY, NEW YORK

CLIENT:
OFFICE OF GENERAL SERVICES

MARK	DATE	DESCRIPTION
	10/13/16	ADDENDUM

PROJECT NUMBER:	45124 -C, H, P, E
DESIGNED BY:	
DRAWN BY:	
FIELD CHECK:	
APPROVED:	

SHEET TITLE:
SITE MOBILIZATION PLAN

DRAWING NUMBER:
G-008

SHEET OF

Oct 12,2016 - 3:10pm
v:\Design And Constr\p451xx\45124\CadSite\fence revised.dwg
36x24 PLOT SHEET

ASBESTOS-CONTAINING MATERIAL QUANTITY TABLE

ASBESTOS-CONTAINING MATERIAL QUANTITY TABLE

ABATEMENT KEY NOTE	ASBESTOS CONTAINING MATERIAL	LOCATION	APPROXIMATE QUANTITY	UNITS
1	REMOVE ALL SPRAY-ON FIREPROOFING	FIRST FLOOR, SECOND FLOOR, THIRD FLOOR, BRIDGE	157,500	SF
	REMOVE ALL SPRAY-ON FIREPROOFING DEBRIS IN EXTERIOR WALL CHASES	FIRST FLOOR, SECOND FLOOR, THIRD FLOOR, BRIDGE	1,600	SF
	REMOVE ALL SPRAY-ON FIREPROOFING DEBRIS IN INTERIOR PLUMBING CHASES	FIRST FLOOR, SECOND FLOOR, THIRD FLOOR, BRIDGE	900	SF
	REMOVE ALL SPRAY-ON FIREPROOFING DEBRIS IN INTERIOR STRUCTURAL STEEL ENCLOSURES	FIRST FLOOR, SECOND FLOOR, THIRD FLOOR, BRIDGE	2,000	SF
	REMOVE ALL SPRAY-ON FIREPROOFING DEBRIS IN ALL BATHROOM CHASES	FIRST FLOOR, SECOND FLOOR, THIRD FLOOR, BRIDGE	800	SF
	REMOVE ALL SPRAY-ON FIREPROOFING DEBRIS IN ALL CEILING SPACES	FIRST FLOOR, SECOND FLOOR, THIRD FLOOR, BRIDGE	157,500	SF
	REMOVE ALL SPRAY-ON FIREPROOFING DEBRIS ON BACK SIDE OF EXTERIOR BRICK	FIRST FLOOR, SECOND FLOOR, THIRD FLOOR, BRIDGE, PENTHOUSE	6,700	SF
2	FILL / ENCASE / ENCLOSE THE IN-FLOOR RACEWAY WITH GROUT (SEE ASBESTOS-CONTAINING MATERIAL QUANTITY TABLE NOTE 1 BELOW)	SECOND FLOOR, THIRD FLOOR	5,300	EA
3	REMOVE ALL MUDDED FITTING INSULATION	FIRST FLOOR, SECOND FLOOR, THIRD FLOOR	3,600	EA
4	REMOVE ALL DUCT INSULATION	PENTHOUSE	3,000	SF
5	REMOVE ALL RADIATOR COATING	FIRST FLOOR, SECOND FLOOR, THIRD FLOOR	6,000	SF
6	REMOVE ALL SHEETROCK AND JOINT COMPOUND	FIRST FLOOR, SECOND FLOOR, THIRD FLOOR	40,500	SF
7	REMOVE ALL SINK UNDERCOATING	SECOND FLOOR	14	EA
8	REMOVE ALL EXTERIOR WINDOW CAULK	EXTERIOR	22,000	LF
9	REMOVE ALL FLOOR TILE (VARIOUS SIZE AND COLOR) AND ASSOCIATED MASTIC WITH NON-ASBESTOS CARPET AND ASSOCIATED NON-ASBESTOS MASTIC IN MULTIPLE LAYERS	SECOND FLOOR, THIRD FLOOR	88,605	SF
10	REMOVE ALL THINSET, MORTAR, CERAMIC TILE AND GROUT FLOOR AT RESTROOMS	SECOND FLOOR, THIRD FLOOR	3,000	SF
11	REMOVE ALL MUD SLAB AT FLOOR OF DECK INFILL AREAS OF ELEVATORS AND ESCALATORS	SECOND FLOOR, THIRD FLOOR	280	SF
12	REMOVE ALL ROOFING MATERIALS	EXTERIOR AT MAIN ENTRANCE CANOPY AND BRIDGE	2,000	SF
13	REMOVE ALL COVE BASE AND ASSOCIATED MASTIC	BRIDGE	30	SF
14	REMOVE ALL CEILING TILES	BRIDGE	1,000	SF
15	REMOVE ALL TERRAZZO FLOORING	BRIDGE	1,100	SF
16	REMOVE ALL WINDOW CAULK / GLAZING	BRIDGE	750	LF
17	REMOVE ALL DUCT INSULATION	BRIDGE	750	SF
18	REMOVE ALL FIREDOORS	BRIDGE	120	SF
19	PROVIDE EXTERIOR FAÇADE OPENINGS FOR APPROXIMATELY 250 SCAFFOLDING/HOIST/STAIR CONNECTIONS AT 1 SF EACH	FIRST FLOOR, SECOND FLOOR, THIRD FLOOR, BRIDGE, PENTHOUSE	250	SF
20	REMOVE ENTIRE FIRST FLOOR TOPPING SLAB (SEE ASBESTOS-CONTAINING MATERIAL QUANTITY TABLE NOTE 3 BELOW.) INCLUDING (1) ALL FLOOR TILE (VARIOUS SIZE AND COLOR) AND ASSOCIATED MASTIC WITH NON-ASBESTOS CARPET AND ASSOCIATED NON-ASBESTOS MASTIC IN MULTIPLE LAYERS (2) ALL THINSET, MORTAR, CERAMIC TILE AND GROUT FLOOR AT RESTROOMS AND (3) ALL MUD SLAB AT FLOOR OF DECK INFILL AREAS OF ELEVATORS AND ESCALATORS	FIRST FLOOR	52,500	SF
	REMOVE CONCRETE SLAB AT SEVEN (7) OPENINGS	SECOND FLOOR	1,076	SF
	REMOVE CONCRETE SLAB AT SIX (6) OPENINGS	THIRD FLOOR	1,408	SF
	REMOVE CONCRETE SLAB AT OPENINGS AS SHOWN ON HA-104	PENTHOUSE FLOOR	1,000	SF
21	PROVIDE 8" ROUND PLUMBING OPENINGS (SEE ASBESTOS-CONTAINING MATERIAL QUANTITY TABLE NOTE 2 BELOW)	SECOND FLOOR, THIRD FLOOR	21	EA
	PROVIDE 6" ROUND PLUMBING OPENINGS (SEE ASBESTOS-CONTAINING MATERIAL QUANTITY TABLE NOTE 2 BELOW)	SECOND FLOOR, THIRD FLOOR	100	EA

ASBESTOS-CONTAINING MATERIAL QUANTITY TABLE NOTES:
1. FOR ABATEMENT KEYNOTE 2, EACH IN-FLOOR RACEWAY FLOOR OPENING IS SIX (6) INCHES IN DIAMETER OR TWELVE (12) INCHES IN DIAMETER. REFER TO VARIANCE FILE NO. 16-0274 FOR 56-8.8 ASBESTOS MATERIAL ENCASEMENT/ENCLOSURE PROCEDURES.
2. REMOBILIZE TO PROVIDE PENETRATIONS FOR PLUMBING, MECHANICAL AND ELECTRICAL SCOPE OF WORK.
3. FOR FIRST FLOOR TOPPING SLAB THICKNESS, REFER TO REMOVAL DRAWING HA-101, KEYED REMOVAL NOTE 8.

PCB QUANTITY TABLE

PCB-CONTAINING MATERIAL QUANTITY TABLE

ABATEMENT KEY NOTE	PCB-CONTAINING MATERIAL	LOCATION	APPROXIMATE QUANTITY	UNITS	DISPOSAL REQUIREMENTS
P1	REMOVE ALL BLACK INTERIOR WINDOW CAULK (52 PPM)	WINDOW CAULK	22,000	LF	PCB CONTAMINATED
P2	REMOVE ALL GRAY EXTERIOR WINDOW CAULK (32,000 PPM)	WINDOW CAULK	22,000	LF	PCB MATERIAL
P3	REMOVE ALL BLACK EXTERIOR CAULK, SANDSTONE TO GRANITE (105,000 PPM)	BETWEEN SANDSTONE AND GRANITE	1,840	LF	PCB MATERIAL
P4	REMOVE ALL SANDSTONE (144 PPM)	FAÇADE	20,430	SF	PCB CONTAMINATED
P5	REMOVE ALL BLACK EXTERIOR CAULK, GRANITE TO GRANITE LEDGE (106,000 PPM)	GRANITE LEDGE	250	LF	PCB MATERIAL
P6	REMOVE ALL BLACK EXTERIOR CAULK, WINDOW TO SANDSTONE (8,000 PPM)	BETWEEN WINDOWS AND SANDSTONE	7,752	LF	PCB MATERIAL
P7	REMOVE ALL BLACK CAULK, GRANITE TO GRANITE FAÇADE (56,000 PPM)	FAÇADE	2,300	LF	PCB MATERIAL

LEAD QUANTITY TABLE

LEAD-CONTAINING MATERIAL QUANTITY TABLE

COMPONENT	SUBSTRATE	COLOR	APPROXIMATE QUANTITY (SF)
WALLS	PLASTER, SHEETROCK, CMU	OFF-WHITE, LIGHT BLUE, BEIGE	150,000
STRUCTURAL STEEL BEAMS	METAL	ORANGE	20,000
STAIR RISER, STRINGER, WALLS	METAL	GRAY	15,000
COLUMN	CONCRETE	OFF-WHITE	10,000
RADIATOR COVER	METAL	OFF-WHITE	6,000
FLOOR	CONCRETE	GRAY, BLACK	5,000
DOORS AND DOOR FRAMES	METAL	BEIGE, BLUE, GRAY, OFF-WHITE, RED, BLACK	3,000
EQUIPMENT	METAL	ORANGE	2,000
INSULATION ON PIPES	PAPER	GREEN, ORANGE, YELLOW, LIGHT BLUE	2,000
CONDUIT	METAL	BLACK / WHITE	1,000
PIPES	METAL	RED	1,000
DUNNAGE	METAL	ORANGE	1,000

UNIVERSAL WASTE QUANTITY TABLE

UNIVERSAL WASTE QUANTITY TABLE

UNIVERSAL WASTE	DESCRIPTION	LOCATION	APPROXIMATE QUANTITY (EACH)
MERCURY	FLUORESCENT LIGHT TUBES	GROUND FL	2,492
PCB OIL	PCB BALLASTS	GROUND FL	20
MERCURY	FLUORESCENT LIGHT TUBES	1ST FLOOR	1,228
MERCURY	FLUORESCENT LIGHT TUBES	2ND FLOOR	1,453
LEAD BATTERY	LEAD IN EMERGENCY LIGHTS	THROUGHOUT	64
MERCURY	FLUORESCENT LIGHT TUBES	THROUGHOUT	64
PCB OIL	PCB BALLASTS IN EMERGENCY LIGHTS	THROUGHOUT	64
REFRIGERANT	REFRIGERANT IN AIR HANDLER	COMPUTER RM	2

REVISED DRAWING
10/13/16

NEW YORK STATE OF OPPORTUNITY. Office of General Services
DESIGN & CONSTRUCTION

CONSULTANT

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STATE OF NEW YORK · DOUGLAS JAMES GIBSON · LICENSED PROFESSIONAL ENGINEER · LICENSE NO. 079423

CONTRACT:
CONSTRUCTION

TITLE:
ABATE HAZARDOUS MATERIALS & RENOVATE BUILDING NO. 4

LOCATION:
STATE OFFICE BUILDING CAMPUS
1220 WASHINGTON AVE.
ALBANY, NY 12226

CLIENT:
OFFICE OF GENERAL SERVICES

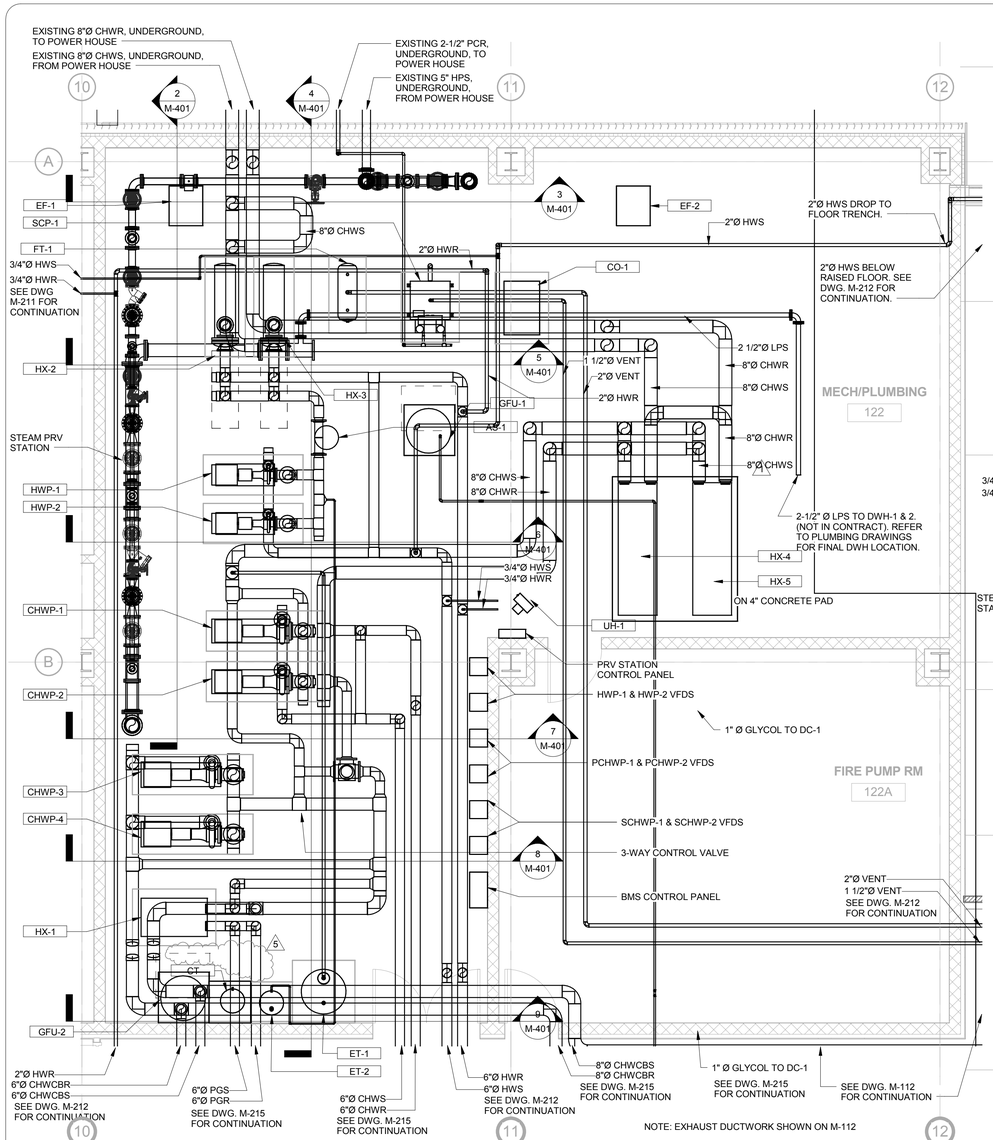
KEY PLAN:

MARK	DATE	DESCRIPTION
5	10/13/16	ADDENDUM 5
	07/11/16	BID DOCUMENTS

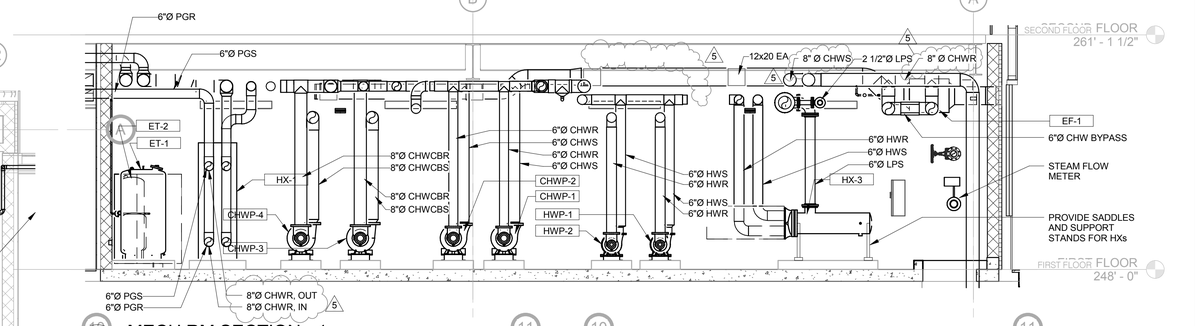
PROJECT NUMBER:	45124 - C
DESIGNED BY:	DG
DRAWN BY:	JG
CHECKED BY:	CV
APPROVED:	DG
SCALE:	NOT TO SCALE

SHEET TITLE:
HAZMAT QUANTITY

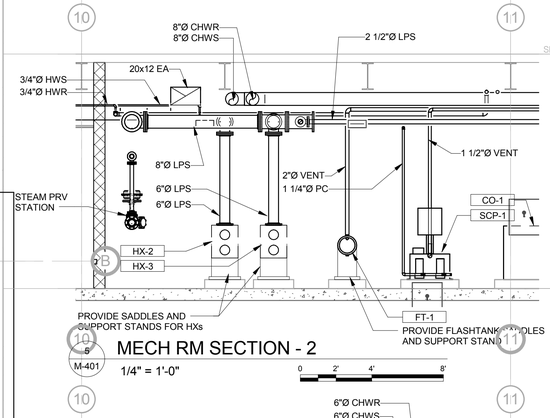
DRAWING NUMBER:
H-101



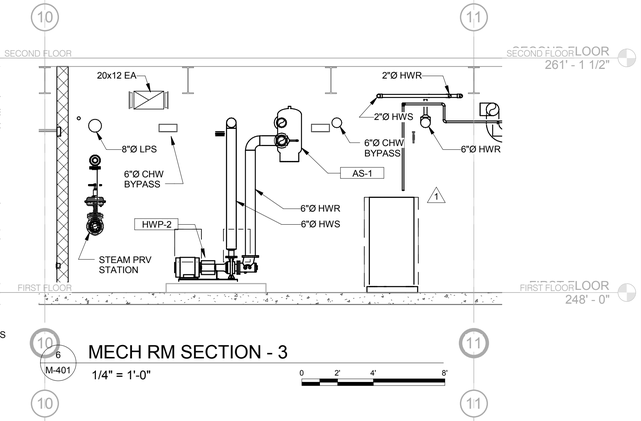
1 MECHANICAL ROOM PART PLAN
M-401 — 1/4" = 1'-0"



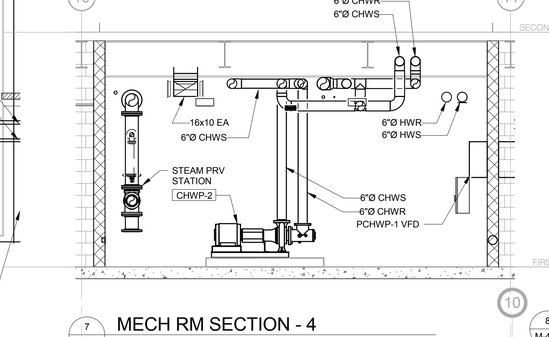
4 MECH RM SECTION - 1
M-401 — 1/4" = 1'-0"



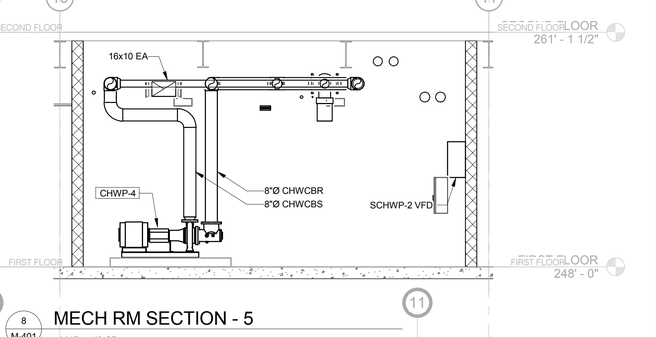
5 MECH RM SECTION - 2
M-401 — 1/4" = 1'-0"



6 MECH RM SECTION - 3
M-401 — 1/4" = 1'-0"

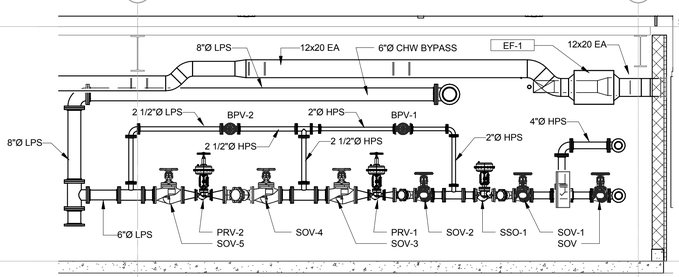


7 MECH RM SECTION - 4
M-401 — 1/4" = 1'-0"



8 MECH RM SECTION - 5
M-401 — 1/4" = 1'-0"

9 MECH RM SECTION - 6
M-401 — 1/4" = 1'-0"



NOTE: PROVIDE PRV STATION ANCHORS AND SUPPORTS.

2 PRV STATION SECTION - WEST
M-401 — 1/4" = 1'-0"

NOTE: PROVIDE PRV STATION ANCHORS AND SUPPORTS.

3 PRV STATION SECTION - NORTH
M-401 — 1/4" = 1'-0"

GENERAL SHEET NOTES

1. PROVIDE ALL CONDENSATE PIPING, VALVES, FITTINGS AND TRAPS THAT ARE NOT SHOWN ON THE FLOOR PLANS BUT REQUIRED FOR A COMPLETE SYSTEM AS INDICATED ON "HVAC HOT WATER GENERATION DIAGRAM" M-601.

REVISED DRAWING 10/13/16

10/12/2016 5:16:09 PM
39624 FLO1 SHEET

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

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N

CONTRACT: HVAC

TITLE: ABATE HAZARDOUS MATERIALS & RENOVATE BUILDING NO. 4

LOCATION: STATE OFFICE BUILDING CAMPUS
1220 WASHINGTON AVE.
ALBANY, NY 12226

CLIENT: OFFICE OF GENERAL SERVICES

KEY PLAN:

MARK	DATE	DESCRIPTION
5	10/13/16	ADDENDUM 5
1	08/26/16	ADDENDUM 1
	07/11/16	BID DOCUMENT

PROJECT NUMBER:	45124 - H
DESIGNED BY:	FG, P.E.
DRAWN BY:	AK
FIELD CHECK:	Checker
APPROVED:	Approver
SCALE:	As indicated

SHEET TITLE: HVAC ENLARGED PART PLANS - 1

DRAWING NUMBER: M-401

SHEET OF

AIR HANDLING UNIT WITH ENERGY RECOVERY SCHEDULE (FAN & FILTERS)

TAG	LOCATION	DIMENSIONS (IN.)			MAXIMUM WEIGHT (LBS)	OUTDOOR AIR (CFM)	SUPPLY AIR (CFM)	RETURN AIR (CFM)	RELIEF AIR (CFM)	SUPPLY FAN (PLENUM FAN)								RETURN FAN (PLENUM FAN)			PRE-FILTER			FINAL FILTER				RETURN FILTER				ELECTRICAL REQUIREMENTS								REMARKS
		L	W	H						E.S.P. (IN.WG)	T.S.P. (IN.WG)	RPM	MOTOR					E.S.P. (IN.WG.)	MAX BHP	HP	MERV	TOTAL FACE AREA (SQ. FT.)	MAX P.D. (FT.)		MERV	TOTAL FACE AREA (SQ. FT.)	FACE VEL. (FPM)	MAX P.D. (FT.)		MERV	TOTAL FACE AREA (SQ. FT.)	FACE VEL. (FPM)	MAX P.D. (FT.)		V	PH	HZ	FLA	MCA	MOP	MFA	
													MAX. BHP	HP	V	PH	HZ					CLEAN	REPLACE				CLEAN	REPLACE				CLEAN	REPLACE							
AHU-1	PENTHOUSE	395	123	99	20650	19206 CFM	17000	15000	17206 CFM	2.5	7.2	1567	28.5	40	480	3	60	1.00	11.96	20	7	0	0.19	0.65	13	0	500	0.30	0.70	7	0	0	0.19	0.65	480	3	60	90.5	113.1	150.0	125.0	100% OA
AHU-2	PENTHOUSE	395	123	99	20650	19206 CFM	17000	15000	17206 CFM	2.5	7.2	1567	28.5	40	480	3	60	1.00	11.96	20	7	0	0.19	0.65	13	0	500	0.30	0.70	7	0	0	0.19	0.65	480	3	60	90.5	113.1	150.0	125.0	100% OA
AHU-3	PENTHOUSE	395	123	99	20650	19206 CFM	17000	15000	17206 CFM	2.5	7.2	1567	28.5	40	480	3	60	1.00	11.96	20	7	0	0.19	0.65	13	0	500	0.30	0.70	7	0	0	0.19	0.65	480	3	60	90.5	113.1	150.0	125.0	100% OA
AHU-4	ELEC 119	46	63	70	816.3	5000 CFM	5000	5000	5000 CFM	1.0	2.6	1254	4.2	5	208	3	60	0.00	0.00	0	0	0	0.00	0.00	8	0	500	0.00	0.00	0	0	0	0.00	0.00	208	3	60	22.5	28.0	50.0	50.0	OA ECONOMIZER
AHU-5	ROOF	52	37	33	550	1800 CFM	1800	1600	1600 CFM	1.2	2.5	1837	1.7	3	480	3	60	0.50	1.45	3	8	0	0.19	0.65	0	0	0	0.00	0.00	8	0	0	0.19	0.65	480	3	60	12.3	13.6	15.0	30.0	100% OA

1

AIR HANDLING UNIT WITH ENERGY RECOVERY SCHEDULE (COILS)

TAG	HEATING COIL							AIR SIDE			HEATING WATER SIDE					COOLING COIL														
	HEATING CFM	FACE AREA (SQ. FT.)	FACE VELOCITY (FPM)	FINNED SIZE H (IN.)	FINNED SIZE W (IN.)	MIN. ROWS/ MAX FPI	TOTAL MBH	EAT (F)	LAT (F)	MAX. PD (IN. W.C.)	EWT (F)	LWT (F)	GPM	MAX. PD (FT. W.C.)	FLUID	FACE AREA (SQ. FT.)	FACE VELOCITY (FPM)	FINNED SIZE H (IN.)	FINNED SIZE W (IN.)	MIN. ROWS/MAX FPI	CAPACITY TOTAL (MBH)	CAPACITY SENS. (MBH)	MAX PD (IN. W.C.)	EAT DB (F)	EAT WB (F)	LAT DB (F)	LAT WB (F)	EWT (F)	LWT (F)	GPM	MAX PD (FT. W.C.)	FLUID
AHU-1	17000	37.5	476	45	60	1 / 11	1357.7	-7	60	0.15	190	170	133	4.53	WATER	37.5	476	45	60	8 / 10	782.7	456.9	1.26	73.9	65.4	50.49	50.45	46	58	128	10.66	WATER
AHU-2	17000	37.5	476	45	60	1 / 11	1357.7	-7	60	0.15	190	170	133	4.53	WATER	37.5	476	45	60	8 / 10	782.7	456.9	1.26	73.9	65.4	50.49	50.45	46	58	128	10.66	WATER
AHU-3	17000	37.5	476	45	60	1 / 11	1357.7	-7	60	0.15	190	170	133	4.53	WATER	37.5	476	45	60	8 / 10	782.7	456.9	1.26	73.9	65.4	50.49	50.45	46	58	128	10.66	WATER
AHU-4	0	0.0	0	0	0	0	0.0	0	0	0.00	0	0	0	0.00	0	0.0	503	0	0		155.7	127.8	0.00	75.0	62.5	51.73	51.59	46	58	27	4.31	WATER

5

AIR HANDLING UNIT WITH ENERGY RECOVERY SCHEDULE (ERW)

TAG	TOTAL ENERGY RECOVERY WHEEL																MAX. P.D. (FT.)	TOTAL EFFECTIVENESS (%)		WHEEL MOTOR HP	PASSIVE DESSICANT WHEEL														MAX. P.D. (FT.)	WHEEL MOTOR HP
	SUMMER DB & WB (F)								WINTER DB & WB (F)												SUMMER DB & WB (F)								WINTER DB & WB (F)									
	OA ENT. WHEEL		EA ENT. WHEEL		OA LVG. WHEEL		EA LVG. WHEEL		OA ENT. WHEEL		EA ENT. WHEEL		OA LVG. WHEEL		EA LVG. WHEEL						SA ENT. WHEEL		EA ENT. WHEEL		SA LVG. WHEEL		EA LVG. WHEEL		SA ENT. WHEEL		EA ENT. WHEEL		SA LVG. WHEEL		EA LVG. WHEEL			
	DB	WB	DB	WB	DB	WB	DB	WB	DB	WB	DB	WB	DB	WB	DB	WB		SUMMER	WINTER		DB	WB	DB	WB	DB	WB	DB	WB	DB	WB	DB	WB	DB	WB		
AHU-1	89.2	72.5	65.1	61.5	73.9	65.4	84.7	70.6	-7.0	-8.1	72.0	54.2	52.0	42.6	7.8	7.8	0.63	81.2	81.2	0.5	51.3	50.8	75.0	62.4	60.0	51.9	65.1	61.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.70	0.5
AHU-2	89.2	72.5	65.1	61.5	73.9	65.4	84.7	70.6	-7.0	-8.1	72.0	54.2	52.0	42.6	7.8	7.8	0.63	81.2	81.2	0.5	51.3	50.8	75.0	62.4	60.0	51.9	65.1	61.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.70	0.5
AHU-3	89.2	72.5	65.1	61.5	73.9	65.4	84.7	70.6	-7.0	-8.1	72.0	54.2	52.0	42.6	7.8	7.8	0.63	81.2	81.2	0.5	51.3	50.8	75.0	62.4	60.0	51.9	65.1	61.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.70	0.5
AHU-5	89.2	72.5	75.0	62.5	79.4	65.8	84.8	69.6	-7.0	-8.1	72.0	54.5	47.6	42.4	17.4	17.0	0.56	69	69	0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

AIR HANDLING UNIT WITH ENERGY RECOVERY SCHEDULE (FAN SOUND DATA)

TAG	LOCATION	SUPPLY FAN SOUND POWER LEVEL (DB)								SUPPLY FAN SOUND POWER LEVEL (DB)								RETURN AIR HEATING COIL															
		62.5	125	250	500	1000	2000	4000	8000	62.5	125	250	500	1000	2000	4000	8000	HEATING CFM	FACE AREA (SQ. FT.)	FACE VELOCITY (FPM)	FINNED SIZE H (IN.)	FINNED SIZE H (IN.)	MIN. ROWS/ MAX FPI	TOTAL MBH	AIR SIDE EAT (F)	AIR SIDE LAT (F)	AIR SIDE MAX. PD (IN W.C.)	HEATING WATER SIDE EWT (F)	HEATING WATER SIDE LWT (F)	HEATING WATER SIDE GPM	HEATING WATER SIDE MAX. PD (IN W.C.)	HEATING WATER SIDE FLUID
AHU-1	PENTHOUSE	92	96	103	102	92	88	82	74	88	95	99	94	90	86	78	68	15000	26.25	571	45	42	1 / 6	331	72	90	0.14	190	170	33.4	0.62	WATER
AHU-2	PENTHOUSE	92	96	103	102	92	88	82	74	88	95	99	94	90	86	78	68	15000	26.25	571	45	42	1 / 6	331	72	90	0.14	190	170	33.4	0.62	WATER
AHU-3	PENTHOUSE	92	96	103	102	92	88	82	74	88	95	99	94	90	86	78	68	15000	26.25	571	45	42	1 / 6	331	72	90	0.14	190	170	33.4	0.62	WATER
AHU-4	ELEC 119	92	85	80	78	80	73	73	67	87	80	58	47	54	55	55	51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AHU-5	ROOF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

5

FAN COIL UNIT SCHEDULE

TAG NO.	LOCATION	SERVICE	TYPE	SCFM	ESP (IN. WG)	MOTOR DATA				ELECTRICAL			COOLING COIL									HEATING COIL						FILTER	CABINET SIZE			OPERATING WEIGHT (LBS)	REMARKS
						TYPE	HP (QTY.)	BHP	MCA	V	PH	HZ	COOLING TOTAL (MBH)	COOLING SENSIBLE (MBH)	EAT DB (F)	EAT WB (F)	LAT DB (F)	LAT WB (F)	FLOW (GPM)	EWT (F)	LWT (F)	WATER MAX. PD (FT WC)	COILS ROWS	HEATING CAPACITY (MBH)	EAT (F)	LAT (F)	EWT (F)	LWT (F)	FLOW (GPM)	MERV	W (IN.)	L (IN.)	H (IN.)		
FCU-1	FIRST FLOOR	LOBBY	CEILING DUCTED	820	0.8	ECM	1.0	0.297	5.75	208	3	60	22.7	17.6	75	62	56	55	4.07	46	58	4.09	6	14.2	72	82	190	170	1.4	13	40	33	18	132	
FCU-2	FIRST FLOOR	LOBBY	CEILING DUCTED	820	0.8	ECM	1.0	0.297	5.75	208	3	60	22.7	17.6	75	62	56	55	4.07	46	58	4.09	6	14.2	72	82	190	170	1.4	13	40	33	18	132	

1

MODULAR AIR-COOLED CHILLER SCHEDULE

TAG NO.	LOCATION	DESIGN AMBIENT TEMP (°F)	PROPYLENE GLYCOL SOLUTION	ENTERING FLUID TEMP (°F)	LEAVING FLUID TEMP (°F)	FLUID GPM	PUMP HEAD (FT WC)	TOTAL HEAT REJECTION (MBH)	MAX PRESSURE DROP (FT)	FLUID VOLUME (GAL)	DRY WEIGHT (LBS)	NO. OF FANS	FAN FLA (EA. FAN)	FAN HP (EA. FAN)	HP	VOLTS	HZ	PH	FLA	EER	OPD	REMARKS
CH-1	ROOF	-7	40%	59	52	577	80	1,852	30	-	25,000	30	2.7	-	90	460	60	3	277	11.1	-	

NOTES:

1. CHILLER SHALL HAVE FLOODED CONTROL TO -20°F.

REVISED DRAWING
10/13/16

10/12/2016 3:42:30 PM
36624 P.L.O.T. SHEET

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

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LI SALTZMAN ARCHITECTS, P.C.
ARCHITECTURE AND PRESERVATION

N

CONTRACT: HVAC

TITLE: ABATE HAZARDOUS MATERIALS & RENOVATE BUILDING NO. 4

LOCATION: STATE OFFICE BUILDING CAMPUS
1220 WASHINGTON AVE.
ALBANY, NY 12226

CLIENT: OFFICE OF GENERAL SERVICES

KEY PLAN:

MARK	DATE	DESCRIPTION
5	10/13/16	ADDENDUM 5
1	08/26/16	ADDENDUM 1
	07/11/16	BID DOCUMENT

PROJECT NUMBER:	45124 - H
DESIGNED BY:	FG, P.E.
DRAWN BY:	AK
FIELD CHECK:	Checker
APPROVED:	Approver
SCALE:	NTS

SHEET TITLE: HVAC SCHEDULES - 1

DRAWING NUMBER: M-801

SHEET OF