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. 44578

CONSTRUCTION WORK - PLA
MAJOR BUILDING RENOVATIONS FOR THE
MANHATTAN FORENSIC
RELOCATION
MANHATTAN PSYCHIATRIC CENTER
600 EAST 125th STREET
WARDS ISLAND, NY 10035

August 27, 2015

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.

DIVISION 1 SECTIONS

1. Page 013300-2, ARTICLE 1.06 ADMINISTRATIVE REQUIREMENTS: Add the following Paragraph:

   "F. The Contractor(s) shall employ or otherwise provide a full-time Submittal Coordinator for no less than 90 days after the Initial Job Meeting (IJM). The Submittal Coordinator shall have regularly been engaged in construction administration for a minimum of 3 years and shall not be employed or otherwise engaged as the Project Manager or Superintendent for either the Work of this Contract or be employed in any role, full or part time, outside of this Contract."

2, Page 014100-2, ARTICLE 1.03 STATE REQUIRED PERMITS AND INSPECTIONS: Add the following Paragraph:

   "B. Each Electrical Contractor shall, at no additional costs to the State, provide for inspection of all electrical Work of the Contract and provide a certificate of compliance from an independent electrical inspection agency acceptable to the State. The following firms are examples of acceptable agencies to the State. Submit, for approval, the qualifications of the independent electrical inspection agency, including those listed below:

   1. ENSIGN ENGINEERING, P.C.
      1111 Calhoun Avenue
      Bronx, New York 10465
      (T) 718-863-5590, (F) 718-863-6178
      rgm@ensignengineering.com
      Attn: Regina Gallagher Marengo, P.E., President

2. NYS Electrical Inspections Inc.,
   278 Indian Head Rd.
   Kings Park NY 11754
   (T) 631-466-4235
3. Long Island Electrical Inspections, LTD (LIEIL)
   25 October Walk
   Long Beach, NY 11561
   (T) 516-442-2285"

ARCHITECTURAL SPECIFICATIONS

3. SECTION 035400 CEMENTITIOUS SELF-LEVELING TOPPING: Discard the Section bound in the Project Manual and substitute the attached Section (Pages 035400-1 thru 035400-7) noted "REVISED 8/12/2015".

4. SECTION 095324 SUSPENDED METAL PANEL CEILING SYSTEM: Discard the Section bound in the Project Manual and substitute the attached Section (Pages 095324-1 thru 095324-10) noted "REVISED 8/12/2015".

HVAC SPECIFICATIONS

5. SECTION 230594 TESTING, ADJUSTING, AND BALANCING: Discard the Section bound in the Project Manual and substitute the attached Section (Pages 230594-1 thru 230594-35) noted "REVISED 8/12/2015".

6. SECTION 230700 INSULATION: Discard the Section bound in the Project Manual and substitute the attached Section (Pages 230700-1 thru 230700-17) noted "REVISED 8/12/2015".

7. SECTION 230800 MECHANICAL SYSTEMS COMMISSIONING: Discard the Section bound in the Project Manual and substitute the attached Section (Pages 230800-1 thru 230800-24) noted "REVISED 8/12/2015".

8. SECTION 232000 PIPING AND PIPE FITTINGS: Discard the Section bound in the Project Manual and substitute the attached Section (Pages 232000-1 thru 232000-19) noted "REVISED 8/12/2015".

TELECOMMUNICATIONS SPECIFICATIONS

9. SECTION 270526 GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 270526-1 thru 270526-8) noted "REVISED 8/12/2015".

10. SECTION 271300 ISP COMMUNICATIONS BACKBONE CABLING: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 271300-1 thru 271300-16) noted "REVISED 8/12/2015".

11. SECTION 271500 COMMUNICATIONS HORIZONTAL CABLING: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 271500-1 thru 271500-13) noted "REVISED 8/12/2015".

12. Page 270528-1, Paragraph 1.2 B.: Change "Telecommunications Contractor" to read "Telecommunications Subcontractor".

13. Page 270536-1, Paragraph 1.2 B.: Change "Telecommunications Contractor" to read "Telecommunications Subcontractor".

14. Page 270544-1, Subparagraphs 1.2 B1 and 2: Change "Telecommunications Contractor" to read "Telecommunications Subcontractor".

15. Page 271100-1, Paragraph 1.02 C.: Change "Telecommunications Contractor" to read "Telecommunications Subcontractor".

ARCHITECTURAL DRAWINGS

16. Drawing No. A-100-2D, BASEMENT FLOOR PLAN PART "D":
    a. Add Fire Extinguisher Cabinet at Col, Lines C&16 & D&22.
    b. Add one Fire Hose Cabinet at P and 24.

17. Drawing No. A-100-2E, FIRST FLOOR PLAN PART "E": Add Fire Extinguisher Cabinet at Col, Lines C&16 & D&22.

18. Drawing No. A- 101-2A, FIRST FLOOR PLAN PART "A":
    a. Add Fire Extinguisher Cabinet at Col, Line O and 5.9.
    b. Change the name of Room 152A from "Property Storage" to read "Property Holding"**.**

19. Drawing Nos. A-103-2B through A 114-2 (Inclusive): Move Fire Extinguisher Cabinet from I &5 to H &6 as shown on Drawing No. A-104-2.

20. Drawing No. A- 103-2C, THIRD FLOOR PLAN PART"C": Revise "Wall Type A2" at Rooms 311A, 312A and 310A to one hr shaft wall design "Type H "as revised on Drawing No. A-900-

21. Drawing No. A-815-A2, INTERIOR DETAILS, Details 2 and 3: Change filler in and insulation to mineral wool.

22. Drawing A-915-2, DOOR SCHEDULE – THIRD FLOOR (A):
    a. Door No. 303A-1:
        1) Door Type Column: Change "EM" to read "HM".
        2) Size Column: Change "36 inch x 84 inch" to read "68 inch x 84 inch".
        3) Hardware Set Column: Change "46" to read "30".
    b. Door No. 303A-2:
        1) Door Type Column: Change "AM" to read "HM".
        2) Size Column: Change "36 inch x 84 inch" to read "68 inch x 84 inch".
        3) Hardware Set Column: Change "46" to read "30".

23. Drawing A-916-2, DOOR SCHEDULE – FOURTH FLOOR (A):
    a. Door No. 403A-1:
        1) Door Type Column: Change "EM" to read "HM".
        2) Size Column: Change "36 inch x 84 inch" to read "68 inch x 84 inch".
        3) Hardware Set Column: Change "46" to read "30".

b. Door No. 403A-2:
   1) Door Type Column: Change “AM” to read “HM”.
   2) Size Column: Change “36 inch x 84 inch” to read “68 inch x 84 inch”.
   3) Hardware Set Column: Change “46” to read “30”.

24. Drawing A-917-2, DOOR SCHEDULE – FIFTH FLOOR (A):
   a. Door No. 503A-1:
      1) Door Type Column: Change “EM” to read “HM”.
      2) Size Column: Change “36 inch x 84 inch” to read “68 inch x 84 inch”.
      3) Hardware Set Column: Change “46” to read “30”.
   b. Door No. 503A-2:
      1) Door Type Column: Change “AM” to read “HM”.
      2) Size Column: Change “36 inch x 84 inch” to read “68 inch x 84 inch”.
      3) Hardware Set Column: Change “46” to read “30”.

25. Drawing A-918-2, DOOR SCHEDULE – SIXTH FLOOR (A):
   a. Door No. 603A-1:
      1) Door Type Column: Change “EM” to read “HM”.
      2) Size Column: Change “36 inch x 84 inch” to read “68 inch x 84 inch”.
      3) Hardware Set Column: Change “46” to read “30”.
   b. Door No. 603A-2:
      1) Door Type Column: Change “AM” to read “HM”.
      2) Size Column: Change “36 inch x 84 inch” to read “68 inch x 84 inch”.
      3) Hardware Set Column: Change “46” to read “30”.

26. Drawing A-919-2, DOOR SCHEDULE – SEVENTH FLOOR (A):
   a. Door No. 703A-1:
      1) Door Type Column: Change “EM” to read “HM”.
      2) Size Column: Change “36 inch x 84 inch” to read “68 inch x 84 inch”.
      3) Hardware Set Column: Change “46” to read “30”.
   b. Door No. 703A-2:
      1) Door Type Column: Change “AM” to read “HM”.
      2) Size Column: Change “36 inch x 84 inch” to read “68 inch x 84 inch”.
      3) Hardware Set Column: Change “46” to read “30”.

27. Drawing A-920-2, DOOR SCHEDULE – EIGHTH FLOOR (A):
   a. Door No. 803A-1:
      1) Door Type Column: Change “EM” to read “HM”.
      2) Size Column: Change “36 inch x 84 inch” to read “68 inch x 84 inch”.
      3) Hardware Set Column: Change “46” to read “30”.
   b. Door No. 803A-2:
      1) Door Type Column: Change “AM” to read “HM”.
      2) Size Column: Change “36 inch x 84 inch” to read “68 inch x 84 inch”.
      3) Hardware Set Column: Change “46” to read “30”.

28. Drawing A-921-2, DOOR SCHEDULE – NINTH FLOOR (A):
   a. Door No. 903A-1:
      1) Door Type Column: Change “EM” to read “HM”.
      2) Size Column: Change “36 inch x 84 inch” to read “68 inch x 84 inch”.
      3) Hardware Set Column: Change “46” to read “30”.

b. Door No. 903A-2:
   1) Door Type Column: Change “AM” to read “HM”.
   2) Size Column: Change “36 inch x 84 inch” to read “68 inch x 84 inch”.
   3) Hardware Set Column: Change “46” to read “30”.

29. Drawing A-922-2, DOOR SCHEDULE –TENTH FLOOR (A):
   a. Door No. 1003A-1:
      1) Door Type Column: Change “EM” to read “HM”.
      2) Size Column: Change “36 inch x 84 inch” to read “68 inch x 84 inch”.
      3) Hardware Set Column: Change “46” to read “30”.
   b. Door No. 1003A-2:
      1) Door Type Column: Change “AM” to read “HM”.
      2) Size Column: Change “36 inch x 84 inch” to read “68 inch x 84 inch”.
      3) Hardware Set Column: Change “46” to read “30”.

30. Drawing A-923-2, DOOR SCHEDULE –ELEVENTH FLOOR (A):
   a. Door No. 1103A-1:
      1) Door Type Column: Change “EM” to read “HM”.
      2) Size Column: Change “36 inch x 84 inch” to read “68 inch x 84 inch”.
      3) Hardware Set Column: Change “46” to read “30”.
   b. Door No. 1103A-2:
      1) Door Type Column: Change “AM” to read “HM”.
      2) Size Column: Change “36 inch x 84 inch” to read “68 inch x 84 inch”.
      3) Hardware Set Column: Change “46” to read “30”.

31. Drawing A-924-2, DOOR SCHEDULE – TWELVTH FLOOR (A):
   a. Door No. 1210A-1:
      1) Door Type Column: Change “EM” to read “HM”.
      2) Size Column: Change “36 inch x 84 inch” to read “68 inch x 84 inch”.
      3) Hardware Set Column: Change “46” to read “30”.
   b. Door No. 1210A-2:
      1) Door Type Column: Change “AM” to read “HM”.
      2) Size Column: Change “36 inch x 84 inch” to read “68 inch x 84 inch”.
      3) Hardware Set Column: Change “46” to read “30”.

32. Drawing A-925-2, DOOR SCHEDULE – THIRTEENTH FLOOR (A):
   a. Door No. 1310A-1:
      1) Door Type Column: Change “EM” to read “HM”.
      2) Size Column: Change “36 inch x 84 inch” to read “68 inch x 84 inch”.
      3) Hardware Set Column: Change “46” to read “30”.
   b. Door No. 1310A-2:
      1) Door Type Column: Change “AM” to read “HM”.
      2) Size Column: Change “36 inch x 84 inch” to read “68 inch x 84 inch”.
      3) Hardware Set Column: Change “46” to read “30”.

33. Drawing A-926-2, DOOR SCHEDULE – FOURTEENTH FLOOR (A):
   a. Door No. 1410A-1:
      1) Door Type Column: Change “EM” to read “HM”.
      2) Size Column: Change “36 inch x 84 inch” to read “68 inch x 84 inch”.
      3) Hardware Set Column: Change “46” to read “30”.

b. Door No. 1410A-2:
   1) Door Type Column: Change “AM” to read “HM”.
   2) Size Column: Change “36 inch x 84 inch” to read “68 inch x 84 inch”.
   3) Hardware Set Column: Change “46” to read “30”.

34. Drawing Nos. AR-100-2A, AR-100-2B, AR-100-2C, AR-100-2D, AR-100-2E, AR-101-2A, AR-101-2B, AR-101-2C, AR-101-2D, AR-101-2E, AR-102-2A, AR-102-2B, AR-102-2C, AR-102-2D, AR-103-2, AR-104-2, AR-105-2, AR-106-2, AR-107-2, AE-108-2, AR-109-2, AR-110-2, AR-111-2, AR-112-2, AR-113-2, AR-114-2, AR-115-2, and AR-116: Add the suffix”-2” to the end of all detail tags.

35. Drawing Nos. AR-103-2, AR-104-2, AR-105-2, AR106-2, AR107-2, AR108-2, AR-109-2, AR-110-2 and AR 111-2: The Work shown on these drawings between Column Lines G and I, and 16 and 19.2 are being modified by Addendum Drawing No. AR-106-2 dated 8/12/2015. The Work shown on this addendum drawing supersedes the work shown on the originally issued drawing between the column lines specified above.

36. Revised Drawings:
   a. Drawing Nos. G100-2 , A-100-2A, A-100-2B, A-100-2C, A-100-2D, A-100-6B, A-101-2A, A-101-2B, A-101-2C, A-101-2D, A-102-2C, A-102-2D, A103-2A , A-103-2B, A-103-2C, A-104-2, A-105-2, A-106-2, A-107-2, A-108-2, A109-2, A110-2, A111-2, A-112-2, A-113-2, A-114-2, A-401-2, A-402-2, A-411-2, A-412-2, A-801-2, A-802A-2, A-802-2, A-805-2, A-807-2, A-808-2, A-810-2, A-811-2, A-815-2, A-815A-2, A-900-2, A905-2, A-911-2, A-945-2, AD-200-2D, AD-201-2D, AD-202-2D, AF 115, AR-100-6B and AT-107-2 noted “REVISED DRAWING 8/12/2015” accompany this Addendum and supersede the same numbered originally issued drawings.

37. Addendum Drawings:
   a. Drawing Nos. A-801A and A-801B noted “ADDENDUM DRAWING 8/12/2015” are attached to this Addendum and form part of the Contract Documents.

STRUCTURAL DRAWINGS

38. Revised Drawings:
   a. Drawing Nos. S-101-2, S-102-2, and S-103-2 noted “REVISED DRAWING 08/12/2015” accompany this Addendum and supersede the same numbered originally issued drawings.

HVAC DRAWINGS

39. Drawing Nos. M-104-2, M-105-2, M-106-2, M-107-2, M-108-2, M-109-2, M-110-2, and M-111-2: The Work shown on these drawings between Column Lines G and I, and 16 and 19.2 are being modified by Addendum Drawing No. M-430-2 dated 8/12/2015. The Work shown on this addendum drawing supersedes the work shown on the originally issued drawing between the column lines specified above.

40. Addendum Drawings:
   a. Drawing No. M-430-2 noted “ADDENDUM DRAWING 08/12/2015” accompanies this Addendum and forms part of the Contract Documents.

41. Revised Drawings:
    a. Drawing Nos. M-001, M-100-2A, M-100-2D, M-101-2D, M-101-2E, M-114-2, M-214-2, M-503, M-505, M-641-2, M-652-2, M-656-2, M-657-2, M-662-2, and M-664-2 noted "REVISED DRAWING 8/12/2015" accompany this Addendum and supersede the same numbered originally issued drawings.

ELECTRICAL DRAWINGS

42. Drawing Nos. E-203-2C, E-204-2B, E-205-2B, E-206-2B, E-207-2B, E-208-2B, E-209-2B, E-210-2B, and E-211-2B.: The Work shown on these drawings between Column Lines G and I, and 16 and 19.2 are being modified by Addendum Drawing No. E-305-2 dated 08/12/15. The Work shown on this addendum drawing supersedes the work shown on the originally issued drawing between the column lines specified above.

43. Addendum Drawings:
    a. Drawing Nos. E-305-2 and E-099-2A noted "ADDENDUM DRAWING 08/12/2015" accompany this Addendum and form part of the Contract Documents.

PLUMBING DRAWINGS

44. Revised Drawings:
    a. Drawing No. P-099-2B noted "REVISED DRAWING 8/12/2015" accompanies this Addendum and supersedes the same numbered originally issued drawing.

FIRE PROTECTION DRAWINGS

45. Drawing No. FP-001, NOTES, Note 11: Delete this Note in its entirety and replace with the following:
    "11. CONTRACTOR SHALL INCLUDE IN THEIR SCOPE TO ENGAGE A FACILITY APPROVED TESTER TO CONDUCT AN INITIAL HYDRANT FLOW TEST PRIOR TO SUBMISSION OF SPRINKLER SHOP DRAWINGS AND HYDRAULIC CALCULATIONS AND ANOTHER HYDRANT FLOW TEST PRIOR TO COMPLETION AND HANDOVER OF THE PROJECT."

46. Addendum Drawings:
    a. Drawing Nos. FP-103-2, FP-104-2, FP-105-2, FP-106-2, FP-107-2, FP-108-2, FP-109-2, FP-110-2 and FP-111-2.: The Work shown on these drawings between Column Lines G and I, and 16 and 19.2 are being modified by Addendum Drawing No. FP-402-2 dated 08/12/15. The Work shown on this addendum drawing supersedes the work shown on the originally issued drawing between the column lines specified above.

47. Revised Drawings:
    a. Drawing Nos. FP-099-2A, FP-099-2B, FP-099-2C, FP-099-2D, and FP-099-2E, noted "REVISED DRAWING 8/12/15" accompany this Addendum and supersede the same numbered originally issued drawings

TELECOMMUNICATIONS DRAWINGS

48. Drawing No. T-001, GENERAL NOTES, Notes 5, 6, and 7: Delete these Notes in their entirety, and replace with the following:

"5. CONDUIT, CABLE TRAY AND CABLING SHOWN ON DRAWINGS ARE ONLY DIAGRAMMATIC AND DO NOT INDICATE ALL RESPECTIVE BENDS, ASSEMBLIES, FITTINGS, MOUNTING HARDWARE AND BOXES WHICH MAY BE REQUIRED. THE TELECOM SUBCONTRACTOR SHALL PROVIDE AND INSTALL CONDUITS, CABLE TRAY AND CABLES ARE INSTALLED AND ROUTED AS REQUIRED EXERCISING GOOD WORKMANSHIP AND IN COMPLIANCE WITH ALL APPLICABLE CODE.

6. THE TELECOM SUBCONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFICATIONS AND COORDINATION OF ALL DIMENSIONS, SIZES, SYSTEM VOLTAGES, QUANTITIES, AND EXTENT OF WORK. THE TELECOM SUBCONTRACTOR SHALL CAREFULLY EXAMINE THE ARCHITECTURAL, CIVIL, ELECTRICAL, STRUCTURAL, MECHANICAL, PIPING, FIRE ALARM, BMS AND SECURITY DRAWINGS IN FULL AND UNDERSTAND THE NATURE AND SCOPE OF WORK. THESE DRAWINGS ARE STRICTLY SCHEMATIC, AND A COMPLETE COORDINATED, FUNCTIONAL, AND CODE/EIA-TIA INDUSTRY STANDARDS COMPLIANT SYSTEM IS INTENDED.

7. THE TELECOM SUBCONTRACTOR SHALL REFER TO THE ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL, FIRE ALARM AND SECURITY DRAWINGS AND SPECIFICATIONS FOR COORDINATION AND EXTENT OF THE WORK OF THE VARIOUS TRADES."

49. Drawing No. T-001, GENERAL NOTES, Notes 9, 10, 11, and 12: Delete these Notes in their entirety, and replace with the following:

"9. TELECOM SUBCONTRACTOR SHALL INSTALL PER INDUSTRY BEST PRACTICES AND PER INSTALLATION METHODS IDENTIFIED IN THE PROJECT SPECIFICATION DOCUMENTS.

10. THE TELECOM SUBCONTRACTOR SHALL PROVIDE AND LABEL ALL PENETRATION FIRE STOPPING FOR THE TELECOMMUNICATIONS ISP BACKBONE AND ISP HORIZONTAL DISTRIBUTION CABLE INFRASTRUCTURE.

11. AT MODULAR FURNITURE AND CASEWORK LOCATIONS THE TELECOM SUBCONTRACTOR SHALL PROVIDE APPROPRIATE SIZED BACK BOX WHIP ASSEMBLY FACEPLATE AND PROVIDE WHIP FROM THE BACK BOX FACEPLATE ASSEMBLY TO THE MODULAR FURNITURE RACEWAY OR CASEWORK POINT OF ENTRY. ROUTE TELECOMMUNICATIONS CABLING FROM THE BACK BOX, THROUGH THE WHIP AND INTO THE MODULAR FURNITURE OR CASEWORK CABLE PATHWAY. IN MODULAR FURNITURE, TELECOMMUNICATIONS CABLING SHALL BE TERMINATED IN A MODULAR FURNITURE RACEWAY COMPATIBLE FLUSH MOUNT FACEPLATE. IN CASEWORK, TELECOMMUNICATIONS CABLING SHALL BE TERMINATED IN SURFACE MOUNT BACK BOX SECURED TO CASEWORK 1'-6" A.F.F. UNLESS OTHERWISE NOTED.

12. THE PROJECT WILL MAINTAIN A STRICT COLOR CODE FOR ALL LOW VOLTAGE SYSTEMS (NOT INCLUDING ELECTRIC LIGHT AND POWER) THROUGHOUT THE CAMPUS. THE TELECOM SUBCONTRACTOR SHALL PROVIDE CABLING IN THE COLOR INDICATED IN THE "COLOR CODE FOR LOW VOLTAGE SYSTEM WIRING" TABLE SHOWN ON THIS SHEET (T-001)."

50. Drawing No. T-001, TELECOM CABLE INFRASTRUCTURE AND COMPONENT INSTALLATION RESPONSIBILITY MATRIX, Responsibility Matrix Heading: Change "PROVIDED BY TELECOM CONTRACT" responsibility matrix heading to read "PROVIDED BY TELECOM SUBCONTRACT"".

51. Drawing Nos. T-100-2, T-101-2, T-102-2, T-103-2, T-104-2, T-105-2, T-106-2, T-107-2, T-108-2, T-109-2, T-110-2, T-111-2, T-112-2, T-113-2, T-114-2, T-115-2 and T-116-2, GENERAL SHEET NOTES: Add the following Note:

    "4. FOR M.I.S. OFFICE 113A-1 AND M.I.S. ROOM 113A PHASING PLAN SEE DRAWING NUMBER T-405A-2."

52. Drawing No. T-101-2: Add view reference to indicate MIS Office 113-A (existing MIS Room) Enlarged Plans are located on Drawing No. T-405A-2.

53. Telecom Drawing Nos. T-100-2A, T-100-2B, T-100-2C, T-100-2D, T-100-2E, T-101-2A, T-101-2B, T-101-2D, T-101-2E, T-102-2A, T-102-2B, T-102-2C, T-102-2D, T-102-2E, T-103-2A, T-103-2B, T-103-2C, T-103-2D, T-103-2E, T-104-2A, T-104-2B, T-105-2A, T-105-2B, T-106-2A, T-106-2B, T-107-2A, T-107-2B, T-108-2A, T-108-2B, T-109-2A, T-109-2B, T-110-2A, T-110-2B, T-111-2A, T-111-2B, T-112-2A, T-112-2B, T-113-2A, T-113-2B, T-114-2A, T-114-2B, T-115-2A, T-115-2B, T-116-2A, and T-116-2B, GENERAL SHEET NOTES: Add the following Note:

    "4. FOR M.I.S. OFFICE 113A-1 AND M.I.S. ROOM 113A PHASING PLAN SEE DRAWING NUMBER T-405A-2."

54. Drawing Nos. T-100-2A, T-100-2B, T-100-2C, T-100-2D, T-100-2E, T-101-2A, T-101-2B, T-101-2D, T-101-2E, T-102-2A, T-102-2B, T-102-2C, T-102-2D, T-102-2E, T-103-2A, T-103-2B, T-103-2C, T-103-2D, T-103-2E, T-104-2A, T-104-2B, T-105-2A, T-105-2B, T-106-2A, T-106-2B, T-107-2A, T-107-2B, T-108-2A, T-108-2B, T-109-2A, T-109-2B, T-110-2A, T-110-2B, T-111-2A, T-111-2B, T-112-2A, T-112-2B, T-113-2A, T-113-2B, T-114-2A, T-114-2B, T-115-2A, T-115-2B, T-116-2A, and T-116-2B, GENERAL SHEET NOTES, Notes 1, 2, and 3: Delete these Notes in their entirety and replace with the following:

    "1. TELECOM OUTLET CABLING SHALL BE ROUTED TO THE SERVING AREA IT-ROOM ON THE SAME FLOOR WITH THE EXCEPTION OF THE 15TH FLOOR WHICH IS ROUTED TO THE FLOOR BELOW. THE TELECOM SUBCONTRACTOR SHALL COORDINATE WITH OTHER TRADES AND CREATE TELECOM CABLE PATHWAYS USING APPROPRIATELY SIZED J-HOOKS TO SUPPORT CATEGORY 6 HORIZONTAL DISTRIBUTION CABLES AND FIBER OPTIC, MULTI-PAIR COPPER AND COAXIAL BACKBONE CABLES. J-HOOKS SHALL BE SPACED NOT FURTHER THAN 48" APART.

2. THE TELECOM SUBCONTRACTOR SHALL PROVIDE ALL BACKBOXES AND CONDUIT STUBS AS INDICATED ON THE LEGEND ON PROJECT DRAWING T-001 AT ALL LOCATIONS SHOWN ON THE ASSOCIATED TELECOM FLOOR PLAN DRAWINGS. THE TELECOM SUBCONTRACTOR SHALL PROVIDE ALL JUNCTION BOXES SHOWN ON THE ASSOCIATED TELECOM FLOOR PLAN DRAWINGS.
3. THE TELECOM SUBCONTRACTOR SHALL PROVIDE ALL WALL, FLOOR AND CEILING PENETRATIONS AS SHOWN ON THE ASSOCIATED PROJECT DRAWINGS AND ADDITIONALLY, AS NEEDED TO ROUTE CABLES AS REQUIRED FOR A COMPLETE EIA/TIA/NEC COMPLIANT CABLE INFRASTRUCTURE."

55. Drawing No. T-101-2C, GENERAL SHEET NOTES: Add the following Note:

"4. FOR M.I.S. OFFICE 113A-1 AND M.I.S. ROOM 113A PHASING PLAN SEE DRAWING NUMBER T-405A-2."

56. Addendum Drawings:
    b. Drawing Nos. TD-100-2, TD101-2 and T-405A-2 noted "ADDENDUM DRAWING 08/12/2015" accompany this Addendum and form part of the Contract Documents.

END OF ADDENDUM

Margaret F. Larkin
Executive Director
Design and Construction

AD/JRC:jc

SECTION 035400

CEMENTITIOUS SELF-LEVELING TOPPING

PART 1 GENERAL

1.01 DESCRIPTION

A. Provide cementitious self-leveling topping/compound and related work as required for a complete installation in accordance with the Contract Documents for Construction. The intent of the work is to achieve level tolerance requirements of 1/8" in 10 feet, non-cumulative, unless a more stringent tolerance is required of the respective finish flooring materials, millwork, furnishings, and similar work over the various existing flooring substrates that are known to exist in the building, including:
   1. Old concrete.
   2. New concrete (with curing compound per Phase 1 Project 44579 contract requirements).
   3. Old terrazzo.
   4. Old "Dex-O-Tex" finish on concrete.

B. The existing ("Old") floors include significant removals of old walls resulting in depressions and trenches, which have been filled with new concrete and extensive new structural and fill concrete installations, resulting in interface joints with the "Old" flooring surfaces.
   1. The Contractor shall refer to and coordinate with the applicable reference drawings.
   2. The Contractor shall assume that all "Old" flooring surfaces contain surface contaminants.

C. The Work of this contract shall also include shot blasting of 100% of the "Old" flooring surfaces to a Minimum CSP 3 to receive cementations underlayment.
   1. The Contractor shall provide an independent ICRI Qualified lab to inspect, sign-off, and file a report certifying that a CSP 3 Profile has been attained, and that all surface contaminants have been removed.

D. The Work of this Contract shall also include repair of structural cracks in existing building substrates exposed by shot blasting.
   1. Expose structural cracks in the existing floors shall be patched prior to installation of self-leveling compound.
   2. Procedure(s) for repairing structural cracks shall be proposed by the Contractor and subject to review and acceptance of the Owner's Representative, Architect, and Structural Engineer.
   3. The contractor shall include pricing for repairing structural cracks in the amount of 250 LF per floor.

E. The Work of this Contract shall also include testing of the moisture content of the slabs in accordance with manufacturers' requirements.

1. The Contractor shall provide documentation of results of each area tested.

F. The Work of this contract shall also include crack control in the finished product installation: The Contractor shall skim coat any hairline cracks that appear in the finished underlayment after cure. The contractor shall assume that cracking may occur at all locations of old walls removed and at all interfaces of old concrete and new concrete. Refer to and coordinate with the reference drawings for all locations.

G. The Work of this contract shall also include isolating self-leveling compound from perimeter walls, columns, penetrations, etc. Provide compressible filler for these locations in order to allow movement and eliminate cracking; subject to review and acceptance of the Owner's Representative and Architect on final shop drawings.

H. Refer to and coordinate with Section 096519, Resilient Tile Flooring, which includes the work of terrazzo resilient tile floor. Terrazzo resilient tile shall be shot and primed in accordance with the recommendations of the leveling compound manufacturer and tile manufacturer.
   1. Anticipate an average thickness of ½-inch of leveling compound but no less than ¼".

I. Provide Unit Pricing, in addition to structural crack repair indicated hereinbefore, if requested by the Director's Representative.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Architectural Woodwork: Section 064000.

B. Ceramic Tile: Section 093013.

C. Resilient Sheet Flooring: Section 096516.

D. Resilient Tile Flooring: Section 096519.

E. Carpet Tile: Section 096813.

F. Furniture: Section 120000.

G. Healthwork Casework: Section 123570.

1.03 SCHEDULING

A. Before commencing floor leveling and related work, submit for review by the Director's Representative and the Architect, a schedule showing the commencement, the order, and the completion dates for the various areas of this Work.

1.04 REFERENCES

A. This system consists of a primer and a mix of special cements and binders which, when mixed with water, becomes a highly liquid cement compound that seeks its own level and produces a flat, smooth surface. Surface shall be true to plane within 1/8" maximum deviation under a 10' straight edge in accordance with ACI 302 1R-96, Flatness Tolerance.

B. International Concrete Repair Institute ICRI Technical Guideline No. 03732: Selecting and Specifying Preparation for Coatings, Sealers, and Polymer Overlays.

1.05 SUBMITTALS

A. Product Data: Manufacturer's catalog sheets, specifications, and installation instructions for each item specified.

1.06 QUALITY ASSURANCE

A. Material Container Labels: Material containers shall bear the manufacturer's label indicating manufacturer's name, trade name of product, lot number, shelf life of product, and mix ratio (if applicable).

B. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced contractors.

C. Installer's Qualifications: The Contractor shall demonstrate qualifications to perform the work of this Section.

D. Source Limitations: Components listed in this section shall be provided by a single manufacturer.

E. Project First Installation:
   1. At designated areas on the site, provide First Installation representing the scope of work. Location: As directed by the Director's Representative.
   2. Provide First Installation consisting of self-leveling topping (floor leveling compound) **o**ver a typical area with existing terrazzo and concrete for review and acceptance of the Director's Representative.
   3. Dimensions and extent of First Installation: As directed by Director's Representative.
   4. Subcontractors' installers providing the First Installation shall be the same installers performing the Work of the Contract.
   5. The accepted First Installation may be used as part of the Work, and may be included in the finished Work. Revise as necessary to secure approval of the Director's Representative.
   6. The First Installation, when approved by the Director's Representative, will be used as datum for comparison in materials, installation, and workmanship with the remainder of the work of this Section for the purposes of acceptance or rejection.

7. If the First Installation is not permitted to be part of the finished Work, completely demolish and remove them from the job site upon completion and acceptance of the Work of this Section.

F. Any and/or all substitutions have to take into consideration their physical location in the Project and have to be able to accept/fit within the spatial constraints of the substituted material, equipment or assembly.

1.07 DELIVERY AND STORAGE

A. Deliver materials to the site in original, sealed containers. Do not deliver materials, which have exceeded shelf life limitation set forth by the manufacturer.

B. Comply with manufacturer's printed instructions for storing materials.

1.08 PROJECT CONDITIONS

A. Environmental Requirements: Comply with the product manufacturer's printed limitations and instructions.

B. Install leveling compound shall be installed after interior walls but approximately two to four weeks before floor finishes are applied as per manufacturer's directions for curing time. Any protrusions resulting from conduit removals or "turned up" concrete from cove base removals are assumed to be removed by others but must be verified as part of the Work.

1.09 TEST SAMPLE

A. Provide field applied 5' x 5' x contract thickness sample of topping over each "old" flooring substrate known to exist in the building, including:
   1. Old concrete.
   2. New concrete (with curing compound per Phase 1 Project 44579 contract requirements).
   3. Old terrazzo.
   4. Old "Dex-O-Tex" finish on concrete.

B. Provide field applied 5' x 5' x contract thickness sample of topping treatment over leveling-compound hairline cracking

B. Provide field applied 5' x 5' x contract thickness sample of treatment of structural cracks in existing building substrates exposed by shot blasting; prior to leveling compound work.

PART 2 PRODUCTS

2.01 MATERIALS

A. The following brand names are specified to establish product generic type and standard of quality. Other comparable products in the manufacturer's same

product series may be required to closely fit the particular job conditions. Use appropriate product for depth of patch and temperature at time of application. More than one product may be required for a particular type of patching mortar. When choice of color is available, select color to match adjoining concrete. A bonding agent/primer and/or sealer shall be used as recommended by the patching mortar manufacturer.

B. Acceptable Manufacturers - Cementitious Self-Leveling Topping:
   1. Laticrete "Supercap SC500" LATICRETE SUPERCAP, LLC Bethany, CT; (agabbott@laticretesupercap.com)
      or approved equal by:
   2. Cement Base, Self-Leveling, Ardex K15 Self-Leveling Underlayment by Ardex.
   3. Level Finish by CMP Specialty Products.

C. Where a vapor barrier is required, provide Laticrete "Supercap Moisture Vapor Control" or approved equal.

D. Aggregate: Underlayment mortar manufacturer's recommended sizes, for thicknesses involved, if required.

E. Cleaning Agent, Bonding Agent/Primer Sealer: As recommended by the patching mortar manufacturer.

F. Water: Clean and free of deleterious amounts of acids, alkalis, and organic materials.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates on which work will be installed and conditions under which work will be performed. Include testing as necessary to quantify condition of the substrate. Do not proceed with work until unsatisfactory conditions have been corrected in an acceptable manner.

B. Commencing work implies acceptance of existing conditions as satisfactory to successful completion of this work

3.02 PREPARATION

A. Protection: Cover or otherwise protect adjacent surfaces not being repaired. Protect after placement in accordance with the product manufacturer's printed instructions.

B. Surface Preparation:
   1. Prepare surface in accordance with the product manufacturers' printed instructions.

2. Remove paint, oils, grease, dirt, salt deposits, laitance and other contaminants from surfaces to be patched. Use cleaning agent where required.
3. Clean areas to be filled with air or water under pressure, except as otherwise recommended by the mortar manufacturer.

C. Coat contact surfaces of existing materials with a bonding agent/primer if recommended in the product manufacturer's instructions.

3.03 APPLICATION - GENERAL

A. Mixing Underlayment Mortar: Comply with mortar manufacturer's printed instructions. Proportion components and sizes of aggregate as recommended by mortar manufacturer for the particular job conditions. Do not over water underlayment mortar.

B. Apply the underlayment mortar in accordance with the product manufacturer's printed instructions.

3.04 APPLICATION – NEW AND EXISTING CONCRETE

A. Follow manufacturer's guidelines i.e., TDS-230S – Laticrete Supercap Substrate Preparation and Primer Guide for existing concrete. Water drop test shall be performed to determine recommended priming method.

B. Review floor covering and adhesive manufacturers' technical data sheets for recommendations on allowable concrete moisture limits. If a vapor barrier is required, install manufacturer's recommended product for Moisture Vapor Control.

3.05 APPLICATION – CEMENTITIOUS TERRAZZO

A. Follow manufacturer's guidelines i.e., TDS-230S – Laticrete Supercap Substrate Preparation and Primer Guide for existing cementitous terrazzo. Water drop test shall be performed to determine recommended priming method.

B. Existing terrazzo areas are assumed to have been treated over the years with floor waxes and cleaning products. Ensure that substrates are inspected for contaminants and other foreign materials that could act as a bond breaker. Remove mechanically.

C. Review floor covering and adhesive manufacturers' technical data sheets for recommendations on allowable concrete moisture limits. If a vapor barrier is required, install manufacturer's recommended product for Moisture Vapor Control.

3.06 CLEANING

A. Clean up spatters and droppings.

B. Remove and properly dispose of leftover materials and debris.

C. Adjacent surfaces shall be left in a clean condition.

D. Work areas are to be kept clean, clear and free of debris at times. Do not allow trash, waste, or debris to collect in the work area. These items shall be removed on a daily basis.

END OF SECTION

SECTION 095324

SUSPENDED METAL PANEL CEILING SYSTEM

PART 1 GENERAL

1.01 DESCRIPTION

A. Provide secure metal panel ceiling system, continuous wall-to-wall, and related work as required for a complete installation in accordance with the Contract Documents for Construction.
   1. Acoustical metal ceiling panels, individually screwed in place.
      a. Friction fit installation of panels is unacceptable.
      b. Panels shall be fastened in such a manner so that each accessible panel can be removed individually without affecting the remainder of the ceiling.
      c. It is a requirement of the contract that the accessible panels be shown and coordinated on the Ceiling Coordination Plans; and subject to the review and approval of the Director's Representative and the Architect.
   2. Concealed grid suspension system.
   3. Primary suspension system including black iron rods, fasteners, main runners, cross tees.
   4. Perimeter trim and box molding with spreader hold down.
   5. Fixture frame.

B. Refer to and coordinate with the Drawings, Reflected Ceiling Plans, and Schedules.

1.02 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION

A. Concrete Inserts: Installed under the Work of Section 033000.

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are not included in this Section of the specifications:
   1. Mineral Acoustic Tile Ceilings, their components and installation.
   2. Ceiling Light Fixtures, their components or installation.
   3. HVAC Air Distribution
   4. Gypsum Board Wall/Partitions and Ceiling Systems

B. Although not furnished by the ceiling system manufacturer, all lighting fixtures are to be compatible with the selected system and independently supported from the structure and provided with fixture frame.

1.04 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. ASTM A 1008 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
2. ASTM A 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
3. ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
4. ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
5. ASTM C 635 Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
6. ASTM C 636 Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels
7. ASTM D 3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
8. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials
9. ASTM E 580 Installation of Metal Suspension Systems in Areas Requiring Moderate Seismic Restraint
10. ASTM E 1111 Standard Test Method for Measuring the Interzone Attenuation of Ceilings Systems
11. ASTM E 1414 Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum
12. ASTM E 1264 Classification for Acoustical Ceiling Products

1.05 SYSTEM DESCRIPTION

A. This specification covers the material, performance, and related requirements for the following ceiling systems, wall to wall, including all necessary acoustical insulation, suspension systems, and fasteners:
1. Suspended Metal Panel Ceiling System - 24 inches x 24 inches. Aluminum panels with Round-Diagonal .063" perforations open area 7% (Armstrong M16); Armstrong World Industries, Metal Works Clip-On and all required components described in 2.01.

1.06 PERFORMANCE REQUIREMENTS

A. Accessibility: Suspended metal panel ceiling system shall be designed and installed to resist access to the plenum area above except through pre-designated access panels which shall be secured to the suspension system with clip on system concealed with set screws. Accessible panels should be Armstrong 7140.

B. Acoustical Requirements: The metal panel ceiling system shall provide a noise reduction coefficient (NRC) of no less than .80 when tested in accordance with ASTM E795-83.

1.07 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 shop drawings, product data, samples, and quality control submittals specified below at the same time as a package.

C. Shop Drawings: Reflected ceiling plans and details that show specific application to the Work. Indicate location of grid members, acoustical units and other items that are part of, built-in with, or coordinated with, the ceiling system, including but not limited to light fixtures and air diffusers.
   1. The security-ceiling contractor shall verify all dimensions, elevations, and job site conditions before fabrication commences.
   2. Indicate concealed fastening of panel to grid and how the individual panel can removed without affecting the rest of the ceiling in a given space or room.

D. Product Data: Manufacturer's printed technical data sheets, specifications, and installation instructions for the following:
   1. Each suspension system type specified.
   2. Acoustical panels specified.
   3. Integral access units.

E. Samples:
   1. An assembled sample of each ceiling panel and its suspension system including main runner, cross tees, perimeter angle, hanger wire, and compression struts. Include method of concealed fastening of panel.

F. Quality Control Submittals:
   1. Certification: Manufacturer's written statement, certifying that the suspension system meets or exceeds the specified structural requirements.

G. Contract Closeout Submittals:
   1. Maintenance Instructions: Two copies of the manufacturer's printed recommendations for cleaning and refinishing the acoustical units. Include precautions regarding materials and methods that may be detrimental to finish and acoustic efficiency.

1.08 QUALITY ASSURANCE

A. Manufacturer Qualifications: A company specializing and regularly engaged in the domestic manufacture of metal panel security ceilings with a minimum of 5 years experience in the production of correctional ceiling systems.

B. Erector Qualifications: A company specializing in the installation of metal panel security ceilings, approved by the manufacturer, and having a minimum of 5 years experience in the installation of correctional ceiling systems

C. Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer

D. Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
   1. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 Classification.

E. Coordination of Work: Coordinate acoustical ceiling work with installers of related work including but not limited to: building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

F. Project Mock-Up and/or First Installation:
   1. At designated areas on the site, provide Project Mock-Up and/or First Installation representing the scope of work.
   2. Coordinate with related trades included, including adjacent walls with Level 4 finish and lights, sprinkler, camera, smoke detector, speaker, diffusers, gypsum board transitions.
   3. Secure metal ceiling may also be required in the Patient Room Mock-up and/or First Installation as indicated on the Drawings. Coordinate accordingly with the Director's Representative.
   4. Locations: As directed by the Director's Representative.
   5. Provide Project Mock-Up for secure metal ceiling required for review and acceptance of the Director's Representative.
   6. Dimensions and extent of Project Mock-Up: 8 ft. x 60 ft. unless otherwise directed by the Director's Representative.
   7. Subcontractors' installers providing the Project Mock-Up and/or First Installation shall be the same installers performing the Work of the Contract.
   8. The accepted Project Mock-Up and/or First Installation may be used as part of the Work, and may be included in the finished Work.
   9. Revise as necessary to secure Director Representative's approval.
   10. The Project Mock-Up, when approved by the Director's Representative, will be used as datum for comparison in materials, installation, and workmanship with the remainder of the work of this Section for the purposes of acceptance or rejection.
   11. If the Project Mock-Up and/or Installation is not permitted to be part of the finished Work, completely demolish and remove from the job site upon completion and acceptance of the Work of this Contract.

F. Alternative Systems
   1. Prior Approval: Unless otherwise provided for in the Contract Documents, proposed product substitutions may be submitted no later than 10 working days prior to the date established for receipt of bids. Acceptability of a proposed substitution is contingent upon the Owner Representative's review of the proposal for acceptability and approved products will be set forth by Addenda or other approved means. If substitute products included in a Bid, and not been approved by Addenda

or other approved means, the specified products shall be provided without additional compensation.

2. Submittals that do not provide adequate data for the product evaluation will not be considered. It is required that proposed substitutions comply with or exceed this section's requirements that include: Single source materials' suppliers; Underwriters' Laboratories Classified Acoustical performance; Panel design, size, composition, color, and finish; Suspension system component profiles and sizes; Compliance with referenced standards and authorities having jurisdiction.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original, unopened containers with manufacturer's product identification labels intact and legible.

B. Store materials in original, unopened containers to prevent soiling. Protect stored materials from physical damage or wetting; in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.

C. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.

D. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

1.10 PROJECT CONDITIONS

A. Environmental Requirements: Comply with the suspended ceiling system manufacturer's printed temperature and ventilation requirements before, during, and after installation.

B. Do not install interior ceilings until space is enclosed and weatherproof; wet work in place is completed and nominally dry; work above ceilings is complete; and ambient conditions of temperature and humidity are continuously maintained at values near those intended for final occupancy. Building areas to receive ceilings shall be free of construction dust and debris.

1.11 MAINTENANCE

A. Extra Materials: Furnish one carton of each size, texture, and type of acoustic units required. Store at the site where directed; packaged with protective covering for storage and identified with appropriate labels.

PART 2 PRODUCTS

2.01 ACCEPTABLE PRODUCTS AND MANUFACTURERS

A. 15/16" Clip-On Metalworks by Armstrong World Industries, with panels individually screwed in place. Friction fit installation of panels is unacceptable. Panels shall be fastened in such a manner so that each accessible panel can be removed individually without affecting the remainder of the ceiling installation.

1. Panel: 24” x 24” x 15/16”
   a. Metalworks Whitelume (WHA), smooth, with butt joint, 7110.
   b. Accessible panels shall be 1/8" reveal 7140. The accessible hole at the accessible panel will be fitted with tamper-proof, set-in screws, and countersunk; provided by General Contractor. Screws shall be 5/16" in depth or shorter.
   c. Perforation options: M16 (Rd 1607), NRC 0.70 with acoustical fleece and fitted with 1" fiberglass infill 8200100. Overall NRC 0.80.
   d. Noise Reduction Coefficient (NRC): ASTM C 423; Classified with UL label on product carton 0.70 + 1" fiberglass infill.
   e. Flame Spread: ASTM E 1264; Class A
   f. Light Reflectance White Panel: ASTM E 1477; 0.77
   g. Dimensional Stability: Standard
   h. Recycle Content: Post-Consumer - 20% Pre-Consumer Waste - 0%.
2. Suspension system: 15/16" Prelude XL cross tee and 7301 main beam, heavy duty (HD)
3. Accessories:
   a. Provide 7119 or 7120 fixture frame for light fixtures and diffusers.
   b. Wall molding to be 7112 box molding with 7113 spreader hold down
   c. All accessories shall be white.
   d. Fasteners shall be tamper-proof.

B. Or Approved Equal.

1. Rockfon SpanAir Clip-In Concealed Metal Panel by Rockwool.

2.02 SUSPENDED METAL PANEL CEILINGS

A. Ceiling Panels shall be factory formed from pre-painted, perforated .040" aluminum. Finish: Smooth, factory painted finish. Microperforated metal with acoustical fleece and fiberglass infill. Provide secure, tamperproof ceiling panel.

B. Acoustical Material: The inside surface of all perforated ceiling panels shall be covered with wrapped white fiberglass insulation of sufficient thickness and density to provide the acoustical requirements.

2.03 SUPPORT SYSTEMS FOR SUSPENDED METAL PANEL CEILINGS

A. The ceiling panel support system shall consist of main runners and cross tees, black iron rods, and fasteners.

1. Main Runners and Cross Tees: Shall conform to the requirements of a heavy-duty classification in accordance with ASTM C-635. They shall be rollformed with a double web and a rectangular bulb from electro-galvanized steel, minimum .020 inch thick, to an overall height of 1-1/2 inch with a flange width of 15/16 inch. The cross tees shall provide a positive mechanical lock into the main runners and the main runners shall have a positive mechanical locking splice. Color: White to match the color of the selected ceiling tile.
2. Hanger Clips: Galvanized steel clips or clamps specifically designed for attachment to structure. Drive-on clips or clamps that depend on friction to hold the device are not acceptable.
3. Strap or rod hangers for use at ceiling: Provide either 1/4" diameter steel rods or 1" x 1/8" steel straps with galvanized finish and related bolts, cadi-clips, tie wire and accessories.
4. Wire Spring Clip supporting 1-1/2" channels to 1/4" diameter rod: Spring clip shall be equal to GAT system or approved equal by Caddy.
5. Main Beam Attachment Clip: Main beam shall be suspended from 1-1/2" channel by means of a 16 gauge steel rectangular clip similar to NRM CBS clip.
6. Vertical Stabilizer Strut if needed, for seismic requirements shall be sized to the plenum depth. Generally a notched minimum one-inch diameter conduit or steel stud installed at the grid intersection and secured to the slab or deck above is needed at splayed bracing wire locations. Strut shall be shall be equal to:
5. Fasteners: Shall be concealed and tamper-proof. Fasteners for securing the wall molding to the wall are to be furnished by the contractor and approved by the Owner’s Representative and Architect.

B. Where adequate clearance is not available to properly install the suspended ceiling support system due to the amount of overhead ductwork and mechanical utilities, provide a channel strut framing system as specified in Section 054000.

2.04 FINISH

A. Ceiling Panels: The metal panels shall have a factory applied paint finish as hereinbefore specified. Prior to painting, aluminum shall be cleaned, rinsed and property treated to receive the paint finish.

B. Suspension Systems: The main runners, cross tees and wall moldings shall have a factory applied paint finish coat to match the ceiling panels as hereinbefore specified.

2.05 ACOUSTICAL CEILING UNITS

A. Metal Ceiling Panels:

1. Acoustical Panels Type ACT-2:

a. Surface Texture: Smooth
b. Composition: Metal
c. Color: Whitelume
d. Size: 24IN x 24IN
e. Edge Profile: Square 15/16IN for interface with Prelude XL 15/16" Exposed Tee grid.
f. Perforation Option: Round - Diagonal
g. Noise Reduction Coefficient(NRC): ASTM C 423; Classified with UL label on product carton 0.70 in addition to the use of 1" Fiberglass Infill 8200100.
h. Flame Spread: ASTM E 1264; Class A
i. Light Reflectance White Panel: ASTM E 1477; 0.77
j. Dimensional Stability: Standard
k. Recycle Content: Post-Consumer - 20% Pre-Consumer Waste - 0%
l. Accessibility: Non-accessible, tamper resistant
m. Acceptable Product: MetalWorks Clip-On Special Order Panel without accessibility hole, as manufactured by Armstrong World Industries.

2. Metal Panel Accessories:
   a. 7110M16 – Ceiling panel (No Accessibility Hole)
   b. 7140 Accessible Panel (With Accessibility Hole)
   c. 7112 - Box Molding
   d. 7113 - Spreader Hold Down
   e. 7119 – Fixture Frame
   f. 8200100 - Fiberglass Infill

2.06 ACOUSTICAL CEILING UNITS

A. Metal Ceiling Panels:
   1. Acoustical Panels Type ACT-X:
      a. Surface Texture: Smooth
      b. Composition: Metal
      c. Color: Whitelume
      d. Size: 48IN x 24IN
      e. Edge Profile: Square 15/16IN for interface with Prelude XL 15/16" Exposed Tee grid.
      f. Perforation Option: Round - Diagonal
      g. Noise Reduction Coefficient(NRC): ASTM C 423; Classified with UL label on product carton 0.70 addition to the use of 1" Fiberglass Infill 8200100.
      h. Flame Spread: ASTM E 1264; Class A
      i. Light Reflectance White Panel: ASTM E 1477; 0.77
      j. Dimensional Stability: Standard
      k. Recycle Content: Post-Consumer - 20% Pre-Consumer Waste - 0%
      l. Accessibility: Non-accessible, tamper resistant
      m. Acceptable Product: MetalWorks Clip-On Special Order Panel without accessibility hole, as manufactured by Armstrong World

Industries.

2. Metal Panel Accessories:
   a. 7111M16 - Ceiling panel (No Accessibility Hole)
   b. 7141 - Accessible panel (With Accessibility Hole)
   c. 7112 - Box Molding
   d. 7113 - Spreader Hold Down
   e. 7120 - Fixture Frame
   f. 8200100 - Fiberglass Infiill

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine surfaces and areas scheduled to receive the ceiling system for defects that will adversely affect the execution and quality of the Work. Do not install the Work until unsatisfactory conditions are corrected.

3.02 PREPARATION

A. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders, and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures

3.03 INSTALLATION OF SUSPENSION SYSTEM

A. Install suspension system in accordance with the manufacturer's printed instructions and final shop drawings.

B. Lay-out: Position grid system so that units less than one-half in width do not occur, unless otherwise shown on the Drawings.

C. Suspension System Installation Tolerances:
   1. Form right angles at intersections of main and cross runners.
   2. Install main runners level to within 1/8 inch in 12 feet. Install cross runners to within 1/32 inch of the required center distances (non-cumulative beyond 12 feet).
   3. Align vertical distance of exposed surfaces between intersecting runners to within 0.015 inch.
   4. Limit horizontal gaps in exposed surfaces of intersecting or abutting members to within 0.020 inch.

D. Mouldings: Install mouldings where ceilings intersect vertical surfaces. Use manufacturer's recommended fasteners suited for secure attachment to the particular substrate. Wall moldings shall be positively anchored through the wall finish material into the wall support system.
   1. Miter cut inside and outside corners to fit within a joint tolerance of 0.020 inch.

3.04 INSTALLATION OF CEILING PANELS

A. Install units in accordance with the manufacturer's printed instructions, final shop drawings, and in compliance with ASTM C 636 and with the authorities having jurisdiction.

B. Place panels to bear all around on suspension members so that panel face is in full contact with all bearing flanges. Remove panels that are warped, distorted, or otherwise fail to seat properly.

C. Install wall moldings at intersection of suspended ceiling and vertical surfaces. Miter corners where wall moldings intersect or install corner caps.

D. For reveal edge panels: Cut and reveal or rabbet edges of ceiling panels at border areas and vertical surfaces.

E. Install acoustical panels in coordination with suspended system, with edges resting on flanges of main runner and cross tees. Cut and fit panels neatly against abutting surfaces. Support edges by wall mouldings.

F. All openings in panels for sprinkler heads, speakers, fire alarms, zone lights (Nurse Call System), HVAC diffusers, etc., to be field cut by the ceiling manufacturer. Coordinate size and locations with the HVAC, Plumbing and Electrical Trades.

G. Provide additional access panels, equal to 15 percent of panels. Locations to be determined by the Director's Representative.

3.05 ADJUSTING AND CLEANING

A. Remove and replace members that have been damaged, broken or cannot be cleaned. Clean exposed surfaces of the Work that have been soiled. Follow manufacturer's instructions.

B. Clean exposed surfaces of ceilings panels, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage.

END OF SECTION

SECTION 230594

TESTING, ADJUSTING AND BALANCING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections, and all other Division 15 Sections, apply to this Section.

1.02 SUMMARY:

A. Section 230594 specifies requirements for testing, adjusting and balancing of air hydronic distribution systems, including the equipment and devices associated with each system to produce the design objectives. The Work shall include checking installations for conformity to design, setting flow and fan and pump speeds, adjusting and testing equipment, controls and devices, recording data, preparing and submitting reports, and recommending modifications to the mechanical installations. The general contractor shall retain the services of an independent testing, adjusting, and balancing agency meeting the qualifications specified to be the single source of responsibility to test, adjust, and balance the building Project. This Section includes testing, adjusting, and balancing of all HVAC systems to produce design performance objectives, including the following:

1. Balancing and documenting airflow water flow of new air handling, heating, ventilating and air conditioning and refrigeration equipment, systems, air inlets and outlets; hot water heating systems including, pumps, heating coils and heating terminal units, to indicated quantities according to specified tolerances; recording all data preparation and submittal of all associated reports, and recommendations of modifications to the mechanical installations, where necessary and as may be applicable.

2. Adjusting and documenting new HVAC equipment, operating temperature and pressure set points and associated air and water flow rates, as applicable, and to within specified limits of accuracy, to provide specified and scheduled performance and quantities.

3. Measuring and documenting electrical performance of HVAC equipment.

4. Setting quantitative performance of HVAC equipment, as specified.

5. Verifying and documenting that all automatic temperature control systems, instrumentation, devices, programming and interlocks are functioning properly, in strict accordance with the specified requirements of Section 230934, 230923.

6. Measuring and documenting sound and vibration throughout the Facilities' installations.

7. Preparation and submittal of reports of testing and balancing procedures and reports of results of the activities and procedures specified to be performed under this Section.

8. Testing of equipment, piping and ductwork, including pressure testing of piping and leakage testing of ductwork, as specified, and submittal of documentation reports attesting to the successful completion of tests.

B. Related Sections include the following:

1. Testing and adjusting requirements unique to particular systems and equipment as specified under the particular Sections of Division 23 under which those systems and equipment are specified to be provided.

2. Field quality-control testing to verify that the workmanship quality for systems and equipment installation, is specified under the respective Sections of Division 23 under which those systems and equipment are specified to be provided, as applicable.

C. The scope of work does not include testing, adjusting and balancing of “existing” equipment. TAB Contractor shall measure the air flows and water flows of the existing systems at connection points and bring the system back to original condition after construction. However, Testing and Balancing contractor shall balance existing systems if initial measurements after the construction indicate out of balance conditions.

1.03 DEFINITIONS:

A. Adjust: To regulate fluid flow rate and air flow rate at the new equipment, such as to reduce fan speed or adjust a damper, according to design quantities.

B. Balance: (Same as "Adjust", above).

C. Procedure: An approach to and execution of a sequence of work operations to yield repeatable results.

D. Report Forms: Test data sheets for recording test data in logical order.

E. Static Head: The pressure due to the weight of the fluid above the point of measurement. In a closed system, static head is equal on both sides of the pump.

F. Suction Head: The height of fluid surface above the centerline of the pump on the suction side.

G. System Effect: A phenomenon that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.

H. System Effect Factors: Allowances used to calculate a reduction of the performance ratings of a fan when installed under conditions different from those presented when the fan was performance tested.

I. Terminal: A point where the controlled medium, such as fluid or energy, enters or leaves the distribution system.

J. Test: A procedure to determine quantitative performance of a system or equipment.

K. Testing, Adjusting, and Balancing Agent: The entity responsible for performing and reporting the testing, adjusting, and balancing procedures.

L. AABC: Associated Air Balance Council.

M. AMCA: Air Movement and Control Association.

N. CTI: Cooling Tower Institute.

O. NEBB: National Environmental Balancing Bureau.

P. SMACNA: Sheet Metal and Air Conditioning Contractors' National Association.

Q. ASHRAE: American Society of Heating Refrigerating and Air Conditioning Engineers.

1.04 SUBMITTALS:

A. Quality-Assurance Submittals: Within 30 days from the General Contractor Notice to Proceed, submit 2 copies of evidence that the testing, adjusting, and balancing Agent and this Project's testing, adjusting, and balancing team members meet the qualifications specified in the "Quality Assurance" Article below.

B. Contract Documents Examination Report: Within 45 days from the General Contractor Notice to Proceed, submit 2 copies of the Contract Documents review report as specified in Part 3 of this Section.

C. “Strategies and Procedures Plan”, “Sample Report Forms” and “Instrument List and Calibration Report”: Within 60 days from the Design-Builder’s Notice to Proceed, submit 2 copies of the testing, adjusting, and balancing strategies and step-by-step procedures as specified in Part 3 "Preparation" Article below. Submittal shall include a complete set of testing, adjusting and balancing report forms intended for use on this Project. The Submittal shall include the Testing, Adjusting and Balancing Agent Specialist’s Instrument List and Calibration Report, including a comprehensive list of the manufacturer, model number and serial number of each of the specific testing and balancing instrumentation, meters, gauges and devices intended for use on this Contract Scope of Work and the dates of most recent calibration of each instrument, gauge, meter and device, and including a written statement attesting that all instrumentation intended for use, as listed, has been calibrated within the last six months of the date of the submittal. (Refer to the specified requirements of Paragraph 230594--?)

D. Certified Testing, Adjusting, and Balancing Reports: Submit 2 copies of reports prepared, as specified under this Section, on approved forms certified by the testing, adjusting, and balancing Agent. Submit certified reports signed by the registered professional engineer of the testing and balancing specialist. Submit final testing and balancing results on applicable report forms, as approved and furnished by the bureau (AABC or NEBB) that is certifying the independent member agency performing the Work. Each final system report form shall bear the signature of the person performing the Work and the signature of the N.Y. State registered Professional Engineer for the performing agency. Include in final reports uncorrected installation deficiencies noted during the process of testing, adjusting and balancing and applicable explanatory comments.

E. Warranty: Submit 2 copies of special warranty specified under the Paragraph 1.08 "Warranty" Article below.

F. Test Reports (Field Tests):

a. Refrigeration Systems: Submit test results on Refrigeration Systems Pressure.

b. Glycol System Test (if applicable): Submit test results.

c. Piping Pressure Tests: Submit Test Results.

d. Ductwork Leakage Tests: Submit Test Results.

1.05 QUALITY ASSURANCE:

A. Agent Qualifications: Engage a testing, adjusting, and balancing agent certified by either AABC, TABB or NEBB. Persons performing the Work of this Section shall be certified by NEBB or AABC and shall have experience on at least 2 projects involving same complexities to those required under this Contract. The testing, adjusting and balancing agency shall have at least a Professional Engineer registered in the State of NY and certified by NEBB or AABC as the Testing and Balancing Engineer who shall sign and seal all the reports.

B. Testing, Adjusting, and Balancing Conference: Meet with OMH and OGS representatives on approval of the testing, adjusting, and balancing strategies and procedures plan to develop a mutual understanding of the details. Ensure the participation of testing, adjusting, and balancing team members, equipment manufacturers' authorized service representatives, HVAC controls Installer, and other support personnel. Provide 7 days' advance notice of scheduled meeting time and location.

1. Agenda Items: Include at least the following:

a. Submittal distribution requirements.

b. Contract Documents examination report.

c. Testing, adjusting, and balancing plan.

d. Work schedule and Project site access requirements.

e. Coordination and cooperation of trades and the General Contractor’s sub-contractors.

f. Coordination of documentation and communication flow.

C. Certification of Testing, Adjusting, and Balancing Reports: Certify the testing, adjusting, and balancing field data reports. This certification includes the following:

1. Review field data reports to validate accuracy of data and to prepare certified testing, adjusting, and balancing reports.

2. Certify that the testing, adjusting, and balancing team complied with the approved testing, adjusting, and balancing plan and the procedures specified and referenced in this Specification.

D. Testing, Adjusting, and Balancing Reports: Use standard forms from AABC's "National Standards for Testing, Adjusting, and Balancing.", or NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems.", or SMACNA's "HVAC Systems--Testing, Adjusting, and Balancing.", or testing, adjusting, and balancing Agent's standard forms approved by the Architect.

E. Instrumentation Type, Quantity, and Accuracy: As described in NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems," Section II, "Required Instrumentation for NEBB Certification."

F. Instrumentation Calibration: Calibrate instruments at least every 6 months or more frequently if required by the instrument manufacturer.

1.06 PROJECT CONDITIONS:

A. Cooperate with OGS, OMH, & MPC during testing, adjusting, and balancing operations to minimize conflicts with MPC operations.

B. The General Contractor shall have the balancing specialist review all the work with the respective manufacturers of the equipment and devices involved and shall coordinate all the Work. The balancing specialist shall examine the Drawings and Specifications to become familiar with Project requirements and to discover conditions in systems' designs that may preclude proper adjusting and balancing of systems and equipment.

C. Provide balancing dampers, pressure taps, gauges, valves, and any other items and components as required for a properly balanced system, whether or not specified herein or shown on the Contract Drawings, all at no additional cost to OMH, OGS. Adjustment or replacement of parts recommended by the balancing specialist shall be made in strict accordance with the respective manufacturer's recommendations.

D. The General Contractor shall have the control manufacturer's representative set the adjustment of the automatically operated dampers, control valves and all the other items and accessories to operate as required.

E. Protection: During test work, protect controls, gauges and accessories which are not designed to withstand test pressures. Do not utilize permanently installed gauges for field testing of systems.

1.07 COORDINATION:

A. Coordinate the efforts of factory-authorized service representatives for systems and equipment, HVAC controls installers, and other mechanics to operate HVAC systems and equipment to support and assist testing, adjusting, and balancing activities.

B. Notice: Provide 7 days' advance notice for each test. Include scheduled test dates and times.

C. Perform testing, adjusting, and balancing after leakage and pressure tests on air, oil and water distribution systems have been satisfactorily completed.

1.08 WARRANTY:

A. General Warranty: The project performance guarantee specified under Paragraph 1.08B, herein below, shall not deprive OMH, OGS of other rights OMH, OGS may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the General Contractor under requirements of the Contract Documents.

B. National Project Performance Guarantee: Provide a guarantee on AABC'S "National Standards" forms stating that AABC will assist in completing the requirements of the

Contract Documents if the testing, adjusting, and balancing Agent fails to comply with the Contract Documents. Guarantee includes the following provisions:

1. The certified Agent has tested and balanced systems according to the Contract Documents.

2. Systems are balanced to optimum performance capabilities within design and installation limits.

1.09 PERFORMANCE REQUIREMENTS:

A. Procedures, measurements, instruments and reports for adjusting and balancing work shall comply with the applicable provisions of the codes, standards, recommendations of the following:

1. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)

2. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

3. National Environmental Balancing Bureau (NEBB)

4. Associated Air Balance Council (AABC)

B. The air delivery or intake of each diffuser, grille, register and duct opening with volume damper, shall be as designed or within plus 10% of the airflow rates shown on the Contract Drawings.

C. The fan airflow rate and static pressure rise across the fan shall be within plus 10% above the design value at design speed.

D. The heating hot water flow rates of pumps and through heating coils and heating terminal units shall be balanced to within zero to plus 10% percent of the hot water flow rates scheduled on the Contract Drawings.

E. Chilled water flow rates of pumps and through chilled water coils shall be balanced to within zero to plus 5 percent of the chilled water flow rates scheduled on contract drawings.

1.10 SEQUENCING AND SCHEDULING:

A. Transmit written notification of proposed date and time of operational tests to OMH, OGS at least 5 days in advance of such tests.

B. Perform cleaning, testing adjusting and balancing Work in the presence of OMH and OGS authorized representatives.

C. Pressure test piping systems inside buildings, at the roughing-in stage of installation, before piping is enclosed by construction work and at other times as directed. Perform test operations in sections as required and directed, to progress the Work in a satisfactory manner and not delay the general construction of the building. Valve or cap-off sections of piping to be tested. The General Contractor can utilize valves required to be installed in the permanent piping systems, or temporary valves or caps as required to perform the Work. The General Contractor is responsible to provide all valves/flanges required in or-

der to perform the pressure testing. Testing valves/flanges shall be indicated on the submitted shop drawings. The General Contractor shall also provide all vents required to vent the air out of the piping prior to performing a hydrostatic test. Fittings for pressure gauges shall be located at the top of the risers. Vent fittings and pressure gauge fittings shall be shown on the submitted shop drawings.

D. Perform environmental systems balancing after cleaning, testing, adjustment, balancing and operational testing Work has been completed.

E. Balance system during a seasonal period of time when outdoor ambient temperature conditions are within ± 5 degrees of the Project Design Outdoor Ambient Temperature Conditions, in order to impose a seasonal peak load on the system; i.e., peak summer months for air conditioning system; peak winter months for heating system. Balance and adjust systems, accordingly, during occurrence of seasonal peak temperature conditions. The Testing, Adjusting and Balancing Agent and the General Contractor shall return to the Project Site within less than a year of the time of initial performance of the testing, adjusting and balancing work, in order to complete performance of testing, adjusting and balancing of all HVAC systems, under peak seasonal conditions, at no additional cost to OMH and OGS.

1.11 CITED STANDARDS:

A. Associated Air Balance Council (AABC):

MN1 National Standards for Total System Balance

B. National Environmental Balancing Bureau (NEBB):

Procedural Standards for Testing, Adjusting and Balancing of Environmental Systems.

C. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA):

HVAC Air Duct Leakage Test Manual

D. American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. (ASHRAE): Standard 111: Practices For Measurement, Testing, Adjusting, and Balancing of Building Heating, Ventilating, Air Conditioning and refrigeration Systems.

PART 2 - PRODUCTS

2.01 PATCHING MATERIALS:

A. Unless otherwise shown on the Drawings, use same products as originally installed for patching holes in insulation, ductwork and housings which have been cut or drilled for test purposes, including access for test instruments, attaching jigs, and similar purposes.

2.02 TESTING MATERIALS:

A. Certified Test Equipment and Instruments

Type and kind as required for the particular system under test. All gauges, instruments and test devices shall be provided with a certificate of calibration and calibration curve or letter indicating that a minimum of five (5) test points have been calibrated. The certifi-

cate and letter must show date of last calibration. The calibration date must be within not more than six months of the testing date.

B. Test Media (air, gas, refrigerant, water)

As specified for the particular piping or system under test.

C. Cleaning Agent (chemical solution, steam, water)

As specified for the particular piping, apparatus or system being cleaned.

D. Glycol (if applicable):

Permanent type propylene-glycol anti-freeze as manufactured by Dow Chemical Co. or Union Carbide.

E. General Contractor's Responsibility

The General Contractor shall furnish energy, fuel, oil, water, air, smoke, light and electrical instruments as required for all testing.

PART 3 - EXECUTION

3.01 EXAMINATION:

A. Examine Contract Documents to become familiar with project requirements and to discover conditions in systems' designs that may preclude proper testing, adjusting, and balancing of systems and equipment.

1. Contract Documents are defined in the General and Supplementary Conditions of the Contract.

2. Verify that required balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers, are provided. Verify that quantities and locations of these balancing devices are accessible and appropriate for effective balancing and for efficient system and equipment operation.

3. Examine the air systems to see that they are free from obstructions. Determine that all dampers, grilles and registers are open, that moving equipment is lubricated, that clean filters are installed, that automatic controls are functioning, and perform other inspection and maintenance activities necessary for proper operation of the systems. Examine terminal units, such as variable-air-volume boxes, to verify that they are accessible and their controls are connected and functioning.

4. Examine the hydronic systems to see that they are free from abnormal obstructions, and that all piping, valves and equipment have been properly made fully operational. Determine that all equipment and control systems are performing correctly by functional testing.

B. Examine approved submittal data of HVAC systems and equipment.

C. Examine project record document requirements described under Section 15500.

D. Examine General Contractor's design data, including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.

E. Examine equipment performance data, including fan curves and pump curves. Relate performance data to project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system. Calculate system effect factors to reduce the performance ratings of HVAC equipment when installed under conditions different from those presented when the equipment was performance tested at the factory. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," Sections 7 through 10; or in SMACNA's "HVAC Systems--Duct Design," Sections 5 and 6. Compare this data with the design data and installed conditions.

F. Examine system and equipment installations to verify that they are complete and that testing, cleaning, adjusting, and commissioning specified under individual Specification Sections of Division 23, have been performed.

G. Examine system and equipment test reports.

H. Examine HVAC system and equipment installations to verify that indicated balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers, are properly installed, and their locations are accessible and appropriate for effective balancing and for efficient system and equipment operation.

I. Examine systems for functional deficiencies that cannot be corrected by adjusting and balancing.

J. Examine air-handling equipment to ensure clean filters have been installed, bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.

K. Examine terminal units, to verify that they are accessible and their controls are connected and functioning.

L. Verify that pipe penetrations and other holes are sealed.

M. Examine strainers for clean screens and proper perforations.

N. Examine 3-way valves for proper installation for their intended function of mixing fluid flows.

O. Examine heat-transfer coils for correct piping connections and for clean and straight fins.

P. Examine open-piping-system pumps to ensure absence of entrained air in the suction piping.

Q. Examine equipment for installation and for properly operating safety interlocks and controls.

R. Examine automatic temperature system components to verify the following:

1. Dampers, valves, and other controlled devices operate by the intended controller.

2. Dampers and valves are in the position indicated by the controller.

3. Integrity of valves and dampers for free and full operation and for tightness of fully closed and fully open positions.

4. Automatic modulating and shutoff valves, including 2-way valves and 3-way mixing valves, are properly connected.

5. Thermostats are located to avoid adverse effects of sunlight, drafts, and cold walls.

6. Sensors are located to sense only the intended conditions.

7. Sequence of operation for control modes is according to the Contract Documents.

8. Controller set points are set at design values. Observe and record system reactions to changes in conditions. Record default set points if different from design values.

9. Interlocked systems are operating.

10. Changeover from heating to cooling mode occurs automatically, as specified under Section 230934.

S. Report deficiencies discovered before and during performance of testing, adjusting, and balancing procedures.

T. Thoroughly clean pipe and tubing prior to installation. During installation, prevent foreign matter from entering the systems. Prevent if possible and remove stoppages or obstructions from piping and systems.

U. Thoroughly clean boiler-burner atomizing compressed air, refrigerant pipe and similar systems prior to pressure or vacuum testing.

3.02 PREPARATION:

A. Prepare a testing, adjusting, and balancing plan that includes strategies and step-by-step procedures.

B. Complete system readiness checks and prepare system readiness reports. Verify the following:

1. Permanent electrical power wiring is complete.

2. Hydronic systems are filled, clean, and free of air.

3. Automatic temperature-control systems are operational.

4. Equipment and duct access doors are securely closed.

5. Balancing dampers, fire dampers and combination fire/smoke dampers are open.

6. Isolating and balancing valves are open and control valves are operational, and all are readily accessible.

7. Access to balancing devices is provided.

8. Doors can be closed so design conditions for system operations can be met.

3.03 GENERAL TESTING AND BALANCING PROCEDURES:

A. Perform testing and balancing procedures on each system according to the procedures contained in SMACNA's "HVAC Systems--Testing, Adjusting, and Balancing" and this Section.

B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary to allow adequate performance of procedures. After testing and balancing, close probe holes and patch insulation with new materials identical to those removed. Restore vapor barrier and finish according to the insulation Specifications for this Project.

C. Mark equipment settings with paint or other suitable, permanent identification material, including damper-control positions, valve indicators, fan-speed-control levers, and similar controls and devices, to show final settings.

D. Notify OMH, OGS when any deficiencies are detected, whether associated with design, installation, or equipment.

E. Balancing specialist shall perform all the procedures and compile all the data for all air, hydronic and oil systems.

F. Data shall include a schematic diagram locating the air inlets, air outlets, variable-air volume boxes, roof-top units, fans, equipment, dampers and regulating devices for air systems, a schematic diagram for location of balancing valves, flow indicators, equipment, and devices for hydronic systems and a schematic diagram for location of equipment, and devices for the fuel oil systems.

G. All instruments used shall be accurately calibrated and maintained in good working order.

3.04 FUNDAMENTAL AIR SYSTEMS' BALANCING PROCEDURES:

A. Record and adjust each fan’s rpm to design requirements. Record motor full load amperes. Prepare test reports for fans.

B. Prepare schematic diagrams of systems' "as-built" duct layouts.

C. Determine the best locations in main and branch ducts for accurate duct airflow measurements.

D. Check the airflow patterns from the outside-air louvers and dampers and the return- and exhaust-air dampers, through the supply-fan discharge and mixing dampers, as applicable.

E. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.

F. Verify that motor starters are equipped with properly sized thermal protection.

G. Check dampers for proper position to achieve desired airflow path.

H. Check for airflow blockages.

I. Check condensate drains for proper connections and functioning.

J. Check for proper sealing of air-handling unit components.

K. Make pitot tube traverse of main supply ducts and obtain design flow rate at fans.

L. Record system static pressure, velocity pressure and total pressure.

M. Adjust system for design supply, transfer and return airflow rate.

N. Adjust system for minimum and maximum (economizer) design flow rates of outside air.

O. Record return air temperatures.

P. Record entering mixed air temperatures.

Q. Record leaving air temperatures.

R. Adjust all main supply, return, relief, and exhaust air ducts to proper design flow rate.

S. Adjust each diffuser, grille and register.

T. Each grille, diffuser and register and duct-opening with volume damper shall be identified as to location and area on the schematic diagram.

U. Size, type and manufacturer of diffusers, grilles and registers and all tested equipment shall be identified and listed in the final report. Manufacturer's data on all equipment shall be used to make required calculations for adjusting and balancing. Readings of diffusers, grilles and registers shall include design required and resultant velocity, required and resultant flow rate after adjustments.

V. All diffusers, grilles and registers shall be adjusted to minimize drafts in all areas.

W. Dampers shall be permanently marked after air balance is complete so that they can be restored to their correct position, if disturbed later.

X. Openings in ductwork for pitot tube insertion shall be sealed with snap-in plugs after air balance is complete.

Y. Main supply, return and exhaust air ducts shall be traversed, using a Pitot tube and manometer. The manometer shall be calibrated to read two significant figures in all velocity pressure ranges. A main duct is defined as either of the following:

1. A duct serving two or more branch ducts

2. A duct emanating from a fan inlet, discharge, or plenum and terminating at one or more outlets.

3. A duct serving five or more outlets.

The intent of this operation is to measure by traverse the total air quantity supplied by the fan and to verify the distribution of air to zones.

Z. Submit data in support of all supply, return and exhaust fan deliveries by the following four methods:

1. By duct traverse of main supply, return and exhaust ducts.

2. By a rotating vane traverse across a filter or coil bank.

3. By plotting revolutions per minute and static pressure readings on the fan curve. Air density corrections must be indicated.

4. By summation of the air quantity readings at all outlets.

AA. For rectangular ducts, take readings at the center point of equal rectangles with not less than 16 and a maximum of 64 readings. Center distances between rectangular areas shall be not more than 6 inches. Take readings as far down stream of fittings as is practicable up to an equivalent of seven duct diameters.

BB. Measure fan and motor speed with a direct reading tachometer and Strobo Tach. Measure amperage and voltage with direct connected or clamp-on instruments.

CC. Inspect all fan scrolls and remove objects or debris. Inspect all coils and remove debris or obstructions. Verify that all fire dampers and smoke dampers are open.

DD. Upon completion of all equipment balancing, all duct volume dampers and other throttling devices shall be marked in the final adjusted position.

EE. All fans shall be completely balanced by the adjustment of sheaves, dampers, and other volume and diverting control devices, to obtain the air quantities indicated on the Contract Drawings. Outside air, exhaust air and return air modulating dampers shall be adjusted to admit the specified quantities of air under all cycles of operation. Final adjusted air quantities shall be within plus 10 percent of the design requirements. Replace sheaves if required to meet design conditions.

FF. Adjust the AHU unit and HV unit outside air, return air and exhaust air dampers to admit the required amounts of air under both summer and winter cycles. Record and submit the outside, return and mixed air temperatures for both cycles after final adjustments.

GG. Comply with NEBB's and ASHRAE’s Procedural Standards for Testing Adjusting and Balancing of Environmental Systems as applicable to mechanical air distribution systems and associated equipment and apparatus.

HH. Submit single line diagrams of duct systems indicating all new and existing terminal outlets identified by number. Data sheets shall list all such outlets denoted by the same numbers, including the outlet's size, "K" factor, location, cubic feet per minute and jet velocity. Submit this data for all supply, return and exhaust air systems.

II. Make preliminary outlet readings and balance the outlet to design CFM and record all readings. Adjust the air outlets and inlets for design delivery.

JJ. Check and record the operation and the final balanced condition of the following air handling systems controls:

1. Economizer system function, calibration and damper synchronization, and exhaust fan interlocks.

2. High temperature limit shutoff functions and calibration, if any.

3. Low temperature limit shutoff functions and calibration, if any.

4. High pressure limit shutoff functions and calibration, if any.

5. Variable Frequency Drive calibration with respected to duct static pressure setpoint adjustments, for VAV type AHU units.

3.05 CONSTANT-VOLUME AIR SYSTEMS' BALANCING PROCEDURES:

A. The procedures specified herein apply to constant-volume supply-, return-, and exhaust-air systems.

B. Adjust fans to deliver total design airflows within the maximum allowable rpm listed by the fan manufacturer.

1. Measure fan static pressures to determine actual static pressure as follows:

a. Measure outlet static pressure as far downstream from the fan as practicable and upstream from restrictions in ducts such as elbows and transitions.

b. Measure static pressure directly at the fan outlet or through the flexible connection.

c. Measure inlet static pressure of single-inlet fans in the inlet duct as near the fan as possible, upstream from flexible connection and downstream from duct restrictions.

d. Measure inlet static pressure of double-inlet fans through the wall of the plenum that houses the fan.

2. Measure static pressure across each air-handling unit component.

a. Simulate dirty filter operation and record the point at which maintenance personnel must change filters.

3. Compare design data with installed conditions to determine variations in design static pressures versus actual static pressures. Compare actual system effect factors with calculated system effect factors to identify where variations occur. Recommend corrective action to align design and actual conditions.

4. Adjust fan speed higher or lower than design, only with the approval of the Engineer. Make required adjustments to pulley sizes, motor sizes, and electrical connections to accommodate fan-speed changes.

5. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure no overload will occur. Measure amperage in full cooling, full heating, and economizer modes to determine the maximum required brake horsepower.

C. Adjust volume dampers in ductwork to design airflows within specified tolerances.

1. Measure static pressure at a point downstream from the balancing damper and adjust volume dampers until the proper static pressure is achieved.

2. Re-measure static pressure after all have been adjusted. Continue to adjust new volume dampers to design airflows within specified tolerances.

D. Measure diffuser, register, grille and duct opening outlets and inlets airflow cfm without making adjustments, where applicable.

1. Measure diffuser, register, grille and duct opening outlets and inlets airflow cfm using a direct-reading hood, where possible.

E. Adjust diffuser, register, grille and duct opening outlets and inlets airflow cfm for each space where applicable, to design airflows within specified tolerances of design values. Make adjustments using volume dampers.

1. Adjust each air terminal inlet and outlet in the same room or space to within specified tolerances of design quantities.

F. Confirm correct operation of the air handling unit economizer control system, in accordance with the specified requirements of Sections 237313, 237314, 237443, and 230934.

3.06 VARIABLE-AIR-VOLUME AIR SYSTEMS' BALANCING PROCEDURES:

A. After the fan systems have been adjusted, set outside-air dampers at minimum, and return air dampers at a position that simulates full-cooling load.

B. Select the terminal unit that is most critical to the supply-fan airflow and static pressure. Measure static pressure. Adjust system static pressure so the entering static pressure for the critical terminal unit is not less than the sum of terminal-unit manufacturer's recommended minimum inlet static pressure plus the static pressure needed to overcome terminal-unit discharge system losses.

C. Measure total system airflow. Adjust to within indicated airflow.

D. Set terminal units at maximum airflow and adjust to deliver the designed maximum airflow. Use terminal-unit manufacturer's written instructions to make this adjustment. When total airflow is correct, balance the air outlets downstream from terminal units.

E. Set terminal units at minimum airflow and adjust to deliver the designed minimum airflow. Check air outlets for a proportional reduction in airflow. If air outlets are out of balance at minimum airflow, report the condition but leave outlets balanced for maximum airflow.

F. Re-measure the return airflow to the fan while operating at maximum return airflow and minimum outside airflow. Adjust the fan and balance the return-air ducts and inlets.

G. Measure static pressure at the most critical terminal unit and adjust the static-pressure controller at the main supply-air duct static pressure sensor to ensure that adequate static pressure is maintained at the most critical unit.

H. Record the final fan performance data.

I. Confirm correct operation of the air handling unit economizer control system, in accordance with the specified requirements of Sections 15858 and 15970.

3.07 HYDRONIC HEATING AND CHILLED WATER PROCEDURES:

The adjusting and balancing of hydronic heating and chilled water systems shall include, but not be limited to, the following:

A. Examine water in systems and determine if water has been treated and the system cleaned.

B. Check expansion/compression tank(s) to confirm that they are not air bound.

C. Purge all air vents at high points of water systems, check automatic air vents, where applicable, and determine if they are operating properly.

D. Coordinate with control manufacturer for required heating temperature controls and corresponding automatic valve operation settings.

E. Open all normally open valves to full open position. Set automatic valves to full coil flow.

F. Complete air balance shall have been accomplished before final water balance begins.

G. Check water pumps for pump rotation and for proper flow rate delivery against manufacturers' pump curves.

H. Set all balancing valves for required flow delivery at mains and branch mains to heating coils and terminal units.

I. Upon completion of flow readings and adjustments of balancing valves, mark all settings and record data, so that they can be restored to their correct "balanced" position, if disturbed later.

J. After required cooling and heating temperature controls and balancing valve operation settings are made, recheck pump flow requirements and readjust system as required.

K. Record pressure drop through coil at set flow rate of coil for full heating. Set pressure drop across bypass valve (where, and if, applicable), to match coil pressure drop.

L. Record and check the following items at each heating element:

1. Inlet water temperatures and static pressure at connections.

2. Leaving water temperatures and the pressure drop of each coil.

3. Flow rate through coil with control valve manually wide open.

M. Record operating suction and discharge pressures of each pump and final total dynamic head and rated amperage versus actual amperage of pump motors.

N. Record entering and leaving water temperatures and flow through all equipment and devices.

O. Check and record all flow rates at all locations in the piping system with flow meters.

P. Determine water flow at in-line freeze-protection hot water pumps. Use the following procedures:

1. Check system resistance. With all valves open, read pressure differential across the pump. Adjust heating coil and control valve bypass balancing valves until design water flow is achieved.

2. Adjust and balance hot water flow rates within plus 5 percent of design.

3. Set heating coil calibrated balancing valves, at calculated pre-settings, for both the "Return" and "Bypass", with the 3-way mixing control valve in the "Bypass-Closed" and "Bypass-Open" positions, respectively.

3.08 MOTORS:

A. Motors, 1/2 HP and Larger: Test at final balanced conditions and record the following design and actual data:

1. Manufacturer, model, and serial numbers.

2. Motor horsepower rating and actual brake horsepower.

3. Motor rpm.

4. Efficiency rating if high-efficiency motor.

5. Nameplate and measured voltage, each phase.

6. Nameplate and measured amperage, each phase.

7. Starter NEMA size, and thermal-overcurrent-protection-element rating.

3.09 AIR-COOLED CONDENSERS/COMPRESSORS:

A. Balance air flow through centrifugal fan type air-cooled condenser to within specified tolerances of design flow. Measure and record the following design and actual measured data, with the compressor operating at design conditions:

1. Verify air-cooled condenser-fan rotation and record fan data, including number of fans, condenser air entering and leaving temperatures, pressure drop, and air flow.

2. Evaporator and condenser refrigerant temperatures and pressures.

3. Power factor.

4. The kW input.

5. Capacity: Calculate in tons of cooling.

3.10 HEAT-TRANSFER COILS:

A. DX, Chilled and Hot Water Coils: Measure and record the following design and actual data for each coil:

1. Entering- and leaving-water temperatures, degrees F (Water coils only); design and actual.

2. Water flow rate, gpm (Water coils only); design and actual.

3. Water pressure drop, feet head (Water coils only); design and actual.

4. Dry-bulb temperatures of entering and leaving air, deg. F (DX and water coils); design and actual.

5. Wet-bulb temperatures of entering and leaving air, deg. F (DX coils and Chilled Water only); design and actual.

6. Airflow, cfm (DX and water coils); design and actual.

7. Air pressure drop, inches wg. (DX and water coils); design and actual.

8. Number of coil rows; tubing outer diameter; fin spacing (fins per foot); design and actual.

3.11 TEMPERATURE TESTING:

A. During testing, adjusting, and balancing, report need for adjustment in temperature regulation within the automatic temperature control system.

B. Measure indoor wet- and dry-bulb temperatures every other hour for a period of 2 successive 8-hour days, in each separately controlled zone, to prove correctness of final temperature settings. Measure when the building or zone is occupied.

C. Measure outside-air, wet- and dry-bulb temperatures.

3.12 AUTOMATIC TEMPERATURE CONTROL SYSTEMS OPERATION VERIFICATION:

A. Verify that controllers are calibrated and commissioned.

B. Check transmitter and controller locations and note conditions that would adversely affect control functions.

C. Record controller settings and note variances between set points and actual measurements.

D. Verify operation of limiting controllers (i.e., high- and low-temperature controllers).

E. Verify free travel and proper operation of control devices such as damper and valve operators.

F. Verify sequence of operation of control devices, in strict accordance with the Control Sequences Of Operation specified under Section 15970. Record control signal AC or DC voltage/miliamperage ranges and corresponding device positions and ranges of operation, and correlate with associated air-flow/temperature and water-flow/temperature measurements. Note the speed of response to input changes.

G. Confirm interaction of electrically operated switch transducers.

H. Confirm interaction of interlock and lockout systems.

I. Record voltages of power supply and controller output. Determine if the system operates on a grounded or non-grounded power supply.

J. Note operation of electric actuators using spring return for proper fail-safe operations.

K. Automatically operated devices that are pertinent to the adjustment of the air handling systems, the hydronic cooling and heating systems, and their associated automatic temperature controls, shall be set and adjusted to deliver the specified quantities of air, water at the specified set-point temperatures and/or pressures, as applicable. All control testing, adjusting and balancing work shall be done in joint collaboration with the authorized representatives of the control device manufacture and of Section 230934 of the specification. The requirements specified herein for the performance of testing, adjusting and balancing of the automatic controls systems are separate from, independent of, and additional to, the specified requirements of Sections 230934 and 230934.

3.13 BALANCING TOLERANCES:

A. Set HVAC system air flow, water flow and oil flow rates within the following tolerances:

1. Supply, Return, Exhaust and Condenser Fans: shall be adjusted to within plus 10 percent and adjusted to within minus 10 percent scheduled flow rates indicated on the Contract Drawings.

2. Duct Openings, Diffusers, Registers and Grilles, Air Outlets and Inlets: shall be adjusted to within plus 10 percent and adjusted to within minus 10 percent of design flow rates indicated on the Contract Drawings.

3. Heating Hot Water Pumps and Heating Terminal Flow Rates: shall be adjusted to within plus 10 percent and adjusted to within minus 10 percent of design scheduled flow rates indicated on the Contract Drawings.

3.14 INTERMEDIATE REPORTING DURING CONSTRUCTION:

A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified under "Examination" Paragraph 3.01, above, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.

B. Status Reports: As Work progresses, prepare reports to describe completed procedures, procedures in progress, and scheduled procedures. Include a list of deficiencies and problems found in systems being tested and balanced. Prepare a separate report for each system.

3.15 FINAL BALANCING REPORT:

A. General: Typewritten, or computer printout in letter-quality font, on standard bond paper, in 3-ring binder, tabulated and divided into sections by tested and balanced systems. Submit reports on AABC National Standards For Total System Balance Forms, and/or NEBB Standard Balance Forms.

B. Include a certification sheet in front of binder signed and sealed by the Certified Testing and Balancing Engineer.

1. Include a list of the instruments used for procedures, along with proof of calibration.

C. Final Report Contents: In addition to the certified field report data, include the following:

1. Manufacturer’s fan curves and pump curves.

2. Manufacturers' rated performance data for all HVAC equipment.

3. Field test reports prepared by system and equipment installers.

4. Other information relative to equipment performance, but do not include approved Shop Drawings and Product Data.

D. General Report Data: In addition to the form titles and entries, include the following data in the final report, as applicable:

1. Title page.

2. Name, address, telephone number and e-mail address of Testing, Adjusting, and Balancing Agent Specialist.

3. Project name.

4. Project location.

5. Engineer's name and address.

6. General Contractor name and address.

7. Report date.

8. Signature and N.Y State P.E. seal of testing, adjusting, and balancing Agent Specialist who certifies the report.

9. Summary of contents, including the following:

a. Design versus final performance.

b. Notable characteristics of systems.

c. Description of system operational sequence, and identification of extent to which it varies or deviates from that specified under the Contract Documents.

10. Nomenclature sheets for each item of equipment.

11. Data for terminal units, where applicable, including manufacturer, type size, and fittings.

12. Notes to explain why certain final data in the body of reports vary from design values.

13. Test conditions for fans performance forms, including the following:

    a. Settings for outside-, return-, and exhaust-air dampers.

    b. Conditions of filters.

    c. Cooling coil, wet- and dry-bulb conditions.

    d. Fan drive settings, including settings and percentage of maximum pitch diameter.

    e. Settings for supply-air static-pressure controller, (where applicable).

    f. Other system operating conditions that affect performance.

E. System Diagrams: Include schematic layouts of all air, oil and hydronic distribution systems. Submit schematic representation of each system with single-line diagrams and include the following:

1. Quantities of outside, supply, return, and exhaust airflows, cfm; design and actual.

2. Water flow rates, gpm; design and actual.

3. Duct, outlet and inlet sizes.

4. Pipe and valve sizes and locations.

5. Terminal units, including VAV duct terminals.

6. Balancing valves.

7. Final balanced positions of each balancing device.

F. Air-Handling Units; Packaged, Self-Contained Air Conditioning Units; Supply Fans; Return/Exhaust Fans; Exhaust Fans; Transfer Fans; Test Reports: Include the following:

1. Unit Data and Test Report Data: Include the following:

    a. Unit identification.

    b. Location.

    c. Manufacturer and type.

    d. Model number and unit size.

    e. Manufacturer's serial number.

    f. Unit arrangement and class.

    g. Discharge and return inlet arrangement.

h. Sheave make, size in inches, and bore.

i. Sheave dimensions, center-to-center and amount of adjustments in inches.

j. Number of belts, and size.

k. Number of filters, type, and size, as applicable.

l. Airflow, cfm, specified and actual.

m. Return airflow, cfm, specified and actual, as applicable.

n. Outside airflow, cfm, specified and actual, as applicable.

o. Total static pressure, and external static pressure, inches wg (as applicable); both specified and actual.

p. Inlet static pressure, inches wg, specified and actual.

q. Discharge static pressure, inches wg; specified and actual.

r. Fan RPM; specified and actual.

s. Motor horsepower, fan brake horsepower, amperage of each phase leg, and voltage; specified and actual.

t. Motor starter NEMA size and overload protection heater ratings.

u. Electric heating coil kilowatts rating, amperage of each phase leg, and voltage; specified and actual.

2. Motor And V-Belt Drive Data: Include the following:

a. Manufacturer and frame type and size.

b. Horsepower, brake horsepower and rpm.

c. Volts, phase, and hertz.

d. Full-load amperage, actual amperage and service factor.

e. Starter NEMA size, rating and overload heater element ratings.

f. Driven sheave and motor sheave, diameters and bores in inches, and RPM's.

g. Sheave center-to-center distances, actual, maximum and minimum, and amount of adjustments in inches.

h. Belt size and quantity.

3. Test Data: Include design and actual values for the following, as applicable:

a. Total supply airflow rate, in cfm.

b. System total and external static pressures, in inches wg.

c. Fan rpm's.

d. Discharge static pressure, in inches wg.

e. Filter type and static-pressure differential, in inches wg.

f. Cooling coil static-pressure differential, in inches wg.

g. Heating coil static-pressure differential, in inches wg.

h. Outside airflow, in cfm.

i. Return and/or exhaust air flows, in cfm.

j. Outside-air damper position.

k. Return-air damper position.

l. Electric heating coil kilowatts rating, amperage of each phase leg, and voltage; specified and actual.

G. Variable Air Volume Boxes:

1. Unit And Test Report Data: Include the following:

a. Air-Handling or Rooftop unit identification.

b. Location and zone.

c. Type, non-fan powered or fan powered.

d. Area served.

e. Manufacturer model number and size.

f. Tag number from system diagram.

g. Design velocity and pressure drop, inches wg.

h. Test (final) velocity.

i. Room Temperature, specified and actual.

j. Minimum inlet static pressure.

k. Minimum design airflow setpoint as a percentage of maximum design airflow; design and actual.

l. Maximum design airflow, cfm.

m. Maximum actual airflow, cfm.

n. Inlet static pressure, actual, inches wg.

o. Hot Water Coil identification.

p. Hot Water Coil Capacity and flow rate gpm; design and actual.

q. Number of coil rows.

r. Coil air pressure drop, design and actual.

s. Rated and actual measured amperage and voltage of VAV Box.

t. Entering-air temperature.

u. Leaving-air temperature.

v. For fan-powered type VAV Boxes, motor horsepower, amperage, voltage, and control power voltage; design and actual.

H. Duct Traverse Reports: Include a diagram with a grid representing the duct cross-section and record the following:

1. Report Data: Include the following:

a. System and air-handling unit number.

b. Location and zone.

c. Traverse air temperature in deg F and correction factor.

d. Duct static pressure in inches wg.

e. Duct size in inches.

f. Duct area in sq. ft.

g. Design airflow rate in cfm.

h. Design velocity in fpm.

i. Actual airflow rate in cfm.

j. Actual average velocity in fpm.

k. Barometric pressure in psig.

I. Condenser/Compressor Reports: For each condenser/compressor package or individual equipment, include the following:

1. Unit Data: Include the following:

a. Unit identification.

b. Manufacturer and model number.

c. Manufacturer's serial number.

d. Refrigerant type and capacity of charge, in pounds.

e. Starter type and NEMA size.

f. Starter thermal overload protection rating.

2. Evaporator Coil Test Reports: Include design and actual values for the following:

a. Refrigerant pressure in psig.

b. Refrigerant temperature in deg F.

3. Compressor Test Data: Include design and actual values for the following:

a. Make and model number.

b. Manufacturer's serial number.

c. Suction pressure in psig.

d. Suction temperature in deg F.

e. Discharge pressure in psig.

f. Discharge temperature in deg F.

g. Oil pressure in psig.

h. Oil temperature in deg F.

i. Voltage at each connection.

j. Amperage for each phase.

k. The kW input.

l. Crankcase heater kW.

m. Supply Air Temperature control set point in deg F.

n. Condenser water control set point in deg F.

o. Refrigerant low-pressure-cutoff set point in psig.

p. Refrigerant high-pressure-cutoff set point in psig.

4. Refrigerant Test Data: Include design and actual values for the following:

a. Oil level.

b. Refrigerant level.

c. Relief valve setting in psig.

d. Unloader set points in psig.

e. Percentage of cylinders unloaded.

J. Condenser Test Reports: For condensers, include the following:

1. Unit Data and Test Data: Include the following:

a. Unit identification.

b. Manufacturer and type.

c. Model and serial numbers.

d. Nominal cooling capacity in tons and rated condenser air flow rate and temperature differential; design and actual.

e. Refrigerant type and weight of charge, in pounds; design and actual.

f. Number and type of fans.(Air-cooled condensers); design and actual.

g. Fan motor manufacturer, frame size, rpm, amperage and horsepower; design and actual.

h. Fan motor voltage at each phase leg connection.

i. Sheave diameter in inches, for belt driven centrifugal type.

j. Sheave diameters, center-to-center distances and amount of adjustments in inches, as applicable.

k. Number of belts, make, and size, as applicable.

K. Pump Test Reports: For pumps, include the following data.

1. Unit Data and Test Data: Include the following:

a. Unit identification number.

b. Location.

c. Service.

d. Manufacturer, size, no. of stages, and impeller diameter(s) (inches).

e. Model and serial numbers.

f. Design and actual water flow rate in gpm, total head, discharge pressure head, and suction pressure head (feet of fluid) at design and actual final balanced conditions.

g. Pump rpm; design and actual.

h. Motor horsepower, pump brake horsepower and rpm; design and actual.

i. Voltage at each phase leg connection; actual.

j. Amperage for each phase; actual.

k. Full-load amperage and service factor; design and actual.

l. Seal type.

m. Pump “shut-off” total head pressure (psig) at “dead-end” flow condition.

n. Static head in feet of head.

L. Ductwork Leakage Tests:

1. Comply with the most recent SMACNA and ASHRAE requirements for ductwork of static pressure classes as specified.

a. Description of ductwork under test.

b. Duct design operating pressure class, based on the scheduled design air handling system fan static pressure, rounded up, in “positive” or “negative” magnitude, to the nearest integral whole number.

c. Duct design test static pressure, to match that of “b.”, hereinabove.

d. Duct capacity, airflow; design.

e. Test apparatus.
   1. Blower size, rpm, motor horsepower.
   2. Orifice, tube size.
   3. Orifice size.
   4. Date Of Calibration.

f. Test static pressure; actual.

g. Test orifice differential pressure; actual.

M. Instrument Calibration Reports: For instrument calibration, include the following:

1. Report Data: Include the following:

a. Instrument type, model and manufacturer.

b. Serial number.

c. Application and range of use.

d. Dates of use.

e. Dates of calibration, including a written statement attesting that all instrumentation intended for use, as listed, has been calibrated within the last six months of the date of the report submittal

N. Cooling Coil Data:

1. Unit and Test Report Data:

a. Identification/number.

b. Location.

c. Service.

d. Manufacturer.

e. Airflow, design and actual.

f. Entering air DB temperature, design and actual.

g. Entering air WB temperature, design and actual.

h. Leaving air DB temperature, design and actual.

i. Leaving air WB temperature, design and actual.

j. Air pressure drop, design and actual.

k. Number of coil rows, tubing outer diameter, and fins-per-foot (fin spacing); design and actual.

O. Heating Coil Data:

1. Unit And Test Data:

   a. Identification tag number.

   b. Location.

   c. Service.

   d. Manufacturer.

   e. Airflow, design and actual.

   f. Water flow, design and actual.

   g. Water pressure drop, design and actual.

   h. Entering water temperature, design and actual.

   i. Leaving water temperature, design and actual.

   j. Entering air temperature, design and actual.

   k. Leaving air temperature, design and actual.

   l. Air pressure drop, design and actual.

   m. Number of coil rows, tubing outer diameter, and fins-per-foot (fin spacing); design and actual.

P. Rooftop HVAC and HV Units:

1. Unit Data and Test Report Data, as applicable:

   a. Location.

   b. Manufacturer.

   c. Model number; total rated unit electrical mca; voltage; maximum overcurrent protection or fuse size, amps; refrigerant type, and charge, in pounds; design and actual.

   d. Total Sensible and Gross Output Cooling Capacities, MBH; and unit EER; design and actual.

e. Heating Coil hot water flow rate, gpm; number of rows; fin spacing (fins per foot); entering and leaving hot water temperatures; and air pressure drop, inches wg; design and actual.

f. Heating Capacity, MBH; specified and actual.

g. Air Conditioning Capacity, tons refrigeration; specified and actual.

h. Supply airflow, supply specified and actual.

i. Outside airflow, specified and actual.

j. Return and exhaust airflow, specified and actual.

k. Cooling coil entering-air temperature.

l. Cooling coil leaving-air temperature.

m. Total and external system static pressures, specified and actual.

n. Supply and Return/Exhaust Fans RPM's, motor horsepower's, brake horsepower's, voltages and amperages of each phase leg, and overload protection heater ratings; design and actual.

o. Discharge and return inlet static pressure; design and actual.

p. Sheave diameters in inches, and bores in inches.

q. Sheave rpm, center-to-center distances, and amount of adjustments in inches.

r. Motor horsepower's, brake horsepower's, voltages and amperages; design and actual.

s. Number of refrigeration compressors, tons each, kw each, voltage and amperages of each, in each phase leg; design and actual.

t. Number of condenser fans, condenser fan cfm's, rpm, condenser fan motor horsepower's, voltage and amperages of each; design and actual.

u. Variable Frequency Drives NEMA sizes and ratings; design and actual.

v. Number of rows of cooling coil; coil fin spacing (fins per foot)' coil tubing outer diameter; cooling coil air pressure drop, inches wg; design and actual.

w. Unit filter type; clean air pressure drop; rated dust-spot efficiency; design and actual.

Q. Air Diffusers, Registers, Grilles, Outlets and Inlets:

1. Unit Data and Test Report Data:

a. Manufacturer.

b. Type, constant, variable, single duct.

c. Identification tag number.

d. Room Location.

e. Model number.

f. Size and “k” factor.

g Inlet static pressure at maximum balanced airflow; actual.

h. Minimum design airflow.

i. Maximum design airflow.

j. Maximum final balanced actual airflow.

k. Inlet static pressure, and static pressure drop; actual.

R. Air Distribution Test Sheet:

1. Design and Test Report Data:

a. Air outlets and inlets tag identification number.

b. Room number/location.

c. Outlets and inlets type.

d. Outlets and inlets size.

e. Area “k” factor.

f. Design velocity, fpm.

g. Design airflow, cfm.

h. Test (final) velocity, fpm; actual.

i. Test (final) airflow, cfm; actual.

j. Percent of design airflow; actual.

S. Pressure Tests – Piping And Equipment:

1. Apply, document and submit results of tests performed as specified herein below.

3.16 PRESSURE TESTS – PIPING:

A. Apply tests as specified below. No work shall be covered or concealed before it is tested. Piping may be concealed after the hydrostatic test and an inspection of the position, pitch and allowance for expansion has been made.

B. Hydrostatic Tests: Hot water piping systems, (including propylene-glycol solution piping, if applicable), and cold water makeup piping systems, shall be tested at not less than 125-pounds per square inch hydrostatic pressure maintained for at least 4-hours during the progress of installation. All leaks shall be properly eliminated. Caulking of leaky joints is not permitted. For testing purposes, end of piping to be tested shall be plugged or capped. Convectors, thermostatic vacuum breakers, control valves, instrumentation and other equipment or apparatus which may be damaged by this hydrostatic test shall be excluded or isolated from the test. Refer to the Section on Sprinkler Work, for testing of sprinkler piping systems. Water piping shall be tested at 150 percent of working pressure, but never at less than 125 psi.

3.17 TESTING OF EQUIPMENT, APPARATUS AND APPURTENANCES:

A. Relief Valves: Increase pressure in equipment or apparatus to relief valve setting to test opening of valves at required relief pressures.

B. Dampers: The dampers, deflectors, and other items and accessories, shall be tested and adjusted during the balancing of systems work. This work shall be carried out by parties other than the person delegated to supervise the operation of the work and instruct OMH and OGS's designated personnel.

3.18 HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS - CLEANING AND OPERATIONAL TESTING:

A. Glycol Systems (where, and if applicable):

1. Cleaning: Flush systems and apparatus, upon completion of pressure and miscellaneous tests. Completely open valves and flush each system with clean water, prior to chemical cleaning. Repeatedly flush at short intervals until twice the system water capacity has been flushed through. Chemically clean systems immediately following flushing operations. Circulate a solution consisting of trisodium phosphate, in a proportion of one pound of chemical to every 50 gallons of the glycol solution in the system. Completely fill system with cleaning solution; vent system and place in operation, with automatic controls operating and valves fully open. Allow system to reach design operating temperature or an operating temperature designated by OMH, OGS, and MPC. Circulate the solution

through the system for a minimum of 4 consecutive hours; immediately drain system and flush with clean water until the pH at the farthest drain matches the clean water input. Keep strainers unplugged during cleaning operations. Remove and clean strainer screens prior to operational test. Refill system with the glycol solution (40% propylene glycol).

2. Operational Test: Run system in an automatic mode for a minimum of 120 consecutive hours. During this time, make final adjustments, including the setting of the balancing valves.

B. Hot Water Systems:

1. After the hot water systems installation has been completed, they shall be chemically cleaned. Notify OMH, OGS, and MPC 5-days in advance of starting the cleaning operation. In the presence of OMH, OGS, and MPC, one of the following solutions shall be placed in the system and circulated: (1) Trisodium Phosphate - one pound for each fifty gallons of water in the system; (2) Sodium Carbonate -one pound for each thirty gallons of water in the system; or (3) Sodium Hydroxide (Lye) - one pound for each fifty gallons in the system. Their preference is in the order named, and a solution of only one type shall be used.

2. Fill, vent, and circulate this solution through the system, allowing it to reach design or operating temperature. After circulating for not less than 4-hours, the solution shall be drained completely from the system, strainers shall be cleaned, and the system shall be refilled with fresh water. The water shall be circulated for one hour, and, at that time, a sample of the water shall be tested for alkalinity in the presence of OMH, OGS, and MPC. The General Contractor shall be responsible for draining and containing all of the piping cleaning solution after its use, transporting the entire volume and contents of the used cleaning solution from the Project Site, and disposal of the entire volume of the cleaning solution in a legal manner, in accordance with all local environmental laws, regulations and restrictions governing the disposal of caustic hazardous waste.

3. Operational Test: Run system in an automatic mode for a minimum of 120 consecutive hours. At completion, make final connections and adjustments to apparatus, equipment and accessories.

3.19 REFRIGERATION SYSTEMS - TESTING, DEHYDRATION AND CHARGING:

A. Refrigerant Piping Leak Test Procedure:

1. Refrigerant Piping used in conjunction with Packaged Split-System Air Conditioning Units as specified under Section 238113: Pressurize with dry nitrogen to a minimum test pressure of 125 psig for R-407C systems, and test for leaks for one hour. Release pressure, repair leaks and retest as necessary until no leaks occur.

B. Dehydration: Following pressure tests, dehydrate each system with a vacuum pump. Draw and hold an initial vacuum of 500 microns. Break this vacuum by pressurizing with dry nitrogen to 50 psig. Draw and hold a second vacuum of 250 microns. Verify vacuum obtained with a mercury column or an electronic vacuum gauge.

C. Refrigerant Charging:

1. Introduce refrigerant of type and quantity required through a filter/drier installed in the temporary charging line.

   a. Prevent moisture and other contaminants from entering the system.

2. Charge liquid refrigerant through a charging valve provided in the high pressure side of the system.

   a. Small amounts of gaseous refrigerant may be charged through the compressor suction service valve port.

3. No bubbles shall appear at the moisture-liquid indicator when the system is fully charged and operational. Do not overcharge.

4. Record the weight in pounds of refrigerant charged into each system and submit this record to OMH and OGS.

D. Adjustments and Operational Testing:

1. Adjustments: Place the system in operation with automatic controls functioning. Adjust controls and apparatus for proper operation. Test thermometers and gauges for accuracy over the entire range. Remove and replace items found defective.

2. Operational Test: Place system in operation, with final connections to equipment and with automatic controls operating, and operate for a minimum of 120 consecutive hours. Operational test shall prove to OMH and OGS that the system can produce the refrigeration effect required by the Contract Drawings and the Specifications.

3.20 ADDITIONAL TESTS:

A. Within 90 days of completing testing, adjusting, and balancing, perform additional testing and balancing to verify that balanced conditions are being maintained throughout and to correct unusual conditions.

B. Seasonal Periods: If initial testing, adjusting, and balancing procedures were not performed during near-peak summer and winter conditions, the General Contractor and TAB Agent Specialist Firm shall return to the Project Site to perform additional inspections, testing, adjusting and balancing of the HVAC systems during peak summer and winter conditions, when outdoor ambient temperatures are at least as high as 89°F DB/73°F WB during the summer, and at least as low as 10°F DB during the winter, at no additional cost to OMH and OGS.

LIST OF SUBMITTALS

SUBMITTED	DATE SUBMITTED	DATE APPROVED
Quality Control Submittals:	_____	_____
Test Reports (Field Tests)		
Refrigeration Systems		
Glycol System Test		
Hot Water and Chilled Water Systems		

Refrigerant Charging:	_____	_____
Record weight in pounds		
Test Reports (Field Tests):		
Precision Test Procedures.		
Precision Test Results.	_____	_____
Factory Testing Affidavits	_____	_____
Testing and Balancing Agent Specialist's AABC/NEBB Membership Certification.	_____	_____
Sample Forms:		
Blank Reports Forms.	_____	_____
List Of Calibrated Instrumentation.		
Testing and Balancing Plan and Procedures.		
P.E. Signed/Sealed Certified Reports:	_____	_____

END OF SECTION

SECTION 230700

INSULATION

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Through Penetration Firestops: Section 078400.

B. Painting: Section 099103.

C. Pipe Hangers and Supports: Section 230529.

1.02 ABBREVIATIONS

A. FS: Federal Specification.

B. K: Thermal Conductivity, i.e., maximum Btu per inch thickness per hour per square foot.

C. pcf: Pounds per cubic foot.

D. PVC: Polyvinylchloride.

1.03 SUBMITTALS

A. Product Data:
   1. Manufacturer's catalog sheets, specifications and installation instructions for insulation materials and jacket materials.
   2. Materials Schedule: Itemize insulation materials and thicknesses for each specified application in Insulation Material Schedules in Part 3 of this Section. Where optional materials are specified, indicate option selected.

B. Quality Control Submittals:
   1. Installers Qualification Data:
      a. Name of each person who will be performing the Work, and their employer's name, business address and telephone number.
      b. Furnish names and addresses of the required number of similar projects that each person has worked on which meet the qualifications.

1.04 QUALITY ASSURANCE

A. Qualifications: The persons installing the Work of this Section and their Supervisor shall be personally experienced in mechanical insulation work and shall have been regularly employed by a company installing mechanical insulation for a minimum of 5 years.

B. Regulatory Requirements:
   1. Insulation installed inside buildings, including duct lining materials, laminated jackets, mastics, sealants and adhesives shall have a Fire Spread/Smoke Developed Rating of 25/50 or less based on ASTM E 84.

PART 2 PRODUCTS

2.01 INSULATION

A. Fibrous Glass (Mineral Fiber) Insulation: Composed principally of fibers manufactured from rock, slag, or glass, with or without binders, and asbestos free.
   1. Preformed Pipe Insulation: Minimum density 3 pcf; ASTM C 547:
      a. Class 1 (Suitable for Temperatures Up to 450 degrees F): K of 0.26 at 75 degrees F.
   2. Premolded Fitting Insulation: Minimum density 4.0 pcf, K of 0.26 at 75 degrees F; ASTM C 547, Class 1.
   3. Insulation Inserts for PVC Fitting Jackets: Minimum density 1.5 pcf, K of 0.28 at 75 degrees F; ASTM C 553, Type III.
      a. Suitable for temperatures up to 450 degrees F.
   4. Block or Board Insulation: Minimum density 3.0 pcf and 6.0 pcf as specified; ASTM C 612:
      a. Type IA or IB (Suitable for Temperatures Up to 450 degrees F): K of 0.26 at 75 degrees F.
   5. Thermal and Acoustic Board Insulation: Minimum density 3.0 pcf, K of 0.27 at 75 degrees F; ASTM C 1071, Type II.
      a. Air Stream Side: Erosion, temperature, and fire resistant type; NFPA 90-A and 90-B.
   6. Blanket Insulation:
      a. For Ductwork (Suitable for Temperatures Up to 450 Degrees F): Minimum density 1.0 pcf, K of 0.31 at 75 degrees F; ASTM C 553, Type II.

B. Flexible Elastomeric Foam Insulation:
   1. FM tested and approved, meeting the following:
      a. Maximum Water Vapor Transmission: 0.10 perms - inch based on ASTM E 96, Procedure A.
      b. K of 0.27 at 75 degrees F based on ASTM C 518 or C 177.
      c. Fire Spread/Smoke Developed Rating: 25/50 or less based on ASTM E 84.
   2. Pipe Insulation: ASTM C 534, Type I.
   3. Sheet Insulation for Ductwork and Equipment: ASTM C 534, Type II, smooth skin one side.
   4. Polyethylene and polyolefin insulation is not acceptable.

C. Acoustical Duct Liner:
   1. For ductwork indicated or specified in section 233113 Metal Ductwork to be acoustically lined, provide Flexible elastomeric duct liner as specified below.

2. Fiberglass duct liner shall comply with ASTM C 1071, NFPA 90A or NFPA 90B, and with NAIMA AH124, "Fibrous Glass Duct Liner Standard."
3. Flexible elastomeric duct liner shall consist of preformed, cellular, closed-cell, sheet materials complying with ASTM C 534, Type II, Grade 1, and with NFPA 90A or NFPA 90B.
4. Antimicrobial erosion resistant coating shall be applied to the surface of the liner to form an interior surface that acts as a moisture repellent and erosion resistant coating.
5. Duct lining burning characteristics shall have a flame spread index less than 25 and smoke developed index less than 50 per ASTM E84.
6. Where duct lining is used, provide the thermal equivalent of the insulation specified. Provide not less than 1 inch thick, 1½ lb. per cubic foot density coated lining, increase duct size shown on the drawings to compensate for the thickness of the lining used.
   a. Approved manufactures: Owens Corning Aeroflex, Johnson Manville Permacote, Linacoustic, Certainteed Unltralite 150.
7. 1” minimum Duct lining shall be provide in supply ductwork Duct lining burning characteristics shall have a flame spread index less than 25 and smoke developed index less than 50 per ASTM E84.

2.02 SCHEDULE

A. The following items shall be acoustically lined. Where distances of lining are indicated, the intent is that all ductwork <u>in any direction</u> be acoustically lined.
   1. All supply air ductwork a distance of 40 feet from fan discharge. If the distance from fan discharge to mechanical equipment room wall is more than 40 feet continue acoustical lining to the mechanical equipment room wall.
   2. All conditioned air supply ductwork from roof top units to a distance of 40 feet from fan discharge. If the distance from fan discharge to roof or wall penetration is less than 40 feet, continue acoustic lining to a distance of 40 feet from fan discharge.
   3. Upstream of return fans a minimum distance of 25 feet.
   4. Downstream of the terminal unit (VAV boxes, FP terminal, etc) a minimum of 10 feet, including any taps taken from the main discharge within this range.

B. High Density Jacketed Insulation Inserts for Hangers and Supports:
   1. For Use with Fibrous Glass Insulation:
      a. Cold Service Piping:
         1) Polyurethane Foam: Minimum density 4 pcf, K of 0.13 at 75 degrees F, minimum compressive strength of 125 psi.
      b. Hot Service Piping:
         1) Calcium Silicate: Minimum density 15 pcf, K of 0.50 at 300 degrees F; ASTM C 533.
      c. Ductwork: Fibrous glass board, minimum density 6 pcf, K of 0.26 at 75 degrees F, conforming to ASTM C 612, Type IA or IB.

2. For Use with Flexible Elastomeric Foam Insulation:
   a. Piping: Hardwood dowels and blocks, length or thickness equal to insulation thickness, other dimensions as specified or required.

C. Cements:
   1. Fibrous Glass Thermal Insulating Cement: Asbestos free; ASTM C 195.
   2. Fibrous Glass Hydraulic Setting Thermal Insulating and Finishing Cement: ASTM C 449/C 449M.

2.02 JACKETS

A. Laminated Vapor Barrier Jackets for Piping and Ductwork: Factory applied by insulation manufacturer, conforming to ASTM C 1136, Types I and II.
   1. Type I: Reinforced white kraft and aluminum foil laminate with kraft facing out.
      a. Pipe Jackets: Furnished with integral 1-1/2 inch self sealing longitudinal lap, and separate 3 inch wide adhesive backed butt strips.
   2. Type II: Reinforced aluminum foil and kraft laminate with foil facing out.
   3. Laminated vapor barrier jackets are not required for flexible elastomeric foam insulation.

B. Canvas Jackets: Cotton duck, fire retardant, complying with NFPA 701, 4 oz or 6 oz per sq yd as specified.

C. Premolded PVC Fitting Jackets:
   1. Constructed of high impact, UV resistant PVC.
      a. ASTM D 1784, Class 14253-C.
      b. Working Temperature: 0-150 degrees F.

D. Metal Jacketing:
   1. Aluminum: ASTM B 209, Alloys 1100, 30003, 3105 or 5005, Temper H14, 0.016 inch thick.
      a. Factory Pre-formed Sectional Pipe Jacketing:
         1) Smooth outer finish with integral bonded laminated polyethylene film - kraft paper moisture barrier underside.
         2) Pittsburg or modified Pittsburg longitudinal lock seams.
         3) 2 inch overlapping circumferential joints with integral locking clips, or butt joints sealed with 2 inch wide mastic backed aluminum snap bands.
      b. Roll Jacketing: Smooth outer finish with integral bonded laminated polyethylene film - kraft paper moisture barrier underside.
      c. Sheet Jacketing: Corrugated 1-1/4 inch x 1/4 inch deep with integral bonded laminated polyethylene film - kraft paper moisture barrier underside.
      d. Fastening Devices:
         1) Strapping: Type 18-8 stainless steel, 0.020 inch thick, 1/2 and 3/4 inch wide as specified.
         2) Wing Seals: Type 18-8 stainless steel, 0.032 inch thick.

3) Sheet Metal Screws: Panhead, Type A, hardened aluminum, and stainless steel.

2. Circumferentially Corrugated Aluminum Jacketing: Childer's Corrolon.
   a. Construction: 3/16 inch circumferentially corrugated embossed aluminum, ASTM B 209, Types 1100, 3003, 3105, or 505, H-14 temper, 0.016 inch thick.

   b. Moisture Barrier: Integrally bonded to jacket over entire surface in contact with insulation.

   c. Fastening Devices:
      1) Strapping: 0.020 inch thick by 1/2 inch wide, Type 3003, 3105, 5005, H-14 temper.
      2) Wing Seals: 0.032 inch thick Type 5005, H-14 temper aluminum.

2.03 ADHESIVES, MASTICS, AND SEALERS

A. Lagging Adhesive (Canvas Jackets): Childers' CP-50A, Epolux's Cadalag 336, Foster's 30-36.

B. Vapor Seal Adhesive (Fibrous Glass Insulation): Childers' CP-82, Epolux's Cadoprene 400, Foster's 85-75 or 85-20.

C. Vapor Barrier Mastic/Joint Sealer (Fibrous Glass Insulation): Childers' CP-30, Epolux's Cadalar 670, Foster's 95-44 or 30-35.

D. Adhesive (Flexible Elastomeric Foam): Armstrong's 520, Childers' CP-80, Epolux's Cadoprene 488, Foster's 82-40.

E. Adhesive (Reinforcing Membrane): Childers' Chil-Spray WB CP-56.

F. Mastic (Reinforcing Membrane): Childers' AK-CRYL CP-9.

G. Sealant (Metal Pipe Jacket): One-part silicone sealant for high temperatures; Dow Corning's Silastic 736 RTV or General Electric's RTV 106.

2.04 MISCELLANEOUS MATERIALS

A. Insulation Fasteners for Ductwork and Equipment:
   1. Acceptable Manufacturers: Duro-Dyne Corp.; Erico Fastening Systems, Inc.
   2. Type: Weld pins, complete with self-locking insulation retaining washers.

B. Pressure Sensitive Tape for Sealing Laminated Jackets:
   1. Acceptable Manufacturers: Alpha Associates, Childers, Ideal Tape, Morgan Adhesive.
   2. Type: Same construction as jacket.

C. Wire, Bands, and Wire Mesh:
   1. Binding and Lacing Wire: Nickel copper alloy or copper clad steel, gage as specified.
   2. Bands: Galvanized steel, 1/2 inch wide x 0.015 inch thick, with 0.032 inch thick galvanized wing seals.
   3. Wire Mesh: Woven 20 gage steel wire with 1 inch hexagonal openings, galvanized after weaving.

D. Metal Corner Angles: Galvanized steel, 2 x 2 inch 28 gage.

E. Reinforcing Membrane: Glass or Polyester, 10 x 10 mesh. Alpha Associates Style 59, Childer's Chil-Glas, Foster's MAST-A-FAB.

PART 3 EXECUTION

3.01 PREPARATION

A. Perform the following before starting insulation Work:
   1. Install hangers, supports and appurtenances in their permanent locations.
   2. Complete testing of piping, ductwork, and equipment.
   3. Clean and dry surfaces to be insulated.

3.02 INSTALLATION, GENERAL

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

B. Piping Insulation: Provide continuous insulation and jacketing when passing thru interior wall, floor, and ceiling construction.
   1. At Through Penetration Firestops: Coordinate insulation densities with the requirements of approved firestop system being installed. See Section 078400.
      a. Insulation densities required by approved firestop system may vary with the densities specified in this Section. When this occurs use the higher density insulation.

C. Do not intermix different insulation materials on individual runs of piping.

3.03 INSTALLATION AT HANGERS AND SUPPORTS

A. Reset and realign hangers and supports if they are displaced while installing insulation.

B. Install high density jacketed insulation inserts at hangers and supports for insulated ductwork, piping, and equipment.

C. Insulation Inserts For Use with Fibrous Glass Insulation:
1. Ductwork: Install 6 pcf density jacketed fibrous glass board, same thickness as adjoining insulation, sized for full bearing on supporting trapeze member, and as required to enable abutting to adjoining insulation and overlapping of jacketing.
2. Piping: Where clevis hangers are used, install insulation shields and high density jacketed insulation inserts between shield and pipe.
   a. Where insulation is subject to compression at points over 180 degrees apart, e.g. riser clamps, U-bolts, trapezes, etc.; fully encircle pipe with 2 protection shields and 2 high density jacketed fibrous glass insulation inserts within supporting members.
      1) Exception: Locations where pipe covering protection saddles are specified for hot service piping, 6 inch and larger.

D. Insulation Inserts For Use with Flexible Elastomeric Foam Insulation:
1. Piping:
   a. Where clevis hangers are used, install insulation shields with hardwood filler pieces, same thickness as adjoining insulation, inserted in undersized die cut or slotted holes in insulation at support points.
   b. Contour hardwood blocks to match the curvature of pipe, and shield.
   c. Coat dowels and blocks with insulation adhesive, and insert while still wet.
   d. Vapor seal outer surfaces of dowels and blocks with adhesive after insertion.
   e. Install filler pieces as follows:

PIPE/TUBING SIZE	FILLER PIECES	POSITION
Thru 1-1/2”	2 dowel plugs	6 o’clock; in tandem
2” thru 4”	1 block 2 dowel plugs	6 o’clock, and 4 & 8 o’clock respectively
6” thru 8”	2 blocks 4 dowel plugs	6 o’clock; in tandem and 4 & 8 o’clock; in tandem

3.04 INSTALLATION OF FIBROUS GLASS COLD SERVICE INSULATION

A. Install insulation materials with a field or factory applied ASTM C 1136 Type I laminated vapor barrier jacket, unless otherwise specified.

B. Piping:
1. Butt insulation joints together, continuously seal minimum 1-1/2 inch wide self sealing longitudinal jacket laps and 3 inch wide butt adhesive backed strips.
   a. Substitution: 3 inch wide pressure sensitive sealing tape, of same material as jacket, may be used in lieu of butt strips.

2. Bed insulation in a 2 inch wide band of vapor barrier mastic, and vapor seal exposed ends of insulation with vapor barrier mastic at each butt joint between pipe insulation and equipment, fittings or flanges at the following intervals:
   a. Horizontal Pipe Runs: 21 ft.
   b. Vertical Pipe Runs: 9 ft.

C. Fittings, Valves, Flanges and Irregular Surfaces:
1. Insulate with mitre cut or premolded fitting insulation of same material and thickness as pipe insulation.
2. Secure insulation in place with 16 gage wire, with ends twisted and turned down into insulation.
3. Butt insulation against pipe insulation and bond with joint sealer.
4. Insulate valves up to and including bonnets, without interfering with packing nuts.
5. Apply leveling coat of insulating cement to smooth out insulation and cover wiring.
6. When insulating cement has dried, seal fitting, valve and flange insulation, by imbedding a layer of reinforcing membrane or 4 oz. canvas jacket between 2 flood coats of vapor barrier mastic, each 1/8 inch thick wet.
7. Lap reinforcing membrane or canvas on itself and adjoining pipe insulation at least 2 inches.
8. Trowel, brush or rubber glove outside coat over entire insulated surface.
9. Exceptions:
   a. In Mechanical Equipment Rooms, Steam Service Rooms, Machine Rooms, Penthouses, Finished Rooms and Finished Spaces: Cover fittings, valves and flanges insulated with fibrous glass with an additional 6 oz canvas jacket, lapped on adjoining insulation and pasted with lagging adhesive.
   b. Type C and D Piping Systems: Valves, fittings and flanges may be insulated with premolded PVC fitting jackets, with fibrous glass insulation inserts.
      1) Additional insulation inserts are required for services with operating temperatures under 45 degrees F or where insulation thickness exceeds 1-1/2 inches. The surface temperature of PVC fitting jacket must not go below 45 degrees F.

3.05 INSTALLATION OF FIBROUS GLASS HOT SERVICE INSULATION

A. Install insulation materials with field or factory applied ASTM C 1136 Type I laminated vapor barrier jacket unless otherwise specified.

B. Canvas Jackets on Piping, Fittings, Valves, Flanges, Unions, and Irregular Surfaces:
1. For Piping 2 inch Size and Smaller: 4 oz per sq yd unless otherwise specified.
2. For Piping Over 2 inch Size: 6 oz per sq yd unless otherwise specified.

C. Piping:
   1. Butt insulation joints together, continuously seal minimum 1-1/2 inch wide self sealing longitudinal jacket laps and 3 inch wide adhesive backed butt strips.
      a. Substitution: 3 inch wide pressure sensitive sealing tape, of same material as the jacket, may be used in lieu of butt strips.
   2. Fill voids in insulation at hanger with insulating cement.
   3. Exceptions:
      a. Piping in Accessible Shafts, Attic Spaces, Crawl Spaces, Unfinished Spaces and Concealed Piping: Butt insulation joints together and secure minimum 1-1/2 inch wide longitudinal jacket laps and 3 inch wide butt strips of same material as jacket, with outward clinching staples on maximum 4 inch centers. Fill voids in insulation at hangers with insulating cement.
      b. Piping in Tunnels: Butt insulation joints together and secure minimum 1-1/2 inch wide longitudinal jacket laps and 3 inch wide butt strips, of same material as jacket, with outward clinching staples on maximum 4 inch centers and 16 gage wires a minimum of 4 loops per section. Fill voids in insulation with insulating cement.

D. Fittings, Valves, Flanges and Irregular Surfaces:
   1. Insulate with mitre cut or premolded fitting insulation of same material and thickness as insulation.
   2. Secure in place with 16 gage wire, with ends twisted and turned down into insulation.
   3. Butt fitting, valve and flange insulation against pipe insulation, and fill voids with insulating cement.
   4. Insulate valves up to and including bonnets, without interfering with packing nuts.
   5. Apply leveling coat of insulating cement to smooth out insulation and cover wiring.
   6. After insulating cement has dried, coat insulated surface with lagging adhesive, and apply 4 oz or 6 oz canvas jacket as required by pipe size.
      a. Lap canvas jacket on itself and adjoining pipe insulation at least 2 inches.
      b. Size entire canvas jacket with lagging adhesive.
   7. Exceptions:
      a. In Types E, F and G Service Piping Systems: Valves, fittings and flanges may be insulated with premolded PVC fitting jackets, with fibrous glass insulation inserts.
         1) Additional insulation inserts are required for services with operating temperatures over 250 degrees F or where insulation thickness exceeds 1-1/2 inches. The surface temperature of PVC fitting jacket must not exceed 150 degrees F.
      b. In Types E, F, and G Service Piping Systems: Insulate fittings, valves, and irregular surfaces 3 inch size and smaller with insulating cement covered with 4 oz or 6 oz canvas jacket as required by pipe size.

1) Terminate pipe insulation adjacent to flanges and unions with insulating cement trowelled down to pipe on a bevel.

c. In Type H Service Piping System: Insulate fittings, valves, flanges, unions, and irregular surfaces 3 inch size and smaller with insulating cement covered with 4 oz or 6 oz canvas jacket as required by pipe size.

d. Fittings, Valves, Flanges, and Irregular Surfaces In Concealed Piping, Piping in Accessible Shafts, Attic Spaces, Crawl Spaces, Unfinished Rooms, Unfinished Spaces, and Tunnels: Sizing of canvas surface is not required.

E. Equipment:

1. Secure fibrous glass block or board insulation in place with wire or galvanized steel bands.
   a. Small Areas: Secure insulation with 16 gage wire on maximum 6 inch centers.
   b. Large Areas: Secure insulation with 14 gage wire or .015 inch thick by 1/2 inch wide galvanized steel bands on maximum 10 inch centers. Stagger insulation joints.
   c. Irregular Surfaces: Where application of block or board insulation is not practical, insulate with insulating cement built-up to same thickness as adjoining insulation.
2. Fill joints, voids and irregular surfaces with insulating cement, to a uniform thickness.
3. Stretch wire mesh over entire insulated surface and secure to anchors, with wire edges laced together.
4. Apply finishing cement, total of 1/2 inch thick, in 1/4 inch thick coats.
   a. Trowel second coat to a smooth hard finish.
5. Neatly bevel insulation around manholes, handholes, cleanouts, ASME stamp, boiler manufacturer's name and catalog number.

E. Mockup requirement:

1. Provide mockup of VAV with RHC with piping and piping insulation, and valves.

3.06 INSTALLATION OF FLEXIBLE ELASTOMERIC FOAM INSULATION

A. Where possible, slip insulation over the pipe, and seal butt joints with adhesive.

1. Where the slip-on technique is not possible, slit the insulation and install.
2. Re-seal with adhesive, making sure the mating surfaces are completely joined.

B. Insulate fittings and valves with miter cut sections. Use templates provided by the manufacturer, and assemble the cut sections in accordance with the manufacturer's printed instructions.

1. Insulate threaded fittings and valves with sleeved fitting covers. Over lap and seal the covers to the adjoining pipe insulation with adhesive.

C. Carefully mate and seal with adhesive all contact surfaces to maintain the integrity of the vapor barrier of the system.

D. Piping Exposed Exterior to a Building, Totally Exposed to the Elements:
   1. Apply flexible elastomeric foam insulation to piping with adhesive.
   2. Apply reinforcing membrane around piping insulation with adhesive or mastic.
   3. Adhesive Applied System: Apply 2 coats of finish. See Section 099103.
   4. Mastic Applied System: Apply another coat of mastic over reinforcing membrane.

3.07 INSTALLATION OF SHEET METAL JACKETING ON PIPING

A. Secure jacketing to insulated piping with preformed aluminum snap straps and stainless steel strapping installed with special banding wrench.

B. Jacket exposed insulated fittings, valves and flanges with mitred sections of aluminum jacketing.
   1. Seal joints with sealant and secure with preformed aluminum bands.
   2. Substitution: Factory fabricated, preformed, sectional aluminum fitting covers may be used in lieu of mitred sections of aluminum jacketing for covering fittings, valves and flanges.

3.08 INSTALLATION OF DUCTWORK INSULATION

A. Fibrous Glass Board Insulation Application:
   1. Secure insulation to ductwork, with duct insulation fasteners spaced 3 inch in from all corners of ducts, with intermediate fasteners on maximum 16 inch centers in all directions.
   2. Butt edges of insulation and fill voids with similar insulation.
   3. Seal minimum 1-1/2 inch wide longitudinal jacket laps continuously with vapor seal adhesive.
   4. Lap circumferential joints with 4 inch wide jacket material and seal laps continuously with vapor barrier lap adhesive, or seal continuously with minimum 3 inch wide pressure sensitive sealing tape, of same material as jacket.
   5. Install metal corner angles over the jacketed insulated corners. Seal exposed ends of insulation with vapor barrier mastic.
   6. Vapor seal breaks in vapor barrier jacketing, exposed surfaces of duct insulation fasteners and metal corner angles, with pressure sensitive sealing tape of same material as jacket or coat with vapor barrier mastic.
   7. Field apply 6 oz canvas jacket over the vapor barrier jacketed insulation where indicated on Ductwork Service Insulation Material Schedule in Part 3 of this Section.
      a. Apply canvas jacket with lagging adhesive, with a 2 inch lap on circumferential and longitudinal seams.
      b. Outward clinching staples may be utilized for additional securement of canvas to bottom of ducts in excess of 48 inch in width.
      c. Apply heavy coat of lagging adhesive to entire canvas surface.

8. Place trapeze hangers, fabricated of steel rods and structural steel channels or angles, outside of jacketed insulated ducts.
   a. Install high density insulation inserts, of thickness equal to insulation, minimum of 4 inch in width by the bottom dimension of the duct, at points of support.
   b. Continuously jacket insulated ducts and filler pieces through supports.

B. Fibrous Glass Blanket Insulation Application:
1. Cut insulation to stretch-out dimensions as recommended by insulation manufacturer.
2. Remove 2 inch wide strip of insulation material from the jacketing on the longitudinal and circumferential joint edges to form an overlapping staple/tape flap.
3. Install insulation with jacketing outside so staple/tape flap overlaps insulation and jacketing on other end.
4. Butt ends of insulation tightly together.
   a. Rectangular and Square Ductwork: Do not compress insulation at duct corners.
5. Staple longitudinal and circumferential joints with outward clinching staples minimum 6 inches on center, and seal with pressure sensitive sealing tape.
6. Cut off protruding ends of fasteners flush with insulation surface and seal with pressure sensitive sealing tape.
7. Install duct insulation fasteners on bottom side of horizontal duct runs, when bottom dimension of the duct is in excess of 24 inches in width.
8. Install duct insulation fasteners on sides of duct risers having a dimension over 24 inches in size.
9. Seal tears, punctures, and penetrations of insulation jacketing with sealing tape.
10. Secure insulation to ductwork with fasteners spaced in accordance with the following schedule:

DUCT DIMENSION	SPACING OF FASTENERS (MINIMUM)
Up to 24 inches	None required.
24 inches to 48 inches	Horizontal Runs: 2 rows - 16 inches on center. Risers: 16 inches on center, all directions.
49 inches to 60 inches	Horizontal Runs: 3 rows - 16 inches on center. Risers: 16 inches on center, all directions.
61 inches and over	Horizontal Runs: 16 inches on center, all directions. Risers: 16 inches on center, all directions.

C. Bench Insulated Ductwork:
1. Insulate ducts prior to erection in place when ducts are required to be installed proximate to walls, ceilings, equipment or other ductwork, which will not permit adequate space for installation of insulation after ducts are installed.

2. Line interior surfaces of ducts with thermal and acoustic board insulation, when the specified application of exterior insulation is impractical.
   a. Written permission from the Director must be received, prior to the substitution of lined ducts for exterior insulated ducts.
   b. Maintain interior cross-sectional areas of ducts, as noted on drawings.

3.09 FIELD QUALITY CONTROL

A. Field Samples: The Director's Representative, may at his discretion, take field samples of installed insulation for the purpose of checking materials and application. Reinsulate sample cut areas.

3.10 PIPING AND EQUIPMENT INSULATION SCHEDULE

A. Insulate all cold service and hot service piping, equipment, and appurtenances except where otherwise specified.

B. Schedule of Items Not to be Insulated:
   1. Do not insulate the following cold service items:
      a. Actual heat transfer surfaces.
      b. Cold water piping buried in direct contact with ground.
      c. Chromium plated piping, unless otherwise specified.
      d. Flexible vibration eliminators.
      e. Refrigerant liquid piping, unless sub-cooled below 70 degrees F.
      f. Water meters.
      g. Chemical feed piping.
   2. Do not insulate the following hot service piping:
      a. Plated or white metal piping.
      b. Piping inside convector and finned tube radiation enclosures.
      d. Drains from heating equipment and appurtenances that flow to waste.
      e. Water and other fluids 81 degrees F to 104 degrees F.
      f. Discharge piping from steam safety and water relief valves.
      g. Vent piping to atmosphere from installed exposed in Mechanical Equipment Rooms, Machine Rooms,
   3. Do not insulate the following hot service fittings, valves, flanges and irregular surfaces:
      a. Flanges and unions in Type E, F and G service piping systems.
      b. Hydronic Specialties:
         1) Flow indicators.
         2) Zone control valves.
         3) Air vents.
         4) Air control fittings.
      c. Safety and relief valves.
      d. Back pressure valves.
      e. Float chambers and level controllers.
      f. Venturi tubes and orifice plates.

4. Do not insulate the following hot service equipment:
   a. Actual heat transfer surfaces.
   b. Hot water pumps.
   c. Chemical feed pumps.
   d. Equipment manholes, handholes, and cleanouts.
   e. ASME stamps, nameplates with manufacturer's name and model number.
5. Do not insulate items installed under other Contracts.
6. Do not insulate mechanical equipment with a factory applied insulated steel jacket.

3.11 COLD SERVICE INSULATION MATERIAL SCHEDULE

TYPE	SERVICE AND TEMPERATURES	INSULATION MATERIAL	PIPE SIZES (INCHES)	MINIMUM (NOMINAL) INSULATION THICKNESS (INCHES)
A&B	Refrigerants, Brine, and Fluids < 40°F	Flex. Elastomeric Foam	All Sizes	1-1/2 1-1/2
C	Chilled Water, other Fluids 40°F to 60°F	Fibrous Glass	All Sizes	1-1/2 1-1/2
D	Domestic Cold Water < 40°F	Fibrous Glass	All Sizes	1

A. **NOTES:**
1. Double the insulation thickness above for piping, installed in tunnels and conduits.
2. Equipment Insulation: Insulation thicknesses above also apply for flat, curved and irregular equipment surfaces.
   a. Insulate equipment with fibrous glass board insulation with minimum density 6 pcf.
   b. Exceptions: Minimum insulation thickness for Type A service shall be a minimum of 1 inch thick for flat, curved and equipment irregular surfaces.
3. Type D Insulation Materials: In addition to the services shown on the schedule above, use Type D materials and thicknesses for the following:
   a. Condensate Drain Piping:
      1) Piping connected to drain pans under cooling coils within unit enclosure, except where over drain pans.
      2) Horizontal condensate drain piping outside unit enclosures.
      3) Vertical condensate drain piping of less than one story immediately following horizontal run.

3.12 HOT SERVICE INSULATION MATERIAL SCHEDULE

	SERVICE AND TEMPERATURES	INSULATION MATERIAL	PIPE SIZES (INCHES)	MINIMUM (NOMINAL) INSULATION THICKNESS (INCHES)
E	All Supply/Return Hot Water (including return bends) VAV Hot Water Coil	Fibrous Glass	Less than 1-1/2 1-1/2 & Over	1-1/2 2
F	Steam & Steam Condensate	Fibrous Glass	Less than 4 4 & Over	2-1/2 3

A. **NOTES:**
1. Insulate piping in tunnels and conduits with insulation of thickness as follows:
   a. Types E, F Service: Minimum 2 inch thick unless greater thickness is specified in Hot Service Insulation material Schedule above.
2. Equipment Insulation:
   a. Insulate the following with fibrous glass block or board insulation:
      1) Convertors.
      2) Condensate return tanks.
   b. Insulate equipment with fibrous glass board insulation with minimum density 6 pcf.
   c. Minimum thickness for flat, curved and irregular equipment surfaces:
      1) 1-1/2 inch for E and F service.
      2) 3 inch for F service.

3.13 SCHEDULE OF METAL JACKETING FOR INSULATED PIPE

A. Jacket exposed insulated risers with preformed sectional aluminum metal jacketing, in Types E service piping systems, installed in finished rooms or finished spaces above Basement Floor Level.
   1. Exception: Preformed sectional aluminum metal jacketing is not required on piping in Mechanical Equipment Rooms, Mechanical Equipment Rooms and Machine Rooms.

B. Install jacketing from floor to ceiling or from floor to first change of direction in riser, when such change in direction is a minimum of 9’-0” above finished floor, whichever is applicable.
   1. The aforementioned also applies to down feed piping systems.

C. Piping Exterior to Building: Jacket insulated piping with circumferentially corrugated aluminum jacketing.
   1. Lap longitudinal and circumferential joints a minimum of 2 inches.

2. Secure jacketing in place with 1/2 inch x 0.020 inch thick aluminum bands secured with aluminum wing type seals, on maximum 12 inch centers.
3. Cover insulated fittings, valves, and offsets with mitered sections of jacketing. Seal joints with mastic, and secure with aluminum strapping and wing seals.
4. Factory fabricated, preformed fitting covers of same material as jacketing may be used instead of mitered jacketing.
5. Install jacketing so as to avoid trapping condensation and precipitation.

3.14 DUCTWORK SERVICE INSULATION SCHEDULE

A. Insulate all ductwork service except where otherwise specified.

B. Do not insulate the following ductwork service items:
1. Exhaust ductwork, unless otherwise shown.
2. Return fans.
3. Exhaust fans.
4. Interior lined ductwork.
5. Flexible ductwork connections.
6. Interior lined air terminal units.
7. Ductwork located within equipment.
8. Ductwork where design temperature difference between interior and exterior of duct or plenum does not exceed 15 degrees F.

3.15 DUCTWORK SERVICE INSULATION MATERIAL SCHEDULE

LOCATION	SERVICE	INSUL. MATERIAL	MINIMUM INSUL. THICKNESS	JACKET TYPE	MINIMUM REQUIRED R VALUE
Outside Building	Supply, Return, Plenum	Fibrous Glass Board	2	I or II	R-8
	Relief, Exhaust, OAI	N/A	N/A	N/A	N/A
Within building envelope assembly, unconditioned space (includes ceilings not used as return plenum)	Supply duct, return duct and OAI	Fibrous Glass Blanket	1 ½	I or II	R-6
	Relief, Exhaust	N/A	N/A	N/A	N/A
Within building envelop assembly, indirectly conditioned space (plenum return above ceiling)	Supply, OAI	Fibrous Glass Blanket	1 ½	I or II	R-6
	Return, Relief, Exhaust	N/A	N/A	N/A	N/A

LOCATION	SERVICE	INSUL. MATERIAL	MINIMUM INSUL. THICKNESS	JACKET TYPE	MINIMUM REQUIRED R VALUE
Exposed, conditioned space	OAI	Fibrous Glass Board	1-1/2	I with Canvas Outer Jacket	R-6
	Supply, Return, Relief, Exhaust	N/A	N/A	N/A	N/A

A. Both minimum thickness and R value must be met. Exceptions:
   1. When located within equipment.
   2. When the design temperature difference between the interior and exterior of the duct or plenum does not exceed 15°F.

A. **NOTES:**
   1. Equipment: Insulate air handling equipment, not furnished with factory applied insulated jacket or internal insulation, with minimum 1-1/2 inch thick fibrous glass board with an ASTM C 1136 Type I jacket, installed and finished as specified for exposed ductwork in finished spaces.

END OF SECTION

SECTION 230800

MECHANICAL SYSTEMS COMMISSIONING

PART 1 GENERAL

SUMMARY

A. This Section includes commissioning requirements for the mechanical systems installed by the Contractor.

B. The Contractor is required to provide commissioning of mechanical systems and equipment as described in this Section, in addition to commissioning related Work described in other Division 23 00 00 Sections.

1.01 GENERAL

A. Commissioning shall take place in two phases. The Pre-functional Testing precedes the Functional Performance Testing.

1. Pre-Functional Testing: Pre-functional testing is the process used to verify that equipment and systems are fully connected, adjusted, and fully operational. Pre-functional testing consists primarily of static inspections and procedures to prepare the equipment or system for initial operation. Pre-functional checklists are prepared typically listing items to inspect and simple component tests to verify proper installation of equipment. Pre-functional checklists augment and are combined with the manufacturer's start-up checklist. Checking a pump for proper rotation is an example of an item that would be considered pre-functional testing. At the conclusion of Pre-functional testing the equipment shall be ready for full operation. (see sample test form included with section 019113)

2. Functional Performance Testing: Performance testing of the dynamic functions and operations of equipment and systems using direct observation and/or monitoring methods. The pre-functional testing for a given system must be successfully completed prior to formal functional performance testing of equipment or subsystems of the given system. Testing the chilled water system is an example of Functional Performance Testing. (See sample test form included with section 019113)

B. The systems installed under Division 230000 shall be commissioned, evaluated, started, and tested to ensure that each performs per the intent of the design and/or representations made relative to performance, efficiency, and suitability for application in this project.

1.02 SYSTEMS TO BE COMMISSIONED

A. The following systems are to be commissioned:
1. Air Handling Units
2. Split System Air Handling Units
3. Cabinet and Unit Heaters
4. Hot Water System
5. VAV Terminal Units
6. Chilled Water System
7. Exhaust Air Systems

8. FPVs
9. ERVs
10. Air Valves
11. Reheat Coils
12. Return Fans
13. Dryer Vent Systems
14. H&V Units
15. Rooftop Package Units
16. Dry Cooler Systems
17. Split System AC Units
18. Condensate Pumps
19. Electrical Systems and Motor Controls
20. Building Automation System

1.03 RELATED WORK SPECIFIED ELSEWHERE

A.	Mechanical General Requirements	Section 230501
B.	Expansion Joints	Section 230517
C.	Flow Metering Devices	Section 230521
D.	Valves for HVAC	Section 230523
E.	Mixing Valves	Section 230524
F.	Pipe Hangers and Supports	Section 230529
G.	Heat Tracing for HVAC Piping	Section 230533
H.	Vibration Isolation	Section 230550
I.	Flexible Vibration Eliminators	Section 230552
J.	Pipe and Valve Identification	Section 230553
K.	Duct and Equipment Identification	Section 230554
L.	Cleaning and Testing	Section 230593
M.	Balancing of Systems	Section 230594
N.	Insulation	Section 230700
O.	Outdoor Piping Insulation and EPDM Jacketing	Section 230721
P.	Direct Digital Building Control System	Section 230923
Q.	Sequence of Operation	Section 230934

R.	Pipe and Pipe Fittings	Section 232000
S.	Strainers	Section 232001
T.	Thermometers and Gauges	Section 232003
U.	Hydronic Specialties	Section 232006
V.	Combination Balancing Valve and Flow Meters	Section 232113
W.	Pumps	Section 232123
X.	Steam Specialties	Section 232201
Y.	Steam Traps	Section 232202
Z.	Water Treatment Closed Hot Water Heating System	Section 232513
AA.	Metal Ductwork	Section 233113
BB.	Ductwork Accessories	Section 233300
CC.	Security Type Ductwork Accessories	Section 233301
DD.	Axial Flow Fans	Section 233413
EE.	Centrifugal Inline Fans	Section 233415
FF.	Centrifugal Fans	Section 233416
GG.	Cloth Dryer Fans	Section 233417
HH.	Power Roof Ventilators	Section 233421
II.	Air Terminal Units	Section 233600
JJ.	Roof Mounted Air Inlets and Outlets	Section 233723
KK.	Air Filters	Section 234100
LL.	Air to Air Energy Recovery Equipment	Section 237200
MM.	Air Handling Units	Section 237313
NN.	Custom, Outdoor, Central-Station Air-Handling Units	Section 237314
OO.	Air Conditioners, Roof Top	Section 237413
PP.	Air Conditioners	Section 238113

QQ.	Coils	Section 238216
RR.	Convectors	Section 238233
SS.	Unit Heaters	Section 238239

1.04 DEFINITIONS

A. Commissioning is a systematic process to ensure that all building systems and equipment perform interactively according to the design intent and the Owner's operational needs. The commissioning process shall encompass and coordinate the traditionally separate functions of system documentation, equipment start-up, control system calibration, testing and balancing, performance testing, and training.

B. Commissioning Authority (CxA): An Owner designated party, not otherwise associated with A/E team members or the Contractor's team. The CA facilitates and coordinates the commissioning activities in concert with the Contractor and the Owner.

C. Commissioning Plan: The document prepared by the CxA that outlines the organization, schedule, and documentation requirements of the commissioning process. It includes a schedule of commissioning process activities, party responsibilities, documentation requirements, communication and reporting protocols, and evaluation procedures. This document is updated throughout the project and managed by the CA for the project.

D. Pre-Functional Checklist: A list prepared by the Contractor that lists items to inspect and items to undergo simple component testing to verify proper installation of equipment. Pre-functional checklists are primarily static inspections and procedures to prepare the equipment or system for initial operation. Pre-functional checklists augment and are combined with the manufacturer's start-up checklist.

E. Pre-Functional Testing: The process used to verify that equipment and systems are fully connected, adjusted, and are fully operational. Pre-Functional Testing includes all testing conducted/documented throughout the construction process; manufactures factory testing, installation testing, pre-functional checklist, manufactures checklist, start-up checklist and manufactures initial start-up.

F. Functional Performance Testing: Demonstration of systems performance through dynamic testing of equipment under various modes of operation and conditions.

1.05 CONTRACTOR RESPONSIBILITIES: The Contractor shall perform the following functions and activities:

A. General:

1. Commissioning Meetings: Contractor shall attend an initial commissioning scope meeting and additional commissioning meetings as required throughout the commissioning process.
   a) These commissioning meetings will be held monthly during early construction and increase in frequency to weekly during the start-up, Pre-functional Testing and Functional Performance Testing phases.
   b) Contractor shall assure that all subcontractors and vendors who have commissioning responsibilities attend the commissioning scope meeting and other commissioning meetings, as appropriate, during the construction process.

2. Contractor shall include commissioning requirements in the execution of his Work. Include individual commissioning tasks by system/area in the project schedule.

B. Pre-functional Testing Phase
1. Prior to start-up, the Contractor prepares Pre-functional Testing procedures for review and approval by the CxA.
2. Pre-functional Testing procedures will be used by the Contractor and CxA to perform start-up and check-out of the systems to be commissioned
3. Start-up & Initial Check-out Plan: As part of the Pre-functional Testing procedures The Contractor shall prepare a complete start-up and initial check-out plan that augments the manufacturer's start-up procedures. The start-up and initial check-out plan shall consist of the following as a minimum:
   a) Use the manufacturer's standard written start-up and check-out procedures in the manufacturer's installation manuals that are normally used as field check-out sheets. Edit the procedures for this project and use them for initial start-up and check-out.
   b) The plan shall include pre-functional checklists and procedures with specific boxes or lines for recording and documenting the checking and inspections of each procedure and a summary statement with a signature block at the end of the plan.
   c) Field check out sheets/ forms that will be used by the factory or field technicians.
4. Contractor submits the Start-up & Initial Check-out Plan for approval.
5. Prior to start-up, the Contractor performs Pre-functional Testing in accordance with the Start-up & Initial Check-out Plan, for each piece of equipment provided in his Contract to ensure that the equipment and systems are properly installed and ready for operation so that functional performance testing may proceed without delays.
6. Start-up and Equipment Check-out: The Contractor, under his own direction, executes and documents the start-up and installation check-out of the approved Pre-functional plan.
7. It is the Contractor's responsibility to ensure the checklists are properly completed. Those executing the checklists are only responsible to perform items that apply to the specific application at hand. These checklists do not take the place of the manufacturer's recommended check-out and start-up procedures or report.
8. Contractor performs the Pre-functional Testing as indicated in the test procedures in Part 3.
9. Contractor submits the completed Start-up and Check-out Plan to the CxA.

C. Functional Performance Testing Phase
1. Contractor performs the Functional Performance Testing in accordance with procedures developed by the CxA. The CxA shall be part of, witness and in some cases conduct the actual testing with the Contractor. The initial outline of the test procedures are included in Part 4. These outlines are included to provide an overview of the types of tests that will be required. The CxA will revise and finalize the procedures based on information submitted by the Contractor and manufactures.
2. During functional performance testing, the Contractor shall place all equipment and systems into operation and continue the operation during each working day of the functional performance testing effort, as required.

1.06 COMMISSIONING AUTHORITY FUNCTIONS & RESPONSIBILITIES:

The Commissioning Authority (CxA) will perform the following functions and activities:

A. General:

1. The primary role of the CxA is to review the installation for construction completeness and ensure that all systems and components have been installed and function in accordance with the contract documents and manufactures specifications.
2. CxA schedules, supervises, conducts and coordinates the testing and commissioning activities as specified herein.
3. CxA chairs periodic team commissioning coordination meetings and issue meeting minutes.
4. CxA reviews Operation and Maintenance manuals for completeness.
5. CxA performs periodic on-site observations.
6. CxA attends project meetings when required.
7. CxA informs the Owner of the results of the commissioning progress, and provides suggestions, as necessary, to correct deficiencies in observed performance or installation. The Commissioning Authority is not authorized to:
   a. Release, revoke, alter, or expand requirements of Contract Documents.
   b. Approve or accept any portion of Work.
   c. Perform any duties of the Contractor.
8. CxA oversees and approves the training of the Owner's operations and maintenance personnel.

B. Pre-functional Testing Phase

1. Pre-functional Testing procedures will be used by the Contractor and CxA to perform start-up and check-out of the systems to be commissioned.
2. CxA reviews the Pre-functional Testing procedures developed by the Contractor.
3. CxA reviews project documentation (Shop Drawings, Product Data, Record Drawings, O&M information, etc.) for systems to be commissioned.
4. CxA witnesses Pre-functional Phase Testing and verifies that Pre-functional Testing is performed.
5. CxA may verify and conduct their own independent verification and Pre-functional Testing in parallel to the Contractor's.

C. Functional Performance Testing Phase

1. CxA develops the Functional Performance Test Procedures. . The initial outline of the test procedures are included in Part 4. These outlines are included to provide an overview of the types of tests that will be required. The CxA will revise and finalize the procedures based on information submitted by the Contractor and manufactures.
2. CxA records commissioning procedures in a Commissioning Plan.
3. CxA oversees the Functional Performance Testing.
4. CxA verifies (spot checks) control component calibration.
5. CxA submits a copy of the test records to the Owner.

1.07 SUBMITTALS

A. General

1. Contractor shall submit documentation for development of pre-functional and functional performance testing procedures.
2. This documentation shall include detailed manufacturer installation, start-up, operating, troubleshooting and maintenance procedures; full details of any Owner-contracted tests;

fan and pump curves; full factory testing reports when specified; and full warranty information, including all responsibilities of the Owner to keep the warranty in force clearly identified.

3. The Contractor shall submit the installation, start-up and check-out materials that are actually shipped inside the equipment and the actual field check-out sheet forms to be used by the factory or field technicians to the Owner.
4. The Commissioning Authority may request further documentation when necessary for the development of Functional Performance Testing and the commissioning process.
5. Contractor shall submit name and qualifications of the Mechanical Commissioning Supervisor.
6. The contractor shall submit copies of approved "Strategies and Procedures Plan" to the Commissioning Authority to allow coordination of verification procedures. All air and hydronic systems will be verified by Commissioning Authority and Contractors Commissioning Agent
7. Submit in accordance with applicable paragraphs of Division 1 – Shop Drawings, Product Data and Samples.

B. Contractor Pre-Functional Phase Submittals:

1. Pre-Functional Testing procedures.
2. Start-up & Initial Check-out Plan.
3. Completed Start-up & Check-out Plan.
4. Manufacturer's start-up procedures.
5. Manufacturer's standard written start-up and check-out procedures.
6. Manufacturer's operation and maintenance manuals. Submit prior to scheduling Pre-functional testing.
7. Field check out sheets/ forms that will be used by the factory or field technicians.
8. Completed Pre-functional Checklists.

C. Functional Phase Submittals:

1. Contractor shall submit documentation required for development of the Functional Performance Testing procedures to be prepared by the CxA.
2. CxA submits the final Functional Performance Testing procedures.
3. CxA submits a copy of the Test Record.

1.08 QUALITY ASSURANCE

A. Qualifications

1. Mechanical Commissioning Supervisor: The Contractor shall identify a mechanical commissioning supervisor. The mechanical commissioning supervisor should have a minimum of ten years experience in mechanical contracting. The mechanical commissioning supervisor shall assist the CxA in conducting, coordinating and executing the required commissioning activities.
2. Technician: Contractor shall provide qualified technicians to execute the testing called for. The technician must be qualified to conduct testing in accordance with the requirements of the Functional Performance Testing procedures.

PART 2 PRODUCTS

2.01 TEST EQUIPMENT

A. Contractor shall supply all safety equipment required for start-up of systems and equipment testing.

B. Contractor shall supply all testing equipment required for start-up of systems and equipment.

C. Contractor shall supply all testing equipment required for Functional Performance Testing for tasks performed by the Contractor. An example of Contractor provided equipment is the test equipment required to test system pressure.

D. The CxA shall normally supply all testing equipment required for Functional Performance Testing tasks performed solely by the CxA. An example of CxA provided test equipment is an ultrasonic flow meter. The contractor shall supply any specialty equipment that the CxA does not have.

E. The Contractor shall supply any special equipment, tools and instruments (only available from vendor or specific to a piece of equipment) required for the Functional Performance Testing of that equipment, according to the requirements of the contract documents and the Functional Performance Test procedures.

F. Contractor shall supply any proprietary test equipment and software required by the Contractor for programming and/or start-up. Contractor shall provide test equipment, demonstrate its use and assist in the commissioning process as required.

PART 3 EXECUTIONS

3.01 PRE-FUNCTIONAL TESTING

A. General
1. Pre-functional Testing is required for each piece of equipment to ensure that the equipment and systems are properly installed and ready for operation, so that Functional Performance Testing may proceed without delay.
2. The execution of the start-up and check-out shall be directed and performed by the Contractor in accordance with manufacturer's published procedures and with the approved procedures. The CxA shall witness to the greatest extent possible the Contractor's required testing, start-up and check-out of all systems and equipment to be commissioned.

B. Preparation
1. Pre-functional testing shall not proceed until the Contractor's Start-up & Initial Check-out Plans have been approved.
2. Two weeks prior to start-up, the Contractor shall schedule start-up and check-out with the Owner.

C. Pre-Functional Test Procedures
1. Start-up & Initial Check-out Plan: The Contractor shall execute his Start-up & Initial Check-out Plan for all equipment provided in his contract, in accordance with the approved Start-up & Initial Check-out Plan.
2. Test all systems, equipment and components in accordance with the Contract Documents, and to the extent necessary that all Work is ready for Functional Performance Testing.

3.02 FUNCTIONAL PERFORMANCE TESTING

A. Examination

1. The Contractor shall review the commissioning functional performance testing procedure developed by the Commissioning Authority.

B. General

1. Functional Performance Testing shall be performed in accordance with the Functional Performance Test procedures outlined below, and/or amended by the CxA.
2. The Owner, Commissioning Authority and Contractor (including all associated subcontractors and vendors) jointly perform Functional Performance Testing as indicated in the Functional Performance Test Procedures. ***Contractor shall provide labor as necessary to perform the Functional Test Procedures under the direction of the CxA. CxA shall witness and document all test results.***
3. . All other activities listed in the Functional Performance Test Procedures will be performed by the Commissioning Authority.
4. Upon completion of each Functional Performance Test, the Contractor and the CxA shall sign the functional performance test record prepared by the CxA. The CxA will submit a copy of the Test Record to the Owner.
5. Deficiencies Identified During Functional Performance Testing: Any deficiencies identified during Functional Performance Testing will be documented by the CxA and brought to the attention of the Owner.
   a. Minor Deficiencies: Testing may continue at the discretion of the Owner and or CxA. The Contractor shall make corrections of minor deficiencies identified during the functional performance testing.

   b. Significant Deficiencies: The Owner and or CxA may stop testing in the event significant deficiencies are identified that prevents proper Functional Performance Testing of the system. The Contractor shall correct deficiencies and schedule the retest of the equipment or system involved.

6. Deferred Testing: Functional Performance Testing may be deferred at the discretion of the Owner and or CxA due to conditions that prevent proper testing of the system. In the event that seasonal testing is required, or tests are delayed by weather, building construction, building occupancy, loading, and/or other conditions that prevent proper demonstration of equipment or system's performance, the test shall be deferred. The deferred tests, when rescheduled, shall be conducted in the same manner as the Functional Performance Testing.

7. Cost of Retesting
   a. The cost for CxA and/or Owner personnel to conduct retesting for a system, equipment and or component necessitated because a specific pre-functional or startup test item, reported to have been successfully completed, but found to be incomplete or faulty, shall be the responsibility of the contractor.
   b. For a deficiency identified during the functional testing, not related to any pre-functional checklist or start-up fault, the CxA and Owner shall direct the retesting of the equipment once at "no charge" for their time. However, all costs for any subsequent retesting shall be the responsibility of the contractor.

7. Expected Results listed will be defined by Commissioning Authority in the Commissioning Plan.

8. Actual Results: Actual results will be verified and documented by Commissioning Authority.

C. Preparation

1. Functional Performance Testing shall not proceed for systems, equipment or components thereof until the Contractor has certified, in writing, that the system, equipment and or components are complete, have been tested, adjusted and balanced and are ready for Functional Performance Testing.
2. Pre-functional testing must be completed and approved prior to the start of Functional Performance Testing.
3. Functional Performance Testing is intended to begin upon completion of a system. The testing may proceed prior to the completion of systems or sub-systems at the discretion of the Owner and or CxA. Beginning testing before full completion shall not relieve the Contractor from fully completing the system, including completion of all pre-functional testing requirements.
4. Due to varying occupancy schedules for this project, Systems Commissioning of up to three separate floors will need to be completed prior to starting the renovation of the remaining floors and their associated systems.

PART 4 FUNCTIONAL PERFORMANCE TEST PROCEDURES

4.01 AIR HANDLING UNITS

A. Functional Elements Required (The following must be performed prior to the execution of the functional testing):
   1. Completed and approved system pre-functional checklists and calibrations available and startup and selected functional tests performed successfully.
   2. Air and water flow balancing complete and approved by Engineer
   3. Control elements active and under supervision of BMS
      a. Dampers
      b. valves
   4. Supply and return fans properly started up
      a. pulleys adjusted and set
      b. bearings lubricated
      c. belts tensioned
   5. Chilled water system available
   6. Heating hot water system available
   7. Exhaust fans operational and under supervision of BMS
   8. Proper filters in place
   9. Those tasks denoted with an asterisk (*) will be performed by the Contractor. All other activities will be performed by the Commissioning Authority.

B. Start Sequence (AHU, RTU.)
   1. Objective
      a. Verify start sequence, damper interlocks, return air fan start sequence, and any associated exhaust air fan start sequences.
   2. Testing Outline
      a. Modify coil discharge temperature setpoint to 10 degrees F above current measurement.
      b. Reset setpoint.
      c. Command unit to start manually through the BMS controller.
      d. Compare BMS reported status indication against field conditions.
      e. Modify all programmed alarm setpoints associated with the AHU/RTU to put variable into alarm status.
      f. Reset setpoints.
      g. Document results on test form.
   3. Expected Results
      a. Supply/return fans start by command from BMS controller.
      b. Area exhaust fans start by command from BMS controller.
      c. Fan status indicates “on” in field and at BMS controller.
      d. All outside air, mixed air and exhaust air dampers open and come under automatic control.
      e. Valves come under automatic control.
      f. Ensure all alarms activate.
      g. Ensure supply/return fans operate to maintain duct static pressure.

C. Stop Sequence (AHU RTU)
   1. Objective
      a. Verify Stop Sequence
   2. Testing Outline

a. Program unit to stop automatically through the BMS controller.
b. Compare BMS reported status indication against field conditions.
c. Document results on test form

3. Expected Results
   a. Supply and return fans stop automatically through the BMS controller.
   b. Area exhaust fans stop automatically through the BMS controller.
   c. Fan status indicates “off” in field and at BMS controller.
   d. Outside air and exhaust air dampers close.
   e. Mixed air dampers open.
   f. Control valves return to normal position.

D. Fire Alarm Stop Sequence (AHU RTU)
1. Objective
   a. Verify Fire Alarm Stop Sequence
2. Testing Outline
   a. Program unit to start automatically through the BMS controller.
   b. Simulate fire condition for the unit.
   c. Compare BMS reported status indication against field conditions.
   d. Document results on test form
3. Expected Results
   a. Supply and return fans stop automatically through the BMS controller.
   b. Area exhaust fans stop automatically through the BMS controller.
   c. Fan status indicates “off” in field and at BMS controller.
   d. Outside air and exhaust air dampers close.
   e. Mixed air dampers open.
   f. Control valves open.

E. Temperature Control Sequence (AHU RTU)
1. Objective
   a. Verify sequences of chilled water control valve, hot water control valve, hot water pump, outside air return air and exhaust air dampers in heating, economizer, and cooling control modes.
2. Testing Outline
   a. Set control system to “occupied” status and program the unit to start automatically through the BMS controller.
   b. Simulate heating mode. Simulate outside air enthalpy condition less than return air enthalpy and a mixed air temperature to 40 degrees F to cause the air dampers to modulate to the minimum outdoor air position and call for heating at the preheat coils.
   c. Force changes to discharge air temperature and observe discharge air temperature reset control operation.
   d. Compare BMS Reported status indication against field conditions.
   e. Reset all parameters.
   f. Simulate economizer mode. Simulate outdoor air enthalpy less than return air enthalpy. Simulate a minimum of three different outdoor air conditions to observe damper modulation from outdoor air damper full open to the minimum position.
   g. Force changes to discharge air temperature and observe discharge air temperature reset control operation.
   h. Compare BMS Reported status indication against field conditions.
   i. Reset all parameters.

j. Simulate cooling mode. Simulate outdoor air enthalpy greater than return air enthalpy.
k. Force changes to discharge air temperatures and observe discharge air temperature reset control operation.
l. Compare BMS Reported status indication against field conditions.
m. Restore the control system to operate automatically to observe equilibrium conditions.
n. Schedule the air handling unit to stop automatically through the BMS controller.
o. Compare BMS Reported status indication against field conditions.
p. Document results on test form.

3. Expected Results
a. The supply and return air fan along with their associated area exhaust fans shall start upon air handling unit start up.
b. Heating mode: When the outside air enthalpy is less than the return air enthalpy, all the dampers will modulate to maintain a mixed air temperature setpoint of 55 degrees F. When the BMS is in the heating mode, the hot water control valve should modulate to maintain the required discharge air setpoint.
c. The outdoor air damper will not drop below its minimum open position.
d. Discharge air temperature should attain setpoint.
e. Economizer mode: The outside, mixed and exhaust air dampers will modulate to maintain the required discharge air setpoint (55 degrees F).
f. The outdoor air damper shall not modulate closed, past the minimum position at any time.
g. Discharge air temperature should attain setpoint.

h. Cooling mode: If outdoor air enthalpy is greater than the return air enthalpy, the chilled water valve modulates to the required discharge air setpoint (55 degrees F). Outdoor air damper remains in minimum position. Exhaust air dampers will be modulated to maintain a fixed pressure drop of 0.1 to 0.2 in wc across the damper.

i. Discharge air temperature should attain setpoint.
j. Upon unit stop, outside air dampers close fully. Supply, return, and area exhaust air fans de-energize and exhaust air dampers close.

F. Approved Air Balancing Report
1. Objective
a. Verify reported airflow values.
2. Testing Outline

a Measure outdoor airflow at minimum damper settings. Compare to BMS readings.
b. Read pressure profile across air handling unit.
c. Traverse supply and return ducts for airflow velocity. Convert to air flow and compare to BMS readings.
d. Measure air flow at supply diffusers and return grilles.
e. Compare test readings to submitted air balancing report.
f. Document results on test form.

3. Expected Results

a. Test readings should confirm the submitted balancing report and should compare favorably with BMS readings.

G. Freeze Protection Thermostat
1. Objective
   a. Verify Freeze Thermostat operation.
2. Testing Outline
   a. Command unit to start manually through the BMS controller.
   b. Apply ice pack to freezestat capillary and hold for 30 seconds minimum.
   c. Compare BMS Reported status indication against field conditions.
   d. Document results.
3. Expected Results
   a. Upon reaching 35 degrees F°, fans shutdown and outdoor air dampers close.
   b. Freeze alarm registers on computer.
   c. The hot water control valve and chilled water control valve modulate to the full open position.
   d. Freeze pumps will run when outside air temperature is below 45° F with 2° F deadband.
   e. Verify pump starts when OAT is below 45° F and runs continuously until OAT is above 47° F.
   f. Unit will return to normal condition when freeze condition is eliminated and freezestat is manually reset.

4.02 SPLIT SYSTEM AIR HANDLING UNITS

A. Functional Elements Required (The following must be performed prior to the execution of the functional testing):
1. Air flow balancing complete and approved by engineer
2. Control elements under control of programmable thermostat
3. Proper filters in place
4. Unit properly evacuated and charged
5. Manufacturers and contractors checklist and start up reports available

B. Split System Air Handling Unit Operation
1. Objective
   a. Verify cooling function.
2. Testing outline
   a. Establish cooling mode
   b. Command unit on.
   c. Adjust temperature on programmable thermometer to 10 degrees above room temperature.
   d. Record response of unit
   e. Adjust temperature on programmable thermometer to 10 degrees below room temperature
   f. Record response of unit
   g. Measure room temperature locally and compare to thermostat on unit
   h. Document results on test form.
3. Expected results
   a. Room thermostat cycles unit on when there is a call for cooling
   b. Recorded temperature matches room temperature

4.03 HOT WATER SYSTEM

A. Functional Elements Required (The following must be performed prior to the execution of the functional testing):
   1. Water balancing completed and approved by Engineer
   2. Piping filled and vented
   3. Piping chemically cleaned and treated
   4. Water treatment completed
   5. Setting and operation of pop safety valves completed
   6. Strainers cleaned after system cleaning
   7. Pumps aligned, started and operational
   8. Control elements active and under supervision of BMS System.

B. Hot Water Pumps
   1. Objective
      a. Verify hot water circulation pump operation.
   2. Testing Outline
      a. Manually start and stop each hot water pump.
      b. Open all AHU hot water control valves to 100% position and start associated HW coil pumps.
      c. Manually place one HW pump into automatic position at its respective VFD if applicable.
      d. Simulate no water flow condition at “lead” pump start up, forcing the DTW system differential pressure to change.
      e. Observe pump status and pressure differential status at the BMS system and in field. Differential pressure measurement shall be the minimum value of DPT-
      f. Document results on test form.
      g. Repeat for Standby pump.
   3. Expected Results
      a. Pumps start/stop manually and pump rotation is correct.
      b. Pump designated as “lead” starts.
      c. When no flow is sensed within 30 seconds of starting the “lead” pump, the “lead” pump will be turned off and the “lag” pump shall be designated as “lead” and shall start.
      d. Water flow is proven on the BMS system.
      e. Verify that an alarm is generated at the BMS system.
      f. Variable speed drive will modulated to maintain 15 psi pressure across supply and return mains.

C. Hot Water Pump Differential Pressure Control
   1. Objective
      a. Verify operation of Variable Speed Pumping.
   2. Testing Outline
      a. Activate hot water pump.
      b. For VFD speed control, differential pressure variable shall be the minimum value. For the differential pressure control valves, the input variable shall be the maximum value.
      c. Note setpoint on differential pressure controller then manipulate setpoint to test pump speed reaction.
      d. Restore setpoint (15 psi design).
      e. Force all control valves to 100% open (AHU, VAV, CAV, HC) and start associated AHU HW coil pumps.

f. Note status of differential bypass valves and record pump differential pressure.
g. Compare controlling point of pump VFD controller to controlling point of differential bypass valve controller under maximum load.
h. Force all but one of the control valves to 0% open.
i. Note status of differential bypass valves and record pump differential pressure.
j. Compare controlling point of pump VFD controller to controlling point of differential bypass valve controller under minimum load.
k. Record results on test form.
l. Repeat for standby pump.

3. Expected Results
   a. VFD modulates to maintain pump differential pressure setpoint.
   b. Pump speed changes in reaction to adjusting differential pressure controller either direction from setpoint.
   c. With all control valves 100% open, the VFD is able to maintain 15 psi setpoint without the differential bypass valve opening.
   d. With all but one of the control valves 0% open, the VFD speed is reduced to minimum before the differential bypass valve opens. The system shall maintain 25 psi HW differential pressure.

D. Approved Water Balancing Report
1. Objective
   a. Verify reported water flow values.
2. Testing Outline
   a. Measure water flow at minimum and maximum VFD readings.
   b. Compare to BMS readings.
   c. Read pressure profile across air handling unit.
   d. Measure water flow with ultrasonic flow meter at selected hot water mains and compare to BMS flow meter readings.
   e. Measure water flow at selected balancing devices.
   f. Compare test readings to submitted report.
   g. Document results on test form.
3. Expected Results
   a. Test readings should confirm the submitted balancing report and should compare favorably with BMS readings.

4.04 CABINET AND UNIT HEATERS

A. Functional Elements Required (The following must be performed prior to the execution of the functional testing):
1. Air balancing complete and approved by engineer
2. Units are operational and checked out by manufacturer
3. Hot water available
4. Power supply available
5. Verify BMS System controls are operational

B. Unit Heaters
1. Objective
   a. Verify proper sequence and control of unit heater.
2. Testing Outline

a. *Raise/lower the thermostat setpoint
b. Measure and record space temperature.
c. Compare temperature to setpoint.
d. Reset return air temperature to normal operating condition.
e. Document results on test form.

3. Expected Results
   a. On a rise in space temperature setpoint, unit heater fan motor starts and heating controls are energized.
   b. On a drop in space temperature setpoint, the unit heater fan motor stops and heating controls are de-energized.

C. Electric Cabinet Heaters
1. Objective
   a. Verify proper sequence and control of air curtains.
2. Testing Outline
   a. Raise/lower the thermostat setpoint
   b. Measure and record space temperature.
   c. Compare temperature to setpoint.
   d. Reset return air temperature to normal operating condition.
   e. Document results on test form.
3. Expected Results
   a. On a rise in space temperature setpoint, unit heater fan motor starts and heating elements are energized.
   b. On a drop in space temperature setpoint, the unit heater fan motor stops and heating elements are de-energized.

4.05 EXHAUST AIR SYSTEMS

A. Functional Elements Required (The following must be performed prior to the execution of the functional testing):
1. Balancing reports complete and approved by engineer
2. Control elements active and under the supervision of BMS System
3. Exhaust fans properly started up
   a. pulleys adjusted and set
   b. bearings lubricated
   c. belts dressed and tensioned
   d. Dampers operate and fully open
4. Associated Air Handling Unit is running.

B. Toilet Exhaust Fans
1. Objective
   a. Ensure toilet exhaust delivers the specified number of air changes without excessive pressure drop, noise or overload conditions.
2. Testing Outline
   a. Collect CFM readings using an anemometer for exhaust air registers.
   b. Collect traverse reading and static pressure profile of duct at exhaust fan.
   c. Collect fan motor RPM and amperage readings.
   d. Document actual conditions versus design on diagrammatic balance form and note any deficiencies. (Provide column for percentage difference, indicate high or low with +/- sign.)
   e. At BMS operator workstation, force exhaust fans on and off.*
   f. Record results on test form.

3. Expected Results
   a. CFM at exhaust registers meet design criteria.
   b. Duct leakage maintained below design standards.
   c. RPM and amperage data coincides with design documents.
   d. BMS system reflects Exhaust Fan start/stop and associated alarms.

C. General Exhaust Fans
1. Objective
   a. Ensure general exhaust delivers the specified volume of exhaust air without excessive pressure drop, noise or overload conditions.
2. Testing Outline
   a. Collect CFM readings using an anemometer for exhaust air registers.
   b. Collect traverse reading and static pressure profile of duct at exhaust fan.
   c. Collect fan motor RPM and amperage readings.
   d. Document actual conditions versus design on diagrammatic balance form and note any deficiencies. (Provide column for percentage difference, indicate high or low with +/- sign.)
   e. Record results on test form.
3. Expected Results
   a. CFM at exhaust registers meet design criteria.
   b. Duct leakage maintained below design standards.
   c. RPM and amperage data coincides with design documents.

4.06 CHILLED WATER SYSTEM

A. Functional Elements Required (The following must be performed prior to the execution of the functional testing):
1. Air balancing complete and approved by engineer
2. Pumps aligned and started up
3. Water flow balancing completed and approved by Engineer
4. Air handlers operational and under control of BMS
5. Pressure differential controls operable
6. Chillers started by manufacturer
7. Cooling tower started by manufacturer
8. Piping chemically cleaned
9. Water treatment system operational
10. Strainers cleaned after system cleaning
11. Control elements active and under supervision of BMS System

B. Chilled Water Pumps Start/Stop Operation
1. Objective
   a. Verify proper start-up, operation and sequence of control for chilled supply water systems.
2. Testing Outline
   a. Manually start and stop each pump.
   b. Simulate outdoor air temperate above 65 degrees F (Variable).
   c. Open all AHU CHW valves to 100% and start associated AHU CHW coil pumps.
   d. Place pumps into automatic control position at VFD.
   e. Simulate no water flow condition at “lead” pump start up, forcing differential pressure across pump to change.
   f. Note the BMS system display status

g. Observe pump status and pressure differential status at the BMS system and in field.
h. Document results on test form.
i. Repeat for other pump.

3. Expected Results

a. Pumps start/start manually and pump rotation is correct.
b. Pump designated as “lead” starts.
c. When no flow is sensed by monitoring motor frequency within 30 seconds of starting the “lead” pump, the “lead” pump will be turn off and the “lag” pump shall be designated as “lead” and shall start.
d. Water flow is proven on the BMS system.
e. Verify that an alarm is generated at the BMS system.
f. Variable speed drive will modulated to maintain 15 psi pressure across supply and return mains.

C. Chilled Water Pump Differential Pressure Control

1. Objective

a. Verify operation of Variable Speed Pumping.

2. Testing Outline

a. Activate pump. For VFD speed control, differential pressure variable shall be the minimum value of DPT- For the differential pressure control valves, the input variable shall be the maximum value of DPT-
b. Note setpoint on differential pressure controller then manipulate setpoint to test pump speed reaction.
c. Restore setpoint (15 psi design).
d. Force all control valves to 100% open and start associated AHU CHW coil pumps.
e. Note status of differential bypass valves and record pump differential pressure.
f. Compare controlling point of pump VFD controller to controlling point of differential bypass valve controller under maximum load.
g. Force all but one of the control valves to 0% open.
h. Note status of differential bypass valve and record pump differential pressure.
i. Compare controlling point of pump VFD controller to controlling point of differential bypass valve controller under minimum load.
j. Record results on test form.
k. Repeat for Standby pump.

3. Expected Results

a. VFD modulates to maintain pump differential pressure setpoint.
b. Pump speed changes in reaction to adjusting differential pressure controller either direction from setpoint.
c. With all control valves 100% open, the VFD is able to maintain 15 psi setpoint without the differential bypass valve opening.
d. With all but one of the CHW control valves 0% open, the VFD speed is reduced to minimum before the differential bypass valve opens. The system shall maintain 25 psi DTW differential pressure as measured by maximum value of DPT.

D. Approved Water Balancing Report
   1. Objective
      a. Verify reported water flow values.
   2. Testing Outline
      a. Measure water flow at minimum and maximum VFD readings.
      b. Compare to BMS readings.
      c. Measure water flow with ultrasonic flow meter at selected chilled water mains and compare to BMS flow meter readings.
      d. Measure water flow at selected balancing devices.
      e. Compare test readings to submitted report.
      f. Document results on test form.
   3. Expected Results
      a. Test readings should confirm the submitted balancing report and should compare favorably with BMS readings.

4.07 INDIVIDUAL ZONE TEMPERATURE CONTROL (VAV Boxes)

1. Objective
   a. Verify operation of perimeter VAV boxes.

2. Testing Outline
   a. Fix associated AHU discharge air setpoint to 55 degrees.
   b. Fix outside air temperature to less than 35 degrees F.
   c. Set zone temperature setpoint to 85 degrees.
   d. After return air stabilizes, reset zone temperature setpoint to 72 degrees.
   e. After return air stabilizes, reset outside air temperature to less than 35 degrees
   f. Compare BMS Reported status indication against field conditions.
   g. Document results on test form.
   h. Reset parameters.
3. Expected Results
   a. VAV damper should modulate to minimum position, valve should open and modulate to attain and then maintain 85 degree F setpoint.
   b. Heating HW pumps modulate accordingly.
   c. When space temperature is set to 72 degrees F, valve should close and damper should open to maximum position and then modulate to attain and eventually maintain 72 degree F setpoint.
   d. Heating HW pumps modulate accordingly.
   e. When outside air is fixed at less than 35 degrees F, VAV flow setpoint should go to minimum and valves will perform control to attain setpoint.

4.08 ELECTRICAL SYSTEMS

A. Functional Elements Required (The following must be performed prior to the execution of the functional testing):
   1. All systems are functional and operational
B. Verify Proper Operation of Motor Starters for Individual Motor Loads
   1. Objective
      a. Ensure proper operation of motor starters in both hand and auto positions.
   2. Testing Outline

a. Compile a comprehensive listing of building motor loads.
b. Compare equipment nameplate data with drawings and specifications.
c. Inspect physical and mechanical condition.
d. Check magnetic starter heater size installed.
e. Motor-Running Protection
   1) Compare overload element rating with motor full-load current rating to verify correct sizing.
   2) If motor-running protection is provided by fuses, verify correct rating considering motor characteristics and power-factor correction capacitors, if applicable.
f. With motor starter in the “auto” position, command motor starter load to “run” from automatic control point.
g. With motor starters in the “auto” position, command motor starter load to “stop” from automatic control point.
h. Switch the motor starter into the “hand” position.
i. Return motor starter “hand/auto” switch to original position.
j. Record results on test form.

3. Expected Results
   a. Each motor starter and its respective heater shall match drawings and specifications.
   b. With the starter in the “auto” position, motor load runs and stops as commanded from automatic control point.
   c. With the starter in the “hand” position, motor load runs continuously.
   d. Run/stop lights shall operate and correspond to load conditions.

C. Verify Voltage, Amperage and Phasing for Motors
1. Objective
   a. Verify voltage, amperage and phasing for motors.
2. Testing Outline

   a. Compile a comprehensive listing of building motor loads.
   b. Compare equipment nameplate data with drawings and specifications.
   c. Inspect physical and mechanical condition.
   d. Inspect for correct anchorage, mounting, grounding, connection and lubrication.
   e. Command motor load or major electrical equipment to run under the expected full load condition.
   f. Verify the absence of unusual mechanical or electrical noise or signs of overheating during initial test run.
   g. Measure the voltage of each phase to ground and phase to phase.
   h. Measure running amperes and evaluate relative to load conditions and nameplate full-load amperes.
   i. Verify rotation to insure correct shaft direction.
   j. Record results on test form.

3. Expected Results

   a. Each motor shall match drawings and specifications.
   b. All motors and major electrical equipment shall operate normally under full load conditions.

c. Voltage, amperage and phasing for motors and major electrical equipment shall comply with the manufacturer's specifications.

D. Verify Motor Functional and Operational Characteristics

1. Objective

a. Verify motor functional/operational characteristics.

2. Testing Outline

a. Compile a comprehensive listing of building motor loads.
b. Compare equipment nameplate data with drawings and specifications.
c. Measure motor winding resistance.
d. Measure the voltage to each motor.
e. Measure the start load and amps.
f. Record results on test form.

3. Expected Results

a. Each motor shall match drawings and specifications.
b. Voltage shall match nameplate.
c. Start load and amps should match nameplate.

4.09 BUILDING AUTOMATION SYSTEM (BMS)

A. Functional Elements Required (The following must be performed prior to the execution of the functional testing):

1. Demonstrate an all-points log to validate operation of 100% of the data points.
2. Demonstrate printout of the following logs:
   a. All points log
   b. Status summary log
   c. Alarm summary log
   d. Single group log
   e. Trend log
   f. Management report logs
3. Demonstrate all functions outlined in specification
4. Demonstrate field programming capabilities outlined in specification
5. The operator station available with specified computer hardware
   a. Lap top available and programmed, if supplied.
   b. Architect/engineer demonstration complete

B. Digital Controllers Activation Test

1. Objective
   a. Verify proper wiring, performance and operation for all digital controllers.

2. Testing Outline
   a. Measure DC voltages on all digital controllers.
   b. Confirm all components of the BMS system are provided with power that originates at a circuit branch panel.
   c. Remove communication line from the BMS system to digital controller for a period of 24 hours.
   d. Confirm all major BMS have functional, local LED operator interfaces.

e. Document results on test form.

3. Expected Results
   a. DC voltages are within manufacturer's tolerances.
   b. All components of the BMS system are provided with power that originates at a circuit branch panel.
   c. Digital controllers are automatically loaded for the BMS system.
   d. When communication line is removed, the digital controller should operate independently and perform all control functions.
   e. All major BMS have functional, local LED operator interfaces.

C. BMS Sensor and Transmitter Verification
1. Objective
   a. Verify accuracies of BMS sensors and transmitters.
2. Testing Outline
   a. Locate all temperature sensor locations and measure actual temperature with a certified digital thermometer.
   b. Locate all enthalpy sensors and measure actual enthalpy.
   c. Locate all pressure sensor locations and measure actual pressure differentials with manometer.
   d. Locate all carbon dioxide detectors and measure actual carbon dioxide levels with hand held instrument.
   e. Locate all Water flow sensors and measure the actual flow rate.
   f. Confirm that all binary output points can be manually overridden through both software and hardware.
   g. Document results on test form.

3. Expected Results

   a. All duct and chilled water temperature sensors readings are within +/- 0.5 degrees F of that at digital controller. All room temperature sensor readings are within +/- 1.0 degree F of that at the digital controller. All other temperature sensor readings are within +/- 0.75 degrees F of that at digital controller.
   b. All other input devices readings shall be within the requirements of the contract documents.
   c. All binary points can be manually overridden through both software and hardware (with feedback indication that an output is overridden.)

D. DDC Portable Operator Workstation Test
1. Objective

   a. Verify proper wiring, performance and operation for operator workstation.

2. Testing Outline

   a. Confirm Computer Workstation conforms to specifications; including printer, monitor and network interface card.
   b. Run a log of all system points required on point schedule.
   c. Confirm Computer Graphics respond as changes in the field occur.
   d. Confirm that all major mechanical systems are able to be remotely controlled through the Computer Graphics.
   e. Document results on test form.

3. Expected Results

   a. Communication with remote panels is established.
   b. Paper-feed on printers operates without bunching or hanging up.
   c. After loss of power, system re-boots software and establishes communications with remote panels without operator's intervention upon power restoration.
   d. All alarms indicate time and date of occurrence on printer.
   e. Remote terminals operate properly when miscellaneous logs and summaries are running.

END OF SECTION

SECTION 232000

PIPING AND PIPE FITTINGS

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Through Penetration Firestops: Section 078400.

B. Sealants: Section 079200.

1.02 SUBMITTALS

A. Product Data:
   1. Catalog sheets and specifications indicating manufacturer name, type, applicable reference standard, schedule, or class for specified pipe and fittings.
   2. Material Schedule: Itemize pipe and fitting materials for each specified application in Pipe and Fittings Schedule in Part 3 of this Section. Where optional materials are specified indicate option selected.

B. Quality Control Submittals:
   1. Installers Qualification Data:
      a. Welder Qualification Data: Copies of certification; include names, home addresses.
      b. Welding Procedures:
         1) Copy of QW-482 “Suggested Format for Welding Procedure Specification (WPS)” for all welders for all weld types.
         2) Copy of QW-483 “Suggested Format for Procedure Qualification Record (PQR)” as specified in Welding Quality Assurance below for all weld types.
      c. Welders’ Certificates:
         1) Copy of QW-484 “Suggested Format for Manufacturer’s Record of Welder or Welding Operator Qualification Tests (WPQ)” for all welders for all weld types.
      d. Brazer Qualification Data for Refrigerant Piping: State refrigerant piping brazing experience; include names, home addresses and social security numbers of brazers.
   2. Welding Procedure Submittals: Submit the following:
      a. Welding Procedure Specifications: Provide for each weld type.
         1) Recommended to use ASME Form E00006, QW-482 “Suggested Format for Welding Procedure Specification (WPS)”.
      b. Procedure Qualification Records: Provide for each weld type.
         1) Recommended to use ASME Form E00007, QW-483 “Suggested Format for Procedure Qualification Record (PQR)”.

   3. Contract Closeout Submittals:

a. Copy of Final Hydrostatic Testing Record Log.

1.03 QUALITY ASSURANCE

A. Qualifications of Welding Procedures, Welders and Welding Operators: Comply with the following:
   1. American Welding Society Standard AWS B 2.1.

B. Welding Procedures:
   1. Record in detail, and qualify the Welding Procedure Specifications for every welding procedure that is proposed to be used for the Project.
   2. Develop procedures for all metals included in the work.
   3. Qualify the procedures for making transition welds between different materials, or between plates or pipes of different wall thickness.
   4. Qualification for each welding procedure shall conform to the requirements of ASME B31.1, and as specified herein.
   5. Describe the method for each system including the number of beads, the volts, the amperes, and the welding rod for various pipe thicknesses and materials.
   6. The welding procedures shall specify end preparation for butt welds including cleaning, alignment, and root openings.
   7. Preheat, interpass temperature control, and postheat treatment of welds shall be as required by approved welding procedures, unless otherwise indicated or specified.
   8. Approval of any procedure does not relieve the Contractor of the sole responsibility for producing acceptable welds.
   9. Welding procedures shall be identified individually and shall be clearly referenced to the type of welding required for this project.
   10. These procedures shall be the same as those used for all pipe welder qualification tests, all shop welds, and all field welds.
   11. Provide procedure qualification records for all proposed Welding Procedure Specifications (WPS).

C. Welder Qualification:
   1. WPQs:
      a. Provide welder qualifications for each welder for each weld type.
      b. Recommended to use ASME Form E00008, QW-484 "Suggested Format for Manufacturer's Record of Welder or Welding Procedure Qualification Tests (WPQ)."

   2. Perform WPQs under the witness of an independent agency.
      a. The witness shall be a representative of an independent testing agency, Authorized Inspector, or consultant, any of which must be approved by the National Certified Pipe Welding Bureau.
      b. The qualifying test segment must be a 2 inch nominal pipe size with wall thickness within range of the WPS.
      c. Tests position shall be "6G" per ASME Section IX.

   3. Evidence of Continuity: Welder qualifications must be current.
      a. If the qualification test is more than 6 months old, provide record of welding continuity for each welder.

b. Record of welding continuity shall show that the welder in question has performed welding to the procedure in question without a 6 month continuous span of inactivity since the date that the welder qualification test was passed for the submitted welding procedure.

c. Record of welding continuity shall include, at a minimum, the welder's employer name and address, the date the welder qualification test was passed, and the dates indicating welding continuity including welding procedure for each date.

D. Weld Records:

1. For all welding within the scope of ASME B31.1, submit for approval an administrative procedure for recording, locating, monitoring, and maintaining the quality of all welds to be performed on the project.
   a. The weld record shall include but not be limited to drawings and schedules identifying location of each weld by individual number, identification of welder who performed each weld by individual welder's name, stamp number, date and WPS used.
2. After achieving qualification, but before being assigned work, each qualified person shall be assigned an identifying number by the Contractor to be used to identify all of his welds.
   a. A list of qualified persons with their respective numbers shall be submitted and maintained accurately with deletions and additions reported promptly.
3. Upon completing a joint, the welder shall mark the pipe not more than 6 inches from the weld with the identifying number and the last two digits of the year in which the work was performed.
   a. Make identification marks with a rubber stamp or felt-tipped marker with permanent, weatherproof ink or other methods approved by the Director's Representative that do not deform the metal.
   b. Place identification marks for seam welds adjacent to the welds at 3-foot intervals.
   c. Identification by die stamps or electric etchers is not acceptable.
   d. Provide required markers. Substitution of a map of welds with welders' names is not acceptable.
4. Maintain a constantly updated log available to the Director's Representative at all times.

E. Qualifications of Brazers: Comply with the following:

1. Section IX ASME Boiler and Pressure Vessel Code, Part QB Brazing.
2. Refrigerant Piping: The persons performing the brazing and their Supervisors shall be personally experienced in refrigerant piping brazing procedures.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Pipe Storage:

1. Upon the receipt of each shipment of pipe on the job, maintain the pipe marking, and store pipe in accordance with ASTM material specifications, and method of manufacture (seamless, etc.) of each length of pipe.
2. Pipe markings shall be clearly readable at the time of pipe installation.
3. If at the time of its installation, any length of pipe not readily identifiable will be subject to rejection, or arbitrary downgrading by the Director's Representative to the lowest grade which has been received on the job to that date.
4. Provide factory-applied plastic end-caps on each length of pipe and tube, except for concrete, corrugated metal, bell and-spigot, and clay pipe.
    a. Maintain end-caps through shipping, storage and handling to prevent pipe-end damage and prevent entrance of dirt, debris, and moisture.

PART 2 PRODUCTS

2.01 STEEL PIPE AND FITTINGS

A. Standard Weight Schedule 40 or Extra Heavy Weight Schedule 80, Black or Galvanized Steel: ASTM A 53, Grade B, Type E or S, or ASTM A 135.
    1. Applications over 400 psig: ASTM A 106.

B. Bending, Coiling, Flanging and Other Special Services: ASTM A 53, Grade A, Type E or S, or ASTM A 135.
    1. Applications over 400 psig: ASTM A 106.

C. Flanges, Welding Neck Type, Same Pressure Rating as Adjoining Pipe: ASME B16.5.

D. Weld Fittings, Carbon Steel:
    1. Butt Welding Type: ASME B16.9.
        a. Allied Piping Products Co., Inc.'s Branchlets, Type 1 or 2.
        b. Bonney Forge Corp.'s Weldolets.
    2. Socket Welding Type: ASME B16.11.
        a. Allied Piping Products Co., Inc.'s Branchlets, Type 1 or 2.
        b. Bonney Forge Corp.'s Thredolets or Sockolets.

E. Malleable Iron, Steam Pattern Threaded Fittings:
    1. 150 lb Class: ASME B16.3.
    2. 300 lb Class: ASME B16.3.

F. Cast Iron Fittings:
    1. Drainage Pattern, Threaded: ASME B16.12.
    2. Steam Pattern, Threaded: ASME B16.4.
        a. Standard Weight: Class 125.
        b. Extra Heavy Weight: Class 250.
    3. Flanged Fittings and Threaded Flanges: ASME B16.1.
        a. Standard Weight: Class 125.
        b. Extra Heavy: Class 250.

G. Unions: Malleable iron, 250 lb class, brass to iron or brass to brass seats.

H. Couplings: Same material and pressure rating as adjoining pipe, conforming to standards for fittings in such pipe. Use taper tapped threaded type in screwed pipe systems operating in excess of 15 psig.

I. Nipples: Same material and strength as adjoining pipe, except nipples having a length of less than one inch between threads shall be extra heavy.

2.02 COPPER AND BRASS PIPE, TUBING AND FITTINGS

A. Copper Tube, Types K, L and M: ASTM B 88.

B. ACR Tube: ASTM B 280.

C. Wrot Copper Tube Fittings, Solder Joint: ASME B16.22.

D. Cast Copper Alloy Tube Fittings, Solder Joint: ASME B16.18.

E. Chrome Plated Grade A Red Brass Threaded Pipe, Standard Weight: ASTM B 43.
   1. Plating: 0.02 mil chromium over 0.2 mil nickel plating, high polish finish.

F. Chrome Plated Cast Brass Threaded Pipe Fittings, 125 lb Class: ASME B16.15.
   1. Plating: 0.02 mil chromium over 0.2 mil nickel plating, high polish finish.

G. Flared Tube Fittings:
   1. Water Tube Type: ASME B16.26.
   2. Refrigerant Tube Type: SAE J513.

H. Flanges: Conform to the Standards for fittings used in systems.
   1. Brazing Flanges: ASME B16.24, hubs modified for brazing ends.

I. Unions: Cast bronze, 150 lb Class, bronze to bronze seats, threaded or solder joint.

2.03 JOINING AND SEALANT MATERIALS

A. Thread Sealant:
   1. LA-CO Industries', Slic-Tite Paste with Teflon.
   2. Loctite Corp.'s No. 565 Thread Sealant.
   3. Thread sealants for potable water shall be NSF approved.

B. Thread Sealant (Natural Gas Piping): Rectorseal Corp.'s T Plus 2 non-hardening pipe dope with teflon.

C. Solder: Solid wire type conforming to the following:

1. Type 2: Lead-free tin-silver solder (ASTM B 32 Alloy Grade Sn 96); All-State Welding Products Inc.'s 430, Engelhard Corp.'s Silvabrite, or J.W. Harris Co. Inc.'s Stay-Brite.
2. Type 3: Lead-free tin-silver solder (ASTM B 32 Alloy Grade E, AC, or HB); Engelhard Corp.'s Silvabrite 100, Federated Fry Metals' Aqua Clean, or J.W. Harris Co. Inc.'s Stay-Safe Bridgit.

D. Soldering Flux for Soldered Joints: All-State Welding Products Inc.'s Duzall, Engelhard Corp.'s General Purpose Liquid or Paste, Federated Fry Metals' Water Flow 2000, or J.W. Harris Co. Inc.'s Stay-Clean.

E. Brazing Alloys:
1. Type 1: AWS A5.8, Class BCup-5, for brazing copper to brass, bronze, or copper; Engelhard's Silvaloy 15, J.W. Harris Co. Inc.'s Stay-Silv 15, and Handy & Harman's Sil-Fos.
2. Type 2: AWS A5.8, Class BAg-7, for brazing copper to steel or stainless steel; Engelhard's Silvaloy-56T, J.W. Harris Co. Inc.'s Safety-Silv 56, and Handy & Harman's Braze 560.

F. Brazing Flux: AWS Type FB3A; Handy & Harman's Handy Flux or J.W. Harris Co. Inc.'s Stay-Silv.

G. Electrodes and Welding Rods:
1. Electrodes for Use in Arc Welding: Heavily coated, not larger than 3/16 inch diameter exclusive of coating, unless otherwise approved.
2. Welding Rods: Free flowing when fused, so as to avoid excessive puddling.
3. Electrodes for Welding Stainless Steels: Coated and used with reverse polarity.
4. Filler material shall conform to the appropriate AWS-ASTM specification.

H. Flange Gasket Material:
1. For Use With Cold Water or Chilled Water: 1/16 inch thick rubber.
2. For Use With Hot Water, or Air: Waterproofed non-asbestos mineral or ceramic fiber, or a combination of metal and waterproofed non-asbestos mineral or ceramic fiber, designed for the temperature and pressures of the piping systems in which installed.
3. For use with Steam, Feedwater, Blow-Off and Natural Gas: Spirally wound, Type 304 stainless steel with non-asbestos filler material, and carbon steel outer ring.
   a. Maximum Operating Pressure: 600 psi at 700 degrees F.
   b. Thickness: 1/16 thick, conforming to the flange face on which they are used.
   c. Acceptable Gaskets: Flexitallic Style CG with Flexite Super Filler by Flexitallic Inc., Deer Park, TX; (281) 479-3491.

I. Flange Bolts, Washers and Nuts
1. Bolts: High strength, ASTM A 193 B7.
2. Washers: ASTM F436 Structural Type 1 hardened steel flat hot dipped galvanized.

3. Nuts: ASTM A194 2H.

J. Anti-Seize Lubricant: Bostik Inc.'s Never Seez or Dow Corning Corp.'s Molykote 1000.

K. Corrosion Protective Tape System: 3M Co., St. Paul, MN.
1. Tape: Scotchrap 50 or 51.
2. Primer: Scotchrap pipe primer.
3. Putty (if required): Strip Caulk insulation putty.

2.04 PACKING MATERIALS FOR BUILDING CONSTRUCTION PENETRATIONS

A. Oiled Oakum: Manufactured by Nupak of New Orleans, Inc., 931 Daniel St., Kenner, LA 70062, (504)466-1484.

B. Mechanical Modular Seals: Thunderline Corp.'s Link Seal wall and floor seals designed for the service of piping system in which installed.

2.05 DIELECTRIC CONNECTORS

A. Dielectric Fitting: Bronze ball valve with end connections and pressure rating to match associated piping.
1. Nipples with inert non-corrosive thermoplastic linings are not acceptable.

B. Flange Electrical Insulation Kit: Consisting of dielectric sleeves and washers, and dielectric gasket.
1. Water Applications:
a. Heating Hot Water: Rated 150 psi at 250 degrees F: ANSI Class 300, full faced durlon gasket with bolt holes, double durlon washers, and durabla sleeves; Model 300 by APS, Lafayette, LA 70596, (337) 233-6116.
b. Potable Water: Rated 150 psi at 250 degrees F: ANSI Class 150, full faced neoprene gasket with bolt holes, double phenolic washers, and mylar sleeves; Model 150 by APS, Lafayette, LA 70596, (337) 233-6116.

2.06 PIPE SLEEVES

A. Type A: Schedule 40 steel pipe.

B. Type B: No. 16 gage galvanized sheet steel.

C. Type C: Schedule 40 steel pipe with 1/4 inch steel collar continuously welded to pipe sleeve. Size steel collars as required to span a minimum of one cell or corrugation, on all sides of the rough opening thru the metal deck.

D. Type D: No. 16 gage galvanized sheet steel with 16 gage sheet steel metal collar rigidly secured to sleeve. Size metal collars as required to span a minimum of one cell or corrugation, on all sides of the rough opening thru the metal deck.

2.07 FLOOR, WALL AND CEILING PLATES

A. Cast Brass: Solid type with polished chrome plated finish, and set screw.

1. Series Z89 by Zurn, 929 Riverside Drive, Grosvenordale, CT 06255, (800) 243-1830.
2. Model 127XXXX by Maguire Mfg., Cheshire CT 06410, (203) 699-1801.

B. Stamped Steel: Split type, polished chrome plated finish, with set screw.
1. Figures 2 and 13 by Anvil International, Portsmouth, NH 03802, (603) 422-8000.

C. Cast Iron or Malleable Iron: Solid type, galvanized finish, with set screw:
1. Model 395 by Anvil International, Portsmouth, NH 03802, (603) 422-8000.
2. Model 900-016XX by Landsdale International, Westville, NJ 08093, (800) 908-0523.

2.08 FLEXIBLE CONNECTIONS

A. Above Ground Application:
1. Acceptable Companies:
   a. Titeflex Inc., Springfield, MA.
   b. Flex-ing, Sherman, TX.
2. Features:
   a. Construction: Convoluted, Type 321 stainless steel inner core, minimum .012 inch wall thickness covered with braided Type 304 stainless steel outer jacket.
   b. UL listed for above ground and underground use.
   c. Connections for unleaded gasoline systems shall be fire rated.
   d. Factory installed male swivel on one end.

2.09 FLEXIBLE CONNECTION ISOLATION JACKET

A. Type: High density polyethylene flexible tube with Buna-N rubber compression seals, air valve stem, and stainless steel clamps; Titeflex Inc.'s Model 111466-1, or Flexing Model Yellow Jacket.

2.10 TEST BOOTS

A. Test boots complete with stainless steel clamps, and air valve stem for tightness testing.
1. Flexible Nitrile Rubber: OPW TBA series, or APT STB or STB-SW series.
2. Flexible Pelethane (Filled with Petroseal Paste): Blue-Line Model Quick Fit series.

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL

A. Install piping at approximate locations indicated, and at maximum height.

B. Install piping clear of door swings, and above sash heads.

C. Make allowances for expansion and contraction.

D. Allow for a minimum of one inch free air space around pipe or pipe covering, unless otherwise specified.

E. Install vertical piping plumb.

F. Use fittings for offsets and direction changes, except for Type K soft annealed copper tube.

G. Cut pipe and tubing ends square; ream before joining.

H. Threading: Use American Standard Taper Pipe Thread Dies.
   1. Thread brass pipe with special threading dies.

I. Make final connections to equipment with unions, flanges, or mechanical type joint couplings.

J. Provide flex connection on each pipe run between CSB and Building8/9 where building structure expansion joints are

3.02 STEAM PIPING SYSTEMS

A. Install to permit complete drainage.

B. Pitch:
   1. Pitch horizontal steam mains, return mains and branches downward, 1/4 inch per 10 feet in direction of flow.
   2. Pitch steam runouts and connections to risers upward, 3/16 inch per foot in direction of flow.
   3. Pitch return branches and runouts downward, 1/4 inch per 10 feet in direction of flow.

C. Use eccentric reducers flat on bottom in horizontal piping.

D. Install drip legs with traps at low points, ends of mains, bottoms of risers and ahead of pressure regulators and control valves.

E. Size short vertical supply and return connections, from horizontal runouts to radiator traps and valves, same size as trap or valve.

3.03 WATER AND PROPYLENE GLYCOL PIPING SYSTEMS

A. Pitch:
   1. Pitch horizontal piping 1/8 inch per 10 feet to drain piping that is installed above roof.
   2. Pitch single pipe systems up in direction of flow 1/8 inch per 10 feet.

B. Air Vents: Install air vents at locations indicated on the drawings, and at each high point in system. Use manually operated air vents, unless otherwise indicated.

C. Drains:
   1. Install piping to be completely drainable. Provide drains at low points, consisting of a 1/2 inch valve with a hose bibb connection, and at the following locations and equipment:
      a. In each section of piping separated by valves.
      b. For each riser, where riser or runout to riser has a valve installed.
      c. For each heating cooling unit, having valves in supply and return connections.
      d. In low point of piping to each down fed convector or radiator.

D. Runouts: Connect runouts to upfeed risers to top of mains, and runouts to downfeed risers to bottom of mains.

3.04 PIPE JOINT MAKE-UP

A. Threaded Joint: Make up joint with a pipe thread compound applied in accordance with the manufacturer's printed application instructions for the intended service. Ream piping ends to remove burrs.
   1. Chrome Plated Brass Piping: Tighten joint with strap or Parmalee wrench; do not mar pipe finish. Install piping so that no threads are visible.

B. Soldered Joint: Thoroughly clean tube end and inside of fitting with emery cloth, sand cloth, or wire brush. Apply flux to the pre-cleaned surfaces. Install fitting, heat to soldering temperature, and join the metals with type solder specified. Remove residue. Ream piping ends to remove burrs.

C. Flanged Pipe Joint:
   1. Install threaded companion flanges on steel pipe; flanges on galvanized pipe are not required to be galvanized.
   2. Provide a gasket for each joint.
      a. Hot Water Pipe Gasket: Coat with a thin film of oil before making up joint.
      b. Compressed, Control, and Instrument Air Pipe Gasket: Coat with a thin film of oil before making up joint.
   3. Flange Bolt Installation:
      a. Clean and coat nuts, bolt threads and washers with anti-seize lubricant before making up joint.
      b. With each bolt; one hardened steel washer is required under the nut.
      c. With each stud; one hardened steel washer is required under the nut at each end.
      d. Torque Requirements: Stress bolts to 30,000 psi.
      e. Check torque with a calibrated breaking action torque wrench on the final torque round.
      f. Bolts shall be cold and hot torqued.

g. Torque Pattern: Cross or star pattern with at least four passes. Limit each pass to 30 percent of full torque increases.

h. Hot torque: Re-torque the flange bolts with the system at normal operating pressure, and operating temperature for minimum of 12 to 15 hours.

4. Coat bolt threads and nuts with anti-seize lubricant before making up joint.

D. Welded Pipe Joint:

1. General:

a. Weld pipe joints only when ambient temperature is above 0 degree F where possible.

b. Bevel pipe ends at a 37.5 degree angle where possible, smooth rough cuts, and clean to remove slag, metal particles, and dirt.

c. Use pipe clamps or tack-weld joints with 1 inch long welds; 4 welds for pipe sizes to 10 inches, 8 welds for pipe sizes 12 inches to 20 inches.

d. Build up welds with stringer-bead pass, followed by hot pass, followed by cover or filler pass.

e. Eliminate valleys at center and edges of each weld.

f. Weld by procedures which will ensure elimination of unsound or unfused metal, cracks, oxidation, blow-holes, and non-metallic inclusions.

g. Do not weld-out piping system imperfections by tack-welding procedures. Refabricate as required to comply with requirements.

h. If piping component ends are bored, such boring shall not result in the finished wall thickness after welding less than the minimum design thickness.

i. Align the inside diameters of piping components to be butt-welded as accurately as is practicable within existing commercial tolerances on diameters, wall thickness and out of roundness.

j. Preserve alignment during welding. The internal misalignment of the ends to be joined shall not exceed 0.05 inch.

2. Welding Processes:

a. All welding on metal piping systems shall be performed using qualified welding procedures and qualified welders and welding operators in accordance with Section IX of the ASME Boiler and Pressure Vessel Code.

b. All welding shall be performed by a process that is compatible with the work being welded and the working conditions. Shielded metal-arc welding (SMAW) shall not be used on work less than 3/16 inch thick.

c. Welding shall be performed by using only one of the following processes:

1) Shielded Metal Arc Welding (SMAW), also know as “Stick” Welding.

2) Gas Tungsten Arc Welding (GTAW), also known as TIG and Heliarc Welding.

3) Submerged Arc Welding (SAW).

d. Where a specific welding process is called for in the piping group, it shall govern.

e. All stainless steel work less than 3/16 inch thick shall be welded by the gas tungsten-arc (GTAW) process with the back side purged with argon. Work thicker than 3/16 inch shall have a root pass by the GTAW Process with the back purged with argon and the balance of the weld may be completed by SMAW Process or any other suitable process.

3. Welding Grooves:

a. Bevel the ends of steel pipe and fittings to be erected with butt welded joints to form welding grooves in accordance with ANSI B16.25, except where otherwise noted herein, or on the Contract Drawings.

b. Bevel welding grooves for butt welded joints in pipe of unequal wall thickness in accordance with ASME Code for Pressure Piping B31.1 - latest edition, latest revision and section that is applicable.

4. Backing Rings: Backing rings or consumable inserts are not acceptable.

5. Cleaning of Welding: Completely remove all slag or flux remaining on the bead of welding before laying down the next successive bead and at the completion of the weld.

a. Wire brush all completed welds a minimum of 2 inches on both sides and coated with one coat of high temperature (minimum rated 500 deg. F) primer prior to being insulated.

6. Preheating of Welded Joints: Pipe adjacent to joints before and during welding shall be preheated by any suitable method in accordance with the qualified welding procedure, and in all cases shall be in accordance with ASME B31.1, Paragraph 131.

7. Weld Quality:

a. All welds shall have full penetration and complete fusion with a minimum of weld metal protruding on the inside of the pipe.

b. The finished weld contour shall be uniform, with the toe or edge of the weld merging smoothly into the base material.

c. Butt welds shall have a slight reinforcement build-up gradually from the toe or edge toward the center of the weld.

d. The limitation on butt weld reinforcement shall be in accordance with ASME B31.1, Table 127.4.2 and shall apply separately to both inside and outside surfaces of the joint.

e. Fillet welds may be slightly concave on the furnished surface.

8. Identification of Welders:

a. Upon completing a joint, the welder shall mark the pipe not more than 6 inches from the weld with the identifying number and the last two digits of the year in which the work was performed.

b. Make Identification marks with a rubber stamp or felt-tipped marker with permanent, weatherproof ink or other methods approved by the Director’s Representative that do not deform the metal.

c. Place identification marks for seam welds adjacent to the welds at 3-foot intervals.

d. Identification by die stamps or electric etchers is not acceptable.

e. Provide required markers. Substitution of a map of welds with welders' names is not acceptable.

9. Postheat Treatment of Welded Joints In Carbon and Ferritic Alloy Steel Pipe:

a. Postheat treatment of welded joints in carbon and ferritic alloy steel piping shall be in accordance with ASME B31.1, as specified in the piping group, or on the Contract Drawings, except the cooling rate for stress relieving shall not exceed 200 degrees F per hour down to 600 degrees F.

1) In each case, the temperature given is a minimum and where a higher temperature is called for in the welding procedure, the welding procedure shall govern.

b. Perform stress relieving by one of the following methods:

1) Electrical resistance or induction coil heating is the preferred method for field use.

a) Record the temperature by pyrometer from the start of the heating operation until 600 degrees F. is reached during cooling.

2) The gas, natural or liquid petroleum, torch stress relieving procedure may be used only where approved by Director's Representative.

a) Maintain temperature record from the start of the heating operation until 600 degrees F. is reached during cooling.

b) Place two measuring thermocouples 180 degrees apart at the centerline of the weld and two measuring thermocouples each placed 90 degrees away from the centerline thermocouples at a distance from the centerline of the weld equal to three times the wall thickness.

3) Furnace post heat treatment may be employed when desirable to treat several welded or formed assemblies simultaneously.

a) Temperature range, heating conditions, holding time, and cooling conditions shall be as outlined above but shall satisfy the requirements for the thickest section, etc. of the load.

b) When this method is used, adequately support pipe and pipe assemblies to minimize distortion.

10. Socket Welding Joints:

a. Where socket welding valves or fittings are used, space pipe with a minimum of 1/16 inch clearance between the end of the pipe and the socket so that no stresses will be imparted to the weld due to "bottoming" of the pipe in the socket.

b. The fit between the socket and the pipe shall conform to applicable standards for socket weld fittings and in no case shall the inside diameter of the socket exceed the outside diameter of the pipe by more than 0.075 inches.

E. Brazed Joint: Thoroughly clean tube end and inside of fitting with emery cloth, sand cloth, or wire brush. Apply flux to the pre-cleaned surfaces. Install fitting, heat to brazing temperature, and join the metals with brazing alloy. Remove residue.

F. Mechanical Joint: Make up joint in conformance with the manufacturer's printed installation instructions, with particular reference to tightening of bolts.

G. Refrigerant Pipe Joint:
1. Hard Drawn Tubing, Brazed Joint: Make up joint with appropriate type of brazing alloy. Sweep piping interior with dry nitrogen at a rate of 1 to 3 cfm during brazing operation.
2. Hard Drawn Tubing, Soldered Joint: Solder joints with Type 2 solder at valves, controls, and other locations where brazing temperatures could cause damage.
3. Soft Annealed Tubing Joint: Make up joints with refrigerant tube type flared fittings. Do not bend tubing at a radius less than 5 times the tube diameter.

H. Dissimilar Pipe Joint:
1. Joining Bell and Spigot and Threaded Pipe: Install a half coupling on the pipe or tube end to form a spigot, and caulk into the cast iron bell.
2. Joining Dissimilar Threaded Piping: Make up connection with a threaded coupling or with companion flanges.
3. Joining Dissimilar Non-Threaded Piping: Make up connection with adapters recommended by the manufacturers of the piping to be joined.
4. Joining Galvanized Steel Pipe and Brass Pipe or Copper Tubing: Make up joint with a dielectric connector.
5. Joining FRP and Threaded Pipe: Make up connection with adapters as recommended by manufacturers of piping being joined.

3.05 PIPING PENETRATIONS

A. Sleeve Schedule: Unless otherwise shown, comply with the following schedule for the type of sleeve to be used where piping penetrates wall, floor, or roof construction:

	CONSTRUCTION	SLEEVE TYPE
1.	Frame construction.	None Required
2.	Foundation walls.	A*
3.	Non-waterproof interior walls.	B*
4.	Non-waterproof interior floors on metal decks.	D*
5.	Non-waterproof interior floors not on metal decks.	B*
6.	Floors not on grade having a floor drain.	A
7.	Floors over mechanical equipment, steam service, machine, and boiler rooms.	A

8.	Floors finished or to be finished with latex composition or terrazzo, and on metal decks.	D*
9.	Floors finished or to be finished with latex composition or terrazzo, and not on metal decks.	A
10.	Earth supported concrete floors.	None Required
11.	Exterior concrete slabs on grade.	A
12.	Fixtures with floor outlet waste piping.	None Required
13.	Metal roof decks.	C
14.	Non-metal roof decks.	A
15.	Waterproof floors on metal decks.	D
16.	Waterproof floors not on metal decks.	A
17.	Waterproof walls.	A

*Core drilling is permissible in lieu of sleeves where marked with asterisks.

B. Diameter of Sleeves and Core Drilled Holes:
   1. Unless otherwise specified, size holes thru floors and walls in accordance with the through penetration fire stopping system being used.
   2. Size holes thru exterior walls or waterproofed walls above inside earth or finished floors, and exterior concrete slabs in accordance with the following:
      a. Uninsulated (Bare) Pipe: Inside diameter of sleeve or core drilled hole 1/2 inch greater than outside diameter of pipe, unless otherwise specified.
      b. Insulated Pipe: Inside diameter of sleeve or core drilled hole 1/2 inch greater than outside diameter of insulation, unless otherwise specified.
      c. Mechanical Modular Seals: Size holes in accordance with the manufacturer's recommendations.

C. Length of Sleeves (except as shown otherwise on Drawings):
   1. Walls and Partitions: Equal in length to total finished thickness of wall or partition.
   2. Floors, Finished: Equal in length to total finished thickness of floor and extending 1/2 inch above the finished floor level, except as follows:
      a. In furred spaces at exterior walls, extend sleeve one inch above the finished floor level.
   3. Exterior Concrete Slabs: Equal in length to total thickness of slab and extending 1/2 inch above the concrete slab.
   4. Roofs: Equal in length to the total thickness of roof construction, including insulation and roofing materials, and extending one inch above the finished roof level.

D. Packing of Sleeves and Core Drilled Holes:
   1. Unless otherwise specified, pack sleeves or cored drilled holes in accordance with Section 078400 - FIRESTOPPING.

2. Pack sleeves in exterior walls or waterproofed walls above inside earth or finished floors with oakum to within 1/2 inch of each wall face, and finish both sides with sealant. See Section 079200.
   a. Sealant Types:
      1) Piping Conveying Materials up to 140 degrees F other than Fuel Oil System Piping: Type 1C (one part).
      2) Piping Conveying Materials over 140 degrees F: Type 4.
      3) Fuel Oil System Piping: Type 1C (2 part).
   b. Mechanical modular seals may be used in lieu of packing and sealant for sleeves and core drilled holes.
3. Pack sleeves in exterior concrete slabs with oakum to full depth, and within 1/2 inch of top of sleeve and finish the remainder with sealant. See Section 079200.
   a. Sealant Types:
      1) Piping Conveying Materials up to 140 degrees F other than Fuel Oil System Piping: Type 1C (one part).
      2) Piping Conveying Materials over 140 degrees F: Type 4.

   b. Mechanical modular seals may be used in lieu of packing and sealant for sleeves and core drilled holes.

E. Weld metal collars of Type C and D sleeves to the upper surface of the metal deck. Seal voids under the metal collar as recommended by the manufacturer of the metal deck.

3.06 FLOOR, WALL AND CEILING PLATES

A. Install plates for exposed uninsulated piping passing thru floors, walls, ceilings, and exterior concrete slabs as follows:
   1. In Finished Spaces:
      a. Piping 4 Inch Size and Smaller: Solid or split, chrome plated cast brass.
      b. Piping Over 4 Inch Size: Split, chrome plated cast brass.
   2. Unfinished Spaces (Including Exterior Concrete Slabs): Solid, unplated cast iron.
   3. Fasten plates with set screws.
   4. Plates are not required in pipe shafts or furred spaces.

3.07 PIPE AND FITTING SCHEDULE

A. Abbreviations: The following abbreviations are applicable to the Pipe and Fitting Schedule:

BS	Black steel.
CI	Cast iron.
GMI	Galvanized malleable iron.
GS	Galvanized steel.
MI	Malleable iron.
SE	Screwed end.

ST	Steel.
SW	Standard weight.
WE	Weld end.
XH	Extra heavy weight.

B. Where options are given, choose only one option for each piping service. No deviations from selected option will be allowed.

C. Schedule of Pipe and Fittings for the different piping services is as follows:

1. Chemical Feed (CMF) 125 psig & less:
   a. 1-1/2 inch and less: SW BS pipe, with SE SW CI fittings, or WE SW ST fittings.
   b. 2 inch and Up: SW BS pipe with WE SW ST fittings.
2. Chemical Feed (CMF) 126 to 250 psig:
   a. 1-1/2 inch and Less: XH BS pipe, with SE XH CI fittings, or WE XH ST fittings.
   b. 2 inch and Up: XH BS pipe with WE XH ST fittings.
3. Chilled Water (CWS & CWR) 125 psig and less:
   a. 2-1/2 inch and less: SW BS pipe with SE SW CI fittings, or Type L hard drawn copper tubing with wrot copper or cast copper alloy solder fittings, and Type 3 solder.
   b. 3 inch Size and up: WE BS piping with SW ST fittings.
4. Chilled Water (CWS & CWR) 126 psi to 250 psi:
   a. 2 inch and Less: SW BS pipe with SE SW CI fittings, or Type L hard drawn copper tubing with wrot copper or cast copper alloy solder fittings, and Type 3 solder
   b. Over 2 inch: SW BS pipe, with WE SW ST fittings.
5. Compressed Air (A) 175 psig and Less (Above Ground):
   a. Option No. 1: Type L hard drawn copper tubing with cast copper alloy or wrot copper solder fittings, and joints made up with Type 3 solder.
   b. Option No. 2: SW BS pipe with 150 lb MI fittings.
6. Compressed Air (A) 176 psig thru 300 psig (Above Ground): SW BS pipe with 300 lb. MI fittings.
7. Hot Water Supply and Return (HWS & HWR) 125 psig and less:
   a. 2-1/2 inch and less: SW BS pipe with SE SW CI fittings, or Type L hard drawn copper tubing with wrot copper or cast copper alloy solder fittings, and Type 3 solder.
   b. 3 inch Size and up: WE BS piping with SW ST fittings.
8. Hot Water (HWS & HWR) 126 psi to 250 psi:
   a. 2 inch and Less: SW BS pipe, with SE SW CI fittings, or Type L hard drawn copper tubing with wrot copper or cast copper alloy solder fittings, and Type 3 solder.
   b. Over 2 inch: SW BS pipe, with WE SW ST fittings.

9. Instrument (Control) Air (IA) 175 psig and Less:
   a. Type L hard drawn copper tubing, with refrigerant tube type flared fittings; or wrot copper or cast copper alloy solder fittings, and Type 3 solder.
   b.

10. Steam (LPS) 125 psig and Less:
    a. 4 inch and Less: SW BS pipe, with SE SW CI fittings, or WE SW ST fittings.
    b. 5 inch and Up: SW BS pipe with WE SW ST fittings.

11. Condensate Returns (LPR and Pumped Returns) 125 psig and less:
    a. 1-1/2 inch and Less: XH BS pipe, with SE XH CI fittings, or WE XH ST fittings.
    b. 2 inch and Above: XH BS pipe with WE XH ST fittings.
12. Condensate Returns (LPR and Pumped Returns) 125 psig and less:
    a. 4 inch and Less: XH BS pipe, with SE XH CI fittings, or WE XH ST fittings.
    b. 5 inch and Up: XH BS pipe with WE XH ST fittings.

13. Refrigerants (RS, RL, HG & RD) 350 psig and less:
    a. All Sizes: Type ACR hard drawn copper tubing with wrot copper fittings, and brazing alloy, unless otherwise specified.
    b. 3/4 inch o.d. size and Less (for final connection within 24 inches of refrigerant equipment): Soft annealed Type ACR copper tubing with refrigerant tube type flared fittings.
14. Drain Piping:
    a. Condensate Drain Piping: Type M hard drawn copper tubing with wrot copper or cast copper alloy solder fittings, and Type 3 solder.
    b. Drain Piping other than Condensate Drains: SW BS pipe, with SE SW CI fittings, or WE SW ST fittings.

END OF SECTION

SECTION 270526

GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Division 26 Specification Sections:

260531	Hangers and Supports for Electrical Systems
260533	Raceways and Boxes for Electrical Systems
260533	Raceways and Boxes for Electrical Systems
260553	Identification for Electrical Systems

C. Division 27 Specification Sections:

270528	Pathways for Communications Systems
270536	Cable Trays for Communications Systems
270544	Sleeves and Sleeve Seals for Communications Pathways and Cabling
271100	Communications Equipment Room Fittings
271300	ISP Communications Backbone Cabling
271500	Communications Horizontal Cabling

1.2 SUMMARY

A. Section Includes:

1. Grounding conductors.
2. Grounding connectors.
3. Grounding busbars.
4. Grounding labeling.

B. Scope

1. The General Contractor shall provide and install ground busbars (TMGB and TGBs), the bonding conductor for telecom (BCT) from the MIS Room telecom main ground busbar to the main electrical service ground, telecom bonding backbones (TBB-1 and TBB-2), the grounding equalizer (GE) between TBBs, the bonding conductor from the ground busbar to the local in-room electrical panel at each IT Room and the bonding conductor from the ground busbar to building steel at each IT Room.

2. The Telecommunications Subcontractor shall provide and install data rack ground busbars and all bonding conductors (BC) from the metallic telecom elements within each IT Room to the ground busbar within that room.

3. Labels shall be provided by both the General Contractor and the Telecommunications Subcontractor and installed on the respective grounding components for which they are responsible.

1.3 DEFINITIONS

A. BCT: Bonding conductor for telecommunications.

B. BC: Bonding Conductor

C. EMT: Electrical metallic tubing.

D. GE: Grounding equalizer

E. TBB: Telecom bonding backbone

F. TGB: Telecommunications grounding busbar.

G. TMGB: Telecommunications main grounding busbar.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.5 INFORMATIONAL SUBMITTALS

A. As-Built Data: Plans showing as-built locations of grounding and bonding infrastructure, including the following:
   1. BCT, TMGB, TGBs, and routing of their bonding conductors.

B. Qualification Data: For installation supervisor, and field inspector.

C. Qualification Data: For testing agency and testing agency's field supervisor.

D. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.

   1. Installation Supervision: Installation shall be under the direct supervision of ITS Technician, who shall be present at all times when Work of this Section is performed at Project site.

2. Field Inspector: Currently registered by BICSI as a Registered Communications Distribution Designer to perform the on-site inspection.

PART 2 - PRODUCTS

2.1 SYSTEM COMPONENTS

A. Comply with J-STD-607-A.

2.2 CONDUCTORS

A. Comply with UL 486A-486B.

B. Insulated Conductors: Stranded copper wire, green or green with yellow stripe insulation, insulated for 600 V, and complying with UL 83.

1. Ground wire for custom-length equipment ground jumpers shall be No. 6 AWG, 19-strand, UL-listed, Type THHN wire.
2. Cable Tray Equipment Grounding Wire: No. 6 AWG.

C. Bare Copper Conductors:
1. Stranded Conductors: ASTM B 8
2. Bonding Conductor: No. 6, stranded conductor.
3. Bonding Jumper: Tinned-copper tape, braided conductors terminated with two-hole copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

2.3 CONNECTORS

A. Irreversible connectors listed for the purpose. Listed by an NRTL as complying with NFPA 70 for specific types, sizes, and combinations of conductors and other items connected. Comply with UL 486A-486B.

B. Compression Wire Connectors: Crimp-and-compress connectors that bond to the conductor when the connector is compressed around the conductor. Comply with UL 467.

1. Electroplated tinned copper, C and H shaped.

C. Busbar Connectors: Cast silicon bronze, solderless compression or exothermic-type, mechanical connector; with a long barrel and two holes spaced on 5/8- or 1-inch centers for a two-bolt connection to the busbar.

2.4 GROUNDING BUSBARS

A. TMGB: Predrilled, wall-mounted, rectangular bars of hard-drawn solid copper, 1/4 by 4 inches in cross section and 18 inches in length. The busbar shall be NRTL listed for use as TMGB and shall comply with J-STD-607-A.

1. Predrilling shall be with holes for use with lugs specified in this Section.
2. Mounting Hardware: Stand-off brackets that provide a 4-inch clearance to access the rear of the busbar. Brackets and bolts shall be stainless steel.
3. Stand-off insulators for mounting shall be Lexan or PVC. Comply with UL 891 for use in 600-V switchboards, impulse tested at 5000 V.

B. TGB: Predrilled rectangular bars of hard-drawn solid copper, 1/4 by 4 inches in cross section and 12 inches in length. The busbar shall be for wall mounting, shall be NRTL listed as complying with UL 467, and shall comply with J-STD-607-A.

1. Predrilling shall be with holes for use with lugs specified in this Section.
2. Mounting Hardware: Stand-off brackets that provide at least a 4-inch clearance to access the rear of the busbar. Brackets and bolts shall be stainless steel.
3. Stand-off insulators for mounting shall be Lexan or PVC. Comply with UL 891 for use in 600-V switchboards, impulse tested at 5000 V.

C. Data Relay Rack Grounding Busbars: Rectangular bars of hard-drawn solid copper, accepting conductors ranging from No. 14 to No. 2/0 AWG, NRTL listed as complying with UL 467, and complying with J-STD-607-A. Predrilling shall be with holes for use with lugs specified in this Section.

1. Rack-Mounted Horizontal Busbar: Designed for mounting in 19-inch equipment racks. Include a copper splice bar for transitioning to an adjoining rack, and stainless-steel or copper-plated hardware for attachment to the rack.

2.5 LABELING

A. Comply with TIA/EIA-606-A and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

B. Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch. Overlay shall provide a weatherproof and UV-resistant seal for label.

PART 3 - EXECUTION

3.1 EXAMINATION

A. The General Contractor shall examine the ac grounding electrode system for compliance with requirements for maximum ground-resistance level and other conditions affecting performance of grounding and bonding of the electrical system.

B. The Telecommunication Subcontractor shall examine the TMGB and all TGB busbars for compliance with requirements for maximum ground-resistance level and other conditions affecting performance of grounding and bonding of the electrical system prior to and after connecting required telecommunications in-room grounding.

C. The General Contractor shall inspect the test results of the ac grounding system measured at the point of BCT connection.

D. The General Contractor and the Telecommunications Subcontractor shall each prepare a written report, endorsed by the each contractor and subcontractor's Installer, listing conditions detrimental to performance of their respective Work.

E. The General Contractor shall proceed with connection of the BCT only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Bonding shall include the ac utility power service entrance, the communications MIS Room TMGB, and the grounding electrode system. The bonding of these elements shall form a loop so that each element is connected to at least two others.

B. Comply with NECA 1.

C. Comply with J-STD-607-A.

3.3 APPLICATION

A. Conductors: Install stranded conductors for No. 6 AWG and larger unless otherwise indicated.

1. The bonding conductors between the TGB and structural steel of steel-frame buildings shall not be smaller than No. 6 AWG.
2. The bonding conductors between the TMGB and structural steel of steel-frame buildings shall not be smaller than No. 6 AWG.

B. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
3. Connections to Ground Rods at Test Wells: Bolted connectors.
4. Connections to Structural Steel: Welded connectors.

C. Conductor Support:

1. Secure grounding and bonding conductors at intervals of not less than 36 inches.

D. Grounding and Bonding Conductors:

1. Install in the straightest and shortest route between the origination and termination point, and no longer than required. The bend radius shall not be smaller than eight times the diameter of the conductor. No one bend may exceed 90 degrees.
2. Install without splices.
3. Support at not more than 36-inch intervals.
4. Install grounding and bonding conductors in 3/4-inch PVC conduit until conduit enters a telecommunications room. The grounding and bonding conductor pathway through a plenum shall be in EMT. Conductors shall not be installed in EMT unless otherwise indicated.

a. If a grounding and bonding conductor is installed in ferrous metallic conduit, bond the conductor to the conduit using a grounding bushing that complies with requirements in Section 270528 "Pathways for Communications Systems," and bond both ends of the conduit to a TMGB/TGB.

3.4 GROUNDING ELECTRODE SYSTEM

A. The BCT between the TMGB and the ac service equipment ground shall not be smaller than No. 3/0 AWG.

3.5 GROUNDING BUSBARS

A. Indicate locations of grounding busbars on Drawings. Install busbars horizontally, on insulated spacers 4 inches minimum from wall, 96 inches above finished floor unless otherwise indicated.

B. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down; connect to horizontal bus.

3.6 CONNECTIONS

A. Bond metallic equipment in a telecommunications equipment room to the grounding busbar in that room, using equipment grounding conductors not smaller than No. 6 AWG.

B. Stacking of conductors under a single bolt is not permitted when connecting to busbars.

C. Assemble the wire connector to the conductor, complying with manufacturer's written instructions and as follows:

1. Use crimping tool and the die specific to the connector.
2. Pretwist the conductor.
3. Apply an antioxidant compound to all bolted and compression connections.

D. Primary Protector: Bond to the TMGB with insulated bonding conductor.

E. Interconnections: Interconnect all TGBs with the TMGB with the telecommunications backbone conductor. If more than one TBB is installed, interconnect TBBs using the grounding equalizer conductor. The telecommunications backbone conductor and grounding equalizer conductor size shall not be less than 2 kcmils/linear foot of conductor length, up to a maximum size of No. 3/0 AWG.

F. Telecommunications Enclosures and Equipment Racks: Bond metallic components of enclosures to the telecommunications bonding and grounding system. Install top-mounted or vertically mounted rack grounding busbar. Bond the equipment grounding busbar to the TGB No. 2 AWG bonding conductors.

G. Structural Steel: Where the structural steel of a steel frame building is readily accessible within the room or space, bond each TGB and TMGB to the vertical steel of the building frame.

H. Electrical Power Panelboards: Where an electrical panelboard for telecommunications equipment is located in the same room or space, bond each TGB to the ground bar of the panelboard.

I. Rack- and Cabinet-Mounted Equipment: The Telecommunications Subcontractor shall bond powered equipment chassis to the cabinet or rack grounding bar. Power connection shall comply with NFPA 70; the equipment grounding conductor in the power cord of cord- and plug-connected equipment shall be considered as a supplement to bonding requirements in this Section.

J. The Telecommunications Subcontractor shall ground IT Room overhead cabletray to the grounding busbar located within the same space.

3.7 IDENTIFICATION

A. Labels shall be preprinted or computer-printed type.

1. Label TMGB with "fs-TMGB," where "fs" is the telecommunications space identifier for the space containing the TMGB.
2. Label TGB(s) with "fs-TGB," where "fs" is the telecommunications space identifier for the space containing the TGB.
3. Label the BCT and each telecommunications backbone conductor at its attachment point: "WARNING! TELECOMMUNICATIONS BONDING CONDUCTOR. DO NOT REMOVE OR DISCONNECT!"
4. At each grounding busbar label bonding conductors (BCs) to identify telecom element at the distant end connection.

3.8 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Each contractor and subcontractor shall inspect physical and mechanical condition of their respective work. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
2. Test the bonding connections of the system using an ac earth ground-resistance tester, taking two-point bonding measurements in each telecommunications equipment room containing a TMGB and a TGB and using the process recommended by BICSI TDMM. Conduct tests with the facility in operation.

    a. The General Contractor shall measure the resistance between the busbar and the nearest available grounding electrode. The maximum acceptable value of this bonding resistance is 100 milliohms.

3. Test for ground loop currents using a digital clamp-on ammeter, with a full-scale of not more than 10 A, displaying current in increments of 0.01 A at an accuracy of plus/minus 2.0 percent.

a. With the grounding infrastructure completed and the communications system electronics operating, the Telecommunications Subcontractor shall measure the current in every conductor connected to the TMGB and each TGB. Maximum acceptable ac current level is 1 A.

C. Excessive Ground Resistance: On completion the Telecommunications Subcontractor shall measure the resistance at the TMGB's BCT. If resistance to ground at the BCT exceeds 5 ohms, notify the construction management project manager promptly and include recommendations to reduce ground resistance.

D. The grounding system will be considered defective if it does not pass tests and inspections.

E. The General Contractor and the Telecommunications Subcontractor shall prepare test and inspection reports for their respective Work.

END OF SECTION

SECTION 271300

ISP COMMUNICATIONS BACKBONE CABLING

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:

1. Pathways.
2. UTP cable.
3. 50/125-micrometer, classification OM3, laser optimized multimode optical fiber cabling.
4. 8.3/125-micrometer singlemode optical fiber cabling.
5. RG-11 coaxial backbone cable
6. Cable connecting hardware, patch panels, and cross-connects.
7. Cable splicing.
8. Cabling identification products.

B. The Telecommunications Subcontractor shall provide and install all telecom related backbone cabling, terminations, testing, labeling and documentation as well as all pathway components to include but not limited to wall, floor and ceiling penetrations, wall, floor and ceiling cores, core sleeves, sleeve seals, firestop, junction boxes, backboxes (to include empty backboxes shown on plan), conduit stub-ups (to include empty conduit stub-ups shown on plan), cable supports, vertical cabletray, overhead cabletray, poke-through devices, the telecom portion of under carpet cable systems and any other items as specified herein.

1.03 DEFINITIONS

A. BICSI: Building Industry Consulting Service International.

B. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.

C. EMI: Electromagnetic interference.

D. IDC: Insulation displacement connector.

E. LAN: Local area network.

F. RCDD: Registered Communications Distribution Designer.

G. UTP: Unshielded twisted pair.

1.04 BACKBONE CABLING DESCRIPTION

A. Backbone cabling system shall provide interconnections between communications equipment rooms, main terminal space, and entrance facilities in the telecommunications cabling system structure. Cabling system consists of backbone cables, cross-connects, and cable terminations.

B. Backbone cabling terminations are located in communications equipment rooms, designated telecom enclosures and at entrance facilities. Bridged taps and splitters shall not be used as part of the ISP fiber optic and UTP copper backbone cabling.

1.05 PERFORMANCE REQUIREMENTS

A. General Performance: Backbone cabling system shall comply with transmission standards in TIA/EIA-568-C.1, when tested according to test procedures of this standard.

1.06 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1. For fiber optic and UTP copper telecommunications cable, include the following installation data for each type used:

    a. Nominal OD.
    b. Minimum bending radius.
    c. Maximum pulling tension.

B. Shop Drawings:

1. System Labeling Schedules: Electronic copy of labeling schedules, in software and format selected by Owner.
2. Cabling administration drawings and printouts.
3. Wiring diagrams to show typical wiring schematics including the following:

    a. Terminal connector blocks.
    b. Building entrance terminals.
    c. Patch panels.

4. Data racks and patch panels. Detail mounting assemblies, and show elevations and physical relationship between the installed components.

1.07 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified layout technician, installation supervisor, and field inspector.

B. Source quality-control reports.

C. Field quality-control reports.

D. Maintenance Data: For splices and connectors to include in maintenance manuals.

1.08 CLOSEOUT SUBMITTALS

A. As Built Documentation:

1. Manufacturer's warranty certificate.
2. Document test results of all cabling.
3. As built floor plan, riser and elevation drawings.

1.09 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Backbone UTP Copper Patch-Panel Units: One of each type.
2. 110-100 Terminal Block w/ Twenty C5 Connectors: One each.
3. Fiber Optic Distribution Cabinets: One of each type.

1.10 QUALITY ASSURANCE

A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.

1. Layout Responsibility: Preparation of Shop Drawings, Cabling Administration Drawings, and field testing program development by an RCDD.
2. Installation Supervision: Installation shall be under the direct supervision of Registered Technician, who shall be present at all times when Work of this Section is performed at Project site.
3. Testing Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.

B. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 50 or less.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. Telecommunications Pathways and Spaces: Comply with TIA/EIA-569-B.

E. Grounding: Comply with ANSI-J-STD-607-A.

1.11 DELIVERY, STORAGE, AND HANDLING

A. Test cables upon receipt at Project site.

1. Test optical fiber cable to determine the continuity of each strand end to end. Use optical fiber flashlight and an optical loss test set.
2. Test optical fiber cable while on reels. Use an optical time domain reflectometer to verify the cable length and locate cable defects, splices, and connector, including the loss value of each. Retain test data and include the record in maintenance data.
3. Test each pair of UTP cable for open grounded, crossed and short circuits.

1.12 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install cables and connecting materials until wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.13 COORDINATION

A. The Telecommunications Subcontractor shall coordinate building telecommunications layouts and the installation of telecommunications pathways and cabling with Owner's IT department representative, the General Contractor and the Electrical Contractor.

PART 2 - PRODUCTS

2.01 PATHWAYS

A. General Requirements: Comply with TIA/EIA-569-B.

B. Cable Support: Provide High Performance Non-Continuous Cable Supports (HPNCCS) systems as specified in specification Section 27 05 28 for support of Category 6 Horizontal Distribution outlet cabling Fiber Optic Backbone Cabling, RG6/RG11 coaxial Backbone Cabling and Category 5e multipair copper Backbone Cabling, designed to prevent degradation of cable performance and pinch points that could damage cable.

C. Cable Trays:

1. Provide cable tray and mounting components, fittings, and assemblies as specified in specification section 27 05 36. Specification section 27 05 36 identifies cable tray requirements for electrical and low voltage cabling.

D. Conduit and Boxes:

1. Provide conduit and back boxes in accordance with specification section 27 05 28. Specification section 27 05 28 identifies raceway and box requirements for low voltage cabling.

2.02 BACKBOARDS

A. Backboards: At telecommunications spaces, provide 3/4 inch plywood backboards.

B. Telecommunications elements shall be mounted to plywood on walls to create required telecommunications room backboard arrangements.

2.03 UTP CABLE

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

1. Belden CDT Inc.; Electronics Division.
2. Berk-Tek; a Nexans company.
3. CommScope, Inc.
4. Draka USA.
5. Genesis Cable Products; Honeywell International, Inc.
6. KRONE Incorporated.
7. Mohawk; a division of Belden CDT.
8. Nordex/CDT; a subsidiary of Cable Design Technologies.
9. Superior Essex Inc.
10. SYSTIMAX Solutions; a CommScope Inc. brand.
11. 3M.
12. Tyco Electronics/AMP Netconnect; Tyco International Ltd.

B. Description: 100-ohm, multi-pair UTP, formed into 25-pair binder groups covered with a plenum rated jacket.

1. Comply with ICEA S-90-661 for mechanical properties.
2. Comply with TIA/EIA-568-C.1 for performance specifications.
3. Comply with TIA/EIA-568-C.2, Category 5e.
4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70 for the following types:

    a. Communications, General Purpose: Type CMP.
    b. Communications, Plenum Rated: Type CMP, complying with NFPA 262.

2.04 UTP CABLE HARDWARE

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

1. TYCO Electronics/AMP NetConnect: Tyco Int’l, Ltd.
2. Ortronics/Legrand.
3. Hubbell Premise Wiring.
4. KRONE Incorporated.
5. Leviton Voice & Data Division.
6. Molex Premise Networks; a division of Molex, Inc.
7. Nordex/CDT; a subsidiary of Cable Design Technologies.

8. Panduit Corp.
9. Siemon Co. (The).

B. General Requirements for Cable Connecting Hardware: Comply with TIA/EIA-568-C.2, IDC type, with modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of same category or higher.

C. Connecting Blocks: 110-style IDC for Category 5e. Provide blocks for the number of cables terminated on the block, plus 25 percent spare. Integral with connector bodies, including plugs and jacks where indicated.

1. Number of Terminals per Field: One for each conductor in assigned cables.

D. Patch Panel: Telco type modular panels housing multiple-numbered jack units with IDC-type connectors at each jack for permanent termination of installed cable's pairs.

1. Number of Jacks per Field: One for each pair of UTP cable indicated.
2. UTP copper backbone cables shall be terminated on Telco type patch panels at one pair per port. In each binder group the 25th pair (violet/slate-slate/violet) shall remain unterminated.

2.05 OPTICAL INDOOR FIBER CABLE

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

1. Berk-Tek; a Nexans company.
2. CommScope, Inc.
3. Corning Cable Systems.
4. General Cable Technologies Corporation.
5. Mohawk; a division of Belden CDT.
6. Nordex/CDT; a subsidiary of Cable Design Technologies.
7. Optical Connectivity Solutions Division; Emerson Network Power.
8. Superior Essex Inc.
9. SYSTIMAX Solutions; a CommScope Inc. brand.
10. 3M.
11. Tyco Electronics/AMP Netconnect; Tyco International Ltd.

B. Fiber Optic Cables

1. The optical fibers shall be glass core with glass cladding. Plastic optical fibers or plastic-clad silica fibers shall not be utilized.

2. With the exception of the I.T. Room 017A to the Outdoor Electrical Equipment backbone cable link which is specified separately in paragraph 2.07, the Inside Plant optical fiber backbone cables shall be of the following types, as indicated on the Contract Drawings:

a. Single-Mode: Single-mode cable shall utilize 9/125 micron optical fibers of either matched-clad (Corning type) or depressed-clad (Lucent type) construction.

1) Maximum Attenuation: 0.40 dB/km at 1310 nm; 0.18 dB/km at 1550 nm.

b. Multi-Mode: OM3 level (100Gb/100 meters) Multi-mode cable shall utilize dual-window, 50/125-micrometer, nonconductive, tight buffer, optical fiber cable.

1) Maximum Attenuation: 3.50 dB/km at 850 nm; 1.5 dB/km at 1300 nm.

3. Cable Ratings:

a. Optical fiber cable installed shall be listed OFCP (Optical Fiber, Conductive, Plenum).

4. Cable Construction:

a. The optical fibers shall be incorporated in the cable construction using tight buffer method. The optical fibers shall be individually clad, jacketed and identified within the buffer tubes.

b. Each fiber shall be distinguishable by means of a continuous color code, continuous numbering, continuous lettering or a combination of methods. Color coding of optical fiber cables shall be in compliance with TIA/EIA-598-B.

c. Cables shall have Kevlar or Aramid yarn strength members surrounding the fiber buffering.

d. Cable Jacket:

1) Dual Armored outer sheath

2) Plenum Rated: Optical Fiber Conductive Plenum (OFCP).

e. Cable Jacket Color: Unless otherwise indicated on the Contract Drawings, fiber optic cable jacket shall be colored as follows:

1) Interior Multi-Mode: Interior rated multi-mode cables shall have an Aqua colored jacket.

2) Interior Single-Mode: Interior rated single-mode cables shall have a Yellow colored jacket.

3) Hybrid composite multimode/singlemode: Hybrid composite multimode/singlemode fiber optic cable shall have a Black colored jacket.

f. The fiber optical characteristics and requirements shall be as indicated on the Contract Drawings.

g. Optical fiber cables shall conform to EIA FOTP-25 for impact resistance.

h. Optical fiber cables shall conform to EIA FOTP-33 for maximum pulling load.

i. Optical fiber cables shall conform to EIA FOTP-26 for crush resistance.

j. Optical fiber cables shall conform to EIA FOTP-41 for compressive load resistance.

k. Optical fiber cables shall conform to EIA FOTP-104 for flexibility.

5. Optical Fiber Connectors

a. Provide LC Type optical connectors capable of terminating optical fiber glass cables.

1) Cross-Connects and Patch Panels: Modular panels housing multiple-numbered, duplex cable connectors.

a) Number of Connectors per Field: One (1) for each fiber of cable or cables assigned to field, plus spare blank positions for 25% expansion.

b) Comply with Optical Fiber Connector Intermateability Standards (FOCIS) specifications of TIA/EIA-604-2, TIA/EIA-604-3-A, and TIA/EIA-604-12. Comply with TIA/EIA-568C-3.B.

c) Quick-connect, simplex and duplex, Type LC connectors. Insertion loss not more than 0.75 dB.

d) For use in faceplates accommodating any combination of snap-in UTP, optical fiber, and coaxial work area jacks.

2.06 OPTICAL FIBER CABLE HARDWARE

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

1. ADC.
2. American Technology Systems Industries, Inc.
3. Berk-Tek; a Nexans company.
4. Corning Cable Systems.
5. Dynacom Corporation.
6. Hubbell Premise Wiring.
7. Molex Premise Networks; a division of Molex, Inc.
8. Nordex/CDT; a subsidiary of Cable Design Technologies.
9. Optical Connectivity Solutions Division; Emerson Network Power.
10. Siemon Co. (The).

B. Cross-Connects and Patch Panels: Modular rack mounted panels housing multiple-numbered, duplex cable connectors.

1. Number of Connectors per Field: One for each fiber of cable or cables assigned to field, plus 25% spare blank positions for future expansion.

C. Cable Connecting Hardware:

1. Comply with Optical Fiber Connector Intermateability Standards (FOCIS) specifications of TIA/EIA-604-2, TIA/EIA-604-3-A, and TIA/EIA-604-12. Comply with TIA/EIA-568-C.3.
2. Quick-connect, simplex and duplex, Type LC connectors. Insertion loss not more than 0.75 dB.

2.07 OPTICAL INDOOR/OUTDOOR FIBER BACKBONE CABLE LINK

A. A six (6) strand singlemode OS2 level fiber optic backbone cable link shall be provided between I.T. Room 017A and the Outdoor Electrical Equipment Area as shown on the associated project drawings. The cable medium shall be singlemode OS2 level, plenum rated indoor/outdoor fiberoptic cable. The Telecommunications Subcontractor shall provide all telecom components to convert network traffic from UTP copper to OS2 fiber and back to UTP copper to include but not limited to the following:

1. Optical Fiber Cable. Singlemode loose tube, gel-free, plenum indoor/outdoor, OFNP (Optical Fiber, Non-conductive, Plenum) rated fiber optic cable. Corning PN: 006ESP-T4101D20.

2. Stainless Steel Enclosure. 20”H x 20”W x 8”D stainless steel Nema 4x enclosure with 17”H x 17”W ¾” plywood back panel. Hoffman PN: A20H2008SS6LP equipped with

one (1) 4-receptacle power strip TrippLite PN: PS120420 and one (1) dual port surface mount jack housing Leviton PN: 41089-2GP with two (2) Cat-6 jacks Leviton PN: 61110-RG6.

3. Wall Fiber Cabinet. Wall mount single panel fiber cabinet. Corning PN: SPH-01P fitted with an LC type pigtailed connector panel Corning PN: CCH-CP06-A9-P03RH.

4. Rack Fiber Cabinet. Rack Mount 1-RU fiber cabinet with an LC type pigtailed connector panel Corning PN: CCH-CP06-A9-P03RH.

5. Media Converter. Provide 10/100/1000BaseT-1000BaseX small form factor media conversion unit in quantities as indicated on the associated project drawings. The Media Converter shall be Transition Networks PN: M/GE-PSW-LX-01 (or approved equal) with the following:

   a. One (1) wall mount AC power adapter per unit

   b. One (1) wall mount bracket per unit Transition Networks PN: WMBM

   c. One (1) duplex 18” OS2 level LC/SC fiber optic patch cable per unit

   d. One (1) 1-meter RJ45/RJ45 cat-6 patch cable per unit.

6. Equipment Shelf. Small peripheral equipment shelf. CPI PN:10758-701 (or approved equal)

2.08 RG11 COAXIAL BACKBONE CABLE

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

1. Belden
2. CommScope, Inc.
3. General Cable Technologies Corporation.
4. Mohawk; a division of Belden CDT.
5. Superior Essex Inc.
6. 3M.

B. RG11 Coaxial Cables

1. Construction: Non Armored
2. Center Conductor: bare Copper
3. Center Conductor Gauge: 14 AWG
4. Shield (Braid Coverage): 95%
5. Shield Gauge: 34 AWG
6. Shield braid Material: Bare copper
7. Characteristic Impedance: 75 ohm (+/- 3ohm)
8. Nominal Velocity Propagation: 84%
9. Jacket: Plenum (CMP)

C. At the Distribution Frames, Coaxial Riser trunk cables shall be terminated using “F” type fittings. At the Distribution Frames Coaxial Riser trunk cables shall be clearly marked and routed to the Distribution Frame Backboard. Coaxial Riser trunk cables shall be formed into a 36” diameter coil with 15 feet of cable slack. Cable coils shall be secured, neatly, to the Distribution Frame Backboard for final routing and termination by the CATV system vendor.

2.09 GROUNDING

A. Comply with ANSI-J-STD-607-A.

2.10 IDENTIFICATION PRODUCTS

A. Comply with TIA/EIA-606-A and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

2.11 SOURCE QUALITY CONTROL

A. Factory test cables on reels according to TIA/EIA-568-C.1.

B. Factory test UTP cables according to TIA/EIA-568-C.2.

C. Factory test multimode optical fiber cables according to TIA/EIA-526-14-A and TIA/EIA-568-C.3.

D. Factory test multimode optical fiber cables according to TIA/EIA-526-7-A and TIA/EIA-568-C.3.

E. Cable will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

PART 3 - EXECUTION

3.01 WIRING METHODS

A. Wiring Method: Install cables in raceways and cable trays except within consoles, cabinets, desks, and counters. Conceal raceway and cables except in unfinished spaces.

B. Wiring Method: Conceal conductors and cables in accessible ceilings, walls, and floors where possible.

C. Wiring within Enclosures: Bundle, lace, and train cables within enclosures. Connect to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.

3.02 INSTALLATION OF CABLES

A. Comply with NECA 1.

B. General Requirements for Cabling:

1. Comply with TIA/EIA-568-C.1.
2. Comply with BICSI TDMM, Ch. 6, "Cable Termination Practices."
3. Install 110-style IDC termination hardware unless otherwise indicated.
4. Terminate all conductors; no cable shall contain un-terminated elements with the exception of a binder group's 25th pair (violet/slate-slate/violet) when terminating multi-pair UTP copper cables on Telco type patch panels at one pair per port. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.
5. ISP Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches (760 mm) and not more than 6 inches (150 mm) from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
6. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.
7. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in the BICSI TDMM, "Cabling Termination Practices" Chapter. Use lacing bars and distribution spools.
8. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
9. Cold-Weather Installation: Bring cable to room temperature before de-reeling. Heat lamps shall not be used to increase temperature of cable.
10. In the communications equipment room, install a 10-foot- (3m) long service loop on each end of cable.
11. Pulling Cable: Comply with BICSI TDMM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.

C. UTP Cable Installation:

1. Comply with TIA/EIA-568-C.2.
2. Do not untwist UTP cables more than 1/2 inch (12 mm) from the point of termination to maintain cable geometry.

D. Optical Fiber Cable Installation:

1. Comply with TIA/EIA-568-C.3.
2. Cable may be terminated on connecting hardware that is rack mounted unless otherwise specified.

E. Open-Cable Installation:

1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
2. Suspend UTP cable not in a wireway or pathway, a minimum of 8 inches (200 mm) above ceilings by cable supports not more than 60 inches (1524 mm) apart.

3. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.

F. Group connecting hardware for cables into separate logical fields.

G. Separation from EMI Sources:

1. Comply with BICSI TDMM and TIA/EIA-569-B recommendations for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
2. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:

   a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches (127 mm).
   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches (300 mm).
   c. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches (610 mm).

3. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:

   a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 2-1/2 inches (64 mm).
   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches (150 mm).
   c. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches (300 mm).

4. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:

   a. Electrical Equipment Rating Less Than 2 kVA: No requirement.
   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches (76 mm).
   c. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches (150 mm).

5. Separation between Communications Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches (1200 mm).
6. Separation between Communications Cables and Fluorescent Fixtures: A minimum of 5 inches (127 mm).

3.03 FIRESTOPPING

A. The Telecommunications Subcontractor shall firestop all telecommunications penetration locations on completion of cable installation.

3.04 GROUNDING

A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.

B. Comply with ANSI-J-STD-607-A.

C. The telecommunications grounding busbars and the bonding backbone are provided by the General Contractor. The Telecommunications Subcontractor shall provide grounding conductors and all bonding connection components within M.I.S. and I.T. rooms and in existing telecom spaces where required.

D. The Telecommunications Subcontractor shall bond metallic equipment to the telecommunications grounding bus bar. Provide grounding conductors sized based on required length in accordance with ANSI-J-STD-607-A.

3.05 IDENTIFICATION

A. The Telecommunications Subcontractor shall identify/lable system components, wiring, and cabling in compliance with TIA/EIA-606-A.

1. Administration Class: 3.
2. Color-code cross-connect fields and apply colors to voice and data service backboards, connections, covers, and labels.

B. Paint and label colors for equipment identification shall comply with TIA/EIA-606-A for Class 3 level of administration.

C. Cable Schedule: Install in a prominent location in each equipment room and wiring closet. List incoming and outgoing cables and their designations, origins, and destinations. Protect with rigid frame and clear plastic cover. Furnish an electronic copy of final comprehensive schedules for Project.

D. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for telecommunications closets, backbone pathways and cables, entrance pathways and cables, terminal hardware and positions, horizontal cables, work areas and workstation terminal positions, grounding buses and pathways, and equipment grounding conductors.

E. Cable and Wire Identification:

1. Label each cable within 4 inches (100 mm) of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
2. Each wire connected to building-mounted devices is not required to be numbered at device if color of wire is consistent with associated wire connected and numbered within panel or cabinet.
3. Exposed Cables and Cables in Cable Trays and Wire Troughs: Label each cable at intervals not exceeding 15 feet (4.5 m).
4. Label each terminal strip and screw terminal in each cabinet, rack, or panel.

a. Individually number wiring conductors connected to terminal strips and identify each cable or wiring group being extended from a panel or cabinet to a building-mounted device with name and number of particular device as shown.
b. Label each unit and field within distribution racks and frames.

5. Identification within Connector Fields in Equipment Rooms and Wiring Closets: Label each connector and each discrete unit of cable-terminating and connecting hardware. Where similar jacks and plugs are used for both voice and data communication cabling, use a different color for jacks and plugs of each service.

F. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color but still complies with requirements in TIA/EIA 606-A, for the following:

1. Cables use flexible vinyl or polyester that flexes as cables are bent.

3.06 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Visually inspect UTP and optical fiber jacket materials for NRTL certification markings. Inspect cabling terminations in communications equipment rooms for compliance with color-coding for pin assignments, and inspect cabling connections for compliance with TIA/EIA-568-C.1.
2. Visually inspect cable placement, cable termination, grounding and bonding, and labeling of all components.
3. Test Coaxial CATV backbone cable for shorts, grounds, opens and continuity.
4. Test UTP copper cabling for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination but not cross-connection.

a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-C.2. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.

5. Fiber Optic Cable Testing

a. All testing shall be performed by fiber optic installation/testing trained personnel.

b. For all installed fiber optic cable EIA 455-171 Method D procedures will be adhered to. (Bi-directional)

c. Connector loss shall not exceed .5 db per termination.

d. The Multimode Fiber Optic Cable loss shall not exceed 4db per kilometer tested at 850nm and 2db per kilometer tested at 1300nm for multimode 50 micron OM-3 enhanced fiber.

e. The Singlemode Fiber Optic Cable loss shall not exceed 1.5db per kilometer tested at 1310nm and 1550nm for 8.3 micron single mode cable.

f. The Telecommunications Subcontractor is responsible for obtaining minimum loss in fiber connections and terminating per manufacturer's specifications. When errors are found, the source of each error shall be determined, corrected, and the cable re-tested. All defective components shall be replaced and re-tested. Defective components that cannot be corrected shall be replaced at the expense of the Telecommunications Subcontractor.

g. Test records shall be maintained using, at a minimum, the following tests criteria: The form shall record specific Distribution Frames, Fiber Optic strand numerical designation, outcome of test, indication of errors found (e.g., a, b, c, d, or e) cable length, re-test results after problem resolution and signature of the technician completing the tests.

h. Test results for fiber optic cable must be submitted with identification to match labels on all distribution enclosure panel hardware. Identification must also correspond with as-builts.

i. Owner reserves the right to observe and verify the accuracy of test results submitted.

C. Data for each measurement shall be documented. Data for submittals shall be printed in a summary report that is formatted similar to Table 10.1 in BICSI TDMM, or transferred from the instrument to the computer, saved as text files, and printed and submitted.

D. Remove and replace cabling where test results indicate that they do not comply with specified requirements.

E. End-to-end cabling will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

END OF SECTION

SECTION 271500

COMMUNICATIONS HORIZONTAL CABLING

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.

B. Division 27, Section 271100 "Communications Equipment Room Fittings."

C. Division 27, Section 271300 "ISP Communications Backbone Cabling."

1.02 SUMMARY

A. Section Includes:
   1. 4 UTP copper cabling.
   2. RG6 coaxial CATV drop cabling
   3. Cable connecting hardware, patch panels, and cross-connects.
   4. Telecommunications outlet/connectors.
   5. Cabling system identification products.
   6. Cable management system.

B. The Telecommunications Subcontractor shall provide and install all telecom related horizontal distribution cabling, terminations, testing, labeling, documentation and a cable management system as well as all pathway components to include but not limited to wall, floor and ceiling penetrations, wall, floor and ceiling cores, core sleeves, sleeve seals, firestop, junction boxes, backboxes (to include empty backboxes shown on plan), conduit stub-ups (to include empty conduit stub-ups shown on plan), cable supports, vertical cabletray, overhead cabletray, poke-through devices, the telecom portion of under carpet cable systems and any other items as specified herein.

1.03 DEFINITIONS

A. BICSI: Building Industry Consulting Service International.

B. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.

C. EMI: Electromagnetic interference.

D. IDC: Insulation displacement connector.

E. LAN: Local area network.

F. Outlet/Connectors: A connecting device in the work area on which horizontal cable or outlet cable terminates.

G. RCDD: Registered Communications Distribution Designer.

H. UTP: Unshielded twisted pair.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate layout and installation of telecommunications cabling with Owner's IT department representatives.

B. Coordinate telecommunications outlet/connector locations with location of power receptacles at each work area.

1.05 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. For Horizontal Distribution cable, include the following installation data for each type used:

   a. Nominal OD.
   b. Minimum bending radius.
   c. Maximum pulling tension.

B. Shop Drawings:

1. System Labeling Schedules: Electronic copy of labeling schedules, in software and format selected by Owner.
2. Cabling administration drawings and printouts.
3. Wiring diagrams to show typical wiring schematics, including the following:

   a. Cross-connects.
   b. Patch panels.
   c. Patch cords.

4. Patch panels. Detail mounting assemblies, and show elevations and physical relationship between the installed components.

C. Samples: For workstation outlets, jacks, jack assemblies, in specified finish, one for each size and outlet configuration and faceplates for color selection and evaluation of technical features.

1.06 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified layout technician, installation supervisor, and field inspector.

B. Source quality-control reports.

C. Field quality-control reports.

1.07 CLOSEOUT SUBMITTALS

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

1.08 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Horizontal Distribution Patch Panels: One of each type.
2. Telecommunication Outlets / Faceplate and Jacks: Two of each type.

1.09 QUALITY ASSURANCE

A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.

1. Layout Responsibility: Preparation of Shop Drawings, Cabling Administration Drawings, and field testing program development by an RCDD.
2. Installation Supervision: Installation shall be under the direct supervision of a Registered Technician, who shall be present at all times when Work of this Section is performed at Project site.
3. Testing Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Test cables upon receipt at Project site.

1. Test each pair of UTP cable for open and short circuits.

PART 2 - PRODUCTS

2.01 HORIZONTAL CABLING DESCRIPTION

A. Horizontal cable and its connecting hardware provide the means of transporting signals between the telecommunications outlet/connector and the horizontal cross-connect located in the communications equipment room. This cabling and its connecting hardware are called a "permanent link," a term that is used in the testing protocols.

1. Horizontal cabling shall contain no more than one transition point or consolidation point between the horizontal cross-connect and the telecommunications outlet/connector.
2. Bridged taps and splices shall not be installed in the horizontal cabling.

3. In accordance with Article 100 of NFPA 70 National Electrical Code any backbone and or horizontal telecom distribution cabling installed in conduit imbedded in concrete slabs or beneath concrete slabs that are in direct contact with the earth must be rated for wet location applications. This includes 4-pair UTP copper station cable. In addition, wet location rated telecom cable that exits the under-slab or in-slab conduit into a plenum space must either be installed in an enclosed raceway system from end to end or the telecom cable must be an indoor/outdoor type with a Communications Multipurpose Plenum (CMP) rating and employ a gel fill or dry-block fill to meet wet location application requirements.

B. The maximum allowable horizontal cable length is 295 feet (90 m). This maximum allowable length does not include an allowance for the length of 16 feet (4.9 m) to the workstation equipment or in the horizontal cross-connect.

C. Cable routing for Patient Telephone communication outlets include routing category 6 cabling through the Patient Telephone's associated Nurse Station Toggle Switch backbox, creating a loop/coil in the Toggle Switch backbox (un-cut) and continuing on to the respective Patient Telephone location and creating a cable coil. At the Patient Telephone location the Category-6 cable shall be terminated on a jack without a faceplate for testing. For detailed requirements see project drawings T-001, T-501 and T-502.

D. Undercarpet cabling and components shall be provided as indicated on the associated project drawings.

E. Where telecom outlets cannot be installed in a flush mount faceplate arrangement the Telecommunications Subcontractor shall provide and install surface raceway for any/all exposed cabling and an appropriately sized surface mount backbox as required.

2.02 PERFORMANCE REQUIREMENTS

A. General Performance: Horizontal cabling system shall comply with transmission standards in TIA/EIA-568-C.1 when tested according to test procedures of this standard.

B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 50 or less.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. Grounding: Comply with J-STD-607-A.

2.03 UTP CABLE

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

1. ADC.
2. Belden Inc.
3. Berk-Tek; a Nexans company.
4. CommScope, Inc.
5. Draka Cableteq USA.
6. Genesis Cable Products; Honeywell International, Inc.
7. Mohawk; a division of Belden Networking, Inc.
8. Superior Essex Inc.
9. SYSTIMAX Solutions; a CommScope, Inc. brand.
10. 3M Communication Markets Division.
11. Tyco Electronics Corporation; AMP Products.

B. Description: 100-ohm, four-pair UTP.

1. Comply with ICEA S-90-661 for mechanical properties.
2. Comply with TIA/EIA-568-C.1 for performance specifications.
3. Comply with TIA/EIA-568-C.2, Category 6.
4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70 for the following types:

   a. Communications, Plenum Rated: Type CMP, complying with NFPA 262.

2.04 UTP CABLE HARDWARE

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

1. ADC.
2. American Technology Systems Industries, Inc.
3. Belden Inc.
4. Dynacom Inc.
5. Hubbell Premise Wiring.
6. Leviton Commercial Networks Division.
7. Molex Premise Networks; a division of Molex, Inc.
8. Panduit Corp.
9. Siemon Co. (The).
10. Tyco Electronics Corporation; AMP Products.

B. General Requirements for Cable Connecting Hardware: Comply with TIA/EIA-568-C.2, IDC type, with modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of same category or higher with the exception of RJ-11 6P6C jacks required for Printer outlets.

C. Patch Panel: Modular panels housing multiple-numbered jack units with IDC-type connectors at each jack for permanent termination of pair groups of installed cables.

1. Comply with TIA/EIA 568-C.2, Category 6

2. Number of Jacks per Field: One for each four-pair UTP cable indicated, plus spares and blank positions adequate to suit specified expansion criteria.

D. Jacks and Jack Assemblies: Modular, color-coded, eight-position modular receptacle units with integral IDC-type terminals.

2.05 TELECOMMUNICATIONS OUTLET/CONNECTORS

A. Jacks: 100-ohm, balanced, twisted-pair connector; four-pair, eight-position modular RJ-45 type jacks for voice and or data communication outlets and three-pair, six-position modular RJ-11 type jacks for one of the two jacks required in Printer communication outlets. Comply with TIA/EIA-568-C.1.

B. Workstation Outlets: Provide faceplates and commensurate jacks as indicated on project drawing T-001.

1. Plastic Faceplate: High-impact plastic for workstation and other outlet locations.
2. Metal Faceplate: 630B Type. Stainless steel for all wall telephone outlet locations.
3. For use with snap-in jacks.

   a. Flush mounting jacks, positioning the cord at a 45-degree angle.

4. Legend: Factory labeled by silk-screening or engraving for stainless steel faceplates.
5. Legend: Snap-in, clear-label covers and machine-printed paper inserts.

2.06 UNDER CARPET CABLING

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

1. Tyco Electronics Corporation; AMP Products (or approved equal).

B. Description: Amp NETCONNECT Category 6 Under-Carpet Conference Room Kit Part No. 1933466-1(or approved equal).

C. Component Schedule:

1. COMPONENT SCHEDULE *
   (* Individual Components For Category 6 Under-Carpet Conference Room Kit Part No. 1933466-1)

#	UNDER CARPET CABLING CONF. RM. KIT CONTENTS	INDIVIDUAL PART NO.	QTY
1	Category 6 Undercarpet Communications Cable	1499539-1	100 - Feet
2	3-Conductor, 12 Awg, Standard Ground, Power Cable	3-553079-3	50 - Feet
3	Flush Wall Frame Communications Transition Box	553739-2	1 - Each
4	Flush Wall Frame Communications Transition Box Cover	553095-1	1 - Each
5	Universal Communications Transition Block, Cat -6	2111682-1	1 - Each
6	4-Port Low Profile Communications Floor Fitting	555287-1	1 - Each
7	Modular Jack Kit, Category 6	1933377-1	4 - Each

8	Flush Wall Power Transition Box	554805-1	1 - Each
9	Flush Wall Power Transition Box Cover	1-553292-3	1 - Each
10	Transition Block For Power	554862-1	1 - Each
11	Top Shield	553536-3	50 - Feet
12	Floor Preparation	554123-3	50 - Feet
13	Spray Adhesive	6-553453-1	1 - Can
14	Hold Down Tape	553481-1	1 - Roll
15	Dual Duplex Receptacle DCR Kit	554192-1	1 - Each

2.07 RG6 COAXIAL CATV CABLE AND OUTLET/CONNECTORS

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

1. ADC.
2. Belden Inc.
3. Berk-Tek; a Nexans company.
4. CommScope, Inc.
5. Draka Cableteq USA.
6. Genesis Cable Products; Honeywell International, Inc.
7. Mohawk; a division of Belden Networking, Inc.
8. Superior Essex Inc.
9. SYSTIMAX Solutions; a CommScope, Inc. brand.
10. 3M Communication Markets Division.
11. Tyco Electronics Corporation; AMP Products.

B. Description: Coaxial cable shall be 75 ohm RG-6/U, quad shield. Cable shall be label-verified. Cable jacket shall be factory marked at regular intervals identifying cable type. RG6 coaxial cable shall be plenum rated and comply with NFPA 70.

C. Outlet: RG6 male F-type connectors. F-81 barrel connector wall outlet plates. Impact resistant single-port faceplate.

D. Patch Panel: Modular panels housing multiple-numbered jack units with F-81 barrel type connectors at each port.

1. Hinged stand-offs for backboard wall mount application

2. Number of ports per Field: One for each RG-6 coaxial cable indicated.

2.08 GROUNDING

A. Comply with J-STD-607-A.

2.09 IDENTIFICATION PRODUCTS

A. Comply with TIA/EIA-606-A and UL 969 for labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

2.10 SOURCE QUALITY CONTROL

A. Factory test UTP cables on reels according to TIA/EIA-568-C.1.

B. Factory test UTP cables according to TIA/EIA-568-C.2.

C. Factory-sweep test coaxial cables at frequencies from 5 MHz to 1 GHz. Sweep test shall test the frequency response, or attenuation over frequency, of a cable by generating a voltage whose frequency is varied through the specified frequency range and graphing the results.

D. Cable will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

PART 3 - EXECUTION

3.01 WIRING METHODS

A. Install cables in pathways and cable trays except within consoles, cabinets, desks, and counters. Conceal pathways and cables except in unfinished spaces.

B. Conceal conductors and cables in accessible ceilings, walls, and floors where possible.

C. Wiring within Enclosures:

1. Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii.
2. Install lacing bars and distribution spools.
3. Install conductors parallel with or at right angles to sides and back of enclosure.

3.02 INSTALLATION OF CABLES

A. Comply with NECA 1.

B. General Requirements for Cabling:

1. Comply with TIA/EIA-568-C.1.
2. Comply with BICSI ITSIM, Ch. 6, "Cable Termination Practices."
3. Install 110-style IDC termination hardware unless otherwise indicated.
4. Terminate conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.

5. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches (760 mm) and not more than 6 inches (150 mm) from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
6. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.
7. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM, "Cabling Termination Practices" Chapter. Install lacing bars and distribution spools.
8. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
9. Cold-Weather Installation: Bring cable to room temperature before de-reeling. Heat lamps shall not be used to increase cable temperature.
10. In the communications equipment room, install a 10-foot- (3-m-) long service loop on each end of cable.
11. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.

C. UTP Cable Installation:

1. Comply with TIA/EIA-568-C.2.
2. Do not untwist UTP cables more than 1/2 inch (12 mm) from the point of termination to maintain cable geometry.
3. Cable routing for Patient Telephone communication outlets include routing category 6 cabling through the Patient Telephone’s associated Nurse Station Toggle Switch backbox, creating a loop/coil in the Toggle Switch backbox (un-cut) and continuing on to the respective Patient Telephone location and creating a cable coil. At the Patient Telephone location the Category-6 cable shall be terminated on an 8P8C category-6 RJ-45 type jack without a faceplate for testing (only). Provision, installation and final termination of Toggle Switches and Patient Telephones are by others. See associated diagram and details on project drawings T-001, T-501 and T-502.
4. Undercarpet cabling and components shall be provided as indicated on the associated project drawings. See associated diagram on project drawing T-501.

D. Separation from EMI Sources:

1. Comply with BICSI TDMM and TIA-569-B for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
2. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:

    a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches (127 mm).
    b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches (300 mm).
    c. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches (610 mm).

3. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:

a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 2-1/2 inches (64 mm).
b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches (150 mm).
c. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches (300 mm).

4. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:

   a. Electrical Equipment Rating Less Than 2 kVA: No requirement.
   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches (76 mm).
   c. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches (150 mm).

5. Separation between Communications Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches (1200 mm).
6. Separation between Communications Cables and Fluorescent Fixtures: A minimum of 5 inches (127 mm).

3.03 GROUNDING

A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.

B. Comply with J-STD-607-A.

C. Comply with specification Section 270526 Grounding and Bonding for Communications Systems and requirements shown on associated project drawings.

D. The General Contractor shall provide and install telecommunications grounding busbars and the bonding backbones, the ground equalizer backbone and the bonding conductor for telecommunications (BCT). The Telecommunications Subcontractor shall provide grounding conductors and all bonding connection components within the M.I.S. Room, The TV Control Room and all I.T. Rooms.

E. The Telecommunications Subcontractor shall bond metallic equipment to the grounding bus bar. Size the ground conductor based on required length of ground wire in accordance with ANSI J-STD-607-A.

3.04 IDENTIFICATION

A. The Telecommunications Subcontractor shall identify/label system components, wiring, and cabling complying with TIA/EIA-606-A.

   1. Administration Class: 3.

B. Use unique, alphanumeric designation for each cable and label cable, jacks, connectors, and terminals to which it connects with same designation. At completion, cable records shall reflect as-built conditions.

C. Label colors for equipment identification shall comply with TIA/EIA-606-A for Class 3 level of administration.

D. Cable Schedule: Post in prominent location in each equipment room and wiring closet. List incoming and outgoing cables and their designations, origins, and destinations. Protect with rigid frame and clear plastic cover. Furnish an electronic copy of final comprehensive schedules for Project.

E. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for telecommunications closets, backbone pathways and cables, entrance pathways and cables, terminal hardware and positions, horizontal cables, work areas and workstation terminal positions, grounding buses and pathways, and equipment grounding conductors. Follow convention of TIA/EIA-606-A. Furnish electronic record of all drawings, in software and format selected by Owner.

F. Cable and Wire Identification:

1. Label each cable within 4 inches (100 mm) of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
2. Each wire connected to building-mounted devices is not required to be numbered at device if color of wire is consistent with associated wire connected and numbered within panel or cabinet.
3. Exposed Cables and Cables in Cable Trays and Wire Troughs: Label each cable at intervals not exceeding 15 feet (4.5 m).
4. Label each terminal strip and screw terminal in each cabinet, rack, or panel.

    a. Individually number wiring conductors connected to terminal strips, and identify each cable or wiring group being extended from a panel or cabinet to a building-mounted device shall be identified with name and number of particular device as shown.
    b. Label each unit and field within distribution racks and frames.

5. Identification within Connector Fields in Equipment Rooms and Wiring Closets: Label each connector and each discrete unit of cable-terminating and connecting hardware. Where similar jacks and plugs are used for both voice and data communication cabling, use a different color for jacks and plugs of each service.

G. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color but still complies with requirements in TIA/EIA-606-A.

1. Cables use flexible vinyl or polyester that flex as cables are bent.

3.05 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

B. Perform the following tests and inspections:

1. Visually inspect UTP and RG6 cable jacket materials for NRTL certification markings. Inspect UTP cabling terminations in communications equipment rooms for compliance with color-coding for pin assignments, and inspect cabling connections for compliance with TIA/EIA-568-C.1.
2. Visually confirm Category 6 and RG6, marking of outlets, cover plates, outlet/connectors, and patch panels.
3. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
4. Test UTP copper cabling for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination but not cross-connection.

    a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-C.2. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.

5. UTP Performance Tests:

    a. Test for each outlet. Perform the following tests according to TIA/EIA-568-C.1 and TIA/EIA-568-C.2:

        1) Wire map.
        2) Length (physical vs. electrical, and length requirements).
        3) Insertion loss.
        4) Near-end crosstalk (NEXT) loss.
        5) Power sum near-end crosstalk (PSNEXT) loss.
        6) Equal-level far-end crosstalk (ELFEXT).
        7) Power sum equal-level far-end crosstalk (PSELFEXT).
        8) Return loss.
        9) Propagation delay.
        10) Delay skew.

C. Document data for each measurement. Data for submittals shall be printed in a summary report that is formatted similar to Table 10.1 in BICSI TDMM, or transferred from the instrument to the computer, saved as text files, and printed and submitted.

D. End-to-end cabling will be considered defective if it does not pass tests and inspections.

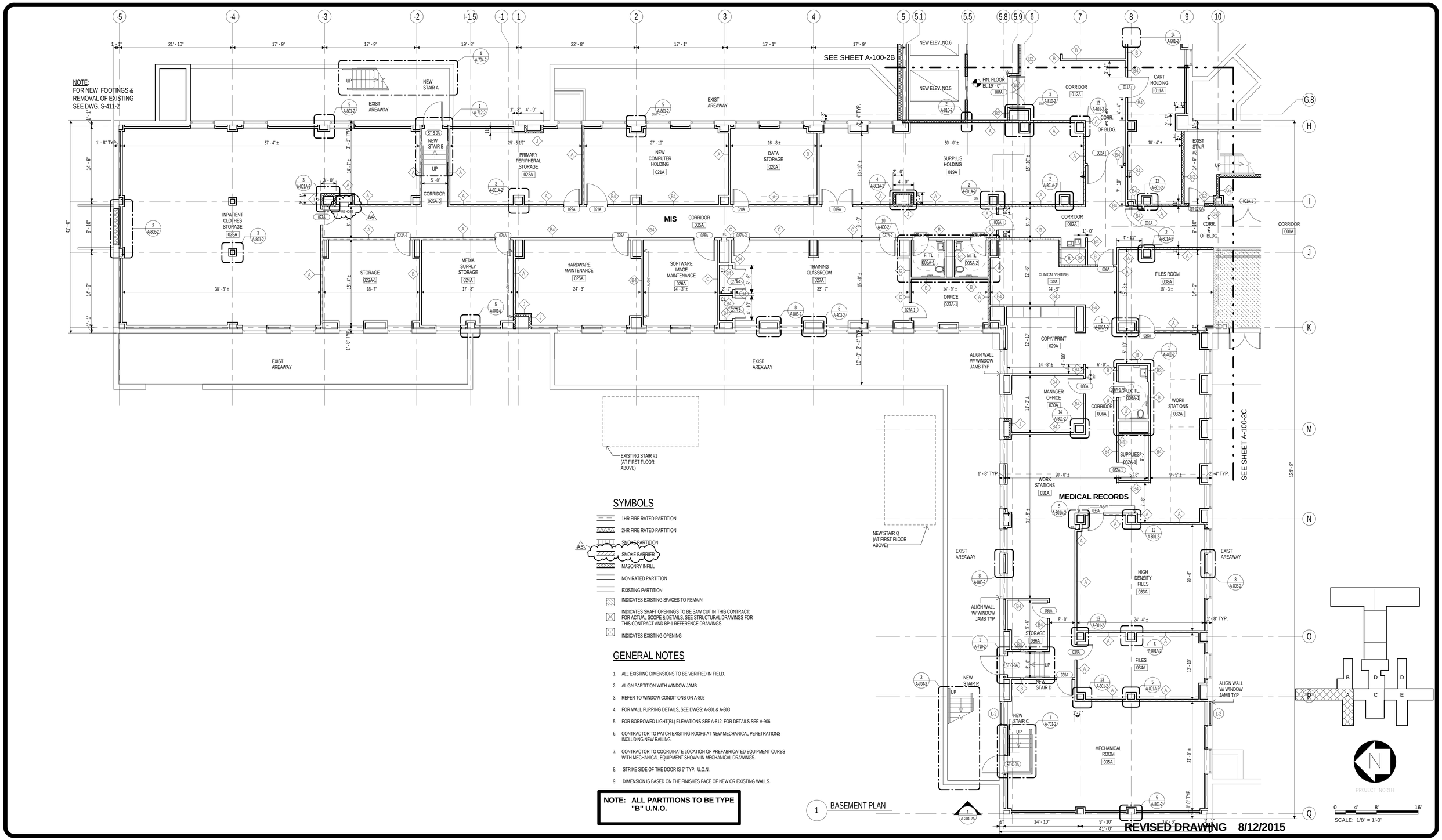
E. Test RG-6 coaxial cables and category-6 cables terminated on 6P6C RJ-11-type jacks (only) for shorts, grounds, opens and continuity.

F. Prepare test and inspection reports.

3.06 DEMONSTRATION

A. Train Owner's maintenance personnel in cable-plant management operations, including changing signal pathways for different workstations, rerouting signals in failed cables, and keeping records of cabling assignments and revisions when extending wiring to establish new workstation outlets.

END OF SECTION



1 BASEMENT PLAN

SYMBOLS

- 1HR FIRE RATED PARTITION
- 2HR FIRE RATED PARTITION
- SMOKE PARTITION
- SMOKE BARRIER
- MASONRY INFILL
- NON RATED PARTITION
- EXISTING PARTITION
- INDICATES EXISTING SPACES TO REMAIN
- INDICATES SHAFT OPENINGS TO BE SAW CUT IN THIS CONTRACT: FOR ACTUAL SCOPE & DETAILS, SEE STRUCTURAL DRAWINGS FOR THIS CONTRACT AND BP-1 REFERENCE DRAWINGS.
- INDICATES EXISTING OPENING

GENERAL NOTES

1. ALL EXISTING DIMENSIONS TO BE VERIFIED IN FIELD.
2. ALIGN PARTITION WITH WINDOW JAMB
3. REFER TO WINDOW CONDITIONS ON A-802
4. FOR WALL FURRING DETAILS, SEE DWGS: A-801 & A-803
5. FOR BORROWED LIGHT(BL) ELEVATIONS SEE A-812, FOR DETAILS SEE A-906
6. CONTRACTOR TO PATCH EXISTING ROOFS AT NEW MECHANICAL PENETRATIONS INCLUDING NEW RAILING.
7. CONTRACTOR TO COORDINATE LOCATION OF PREFABRICATED EQUIPMENT CURBS WITH MECHANICAL EQUIPMENT SHOWN IN MECHANICAL DRAWINGS.
8. STRIKE SIDE OF THE DOOR IS 6" TYP. U.O.N.
9. DIMENSION IS BASED ON THE FINISHES FACE OF NEW OR EXISTING WALLS.

NOTE: ALL PARTITIONS TO BE TYPE "B" U.N.O.

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

A Joint Venture
225 Park Avenue South
New York, New York 10003

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE:

BASEMENT FLOOR PLAN, PART "A"

BUILDING NUMBER:	DRAWING NUMBER:
102	A-100-2A
SHEET	

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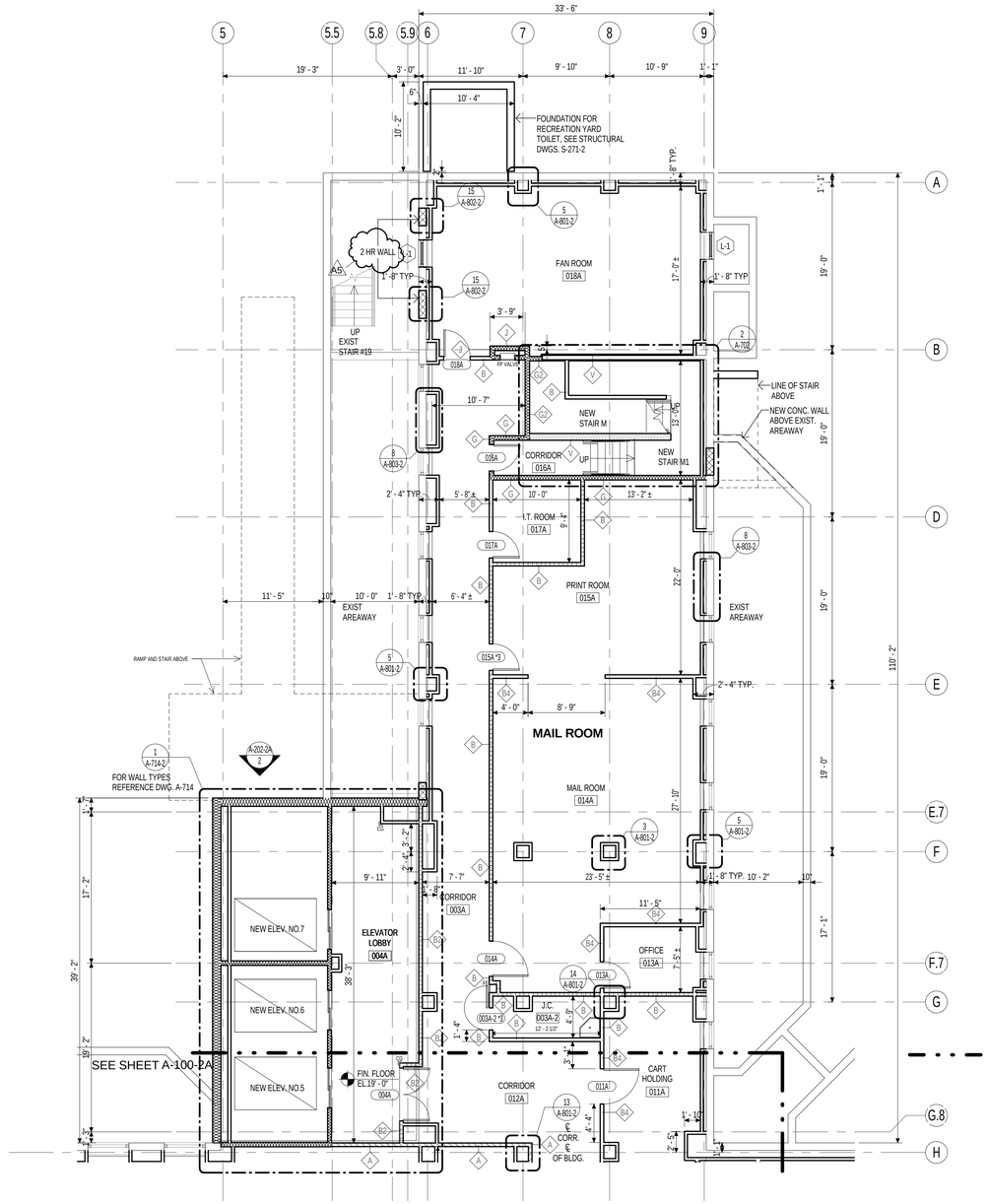

1 BASEMENT FLOOR PLAN, PART "B"

NOTE: ALL PARTITIONS TO BE TYPE "B" U.N.O.

SYMBOLS

- 1HR FIRE RATED PARTITION
- 2HR FIRE RATED PARTITION
- SMOKE PARTITION
- SMOKE BARRIER
- MASONRY WALL
- NON RATED PARTITION
- EXISTING PARTITION
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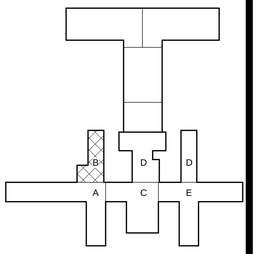
9. DIMENSION IS BASED ON THE FINISHES FACE OF NEW OR EXISTING WALLS.



PROJECT NORTH

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SCALE: 1/8" = 1'-0"

REVISED DRAWING 8/12/2015

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DESIGN & CONSTRUCTION

CONSULTANTS:

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600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER: 44578
DESIGNED BY: MAK / WW
DRAWN BY: LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK: N/A
APPROVED: WS / MAK / LF

SHEET TITLE: BASEMENT FLOOR PLAN, PART "B"

BUILDING NUMBER: 102

DRAWING NUMBER: A-100-2B

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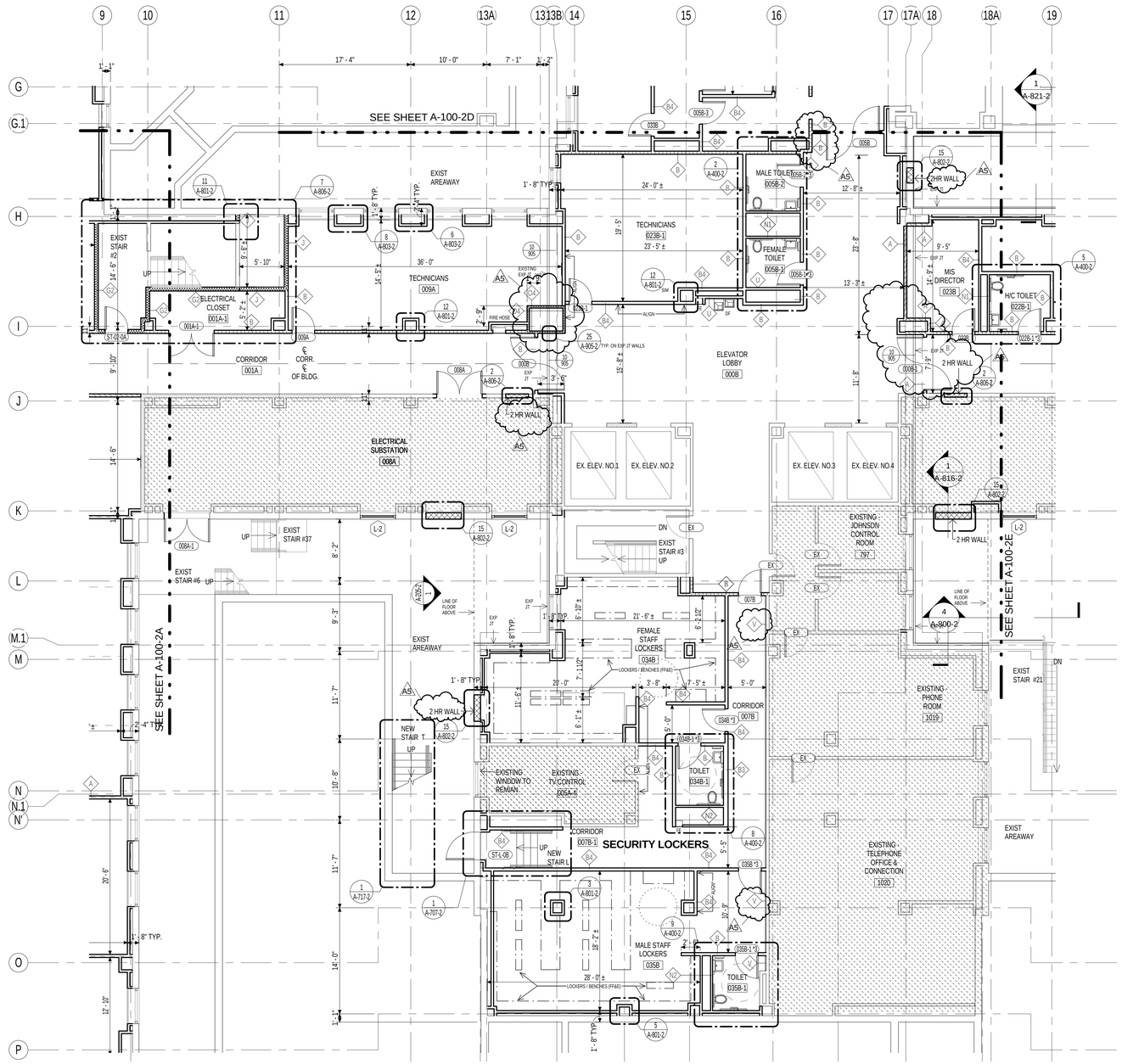

1 BASEMENT FLOOR PLAN, PART "C"

NOTE: ALL PARTITIONS TO BE TYPE "B" U.N.O.

SYMBOLS

- 1HR FIRE RATED PARTITION
- 2HR FIRE RATED PARTITION
- SMOKE PARTITION
- SMOKE BARRIER
- MASONRY WALL
- NON RATED PARTITION
- EXISTING PARTITION
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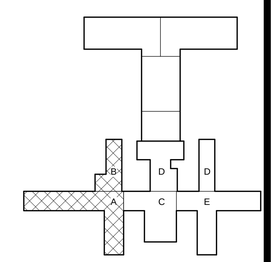
9. DIMENSION IS BASED ON THE FINISHES FACE OF NEW OR EXISTING WALLS.



PROJECT NORTH

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SCALE: 1/8" = 1'-0"

REVISED DRAWING 8/12/2015

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DESIGN & CONSTRUCTION

CONSULTANTS:

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LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
AS	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE:
BASEMENT FLOOR PLAN, PART "C"

BUILDING NUMBER: 102

DRAWING NUMBER: A-100-2C

SHEET

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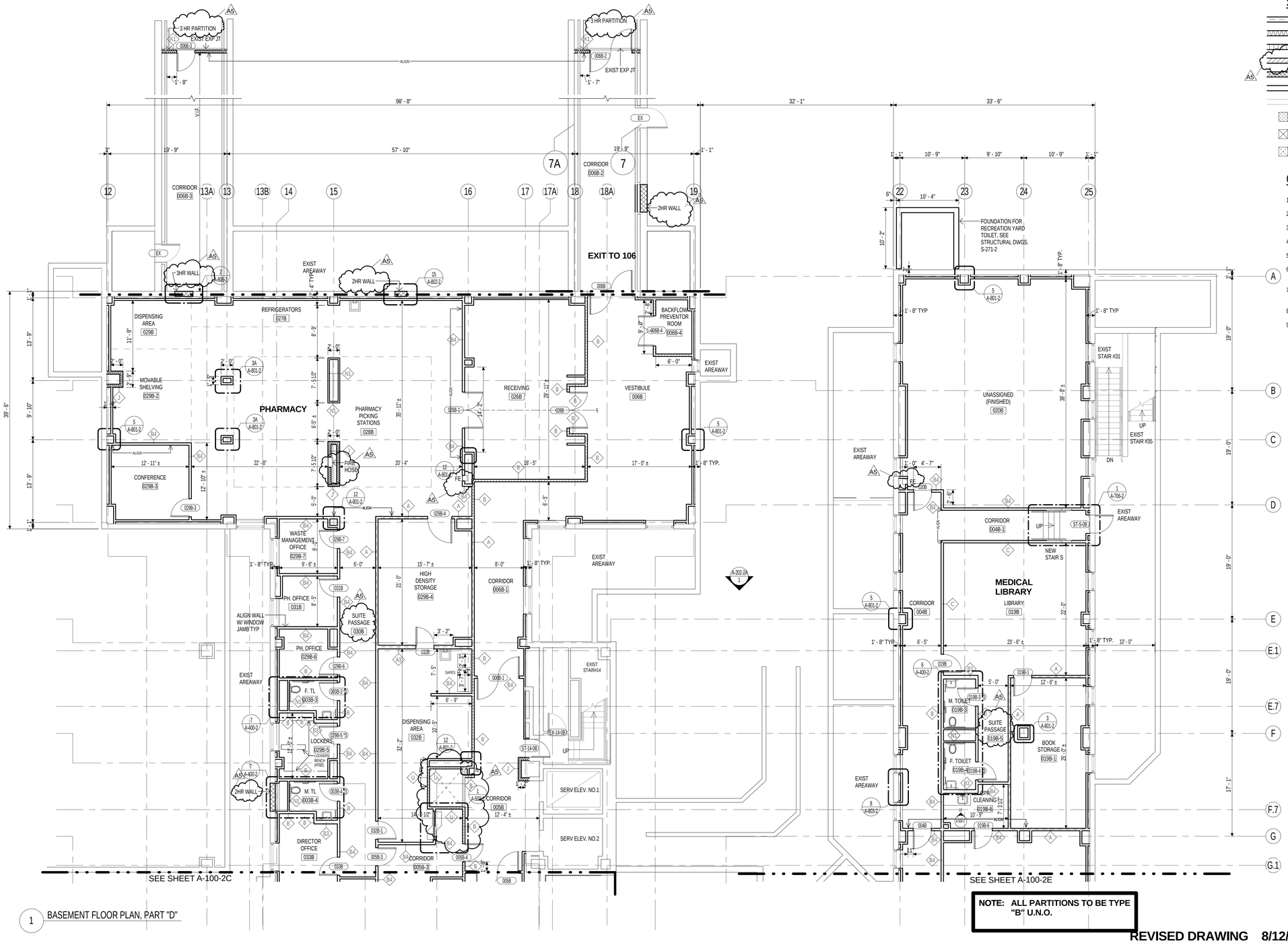

1 BASEMENT FLOOR PLAN, PART "D"

SYMBOLS

- 1HR FIRE RATED PARTITION
- 2HR FIRE RATED PARTITION
- SMOKE PARTITION
- SMOKE BARRIER
- MASONRY INFILL
- NON RATED PARTITION
- EXISTING PARTITION
- INDICATES EXISTING SPACES TO REMAIN
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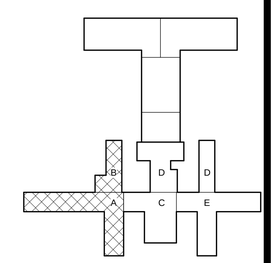

PROJECT NORTH

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SCALE: 1/8" = 1'-0"

NOTE: ALL PARTITIONS TO BE TYPE "B" U.N.O.

REVISED DRAWING 8/12/2015

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

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CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE:

BASEMENT FLOOR PLAN, PART "D"

BUILDING NUMBER:	DRAWING NUMBER:
102	A-100-2D
SHEET	

8/25/2015 12:33:38 PM

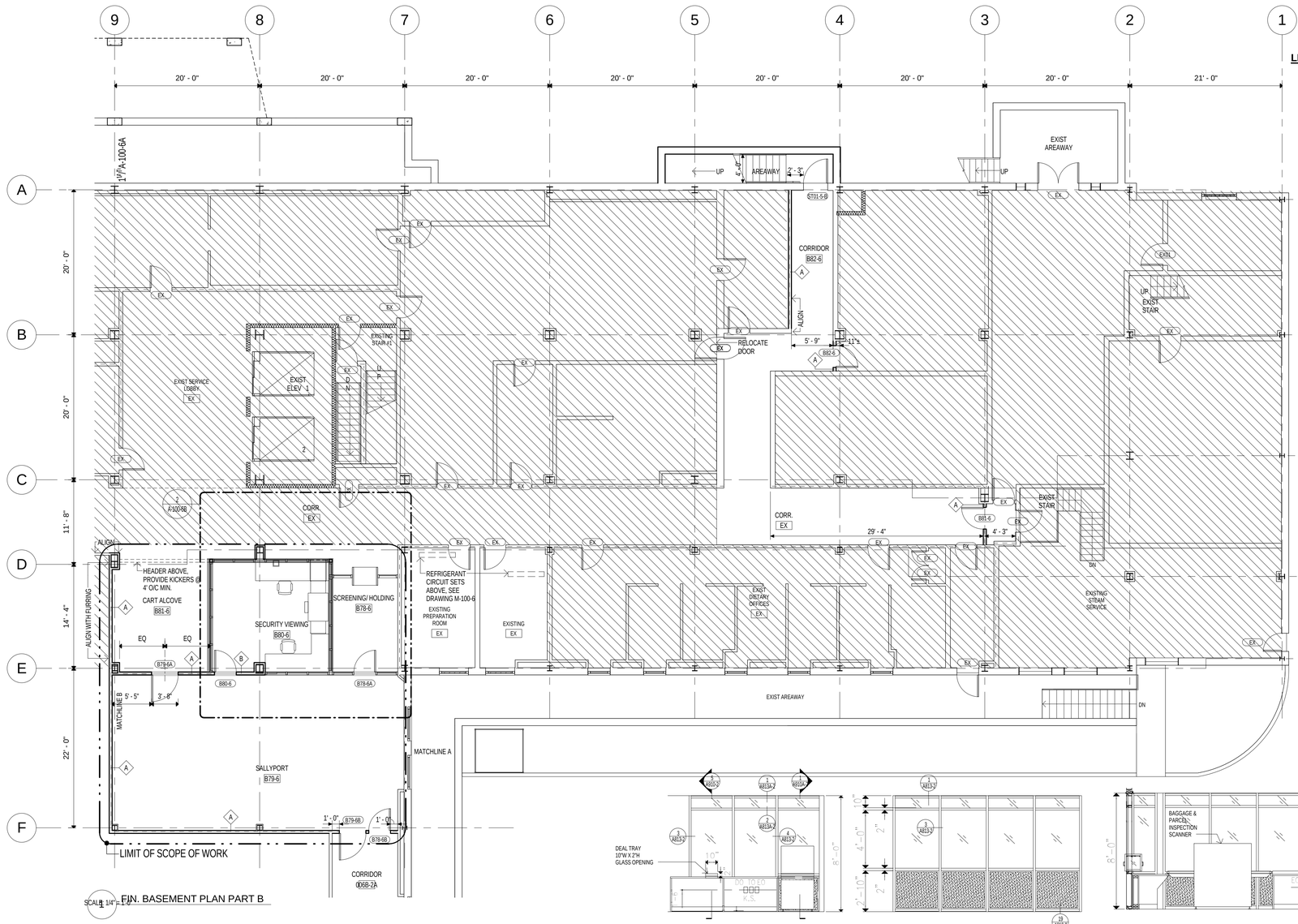
LEGEND:

BOUNDARY OF FIBERGLASS AND GLASS PARTITION TO BE DESIGNED BY BALLISTIC PROOF SUPPLIER/CONTRACTOR TO MEET BALLISTIC LEVEL 3 DESIGN REQUIREMENTS.

BOUNDARY OF FIBERGLASS AND GLASS PARTITION TO BE DESIGNED BY BALLISTIC PROOF SUPPLIER/CONTRACTOR TO MEET BALLISTIC LEVEL 2 DESIGN REQUIREMENTS.

NOTE: INDICATES EXISTING AREAS TO REMAIN

* FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS REFER TO BUILDING 102 NOTES



1 FIN. BASEMENT PLAN PART B
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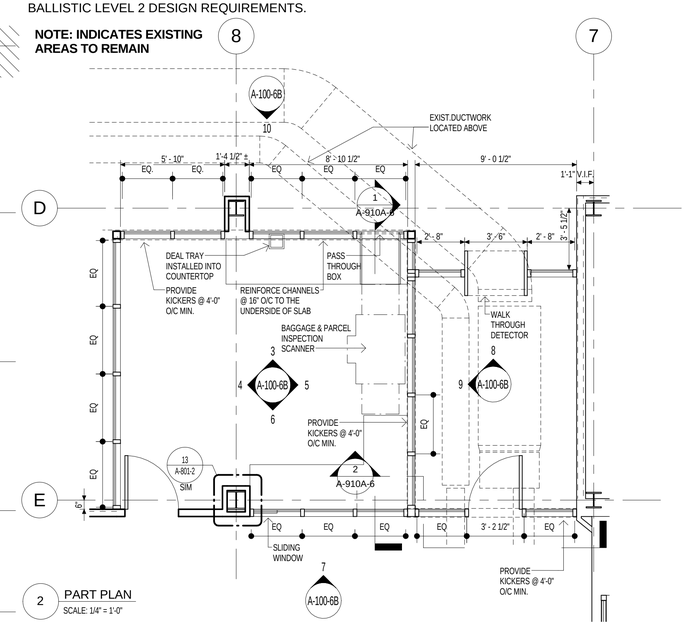
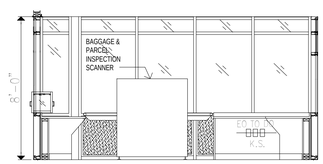


2 PART PLAN
SCALE: 1/4" = 1'-0"

3 ELEVATION
SCALE: 1/4"=1'-0"

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



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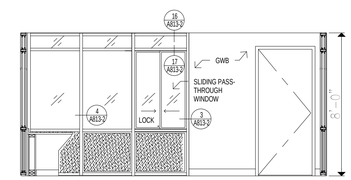

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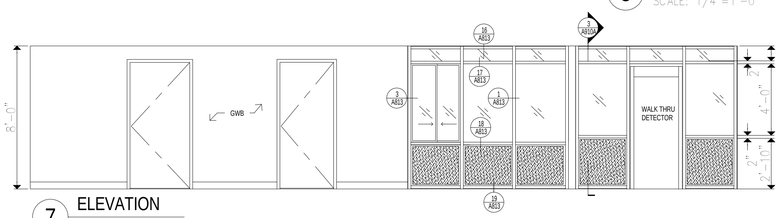
SCALE: 1/4"=1'-0"



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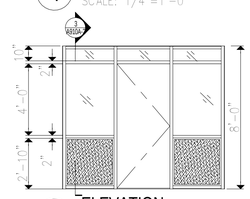
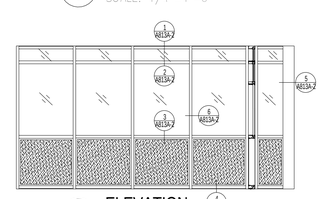
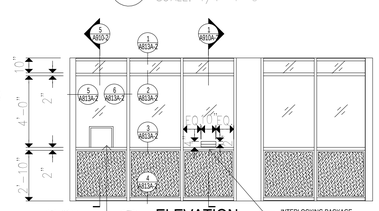
SCALE: 1/4"=1'-0"



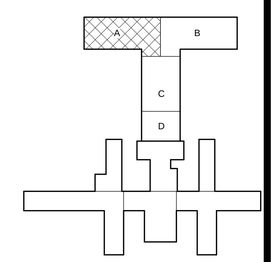
8 ELEVATION
SCALE: 1/4"=1'-0"



9 ELEVATION
SCALE: 1/4"=1'-0"



10 ELEVATION
SCALE: 1/4"=1'-0"



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SCALE: As indicated

REVISED DRAWING 8/12/2015

8/25/2015 12:00:55 PM

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	6-15-2015	BID DOCUMENT

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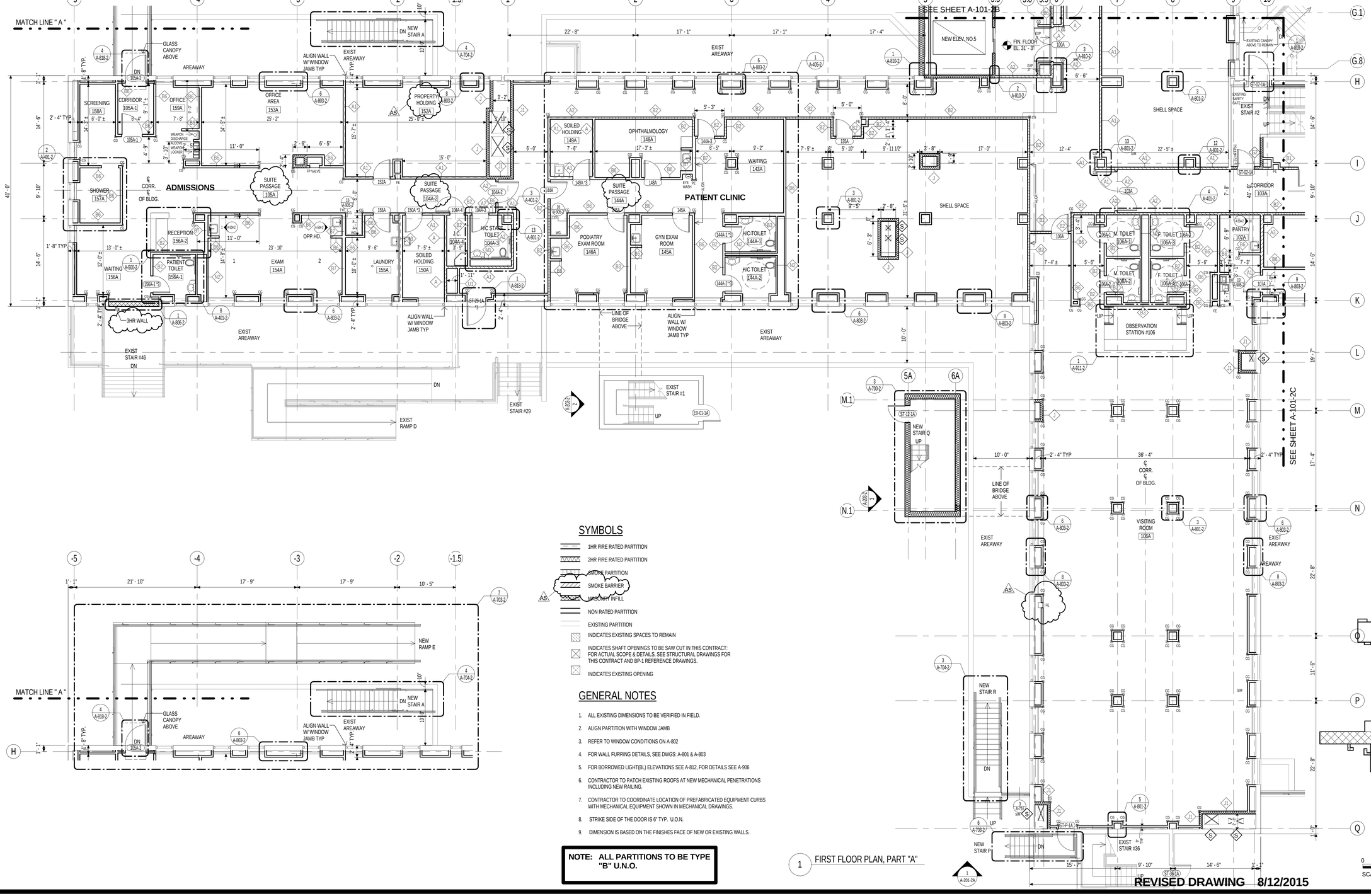
DRAWN BY:	LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE:
BASEMENT PLAN, PART "B" & ELEVATIONS

BUILDING NUMBER: 106

DRAWING NUMBER: A-100-6B

SHEET



1 FIRST FLOOR PLAN, PART "A"

SYMBOLS

- 1HR FIRE RATED PARTITION
- 2HR FIRE RATED PARTITION
- SMOKE PARTITION
- SMOKE BARRIER
- MASONRY INFILL
- NON RATED PARTITION
- EXISTING PARTITION
- INDICATES EXISTING SPACES TO REMAIN
- INDICATES SHAFT OPENINGS TO BE SAW CUT IN THIS CONTRACT: FOR ACTUAL SCOPE & DETAILS, SEE STRUCTURAL DRAWINGS FOR THIS CONTRACT AND BP-1 REFERENCE DRAWINGS.
- INDICATES EXISTING OPENING

GENERAL NOTES

1. ALL EXISTING DIMENSIONS TO BE VERIFIED IN FIELD.
2. ALIGN PARTITION WITH WINDOW JAMB
3. REFER TO WINDOW CONDITIONS ON A-802
4. FOR WALL FURRING DETAILS, SEE DWGS: A-801 & A-803
5. FOR BORROWED LIGHT(BL) ELEVATIONS SEE A-812, FOR DETAILS SEE A-906
6. CONTRACTOR TO PATCH EXISTING ROOFS AT NEW MECHANICAL PENETRATIONS INCLUDING NEW RAILING.
7. CONTRACTOR TO COORDINATE LOCATION OF PREFABRICATED EQUIPMENT CURBS WITH MECHANICAL EQUIPMENT SHOWN IN MECHANICAL DRAWINGS.
8. STRIKE SIDE OF THE DOOR IS 6" TYP. U.O.N.
9. DIMENSION IS BASED ON THE FINISHES FACE OF NEW OR EXISTING WALLS.

NOTE: ALL PARTITIONS TO BE TYPE "B" U.N.O.

REVISED DRAWING 8/12/2015

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

A Joint Venture

225 Park Avenue South
New York, New York 10003

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER: 44578
DESIGNED BY: MAK / WW
DRAWN BY: LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK: N/A
APPROVED: WS / MAK / LF

SHEET TITLE: FIRST FLOOR PLAN, PART "A"

BUILDING NUMBER: 102
DRAWING NUMBER: A-101-2A
SHEET

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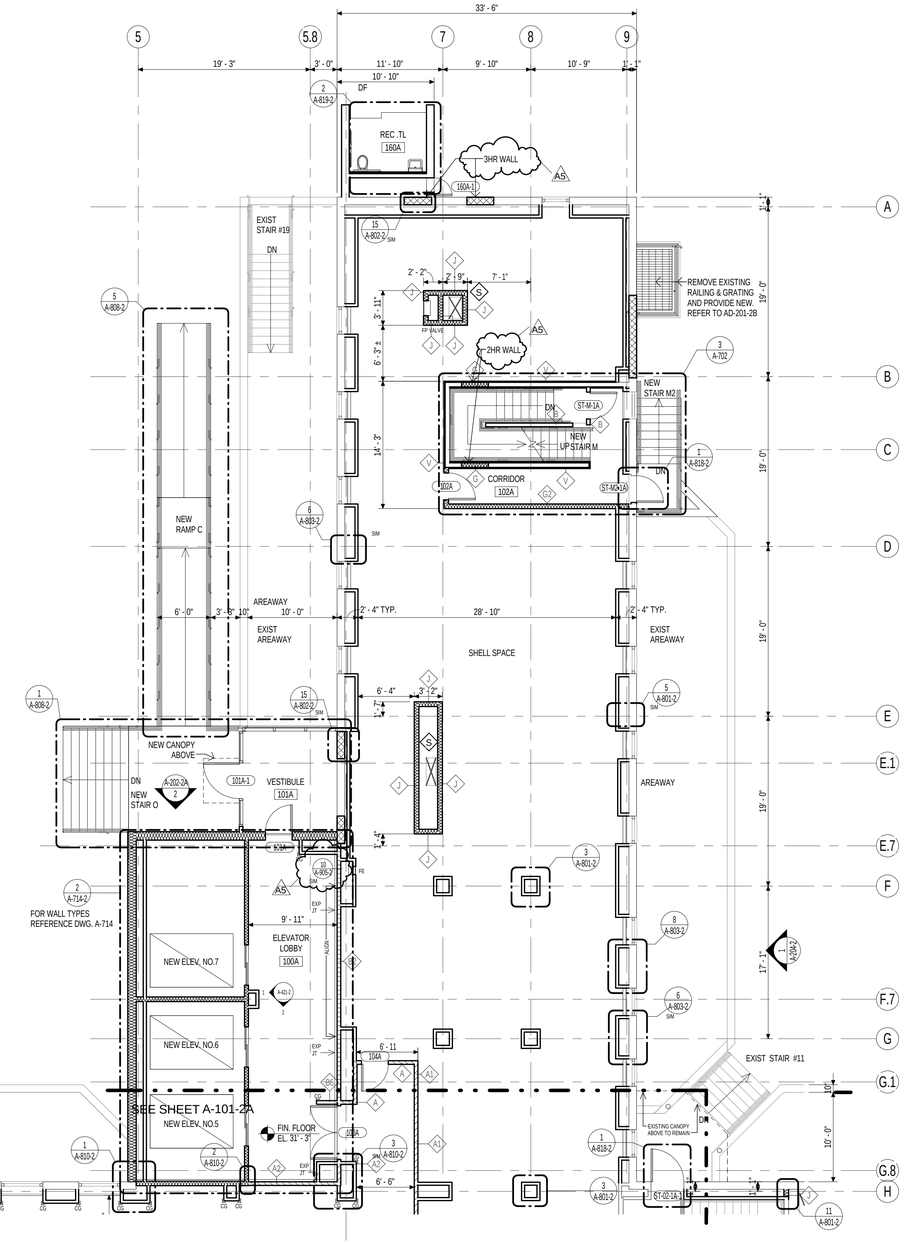

1 FIRST FLOOR PLAN, PART "B"

NOTE: ALL PARTITIONS TO BE TYPE "B" U.N.O.

SYMBOLS

- 1HR FIRE RATED PARTITION
- 2HR FIRE RATED PARTITION
- SMOKE PARTITION
- SMOKE BARRIER
- MASONRY INFILL
- NON RATED PARTITION
- EXISTING PARTITION
- INDICATES EXISTING SPACES TO REMAIN
- INDICATES SHAFT OPENINGS TO BE SAW CUT IN THIS CONTRACT: FOR ACTUAL SCOPE & DETAILS, SEE STRUCTURAL DRAWINGS FOR THIS CONTRACT AND BP-1 REFERENCE DRAWINGS.
- INDICATES EXISTING OPENING

GENERAL NOTES

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2. ALIGN PARTITION WITH WINDOW JAMB
3. REFER TO WINDOW CONDITIONS ON A-802
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5. FOR BORROWED LIGHT(BL) ELEVATIONS SEE A-812, FOR DETAILS SEE A-906
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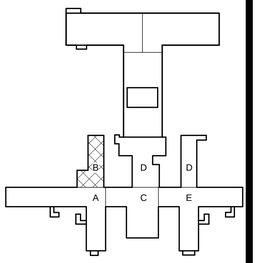
9. DIMENSION IS BASED ON THE FINISHES FACE OF NEW OR EXISTING WALLS.



PROJECT NORTH

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

REVISED DRAWING 8/12/2015

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

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600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
AS	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER: 44578
DESIGNED BY: MAK / WW
DRAWN BY: LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK: N/A
APPROVED: WS / MAK / LF

SHEET TITLE: FIRST FLOOR PLAN, PART "B"

BUILDING NUMBER: 102
DRAWING NUMBER: A-101-2B
SHEET

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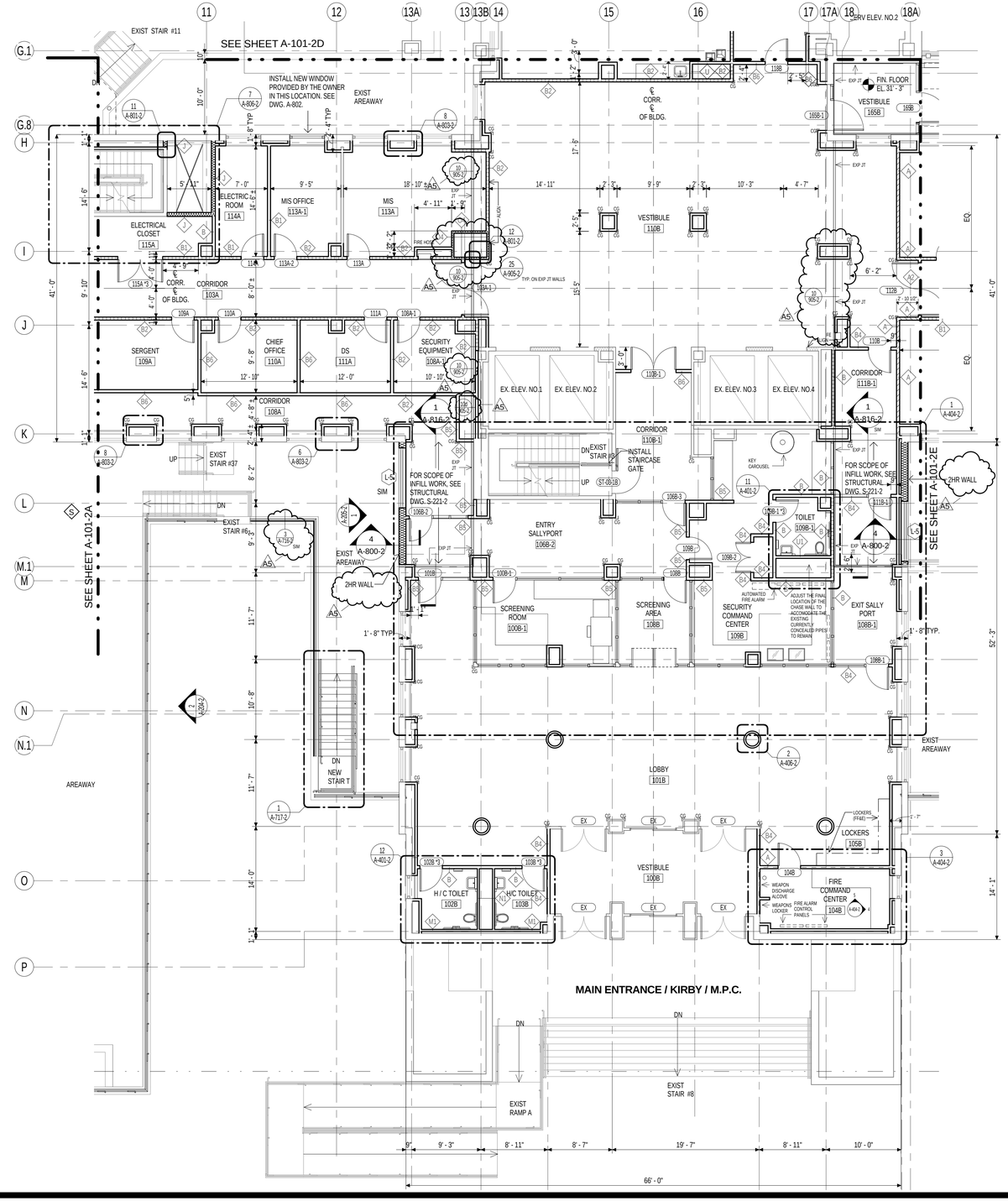

1 FIRST FLOOR PLAN, PART "C"

SYMBOLS

- 1HR FIRE RATED PARTITION
- 2HR FIRE RATED PARTITION
- SMOKE PARTITION
- SMOKE BARRIER
- MASONRY WALL
- NON RATED PARTITION
- EXISTING PARTITION
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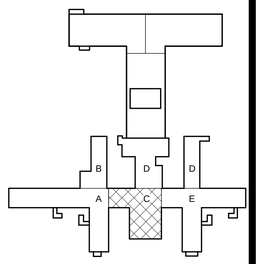

PROJECT NORTH

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

NOTE: ALL PARTITIONS TO BE TYPE "B" U.N.O.

REVISED DRAWING 8/12/2015

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CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER: 44578
DESIGNED BY: MAK / WW
DRAWN BY: LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK: N/A
APPROVED: WS / MAK / LF

SHEET TITLE: FIRST FLOOR PLAN, PART "C"

BUILDING NUMBER: 102
DRAWING NUMBER: A-101-2C
SHEET

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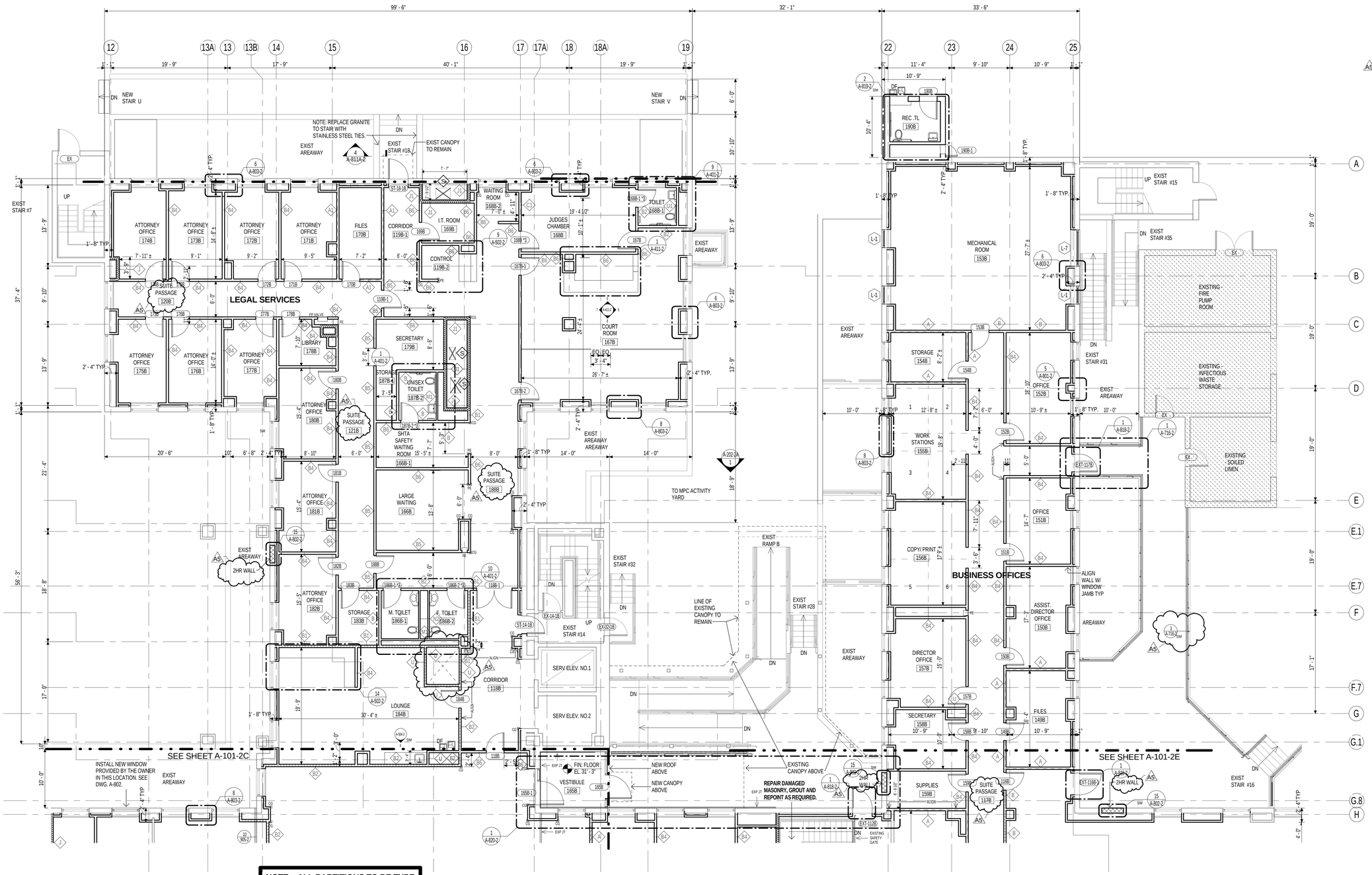

1 FIRST FLOOR PLAN, PART "D"

NOTE: ALL PARTITIONS TO BE TYPE "B" U.N.O.

SYMBOLS

- 1HR FIRE RATED PARTITION
- 2HR FIRE RATED PARTITION
- SMOKE PARTITION
- SMOKE BARRIER
- MASONRY WALL
- NON RATED PARTITION
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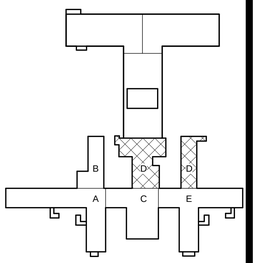

PROJECT NORTH

SCALE: 1/8" = 1'-0"

REVISED DRAWING 8/12/2015

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600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE: FIRST FLOOR PLAN, PART "D"

BUILDING NUMBER:	DRAWING NUMBER:
102	A-101-2D

SHEET

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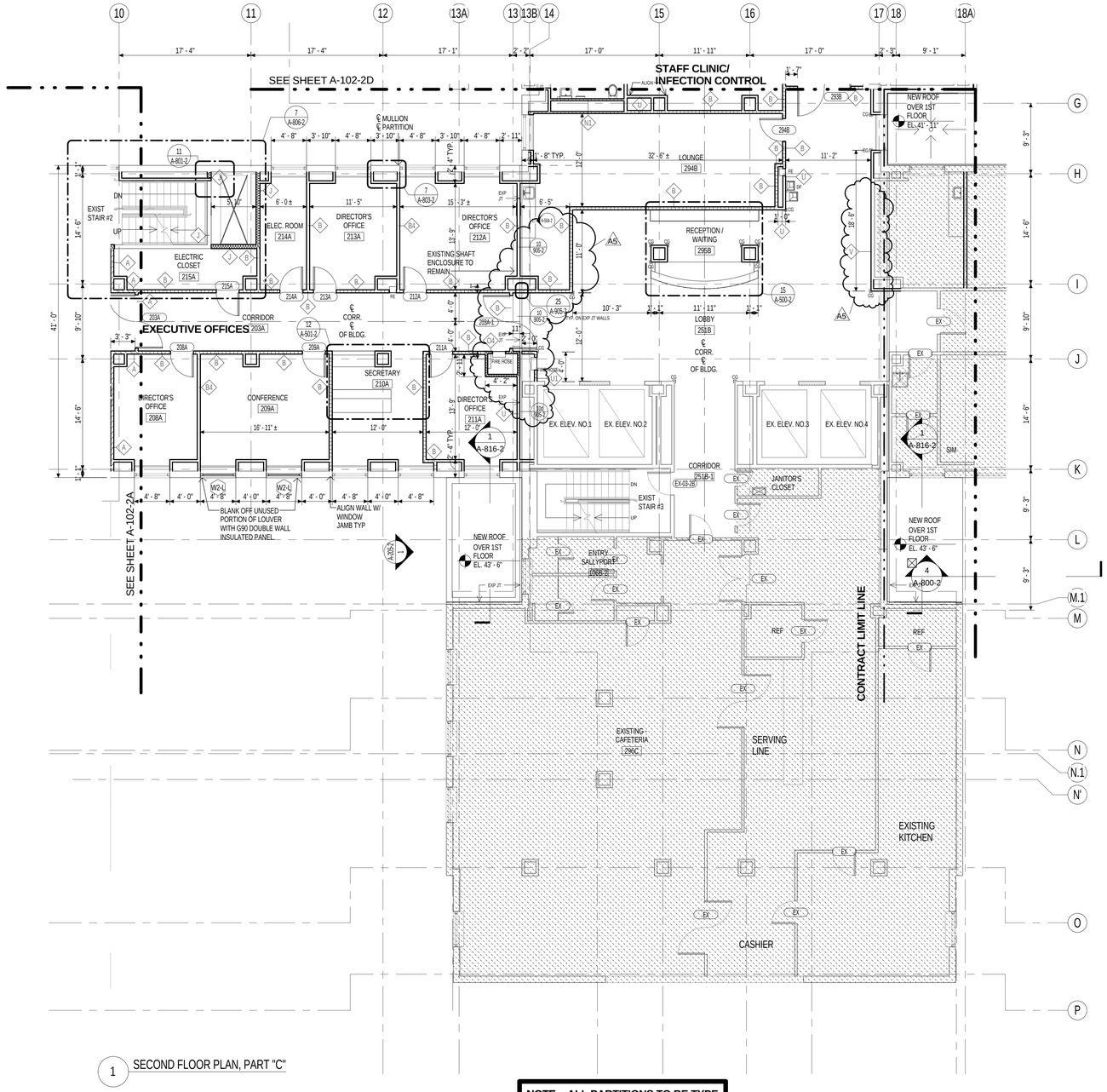

1 SECOND FLOOR PLAN, PART "C"

NOTE: ALL PARTITIONS TO BE TYPE "B" U.N.O.

SYMBOLS

- 1HR FIRE RATED PARTITION
- 2HR FIRE RATED PARTITION
- SMOKE PARTITION
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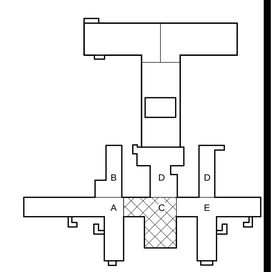

PROJECT NORTH

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

REVISED DRAWING 8/12/2015

NEW YORK STATE OF OPPORTUNITY. | Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

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LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
AS	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE: SECOND FLOOR PLAN, PART "C"

BUILDING NUMBER: 102

DRAWING NUMBER: A-102-2C

SHEET

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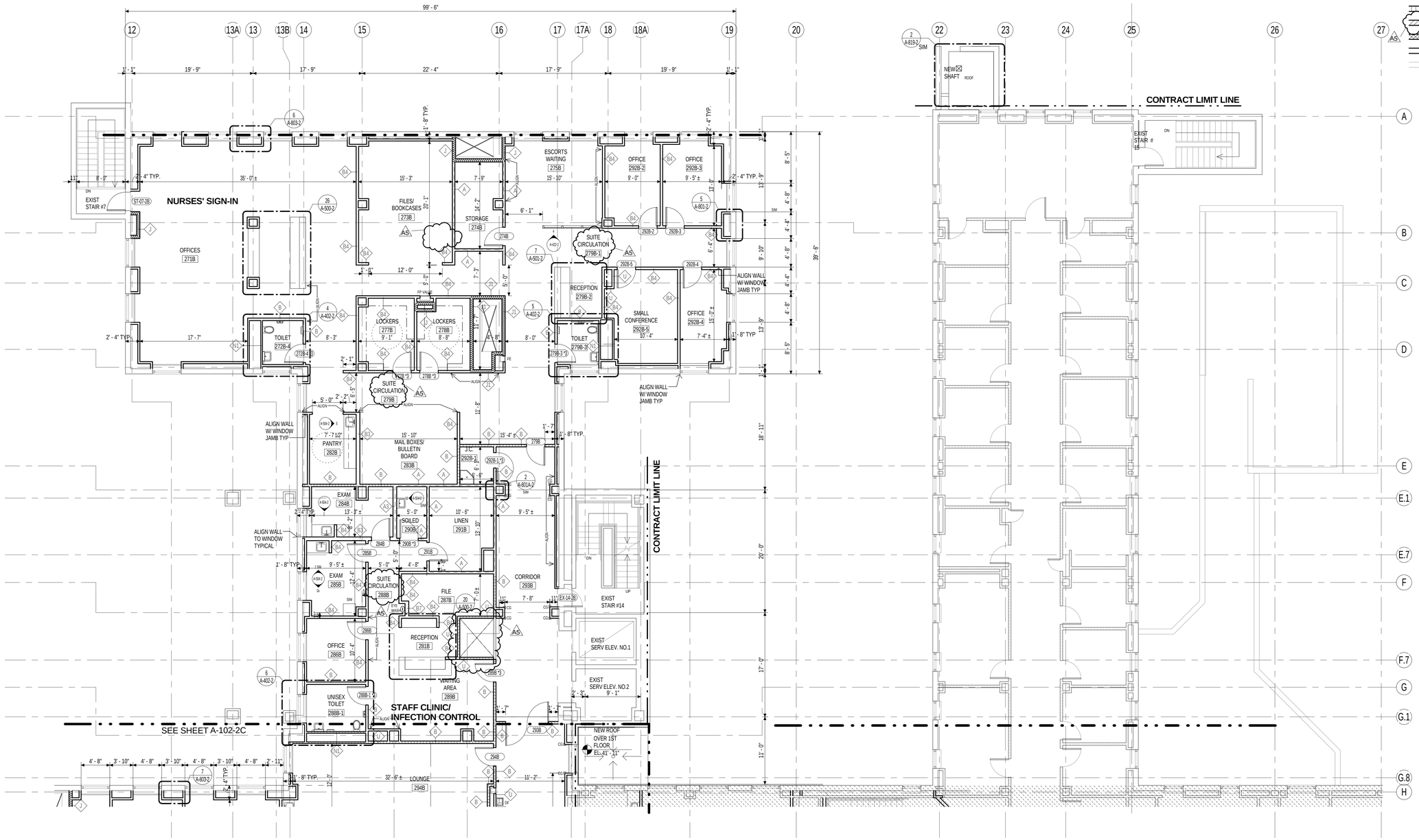

1 SECOND FLOOR PLAN, PART "D"

NOTE: ALL PARTITIONS TO BE TYPE "B" U.N.O.

SYMBOLS

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- 2HR FIRE RATED PARTITION
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- SMOKE BARRIER
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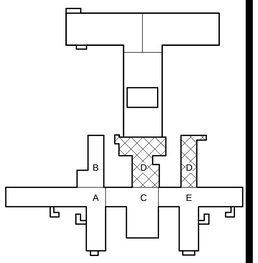

PROJECT NORTH

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

REVISED DRAWING 8/12/2015

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600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
AS	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER: 44578
DESIGNED BY: MAK / WW
DRAWN BY: LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK: N/A
APPROVED: WS / MAK / LF

SHEET TITLE: SECOND FLOOR PLAN, PART "D"

BUILDING NUMBER: 102
DRAWING NUMBER: A-102-2D
SHEET

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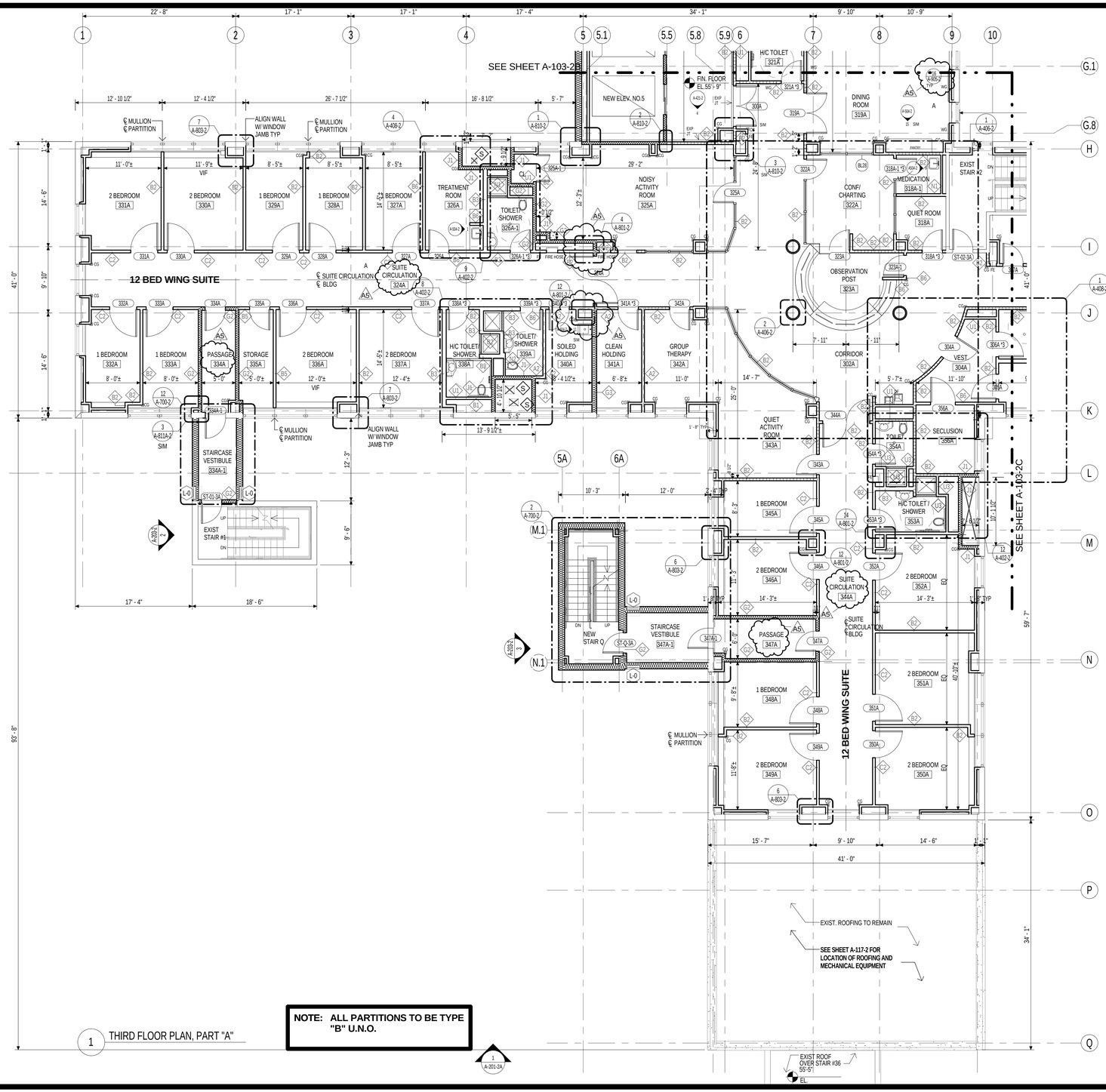

1 THIRD FLOOR PLAN, PART "A"

NOTE: ALL PARTITIONS TO BE TYPE "B" U.N.O.

SYMBOLS

- 1HR FIRE RATED PARTITION
- 2HR FIRE RATED PARTITION
- SMOKE PARTITION
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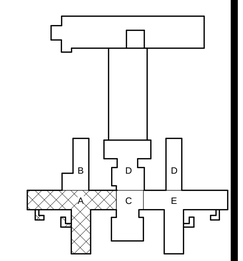

PROJECT NORTH

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

REVISED DRAWING 8/12/2015

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	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE: THIRD FLOOR PLAN, PART "A"

BUILDING NUMBER: 102

DRAWING NUMBER: A-103-2A

SHEET

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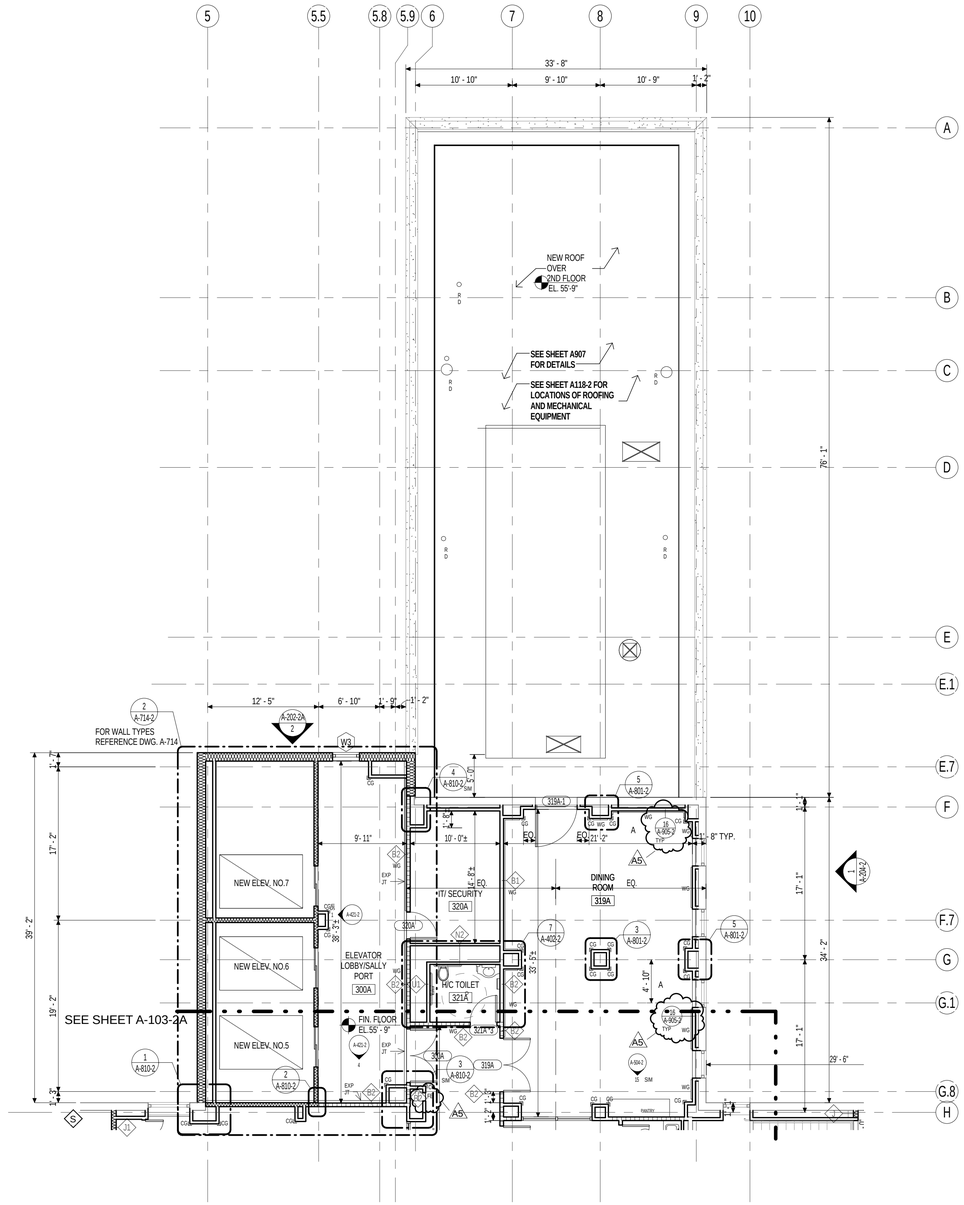

1 THIRD FLOOR PLAN, PART "B"

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SYMBOLS

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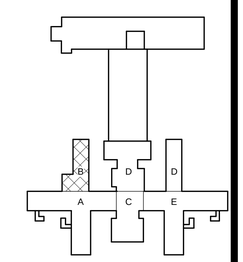
4. FOR WALL FURRING DETAILS, SEE DWGS: A-801 & A-803
5. FOR BORROWED LIGHT(BL) ELEVATIONS SEE A-812, FOR DETAILS SEE A-906
6. CONTRACTOR TO PATCH EXISTING ROOFS AT NEW MECHANICAL PENETRATIONS INCLUDING NEW RAILING.
7. CONTRACTOR TO COORDINATE LOCATION OF PREFABRICATED EQUIPMENT CURBS WITH MECHANICAL EQUIPMENT SHOWN IN MECHANICAL DRAWINGS.
8. STRIKE SIDE OF THE DOOR IS 6" TYP. U.O.N.
9. DIMENSION IS BASED ON THE FINISHES FACE OF NEW OR EXISTING WALLS.



PROJECT NORTH

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

REVISED DRAWING 8/12/2015

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

A Joint Venture
225 Park Avenue South
New York, New York 10003

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER: 44578
DESIGNED BY: MAK / WW
DRAWN BY: LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK: N/A
APPROVED: WS / MAK / LF

SHEET TITLE: THIRD FLOOR PLAN, PART "B"

BUILDING NUMBER: 102
DRAWING NUMBER: A-103-2B
SHEET

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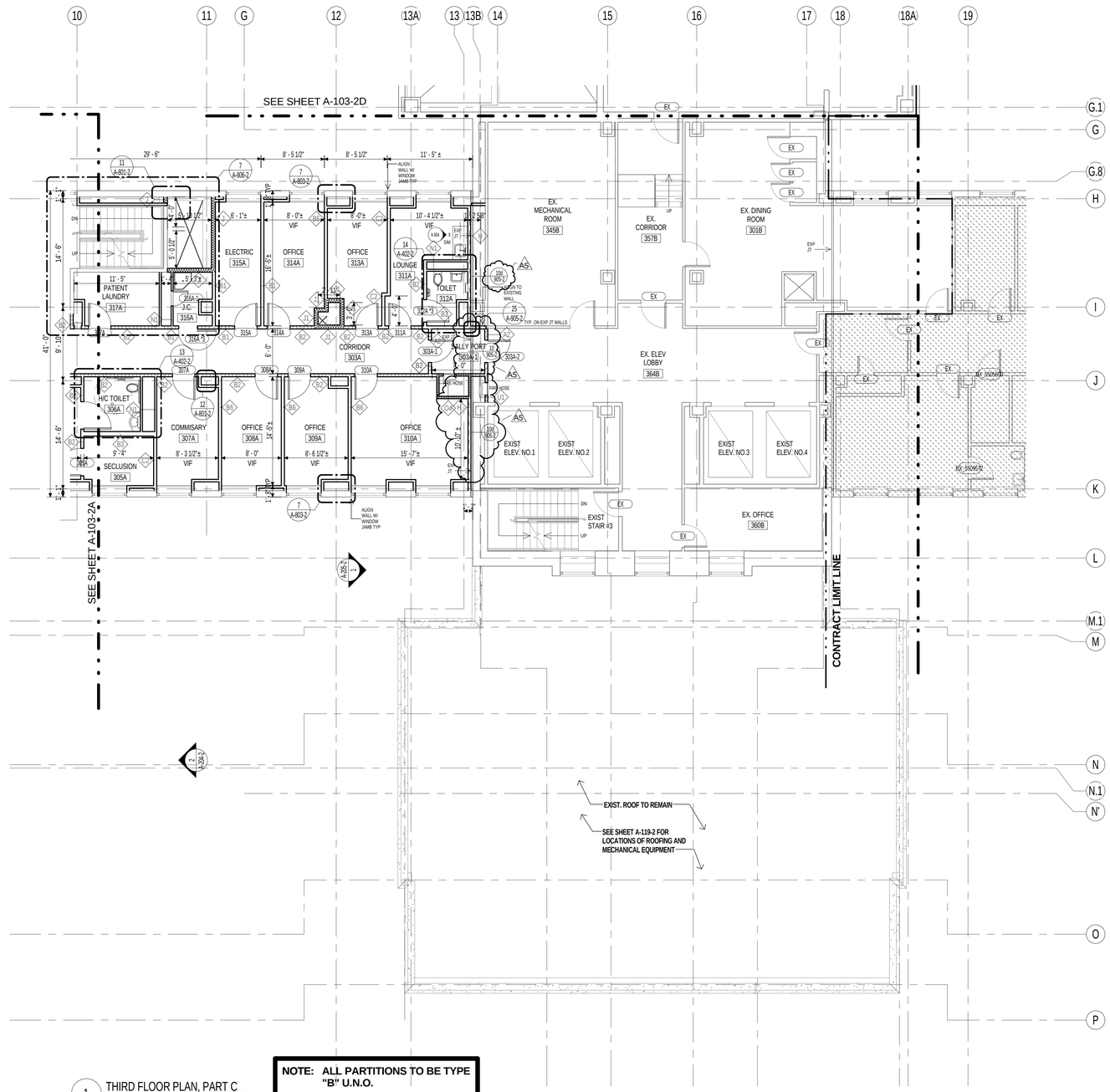

1 THIRD FLOOR PLAN, PART C

NOTE: ALL PARTITIONS TO BE TYPE "B" U.N.O.

SYMBOLS

- 1HR FIRE RATED PARTITION
- 2HR FIRE RATED PARTITION
- SMOKE PARTITION
- SMOKE BARRIER
- MASONRY INFILL
- NON RATED PARTITION
- EXISTING PARTITION
- INDICATES EXISTING SPACES TO REMAIN
- INDICATES SHAFT OPENINGS TO BE SAW CUT IN THIS CONTRACT: FOR ACTUAL SCOPE & DETAILS, SEE STRUCTURAL DRAWINGS FOR THIS CONTRACT AND BP-1 REFERENCE DRAWINGS.
- INDICATES EXISTING OPENING

GENERAL NOTES

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3. REFER TO WINDOW CONDITIONS ON A-802
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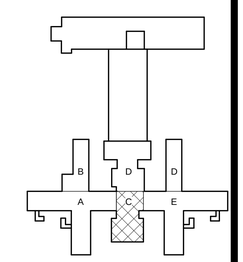
8. STRIKE SIDE OF THE DOOR IS 6" TYP. U.O.N.
9. DIMENSION IS BASED ON THE FINISHES FACE OF NEW OR EXISTING WALLS.



PROJECT NORTH

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

REVISED DRAWING 8/12/2015

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

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LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

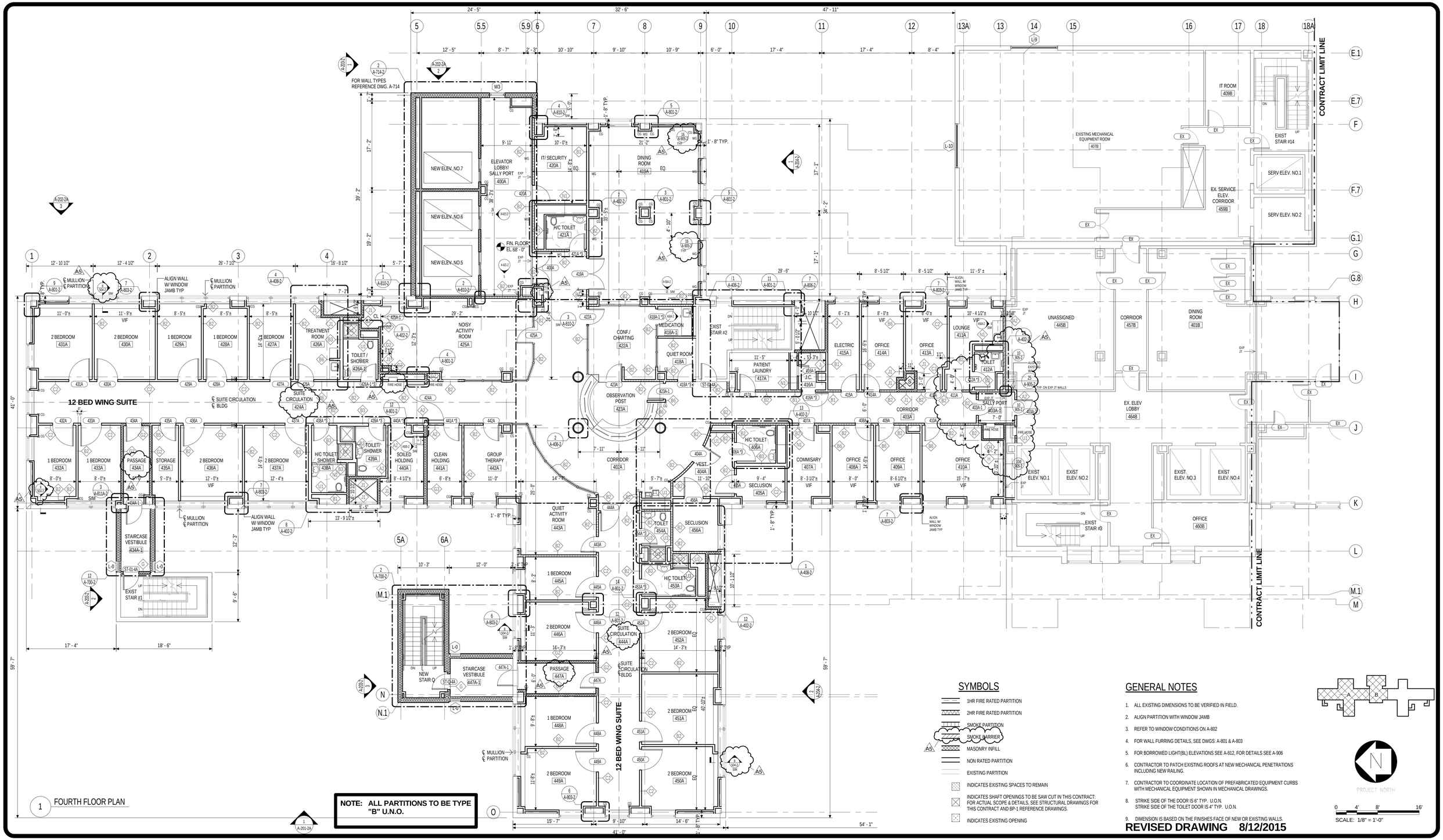
MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER: 44578
DESIGNED BY: MAK / WW
DRAWN BY: LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK: N/A
APPROVED: WS / MAK / LF

SHEET TITLE: THIRD FLOOR PLAN, PART "C"

BUILDING NUMBER: 102
DRAWING NUMBER: A-103-2C
SHEET

8/25/2015 2:37:39 PM



1 FOURTH FLOOR PLAN

NOTE: ALL PARTITIONS TO BE TYPE "B" U.N.O.

SYMBOLS

- 1HR FIRE RATED PARTITION
- 2HR FIRE RATED PARTITION
- SMOKE PARTITION
- SMOKE BARRIER
- MASONRY INFILL
- NON RATED PARTITION
- EXISTING PARTITION
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REVISED DRAWING 8/12/2015

PROJECT NORTH

SCALE: 1/8" = 1'-0"

NEW YORK STATE OF OPPORTUNITY. | Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

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TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER: 44578
DESIGNED BY: MAK / WW
DRAWN BY: LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK: N/A
APPROVED: WS / MAK / LF

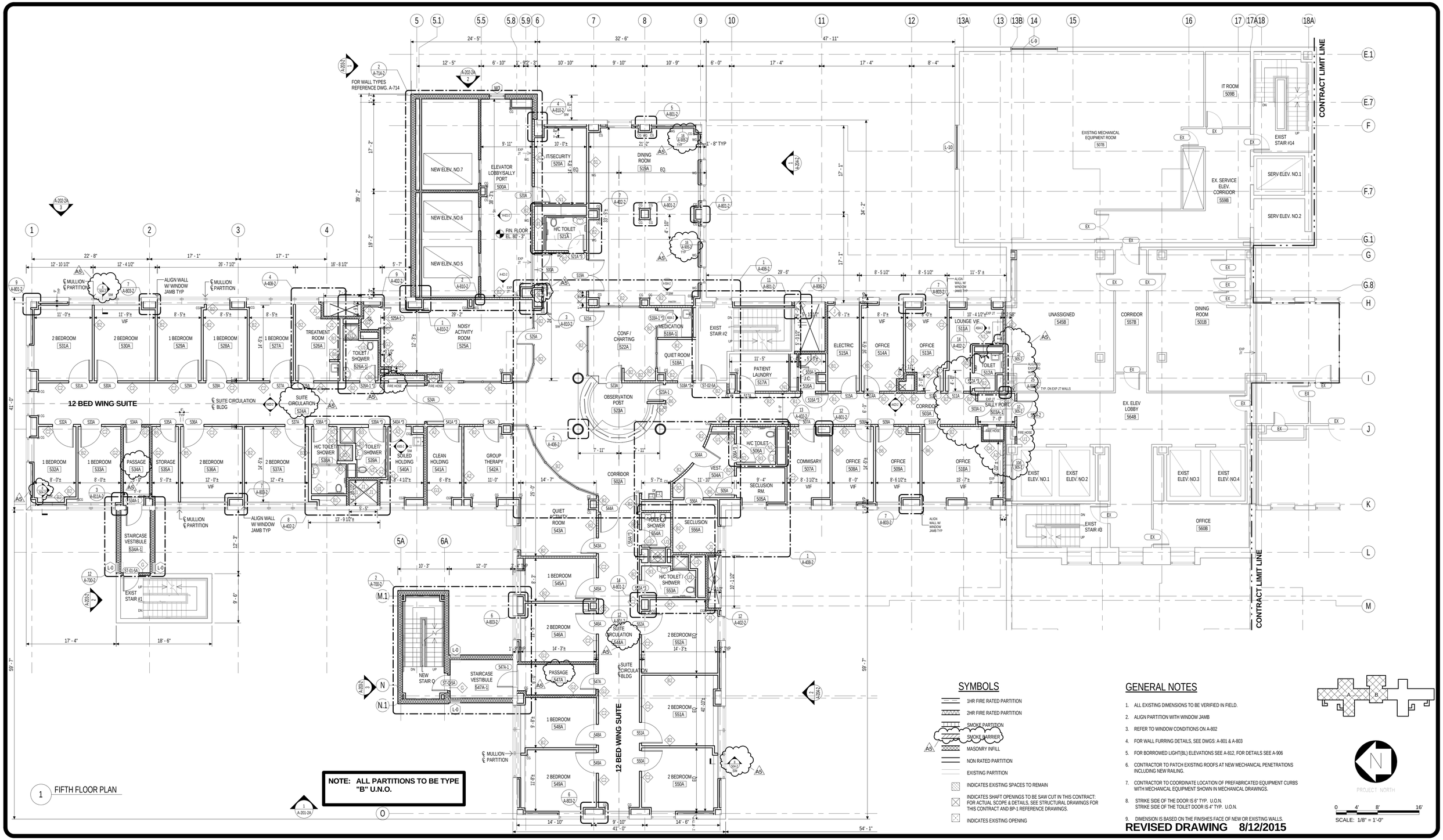
SHEET TITLE: FOURTH FLOOR PLAN

BUILDING NUMBER: 102

DRAWING NUMBER: A-104-2

SHEET

8/25/2015 2:37:05 PM



SYMBOLS

- 1HR FIRE RATED PARTITION
- 2HR FIRE RATED PARTITION
- SMOKE PARTITION
- SMOKE BARRIER
- MASONRY INFILL
- NON RATED PARTITION
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9. DIMENSION IS BASED ON THE FINISHES FACE OF NEW OR EXISTING WALLS.

REVISED DRAWING 8/12/2015

PROJECT NORTH

SCALE: 1/8" = 1'-0"

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER: 44578
DESIGNED BY: MAK / WW
DRAWN BY: LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK: N/A
APPROVED: WS / MAK / LF

SHEET TITLE: FIFTH FLOOR PLAN

BUILDING NUMBER: 102

DRAWING NUMBER: A-105-2

SHEET

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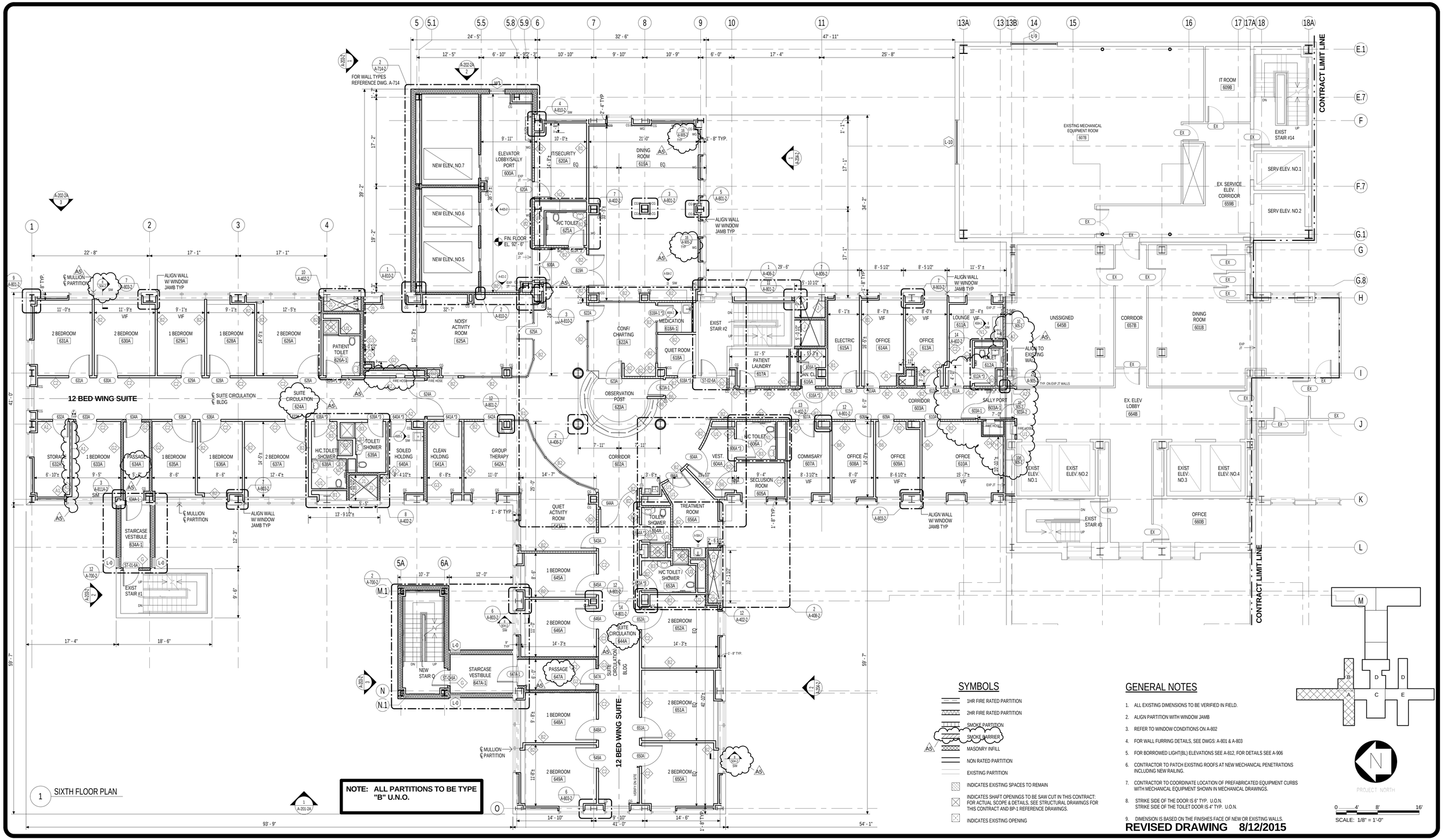

SYMBOLS

- 1HR FIRE RATED PARTITION
- 2HR FIRE RATED PARTITION
- SMOKE PARTITION
- SMOKE BARRIER
- MASONRY INFILL
- NON RATED PARTITION
- EXISTING PARTITION
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9. DIMENSION IS BASED ON THE FINISHES FACE OF NEW OR EXISTING WALLS.

REVISED DRAWING 8/12/2015

PROJECT NORTH

SCALE: 1/8" = 1'-0"

NEW YORK STATE OF OPPORTUNITY. | Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

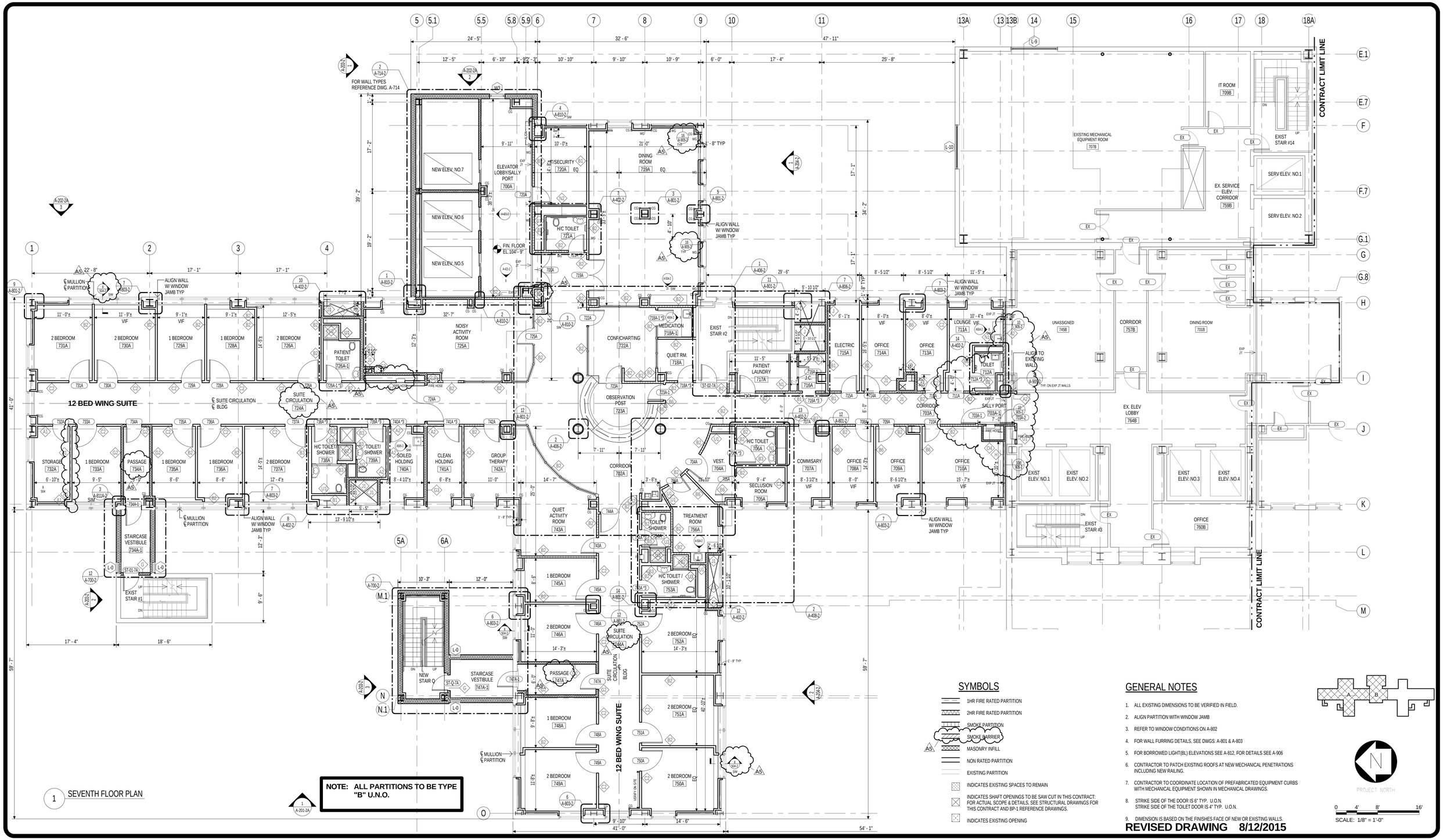
MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE: SIXTH FLOOR PLAN

BUILDING NUMBER:	DRAWING NUMBER:
102	A-106-2
SHEET	

8/25/2015 4:36:51 PM



1 SEVENTH FLOOR PLAN

SYMBOLS

- 1HR FIRE RATED PARTITION
- 2HR FIRE RATED PARTITION
- SMOKE PARTITION
- SMOKE BARRIER
- MASONRY INFILL
- NON RATED PARTITION
- EXISTING PARTITION
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9. DIMENSION IS BASED ON THE FINISHES FACE OF NEW OR EXISTING WALLS.

REVISED DRAWING 8/12/2015

PROJECT NORTH

SCALE: 1/8" = 1'-0"

NEW YORK STATE OF OPPORTUNITY. | Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

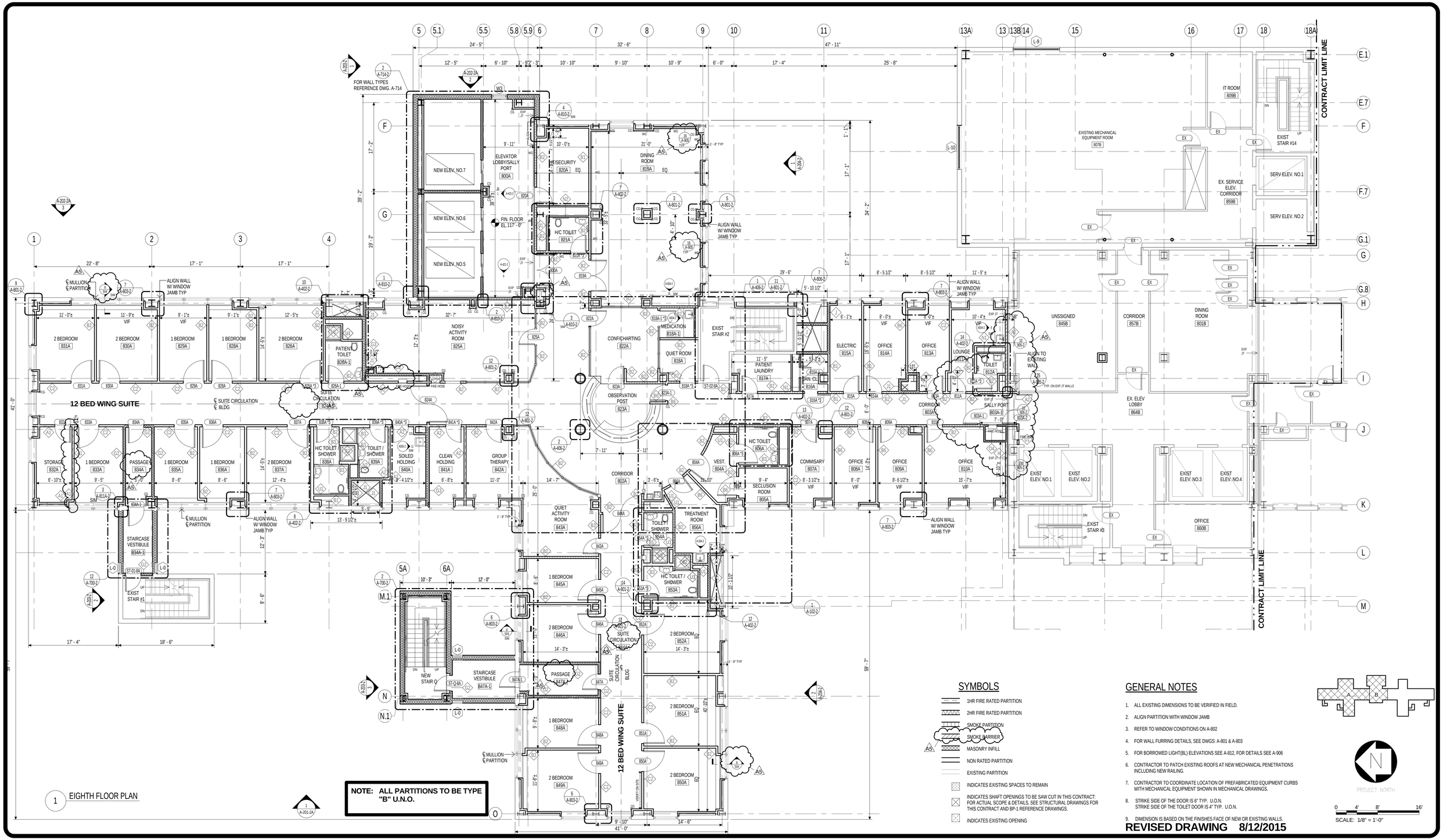
MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE: SEVENTH FLOOR PLAN

BUILDING NUMBER:	DRAWING NUMBER:
102	A-107-2
SHEET	

8/25/2015 4:36:59 PM



1 EIGHTH FLOOR PLAN

SYMBOLS

- 1HR FIRE RATED PARTITION
- 2HR FIRE RATED PARTITION
- SMOKE PARTITION
- SMOKE BARRIER
- A5 MASONRY INFILL
- NON RATED PARTITION
- EXISTING PARTITION
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REVISED DRAWING 8/12/2015

PROJECT NORTH

SCALE: 1/8" = 1'-0"

NEW YORK STATE OF OPPORTUNITY. | Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE: EIGHTH FLOOR PLAN

BUILDING NUMBER:	DRAWING NUMBER:
102	A-108-2
SHEET	

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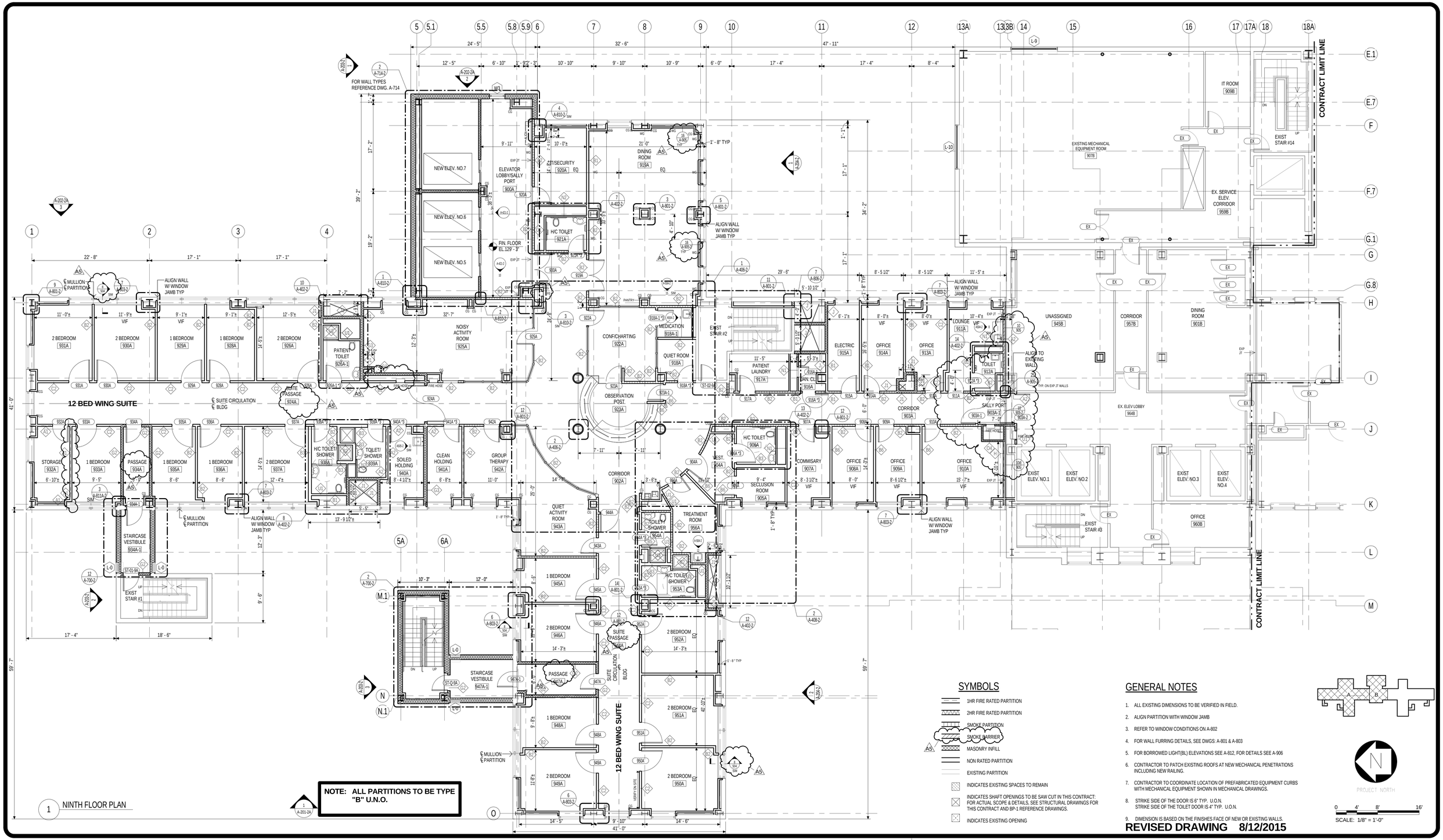

1 NINTH FLOOR PLAN

SYMBOLS

- 1HR FIRE RATED PARTITION
- 2HR FIRE RATED PARTITION
- SMOKE PARTITION
- SMOKE BARRIER
- MASONRY INFILL
- NON RATED PARTITION
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REVISED DRAWING 8/12/2015

PROJECT NORTH

SCALE: 1/8" = 1'-0"

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

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CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

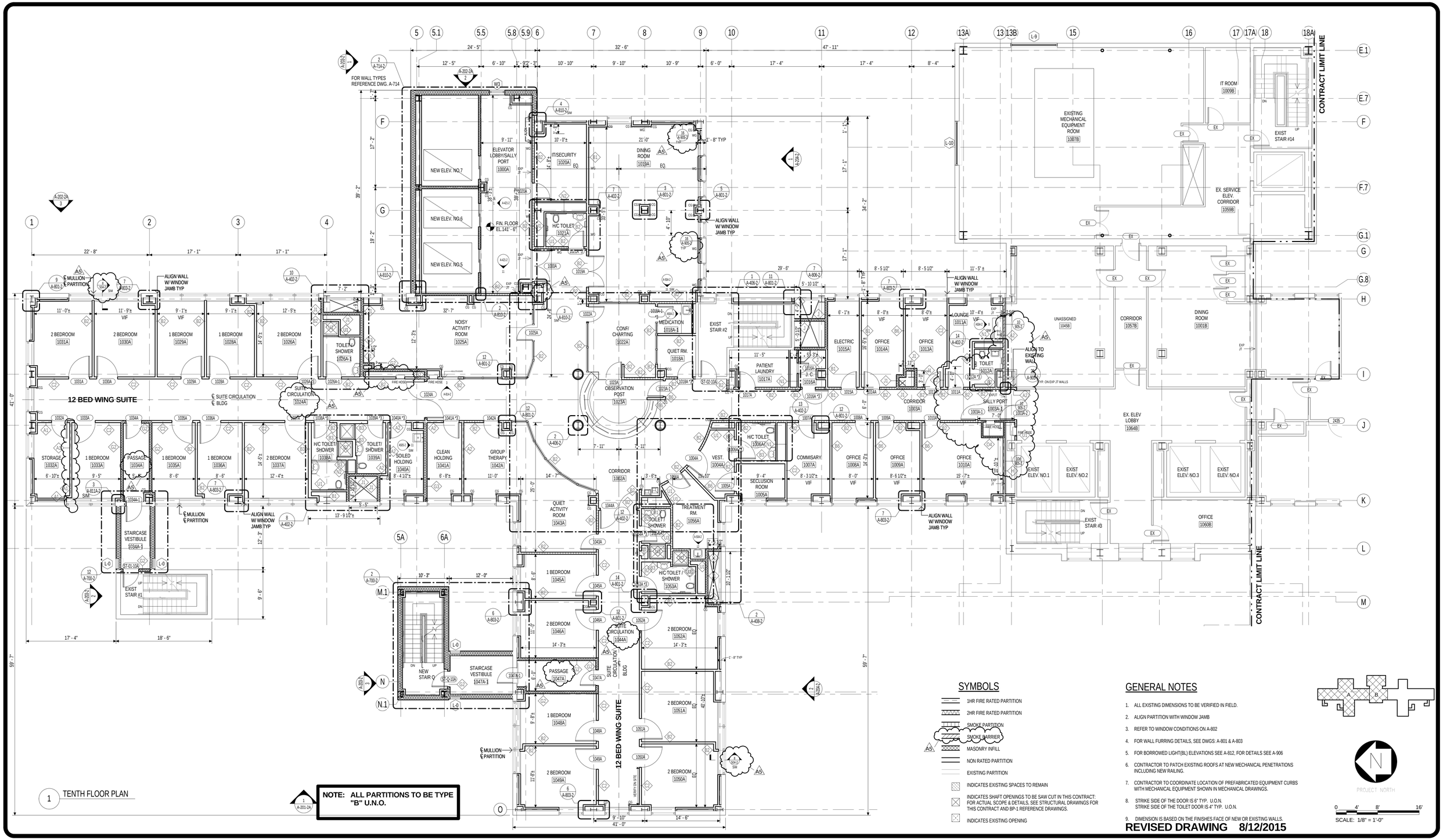
SHEET TITLE: NINTH FLOOR PLAN

BUILDING NUMBER: 102

DRAWING NUMBER: A-109-2

SHEET

8/25/2015 4:37:35 PM



SYMBOLS

- 1HR FIRE RATED PARTITION
- 2HR FIRE RATED PARTITION
- SMOKE PARTITION
- SMOKE BARRIER
- MASONRY INFILL
- NON RATED PARTITION
- EXISTING PARTITION
- INDICATES EXISTING SPACES TO REMAIN
- INDICATES SHAFT OPENINGS TO BE SAW CUT IN THIS CONTRACT: FOR ACTUAL SCOPE & DETAILS, SEE STRUCTURAL DRAWINGS FOR THIS CONTRACT AND BP-1 REFERENCE DRAWINGS.
- INDICATES EXISTING OPENING

GENERAL NOTES

1. ALL EXISTING DIMENSIONS TO BE VERIFIED IN FIELD.
2. ALIGN PARTITION WITH WINDOW JAMB
3. REFER TO WINDOW CONDITIONS ON A-802
4. FOR WALL FURRING DETAILS, SEE DWGS: A-801 & A-803
5. FOR BORROWED LIGHT(BL) ELEVATIONS SEE A-812, FOR DETAILS SEE A-906
6. CONTRACTOR TO PATCH EXISTING ROOFS AT NEW MECHANICAL PENETRATIONS INCLUDING NEW RAILING.
7. CONTRACTOR TO COORDINATE LOCATION OF PREFABRICATED EQUIPMENT CURBS WITH MECHANICAL EQUIPMENT SHOWN IN MECHANICAL DRAWINGS.
8. STRIKE SIDE OF THE DOOR IS 6" TYP. U.O.N. STRIKE SIDE OF THE TOILET DOOR IS 4" TYP. U.O.N.
9. DIMENSION IS BASED ON THE FINISHES FACE OF NEW OR EXISTING WALLS.

REVISED DRAWING 8/12/2015

PROJECT NORTH

SCALE: 1/8" = 1'-0"

NEW YORK STATE OF OPPORTUNITY. | Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

A Joint Venture
225 Park Avenue South
New York, New York 10003

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

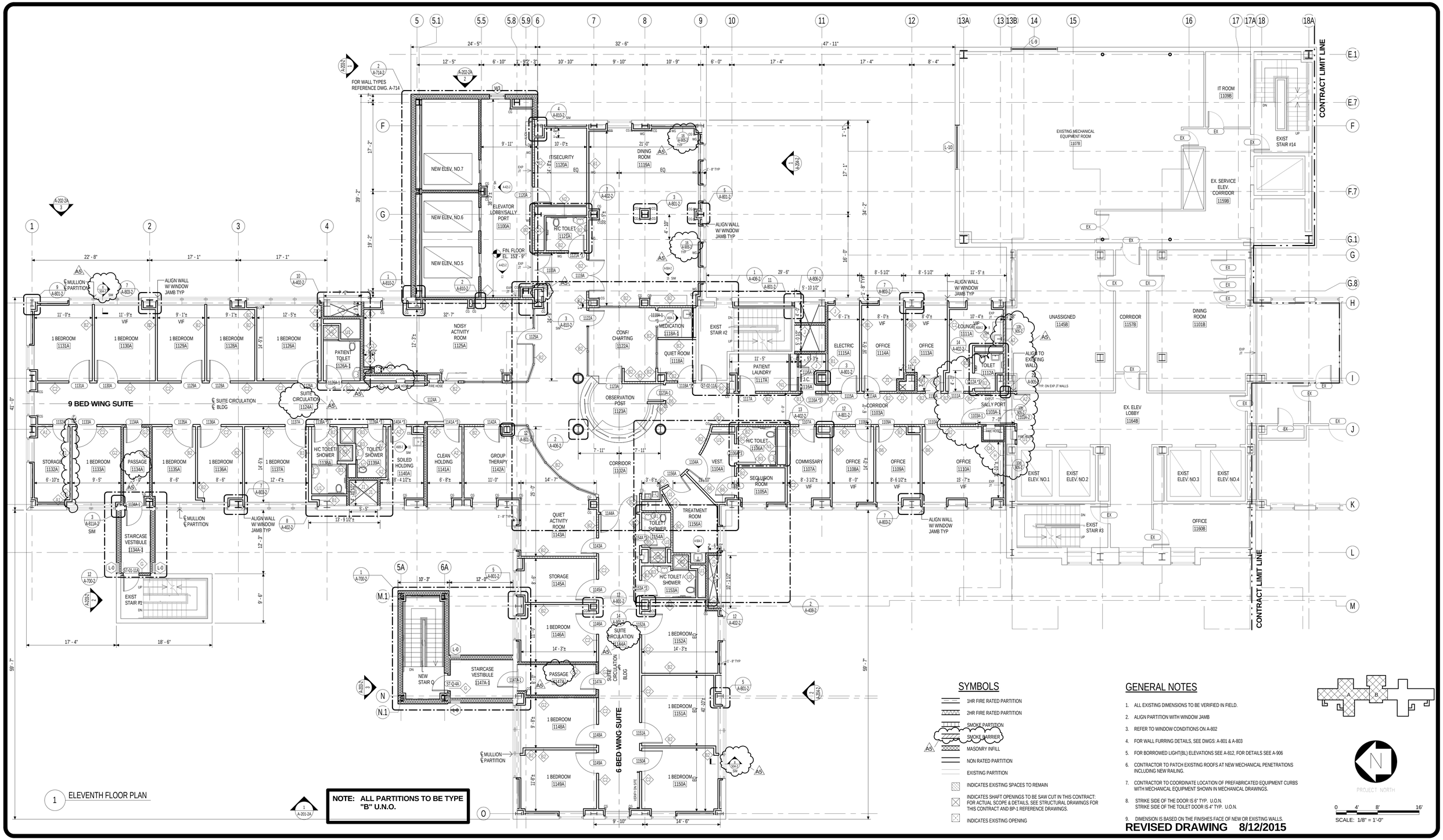
MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER: 44578
DESIGNED BY: MAK / WW
DRAWN BY: LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK: N/A
APPROVED: WS / MAK / LF

SHEET TITLE: TENTH FLOOR PLAN

BUILDING NUMBER: 102
DRAWING NUMBER: A-110-2
SHEET

8/25/2015 4:37:47 PM



1 ELEVENTH FLOOR PLAN

SYMBOLS

- 1HR FIRE RATED PARTITION
- 2HR FIRE RATED PARTITION
- SMOKE PARTITION
- SMOKE BARRIER
- MASONRY INFILL
- NON RATED PARTITION
- EXISTING PARTITION
- INDICATES EXISTING SPACES TO REMAIN
- INDICATES SHAFT OPENINGS TO BE SAW CUT IN THIS CONTRACT: FOR ACTUAL SCOPE & DETAILS, SEE STRUCTURAL DRAWINGS FOR THIS CONTRACT AND BP-1 REFERENCE DRAWINGS.
- INDICATES EXISTING OPENING

GENERAL NOTES

1. ALL EXISTING DIMENSIONS TO BE VERIFIED IN FIELD.
2. ALIGN PARTITION WITH WINDOW JAMB
3. REFER TO WINDOW CONDITIONS ON A-802
4. FOR WALL FURRING DETAILS, SEE DWGS: A-801 & A-803
5. FOR BORROWED LIGHT(BL) ELEVATIONS SEE A-812, FOR DETAILS SEE A-906
6. CONTRACTOR TO PATCH EXISTING ROOFS AT NEW MECHANICAL PENETRATIONS INCLUDING NEW RAILING.
7. CONTRACTOR TO COORDINATE LOCATION OF PREFABRICATED EQUIPMENT CURBS WITH MECHANICAL EQUIPMENT SHOWN IN MECHANICAL DRAWINGS.
8. STRIKE SIDE OF THE DOOR IS 6" TYP. U.O.N. STRIKE SIDE OF THE TOILET DOOR IS 4" TYP. U.O.N.
9. DIMENSION IS BASED ON THE FINISHES FACE OF NEW OR EXISTING WALLS.

REVISED DRAWING 8/12/2015

PROJECT NORTH

SCALE: 1/8" = 1'-0"

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

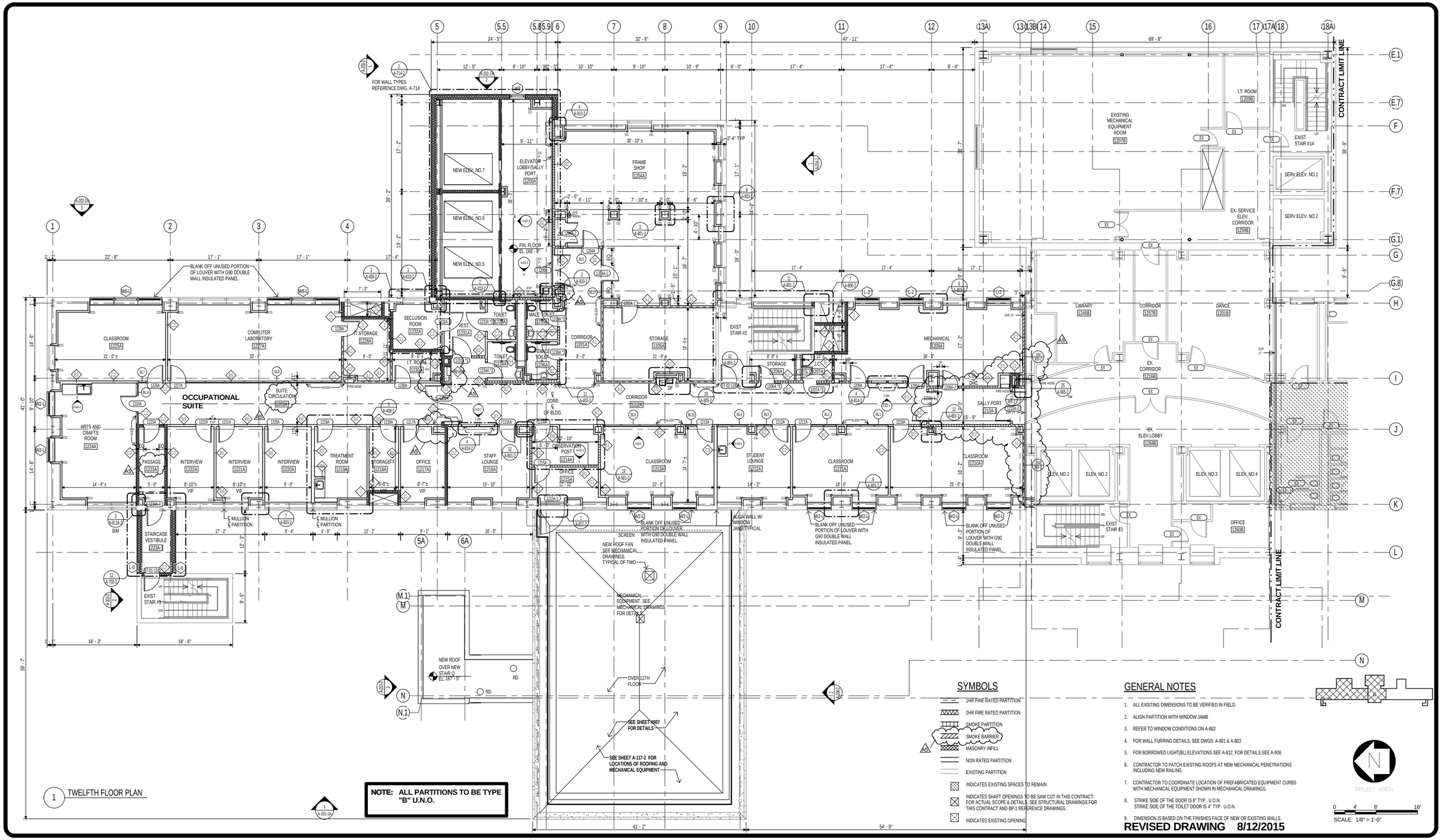
PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE: ELEVENTH FLOOR PLAN

BUILDING NUMBER:	DRAWING NUMBER:
102	A-111-2

SHEET

8/25/2015 4:37:58 PM



1 TWELFTH FLOOR PLAN

NOTE: ALL PARTITIONS TO BE TYPE "B" U.N.O.

SYMBOLS

- 1HR FIRE RATED PARTITION
- 2HR FIRE RATED PARTITION
- SMOKE PARTITION
- SMOKE BARRIER
- MASONRY INFILL
- NON RATED PARTITION
- EXISTING PARTITION
- INDICATES EXISTING SPACES TO REMAIN
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- INDICATES EXISTING OPENING

GENERAL NOTES

1. ALL EXISTING DIMENSIONS TO BE VERIFIED IN FIELD.
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7. CONTRACTOR TO COORDINATE LOCATION OF PREFABRICATED EQUIPMENT CURBS WITH MECHANICAL EQUIPMENT SHOWN IN MECHANICAL DRAWINGS.
8. STRIKE SIDE OF THE DOOR IS 6" TYP. U.O.N. STRIKE SIDE OF THE TOILET DOOR IS 4" TYP. U.O.N.
9. DIMENSION IS BASED ON THE FINISHES FACE OF NEW OR EXISTING WALLS.

REVISED DRAWING 8/12/2015

PROJECT NORTH

SCALE: 1/8" = 1'-0"

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102 600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER: 44578
DESIGNED BY: MAK / WW
DRAWN BY: LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK: N/A
APPROVED: WS / MAK / LF

SHEET TITLE: TWELFTH FLOOR PLAN

BUILDING NUMBER: 102
DRAWING NUMBER: A-112-2
SHEET

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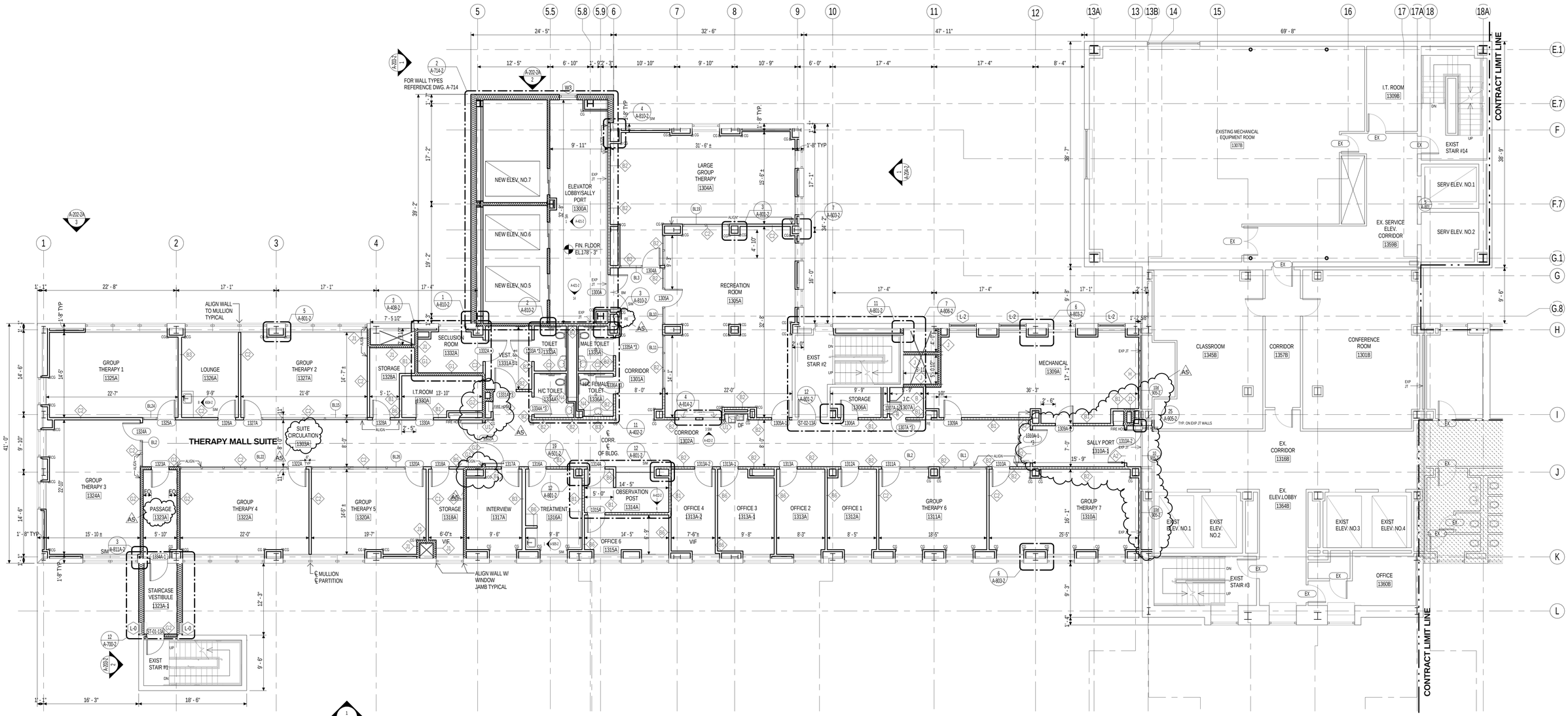

1 THIRTEENTH FLOOR PLAN

NOTE: ALL PARTITIONS TO BE TYPE "B" U.N.O.

SYMBOLS

- 1HR FIRE RATED PARTITION
- 2HR FIRE RATED PARTITION
- SMOKE PARTITION
- SMOKE BARRIER
- A5 MASONRY INFILL
- NON RATED PARTITION
- EXISTING PARTITION
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GENERAL NOTES

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5. FOR BORROWED LIGHT(BL) ELEVATIONS SEE A-812, FOR DETAILS SEE A-906
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7. CONTRACTOR TO COORDINATE LOCATION OF PREFABRICATED EQUIPMENT CURBS WITH MECHANICAL EQUIPMENT SHOWN IN MECHANICAL DRAWINGS.
8. STRIKE SIDE OF THE DOOR IS 6" TYP. U.O.N. STRIKE SIDE OF THE TOILET DOOR IS 4" TYP. U.O.N.
9. DIMENSION IS BASED ON THE FINISHES FACE OF NEW OR EXISTING WALLS.

REVISED DRAWING 8/12/2015

PROJECT NORTH

SCALE: 1/8" = 1'-0"

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

A Joint Venture

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER: 44578
DESIGNED BY: MAK / WW
DRAWN BY: LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK: N/A
APPROVED: WS / MAK / LF

SHEET TITLE: THIRTEENTH FLOOR PLAN

BUILDING NUMBER: 102

DRAWING NUMBER: A-113-2

SHEET

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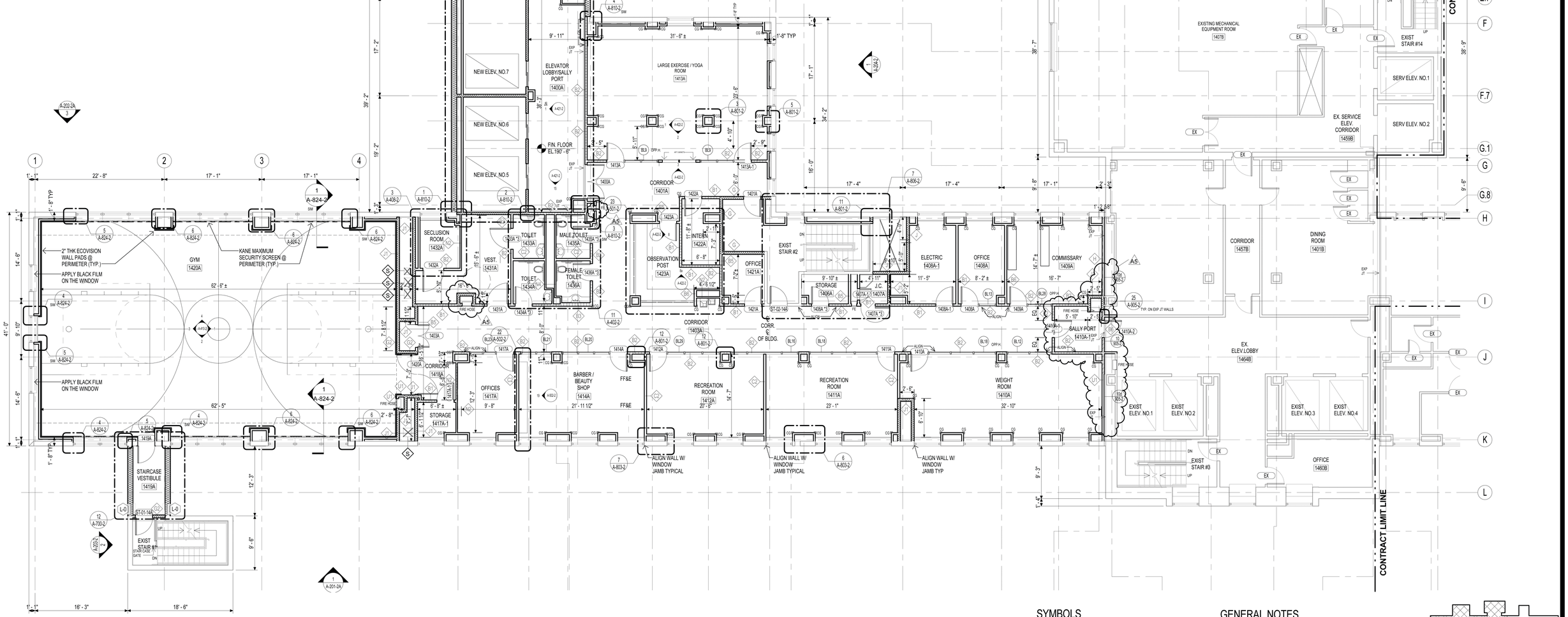

1 FOURTEENTH FLOOR PLAN

NOTE: ALL PARTITIONS TO BE TYPE "B" U.N.O.

SYMBOLS

- 1HR FIRE RATED PARTITION
- 2HR FIRE RATED PARTITION
- SMOKE PARTITION
- SMOKE BARRIER
- A5 MASONRY INFILL
- NON RATED PARTITION
- EXISTING PARTITION
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5. FOR BORROWED LIGHT(BL) ELEVATIONS SEE A-812, FOR DETAILS SEE A-906
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7. CONTRACTOR TO COORDINATE LOCATION OF PREFABRICATED EQUIPMENT CURBS WITH MECHANICAL EQUIPMENT SHOWN IN MECHANICAL DRAWINGS.
8. STRIKE SIDE OF THE DOOR IS 6" TYP. U.O.N. STRIKE SIDE OF THE TOILET DOOR IS 4" TYP. U.O.N.
9. DIMENSION IS BASED ON THE FINISHES FACE OF NEW OR EXISTING WALLS.

A B

N
PROJECT NORTH

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

REVISED DRAWING 8/12/2015

NEW YORK STATE OF OPPORTUNITY. | Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS PC | STV 100 Years

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER: 44578
DESIGNED BY: MAK / WW
DRAWN BY: LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK: N/A
APPROVED: WS / MAK / LF

SHEET TITLE: FOURTEENTH FLOOR PLAN

BUILDING NUMBER: 102
DRAWING NUMBER: A-114-2
SHEET

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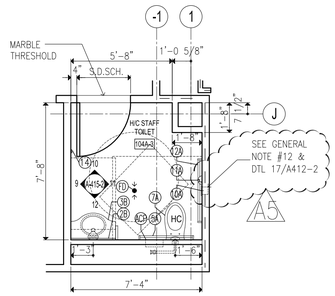

3 TOILET
104A-3

GENERAL NOTES:

1. REFER TO SHEET A-412-2 FOR PLUMBING FIXTURE AND ACCESSORIES MOUNTING HEIGHTS.
2. REFER TO ROOM FINISH SCHEDULE SHEETS FOR FINISHES AND CEILING HEIGHTS.
3. LOCATE DOOR FRAMES 4" OFF PERPENDICULAR WALL ON HINGE SIDE U.N.O.
4. PROVIDE MIN 12 GA MTL PLATE SUPPORT FOR ALL PLUMBING ACCESSORIES (TYP) (U.N.O.)
5. USE OF SHOWER TRACK & CURTAINS AND SOAP DISPENSER AS PER SCHEDULE (TYP)
6. TOILET PARTITION DIMENSIONS ARE TAKEN FROM FINISHED FACE OF PARTITION.
7. FOR PARTITION TYPES & TAG LOCATIONS REFER TO FLOOR PLANS & PARTITION TYPES DRAWINGS
8. PROVIDE MIN. 1/8" PLF FLOOR POSITIVE DRAINAGE SLOPE IN TOILETS WITH FLOOR DRAIN (TYP)
9. PROVIDE MIN. 1/4" PLF SHOWER FLOOR POSITIVE DRAINAGE SLOPE (TYP)
10. REFER TO DETAIL 6/A905-2 FOR ADA ACCESSIBLE MARBLE THRESHOLD (TYP)
11. SOAP DISPENSER AND TOILET PAPER DISPENSER TO BE PROVIDED BY VENDOR
12. TOILET TISSUE HOLDER (TAG 10A) RECESSED MOUNTED IN THE FIRE RATED PARTITIONS SHALL BE FULLY WRAPPED AND PROTECTED WITH 3M FIRE BARRIER MOLDABLE PUTTY (TYP. WHERE INDICATED ON DWG APPLICABLE @ DTL #8, 9, 10 DWG A402-2 & DTL #3 DWG A401-2 ONLY) A5

LEGEND:

PROJECT NORTH

0 2' 4' 8'
SCALE: 1/4" = 1'-0"

REVISED DRAWING 8-12-15

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

CONSULTANTS:
RBSD ARCHITECTS P.C. | STV 100 Years
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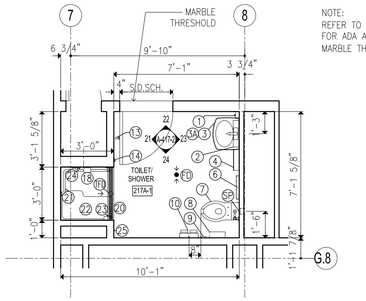
LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035
CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	JS/SV
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE:
DETAILED PLAN - TOILETS & SHOWERS 2

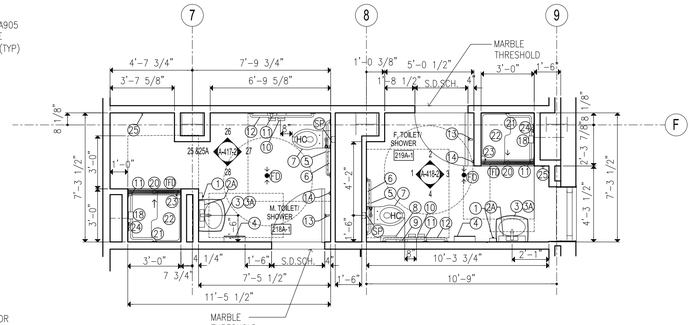
BUILDING NUMBER: 102
DRAWING NUMBER: A-401-2
SHEET



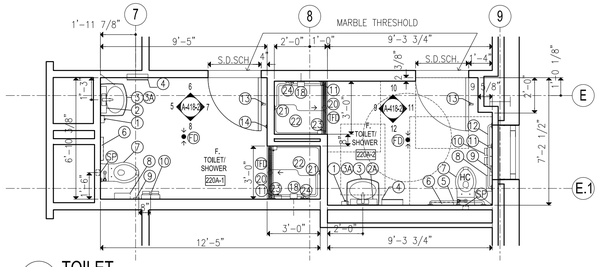
1 TOILET
217A-1

NOTE:
REFER TO DETAIL 6/A905
FOR ADA ACCESSABLE
MARBLE THRESHOLD (TYP)

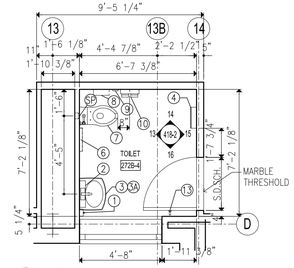
NOTE:
1. S.D.SCH. STAND FOR "SEE DOOR SCHEDULE"
2. **UX.TL.** STAND FOR UNISEX TOILET
3. **HC** STAND FOR ADA ACCESIBLE PLUMBING FIXTURES



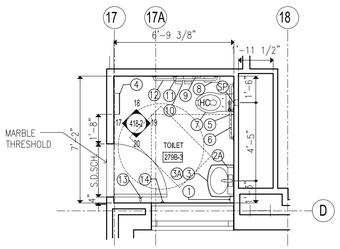
2 TOILET
218A-1 & 219A-1



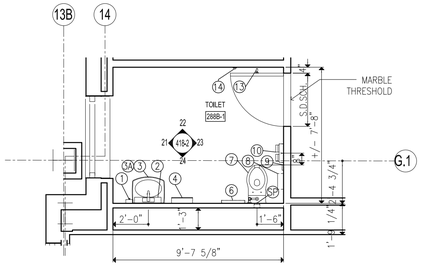
3 TOILET
220A-1 & 220A-2



4 TOILET
272B-4

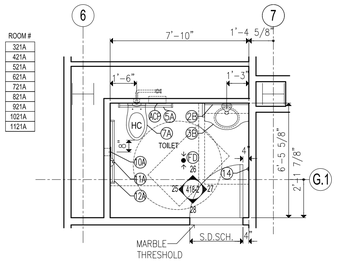


5 TOILET
279B-3

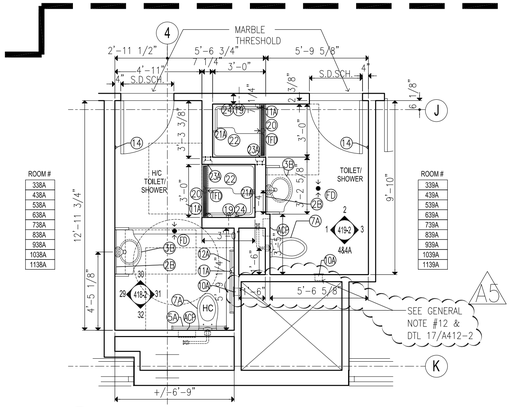


6 TOILET
288B-1

TYPICAL TOILET/SHOWER LAYOUTS FROM 3RD FLOOR AND ABOVE SHOWN UNDER DASHED LINE. SEE DETAIL TAG ON PLANS FOR LOCATION & ROOM #



7 TOILET



8 TYP. TOILET AND SHOWER

SPECIAL NOTES

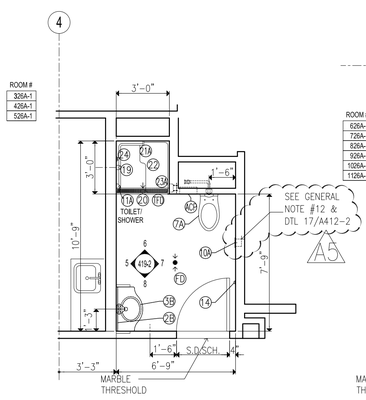
*SCHLUTER SYSTEM TO BE INCORPORATED IN THE ENTIRE FLOORS AND WALLS WITHIN PATIENT TOILETS, PATIENT TOILETS/SHOWERS, GANG-TOILETS, AND NON-PATIENT SHOWERS.

GENERAL NOTES:

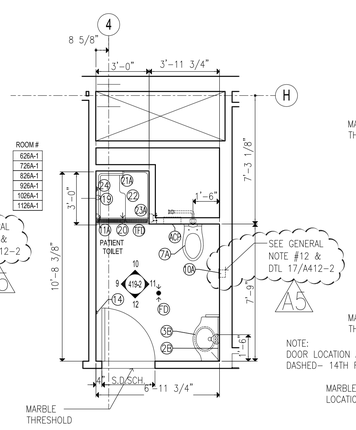
1. REFER TO SHEET A-412-2 FOR PLUMBING FIXTURE AND ACCESSORIES MOUNTING HEIGHTS.
2. REFER TO ROOM FINISH SCHEDULE SHEETS FOR FINISHES AND CEILING HEIGHTS.
3. LOCATE DOOR FRAMES 4" OFF PERPENDICULAR WALL ON HINGE SIDE U.N.O.
4. PROVIDE MIN 12 GA MTL PLATE SUPPORT FOR ALL PLUMBING ACCESSORIES (TYP) (U.N.O.)
5. USE OF SHOWER TRACK & CURTAINS AND SOAP DISPENSER AS PER SCHEDULE (TYP)
6. TOILET PARTITION DIMENSIONS ARE TAKEN FROM FINISHED FACE OF PARTITION.
7. FOR PARTITION TYPES & TAG LOCATIONS REFER TO FLOOR PLANS & PARTITION TYPES DRAWINGS
8. PROVIDE MIN. 1/8" PLF FLOOR POSITIVE DRAINAGE SLOPE IN TOILETS WITH FLOOR DRAIN (TYP)
9. PROVIDE MIN. 1/4" PLF SHOWER FLOOR POSITIVE DRAINAGE SLOPE (TYP)
10. REFER TO DETAIL 6/A905-2 FOR ADA ACCESSIBLE MARBLE THRESHOLD (TYP)
11. SOAP DISPENSER AND TOILET PAPER DISPENSER TO BE PROVIDED BY VENDOR
12. TOILET TISSUE HOLDER (TAG 10A) RECESSED MOUNTED IN THE FIRE RATED PARTITIONS SHALL BE FULLY WRAPPED AND PROTECTED WITH 3M FIRE BARRIER MOLDABLE PUTTY (TYP. WHERE INDICATED ON DWG APPLICABLE @ DTL #8, 9, 10 DWG A402-2 & DTL #3 DWG A401-2 ONLY)

LEGEND:

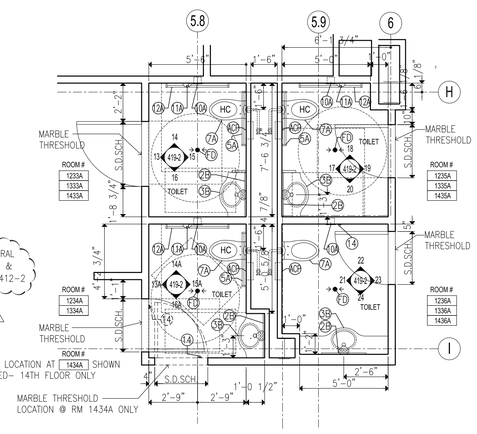
1. AUTOMATIC WALL-MOUNTED SOAP DISPENSER GEORGIA-PACIFIC #52052
2. ASI-600 SS FRAME W/1/4" THK. POLYCARBONATE MIRROR
2A. CUSTOM S.S. FRAME W/1/4" THK. POLYCARBONATE MIRROR NOTE: SIZE VARIES AS PER LOCATION AND FULL WIDTH OF THE CUSTOM LAVATORY UNIT (3A) SHOWN
2B. ASI-600 SS FRAME W/1/4" THK. POLYCARBONATE MIRROR (TILTED @ HC LOCATION ONLY)
3. LAVATORY- WALL MOUNT KOHLER MODEL PINOIR K-2035-4 W/SHROUD K-2057 INSTALL PER MANUFACT. INSTRUCTION WITH TAMPER-PROOF FASTENERS
3A. SLOAN OPTIMA ELECTRONIC FAUCET MODEL ETF-80
3B. CUSTOM LAVATORY W/ INTEGRAL OVAL SINK GLACIER WHITE W/HEAVY-DUTY VANDAL RESISTANT SKIRTS SECURED W/TAMPER-PROOF FASTENERS AND ● LIGATURE RESISTANT SENSOR FAUCET BSP SF370/SAL-5011
4. SURFACE-MOUNTED PAPER TOWEL DISPENSER /WASTE RECEPTACLE BOBRICK B-3699
5. 1 1/4"OD 36"L HORIZONTAL GRAB BAR BOBRICK B-5806 SERIES
5B. 1 1/4"OD 24"L HORIZONTAL GRAB BAR W/ INTEGRAL LIGATURE RESISTANT CLOSURE PLATE & SLOPING END PLATE
6. 1 1/4"OD 36"L HORIZONTAL GRAB BAR W/ INTEGRAL LIGATURE RESISTANT CLOSURE PLATE & (2) TWO SLOPING END PLATE
6A. 1 1/4"OD 36"L HORIZONTAL GRAB BAR W/ INTEGRAL LIGATURE RESISTANT CLOSURE PLATE & (2) TWO SLOPING END PLATE
6B. SURFACE MOUNTED TOILET SEAT-COVER DISPENSER BOBRICK B-221
7. TOILET AMERICAN STANDARD AFWALL MODEL #2257.103 W/TOP SPUD EXPOSED INFRARED FLUSHOMETER SLOAN OPTIMA 111-1.6 ES-S TMO OLSONITE OPEN SEAT MODEL 95A
SP. SENSOR PLATE
7A. KOHLER-SIFTON K-4460-C WALL MOUNTED DETACHABLE OPEN SEAT AND INFRARED AUTOMATIC FLUSHOMETER ● SLOAN OPTIMA 143 ES-S 3.5GPH BLOWOUT
8A. ACCESS PANEL
8. SURFACE MOUNTED SANITARY NAPKIN DISPOSAL BOBRICK B-254
9. SURFACE MOUNTED SANITARY DISPOSAL BAG DISPENSER BOBRICK B-3541
10. MULTI ROLL TOILET TISSUE DISPENSER LIGATURE RESISTANT EVANS & PAUL ENP-TPD01 SERIES
10A. RECESSED TOILET TISSUE HOLDER ACORN 1840-FA SERIES
11. 1 1/4"OD 18"L VERTICAL GRAB BAR BOBRICK B-5806 SERIES
11A. 1 1/4"OD 18"L VERTICAL GRAB BAR W/ INTEGRAL LIGATURE RESISTANT CLOSURE PLATE & (2) TWO SLOPING END PLATE
12. 1 1/4"OD 42"L HORIZONTAL GRAB BAR BOBRICK B-5806 SERIES
12A. 1 1/4"OD 42"L HORIZONTAL GRAB BAR W/ INTEGRAL LIGATURE RESISTANT CLOSURE PLATE & (2) TWO SLOPING END PLATE
13. SURFACE-MOUNTED HAT AND COAT HOOK
14. DOOR KNOB WALL BUMPER GLYNN-JOHANSON -60W
15. NAPKIN/TAMPON VENDOR BOBRICK - B-2706 SERIES
16. ELECTRIC HAND DRYER XLERATOR XL-SB BRUSHED STAINLESS STEEL WITH NOISE REDUCTION NOZZLE
18. WALL MOUNTED SHOWER HEAD KOHLER K-8022
19. WALL MOUNTED LIGATURE RESISTANT SHOWER HEAD SYMMONS #4-150
20. EXTRUDED PVC SHOWER CURTAIN TRACK INPRO CORPORATION CEILING MOUNTED W/ULTRA/WHISPER CUBE CARRIER POP-OUT & VINYL CURTAIN
21. HORIZONTAL-TWO-WALLTUB/SHOWER/TOILET COMPARTMENT BAR 18" X 34" BOBRICK B-6861
21A. HORIZONTAL-TWO-WALLTUB/SHOWER/TOILET COMPARTMENT BAR 18" X 34" W/INTEGRAL LIGATURE RESISTANT CLOSURE PLATE & (2) TWO SLOPING END PLATE
22. SOLID PHENOLIC FOLDING SHOWER SEAT
23. SOAP DISPENSER WALL MOUNTED
23A. SECURITY RECESSED SOAP DISH ACORN #1832
24. SHOWER CONTROL/ACTIVATOR BSP MODEL SV 230
25. UTILITY HOOK
FD. FLOOR DRAIN (SEE DTL 3/A815 AND FLOOR PLANS FOR LOCATION)
A1. ACCESSIBLE SHOWER SADDLE (SEE DTL 6/A815)
FD. TRENCH TYPE FLOOR DRAIN (SEE DTL 4/A815)
TP. TOILET PARTITION CEILING HUNG



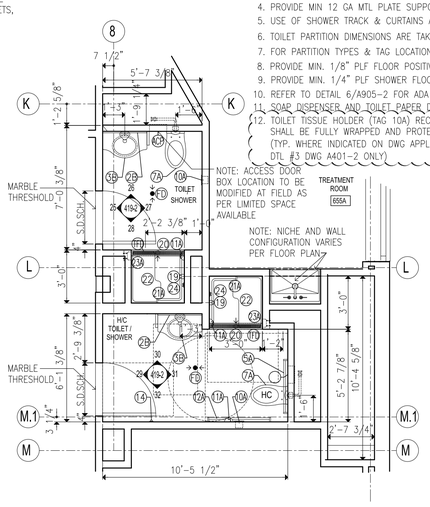
9 TOILET



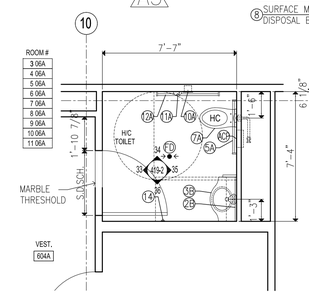
10 TOILET



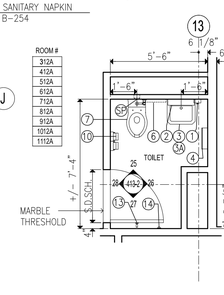
11 TOILETS



12 TOILETS



13 TOILET



14 TOILET

PROJECT NORTH

SCALE: 1/4" = 1'-0"

REVISED DRAWING 8-12-15

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

CONSULTANTS:
RBSD ARCHITECTS P.C. | STV 100 Years
A Joint Venture
225 Park Avenue South
New York, New York 10003

WARNING:
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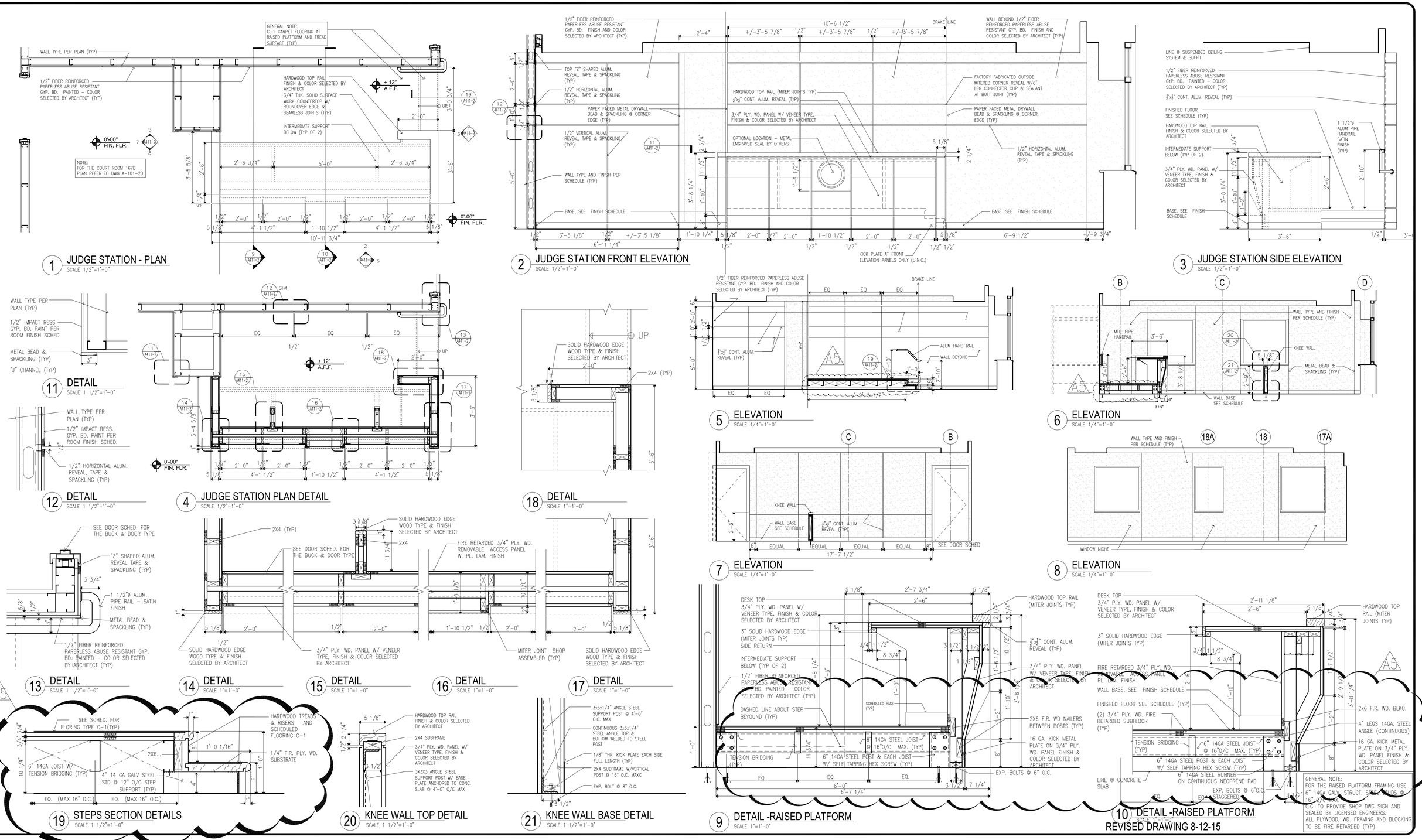
CONTRACT: CONSTRUCTION
TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION
LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102 600 EAST 125TH STREET WARDS ISLAND, NY 10035
CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	JS/SV
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE:
DETAILED PLAN - TOILETS & SHOWERS 3

BUILDING NUMBER: 102
DRAWING NUMBER: A-402-2
SHEET



NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

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CONTRACT:
CONSTRUCTION

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MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM
	6-15-2015	BID DOCUMENT

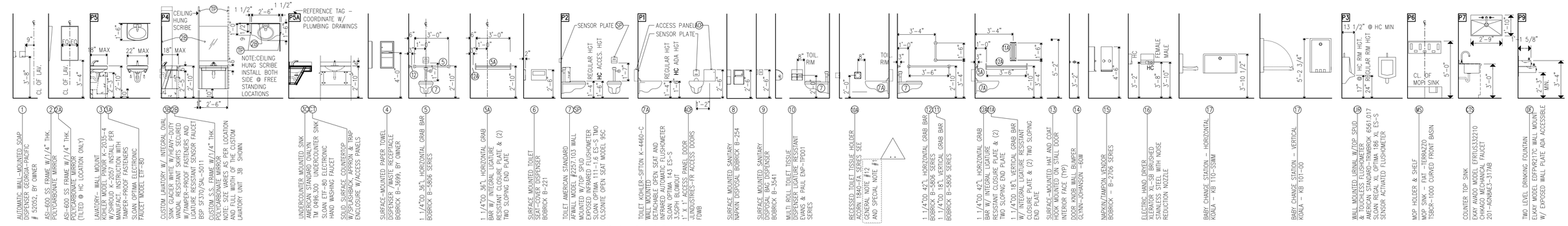
PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	JS/ SV
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE:
COURTROOM & ELEVATIONS

BUILDING NUMBER: 102

DRAWING NUMBER: A-411-2

SHEET



LEGEND:

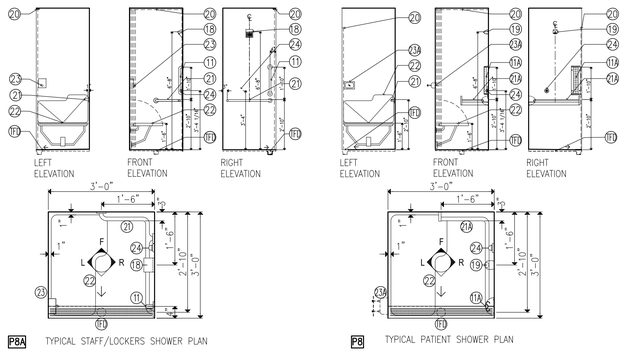
- (18) WALL MOUNTED SHOWER HEAD KOHLER K-8022
- (19) WALL MOUNTED LIGATURE RESISTANT SHOWER HEAD SYMMONS 4-150
- (20) EXTRUDED PVC SHOWER CURTAIN TRACK INPRO CORPORATION CEILING MOUNTED W/ULTRA/WHISPER CUBE CARRIER POP-OUT & VINYL CURTAIN
- (21) HORIZONTAL-TWO-WALLTUB/SHOWER/TOILET COMPARTMENT BAR 18" X 34" BOBRICK B-6861
- (21A) HORIZONTAL-TWO-WALLTUB/SHOWER/TOILET COMPARTMENT BAR 18" X 34" W/INTEGRAL LIGATURE RESISTANT CLOSURE PLATE & (2) TWO SLOPING END PLATE
- (22) SOLID PHENOLIC FOLDING SHOWER SEAT
- (23) SOAP DISPENSER WALL MOUNTED
- (24) SECURITY RECESSED SOAP DISH ACORN #1832
- (24) SHOWER CONTROL/ACTIVATOR BSP MODEL SV 230
- (25) UTILITY HOOK
- (FD) FLOOR DRAIN (SEE DTL 3/A815-2 AND FLOOR PLANS FOR LOCATION)
- (A) ACCESSIBLE SHOWER SADDLE (SEE DTL 6/A815-2)
- (TD) TRENCH TYPE FLOOR DRAIN (SEE DTL 4/A815-2)
- (T) SOLID SURFACE COUNTERTOP W/SPLASHBACK, APPRON & TRAP ENCLOSURE W/ACCESS PANELS

GENERAL NOTES:

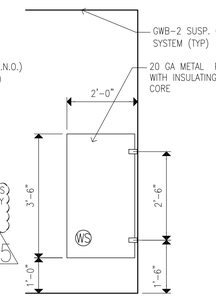
1. REFER TO SHEET A-412-2 FOR PLUMBING FIXTURE AND ACCESSORIES MOUNTING HEIGHTS.
2. REFER TO ROOM FINISH SCHEDULE SHEETS FOR FINISHES AND CEILING HEIGHTS.
3. LOCATE DOOR FRAMES 4" OFF PERPENDICULAR WALL ON HINGE SIDE U.N.O.
4. PROVIDE MIN 12 GA MTL PLATE SUPPORT FOR ALL PLUMBING ACCESSORIES (TYP) (U.N.O.)
5. USE OF SHOWER TRACK & CURTAINS AND SOAP DISPENSER AS PER SCHEDULE (TYP)
6. TOILET PARTITION DIMENSIONS ARE TAKEN FROM FINISHED FACE OF PARTITION.
7. FOR PARTITION TYPES & TAG LOCATIONS REFER TO FLOOR PLANS & PARTITION TYPES DWG.
8. PROVIDE MIN. 1/8" PLF FLOOR POSITIVE DRAINAGE SLOPE IN TOILETS WITH FLOOR DRAIN (TYP)
9. PROVIDE MIN. 1/4" PLF SHOWER FLOOR POSITIVE DRAINAGE SLOPE (TYP)
10. REFER TO DETAIL 6/A905-2 FOR ADA ACCESSIBLE MARBLE THRESHOLD (TYP)
11. SOAP DISPENSER AND TOILET PAPER DISPENSER TO BE PROVIDED BY VENDOR.
12. TOILET TISSUE HOLDER (TAG 10A) RECESSED MOUNTED IN THE FIRE RATED PARTITIONS SHALL BE FULLY WRAPPED AND PROTECTED WITH 3M™ FIRE BARRIER MOLDABLE PUTTY (TYP. WHERE INDICATED ON DWG - APPLICABLE @ DTL #8, 9, 10 DWG A402-2 & DTL #3 DWG A401-2 ONLY)

SPECIAL NOTES:

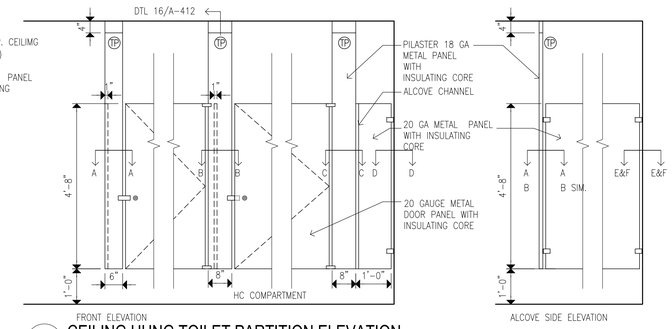
1. TAMPER RESISTANT FASTENERS ARE TO BE USED AT ALL FASTENERS EXPOSED TO VIEW ON EVERY PRODUCT AND ASSEMBLY EXPOSED TO VIEW OR ACCESSIBLE WITHIN THE INPATIENT ENVIROMENT
2. PERFORMANCE CRITERIA / TAMPER PROOF FASTENERS; ALL FASTENERS EXPOSED TO VIEW SHALL BE TAMPER RESISTANT, OF THE HEXALOBULAR (6-LOBED), PIN REJECT, INTERNAL DRIVE SYSTEM, MEETING ISO STANDARD 100664
3. SCHLUTER SYSTEM TO BE INCORPORATED IN THE ENTIRE FLOORS AND WALLS WITHIN PATIENT TOILETS, PATIENT **TOILETS/SHOWERS,GANG-TOILETS, AND NON-PATIENT SHOWERS.**



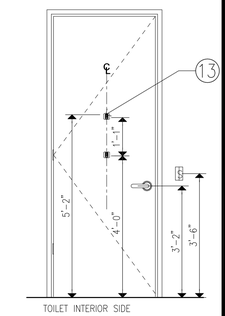
1 PLUMBING FIXTURE & ACCESSORIES MOUNTUNG HEIGHTS NTS



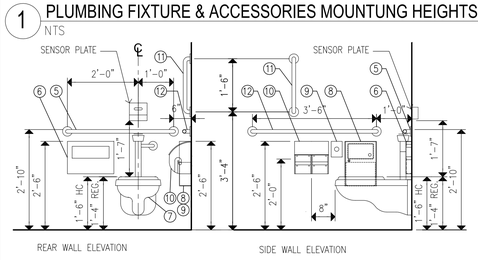
3 URINAL SCREEN NTS

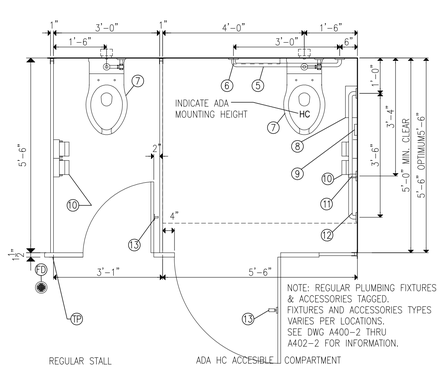


4 CEILING HUNG TOILET PARTITION ELEVATION NTS

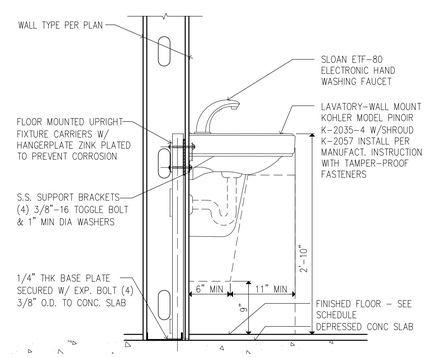


5 DOOR ELEVATION NTS

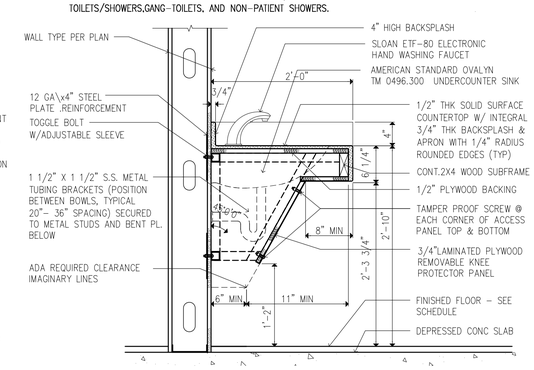




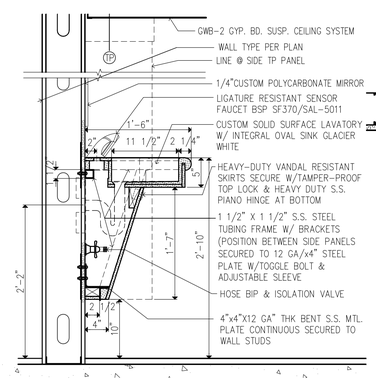
2 HC ACCESSIBLE TOILET COMPARTMENT NTS



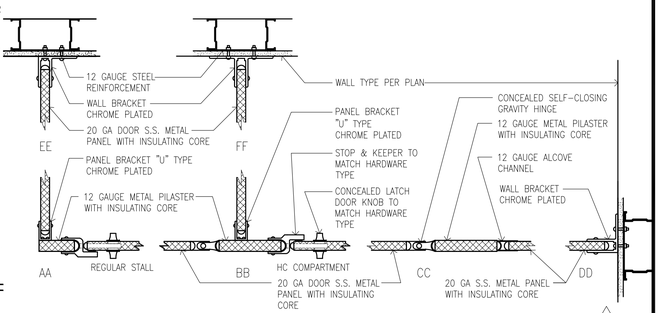
6 TYPICAL STAFF/ VISITORS LAVATORY SECTION NTS



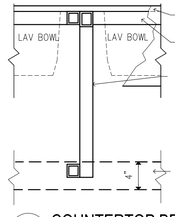
7 TYPICAL GANG TOILETS LAVATORY COUNTER SECTION NTS



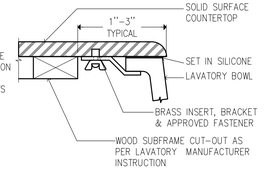
8 CUSTOM PATIENT LAVATORY SECTION NTS



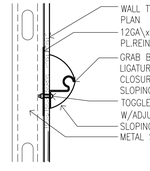
11 TOILET PARTITIONS PLAN DETAIL 006A-1



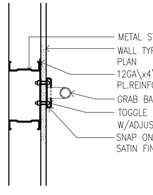
9 COUNTERTOP BRACKETS NTS



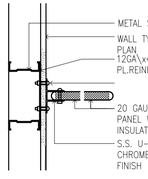
10 DETAIL @ COUNTERTOP LAVATORY NTS



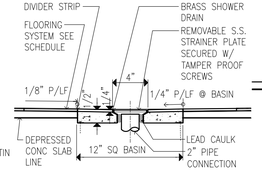
12 SECURITY GRAB BAR NTS



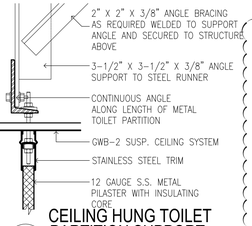
13 GRAB BAR SUPPORT NTS



14 URINAL SCREEN NTS

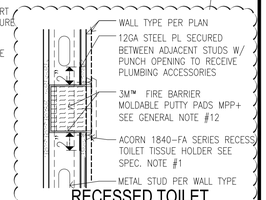


15 FLOOR DRAIN NTS



16 CEILING HUNG TOILET PARTITION SUPPORT NTS

REVISED DRAWING 8-12-15



17 RECESSED TOILET PAPER HOLDER IN RATED WALL DETAIL NTS

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

A Joint Venture

225 Park Avenue South
New York, New York 10003

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM
	6-15-2015	BID DOCUMENT

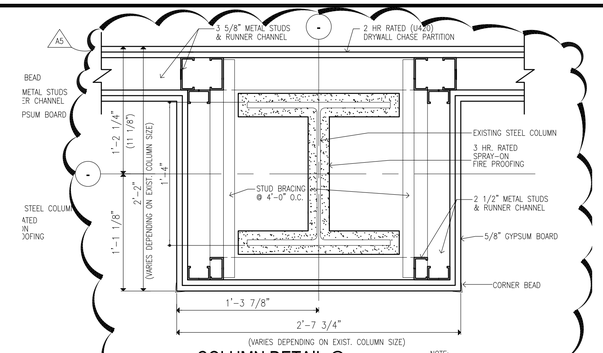
PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	JS/SV
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE:

TOILET ACCESSORIES & PLUMBING FIXTURES MOUNTING HEIGHTS

BUILDING NUMBER:	DRAWING NUMBER:
102	A-412-2

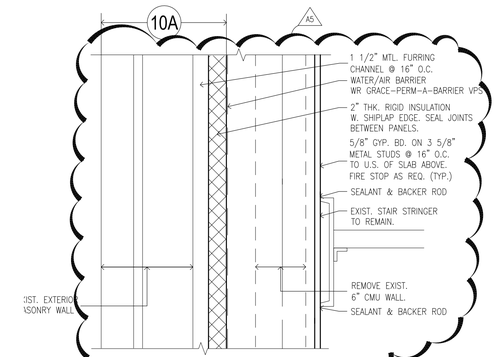
SHEET



COLUMN DETAIL @
2 HR RATED WALL (U420)
UL DESIGN NO. X704

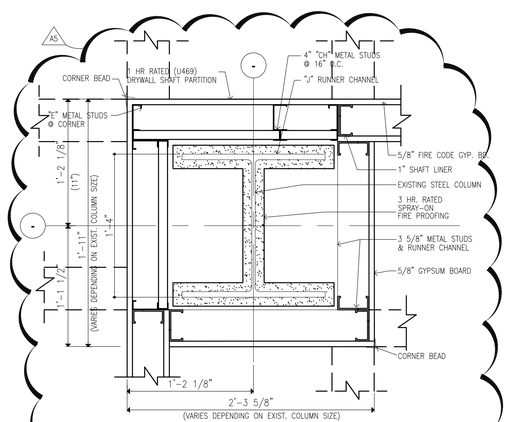
4 SCALE 1 1/2"=1'-0"

NOTE:
UL DESIGN X704 REFERS TO STEEL COLUMN W. SPRAY-ON FIRE PROOFING ONLY.



10 DETAIL @ EXIST. STAIR # 2
SCALE 1 1/2"=1'-0"

10A DETAIL @ ROOM # 016-B
SCALE 1 1/2"=1'-0"



COLUMN DETAIL @
1 HR RATED WALL (U469)
UL DESIGN NO. X704

13 SCALE 1 1/2"=1'-0"

NOTE:
UL DESIGN X704 REFERS TO STEEL COLUMN W. SPRAY-ON FIRE PROOFING ONLY.

NOTES:
TAMPER RESISTANT FASTENERS:
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REVISED DRAWING 8-12-15

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

CONSULTANTS:
RBSD ARCHITECTS P.C. | STV 100 Years
A Joint Venture
225 Park Avenue South
New York, New York 10003

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

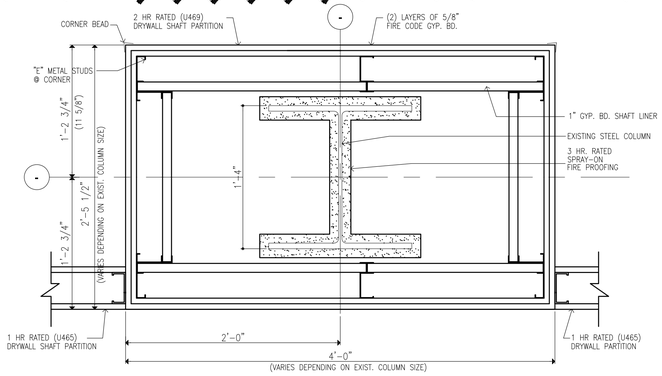
CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	JS/SV
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE:
WALL & COLUMN DETAILS

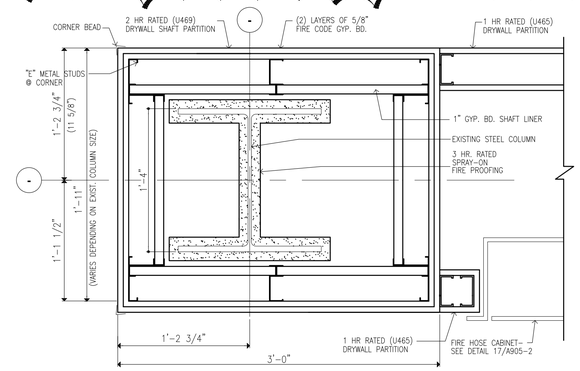
BUILDING NUMBER: 102
DRAWING NUMBER: A-801-2
SHEET



2 HR RATED COLUMN ENCLOSURE (U469)
UL DESIGN NO. X704

4 SCALE 1 1/2"=1'-0"

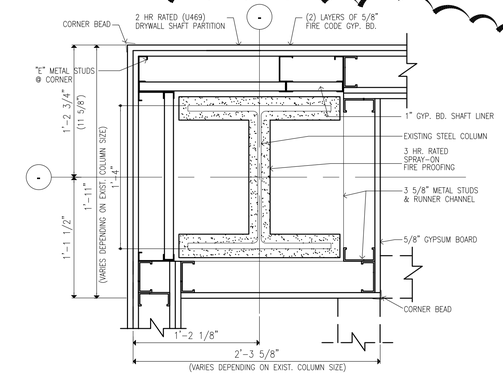
NOTE:
UL DESIGN X704 REFERS TO STEEL COLUMN W. SPRAY-ON FIRE PROOFING ONLY.



2 HR RATED COL. ENCLOSURE (U469)
AT FIRE HOSE CABINET
UL DESIGN NO. X704

3 SCALE 1 1/2"=1'-0"

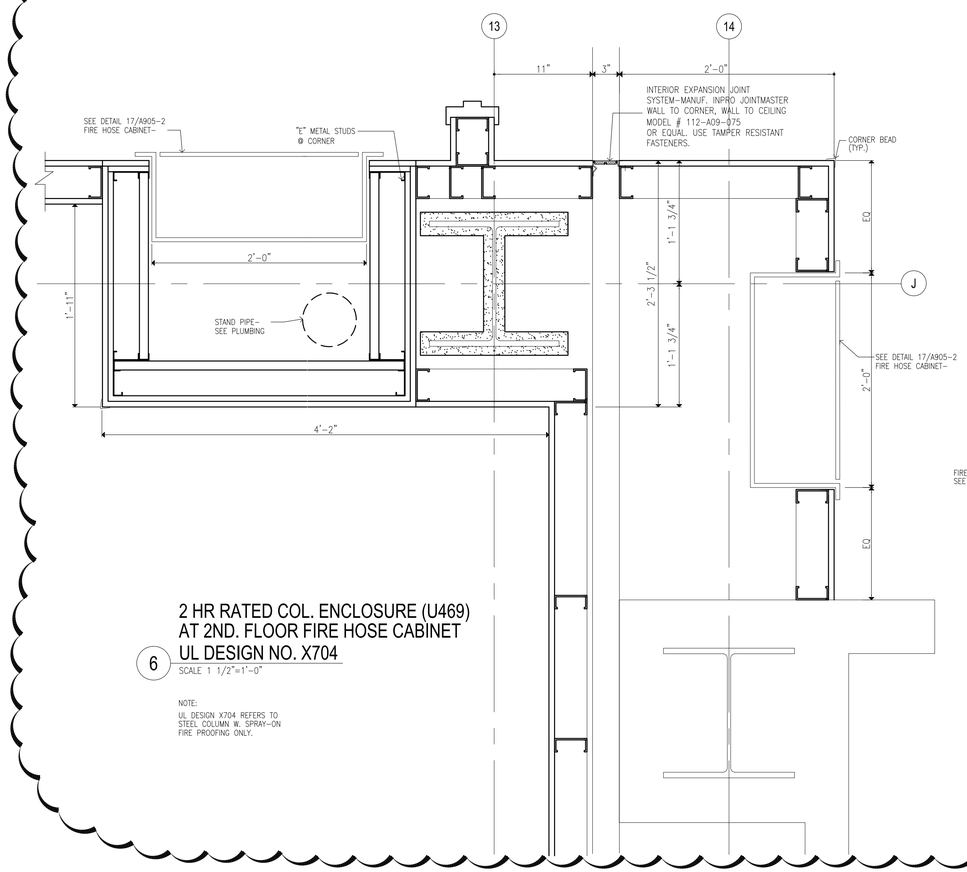
NOTE:
UL DESIGN X704 REFERS TO STEEL COLUMN W. SPRAY-ON FIRE PROOFING ONLY.



COLUMN DETAIL @
2 HR RATED WALL (U469)
UL DESIGN NO. X704

1 SCALE 1 1/2"=1'-0"

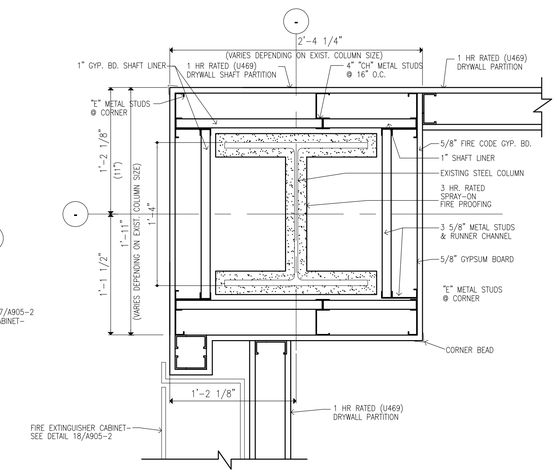
NOTE:
UL DESIGN X704 REFERS TO STEEL COLUMN W. SPRAY-ON FIRE PROOFING ONLY.



2 HR RATED COL. ENCLOSURE (U469)
AT 2ND. FLOOR FIRE HOSE CABINET
UL DESIGN NO. X704

6 SCALE 1 1/2"=1'-0"

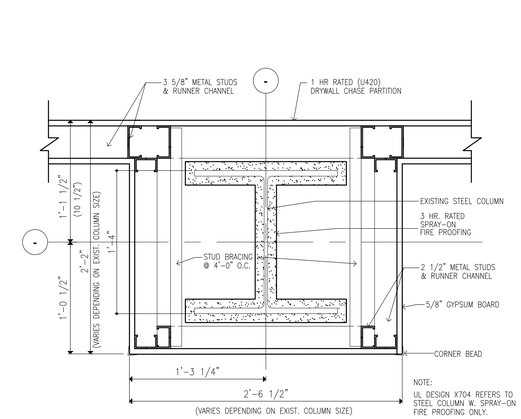
NOTE:
UL DESIGN X704 REFERS TO STEEL COLUMN W. SPRAY-ON FIRE PROOFING ONLY.



1 HR RATED COL. ENCLOSURE (U465)
AT FIRE EXTINGUISHER CABINET
UL DESIGN NO. X704

5 SCALE 1 1/2"=1'-0"

NOTE:
UL DESIGN X704 REFERS TO STEEL COLUMN W. SPRAY-ON FIRE PROOFING ONLY.



NOTE:
UL DESIGN X704 REFERS TO STEEL COLUMN W. SPRAY-ON FIRE PROOFING ONLY.

COLUMN DETAIL @
1 HR RATED WALL (U420)
UL DESIGN NO. X704 FOR COLUMN

2 SCALE 1 1/2"=1'-0"

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ADDENDUM DRAWING 8-12-15

NEW YORK STATE OF OPPORTUNITY. Office of General Services
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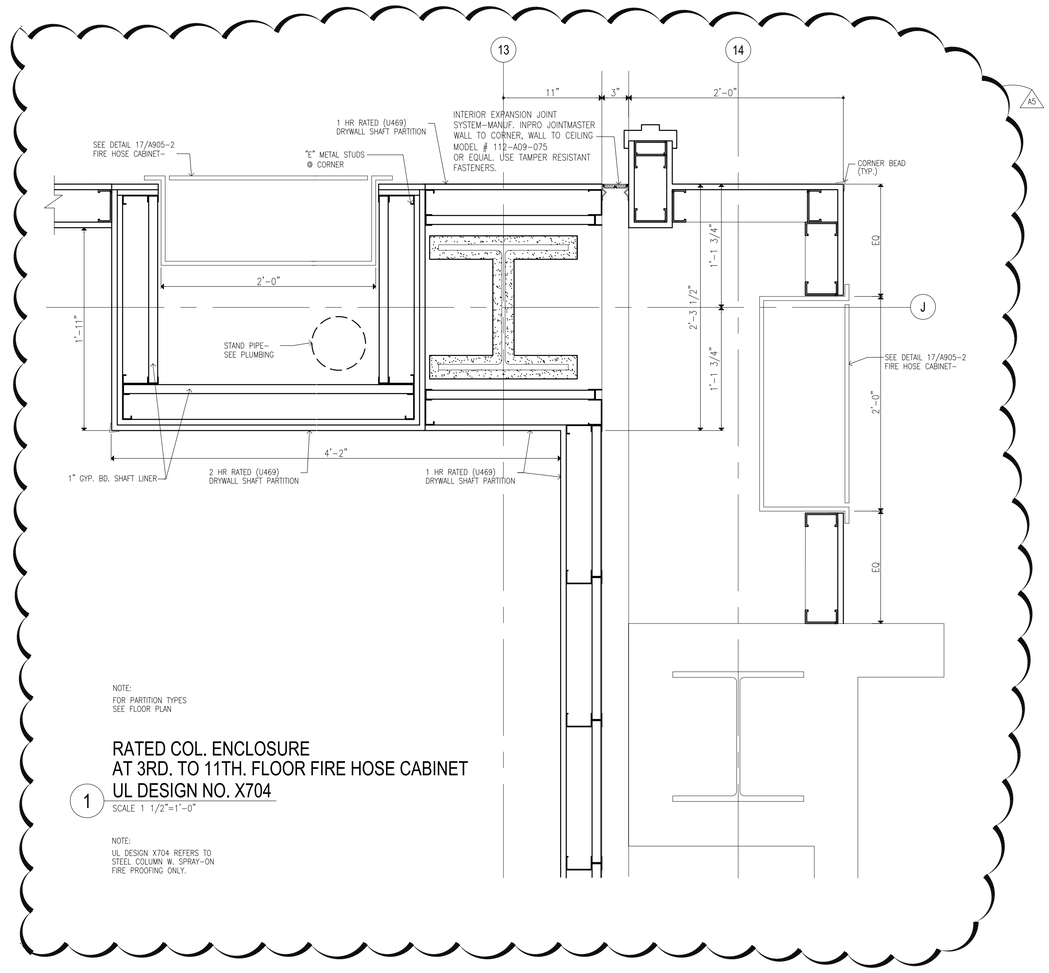
LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102 600 EAST 125TH STREET WARDS ISLAND, NY 10035
CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	JS/SV
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE:
WALL & COLUMN DETAILS

BUILDING NUMBER: 102
DRAWING NUMBER: A-801A-2
SHEET



NOTE:
FOR PARTITION TYPES
SEE FLOOR PLAN

RATED COL. ENCLOSURE AT 3RD. TO 11TH. FLOOR FIRE HOSE CABINET UL DESIGN NO. X704

1 SCALE 1 1/2"=1'-0"

NOTE:
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STEEL COLUMN W. SPRAY-ON
FIRE PROOFING ONLY.

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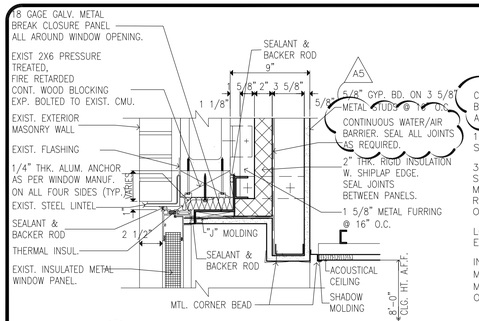
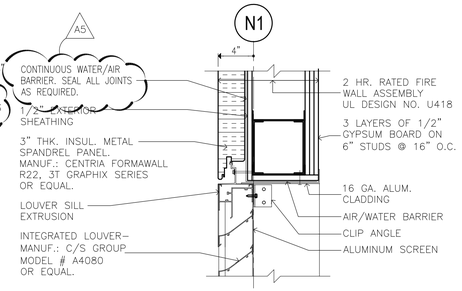
BUILDING NUMBER: 102

DRAWING NUMBER: A-801B-2

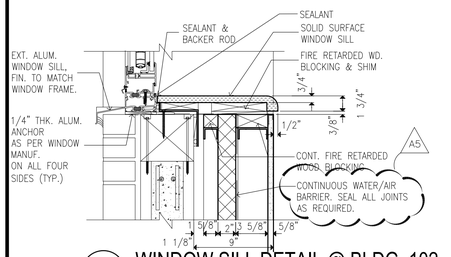
SHEET



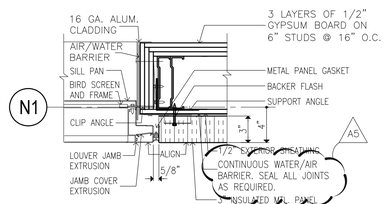
1 WINDOW HEAD DETAIL @ 102 BLDG.
SCALE: 1 1/2"=1'-0"



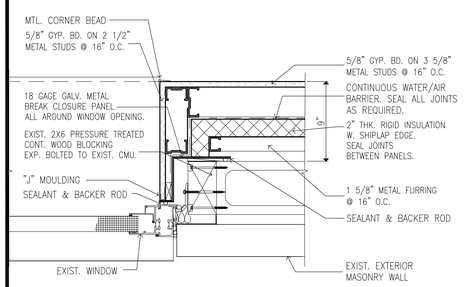
5 LOUVER HEAD DETAIL
SCALE: 1 1/2"=1'-0"



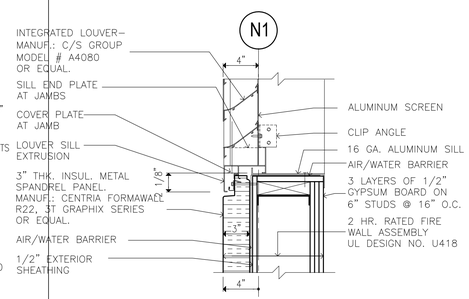
2 WINDOW SILL DETAIL @ BLDG. 102
SCALE: 1 1/2"=1'-0"



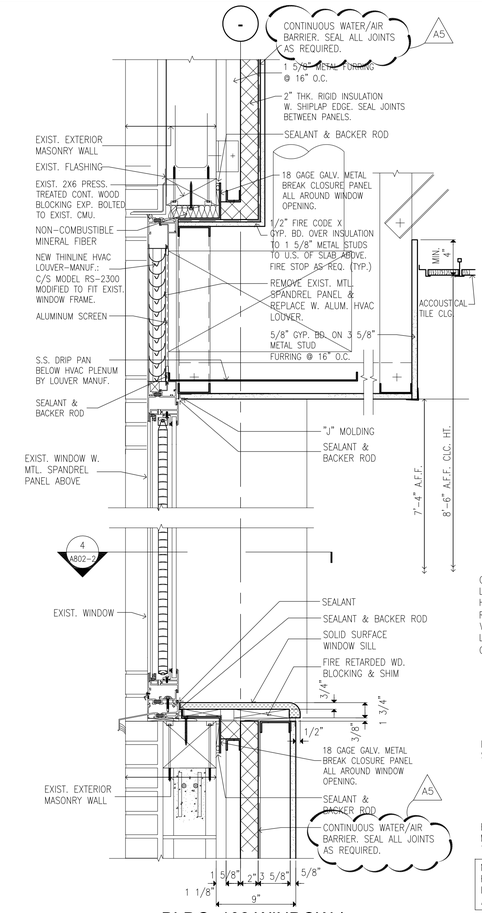
10 LOUVER JAMB DETAIL
SCALE: 1 1/2"=1'-0"



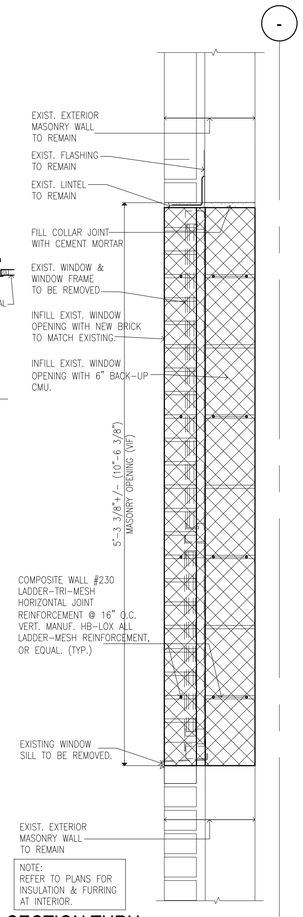
3 WINDOW JAMB DETAIL @ BLDG. 102
SCALE: 1 1/2"=1'-0"



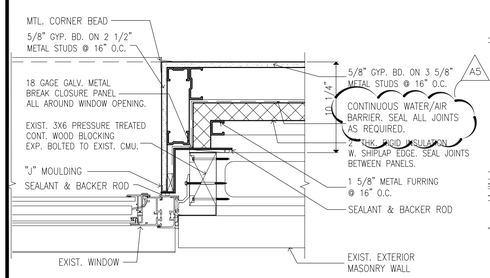
6 LOUVER SILL DETAIL
SCALE: 1 1/2"=1'-0"



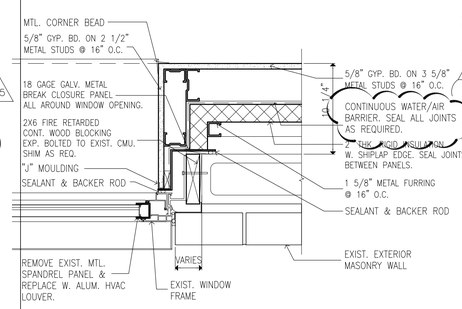
8 BLDG. 102 WINDOW / LOUVER SECTION
SCALE: 1 1/2"=1'-0"



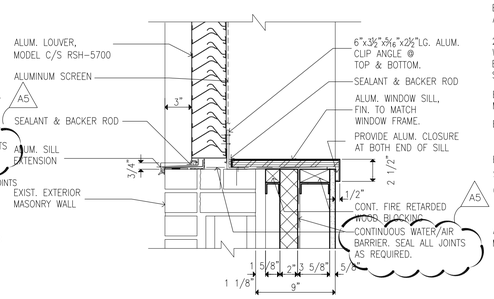
13 SECTION THRU MASONRY OPENING INFILL
SCALE: 1 1/2"=1'-0"



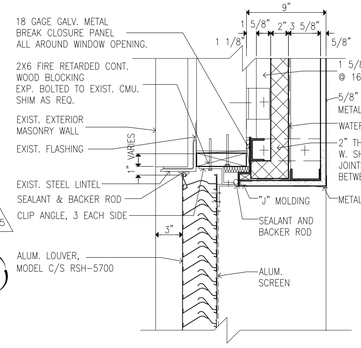
4 WINDOW JAMB DETAIL @ BLDG. 102
SCALE: 1 1/2"=1'-0"



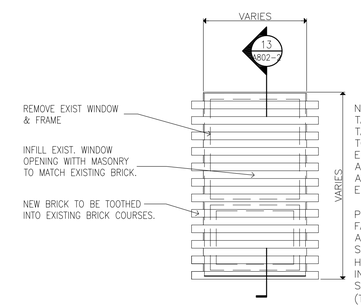
9 WINDOW /LOUVER JAMB DETAIL @ BLDG. 102
SCALE: 1 1/2"=1'-0"



11 LOUVER SILL DETAIL @ BLDG. 102
SCALE: 1 1/2"=1'-0"



12 LOUVER HEAD DETAIL @ BLDG. 102
SCALE: 1 1/2"=1'-0"



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(TYPICAL ALL PATIENT AREAS)

15 ELEVATION @ MASONRY OPENING INFILL
SCALE: 1/2"=1'-0"

REVISED DRAWING 8-12-15

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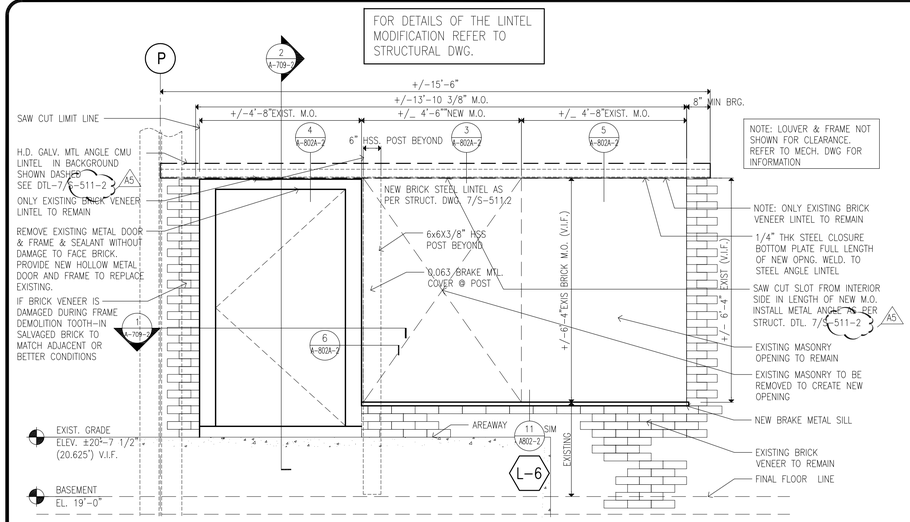
LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102 600 EAST 125TH STREET WARDS ISLAND, NY 10035
CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM
	6-15-2015	BID DOCUMENT

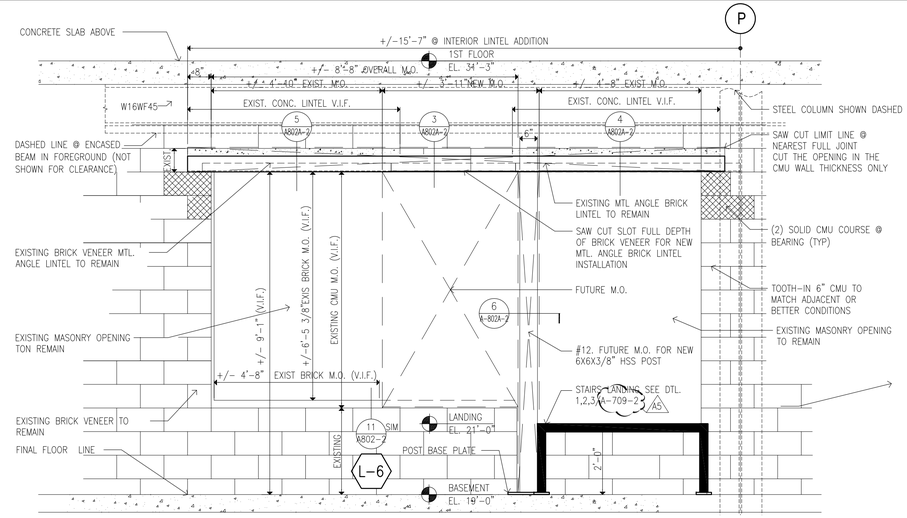
PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	JS/SV
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE:
WINDOW DETAILS AND MASONRY INFILL DETAILS

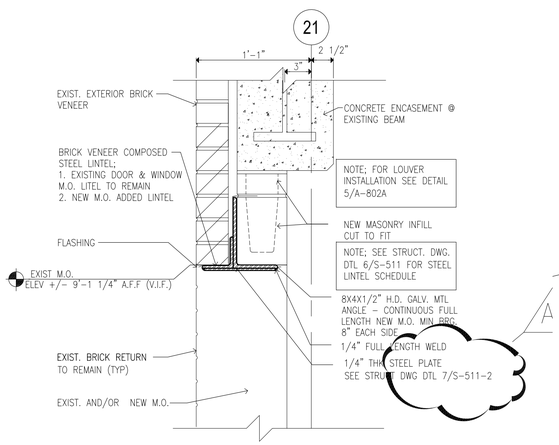
BUILDING NUMBER: 102
DRAWING NUMBER: A-802-2
SHEET



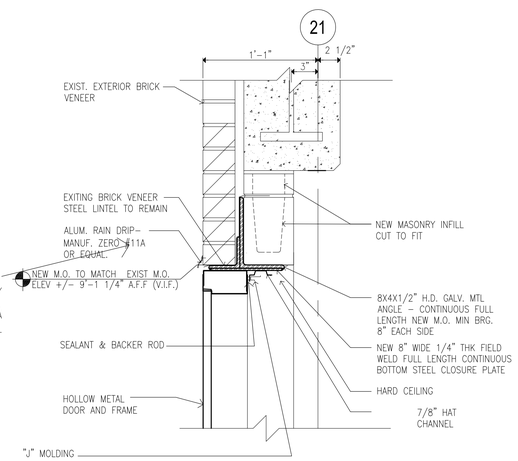
1 M.O. WIDENING DETAIL @ BLDG. 102 (EXTERIOR VIEW)
SCALE: 1/2"=1'-0"



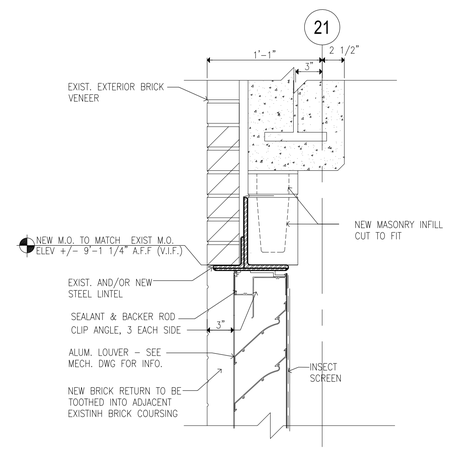
2 M.O. WIDENING DETAIL @ BLDG. 102 (INTERIOR VIEW)
SCALE: 1/2"=1'-0"



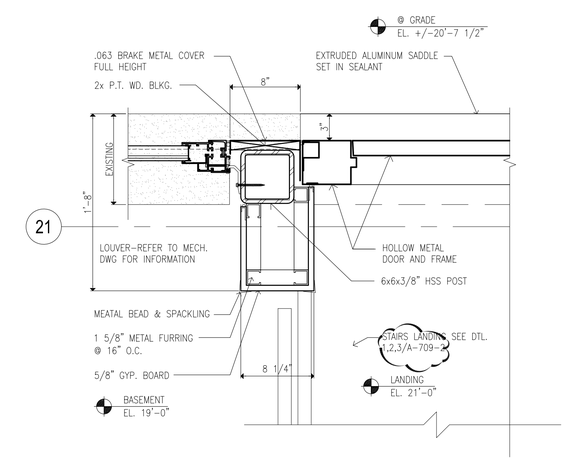
3 M.O. WIDENING DETAIL @ BLDG. 102
SCALE: 1 1/2"=1'-0"



4 DOOR HEAD DETAIL @ BLDG. 102
SCALE: 1 1/2"=1'-0"



5 LOUVER HEAD DETAIL @ BLDG. 102
SCALE: 1 1/2"=1'-0"



6 JAMB DETAIL @ DOOR - LOUVER
SCALE: 1 1/2"=1'-0"

ERECTION SEQUENCE:

1. REMOVE EXISTING DOOR AND/OR WINDOW & FRAME CAREFULLY DO NOT DAMAGE EXTERIOR BRICK VENEER.

2. SEE DETAILS THIS SHEET FOR THE CREATION OF NEW LINTEL TO SPAN NEWLY REQUIRED MASONRY OPENING

3. IF DURING DEMOLITION BRICK VENEER IS DAMAGED CONTRACTOR TO TOOTH IN SALVAGED BRICK TO MATCH ADJACENT EXISTING OR BETTER CONDITIONS AT NO COST TO THE OWNER.

4. CREATE NEW MASONRY OPENING IN DIMENSION AS INDICATED ON DRAWING AND/OR REQUIRED BY LOUVER SCHEDULE.

PHASE #1:

5. INSTALL TEMPORARY MASONRY SUPPORT AS REQUIRED

6. CAREFULLY COPE AND REMOVE EXISTING (CMU/CONCRETE) LINTELS AT EXISTING DOOR AND WINDOW LOCATIONS. ALL WORKS TO BE DONE FROM INTERIOR OF THE BUILDING (TYP)

7. CAREFULLY COPE AND REMOVE PORTION OF THE EXISTING CMU BETWEEN ADJACENT ALREADY REMOVED EXISTING (CMU/CONCRETE) LINTELS.

8. DO NOT DAMAGE EXTERIOR BRICK VENEER VUTE DURING WORK ON ITEMS 6. & 7..

9. SAW CUT SLOT FULL DEPTH OF BRICK VENEER ALIGN W/ ADJACENT BRICK VENNER STEEL LINTELS TO REMAIN TO INSTALL PORTION OF NEW STEEL LINTEL AT FUTURE MASONRY OPENING.

10. INSTALL NEW MTL ANGLE BRICK VENEER LINTEL BETWEEN EXISTING TO REMAIN AND BUTT WELD EACH SIDE FULL LENGTH.

11. CUT/COPE SLOT AS INDICATED ON DRAWING AND INSTALL 6X6X3/8" HSS POST

12. INSTALL CONTINUOUS CMU LINTEL AS PER DETAIL 7/S-511-2

13. REMOVE REMAINING CMU AND BRICK VENEER BELOW NEW MTL. LINTEL IN AREA AS INDICATED ON DRAWING.

PHASE #2:

14. FIELD WELD STEEL CLOSURE BOTTOM PLATE UNDER THE STEEL LINTELS AS INDICATED ON DETAIL 7/S-511-2 GRIND SMOOTHLY AND FINISH TO MATCH NEW METAL DOOR AND LOUVER FRAMES

15. FILL VOID IN CMU WALL ABOVE OPENING WITH 6" SOLID CMU AND NON SHRINK GROUT. CUT TO FIT AS REQ'D.

16. INSTALL NEW H.M. DOOR AND FRAME AS PER SCHEDULE

17. INSTALL NEW LOUVER AND FRAME AS PER MECH. DWG.

18. PRIME AND FINISH ALL METAL PARTS AS PER FINISH SCHEDULE.

REVISED DRAWING 8-12-15

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	6-15-2015	BID DOCUMENT

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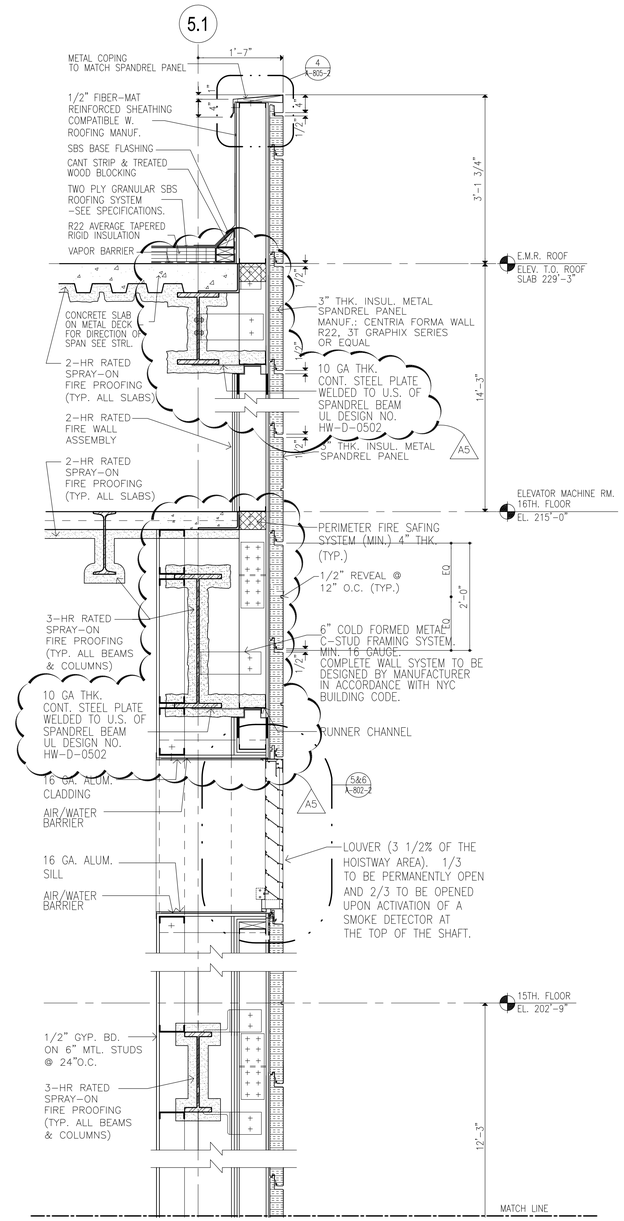
DRAWN BY:	JS/SV
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE: MASONRY OPENING DETAILS

BUILDING NUMBER: 102
DRAWING NUMBER: A-802A-2
SHEET



NOTES:
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REVISED DRAWING 8-12-15

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

A Joint Venture

225 Park Avenue South
New York, New York 10003

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	JS/SV
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

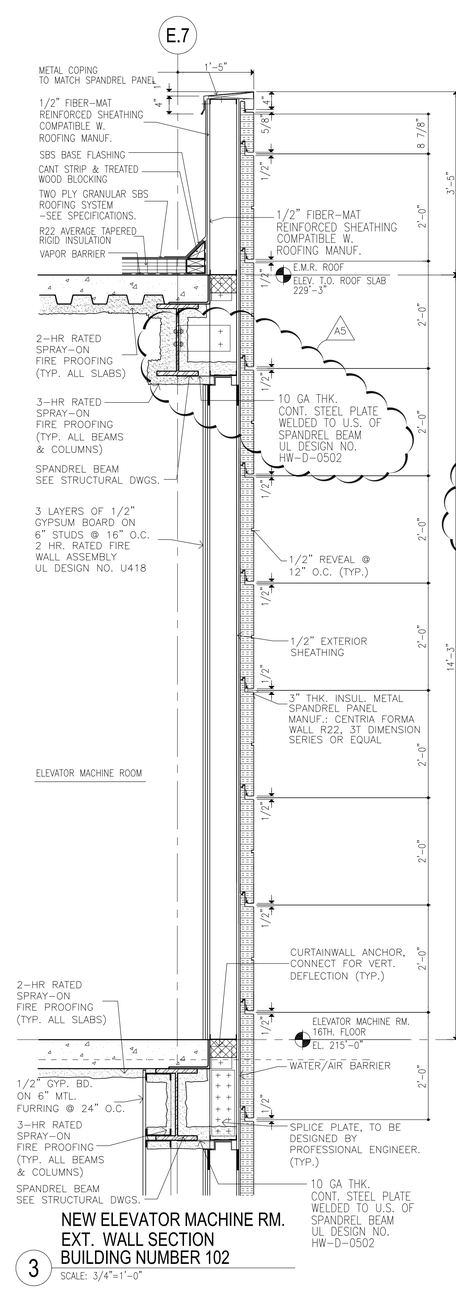
SHEET TITLE:

WALL SECTIONS

BUILDING NUMBER: 102

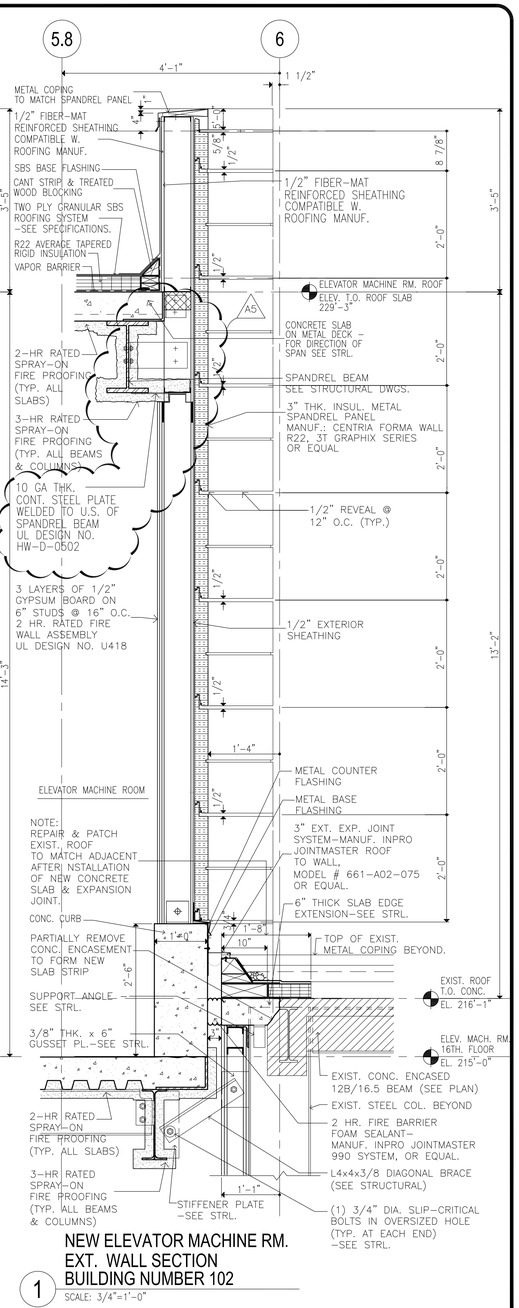
DRAWING NUMBER: A-805-2

SHEET



NEW ELEVATOR MACHINE RM.
EXT. WALL SECTION
BUILDING NUMBER 102

3 SCALE: 3/4"=1'-0"



NEW ELEVATOR MACHINE RM.
EXT. WALL SECTION
BUILDING NUMBER 102

1 SCALE: 3/4"=1'-0"

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REVISED DRAWING 8-12-15

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CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM
	6-15-2015	BID DOCUMENT

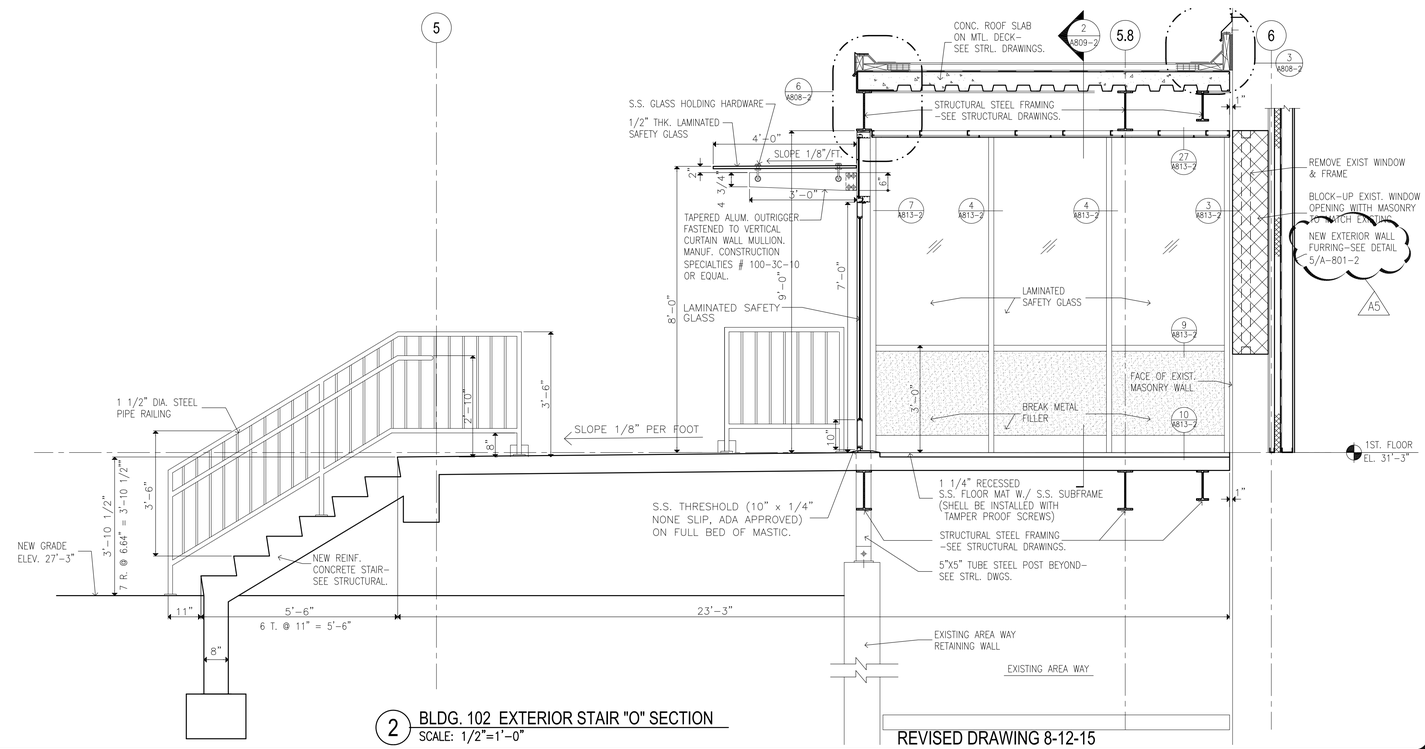
PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	JS/SV
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE:

WALL SECTIONS

BUILDING NUMBER:	DRAWING NUMBER:
102	A-807-2

SHEET



2 BLDG. 102 EXTERIOR STAIR "O" SECTION
SCALE: 1/2"=1'–0"

REVISED DRAWING 8-12-15

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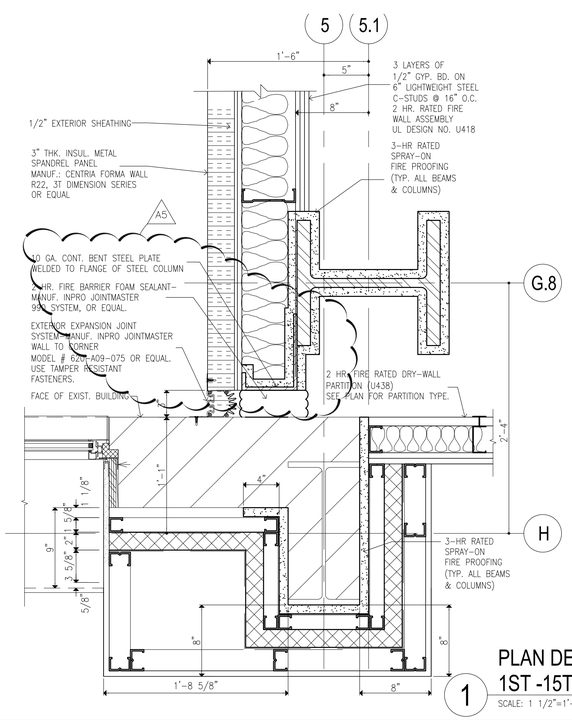
MARK	DATE	DESCRIPTION
A6	8-12-2015	ADDENDUM
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	JS/SV
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE:
VESTIBULE 101A PLAN, SECTION & DETAILS

BUILDING NUMBER: 102
DRAWING NUMBER: A-808
SHEET



PLAN DETAIL @ 1ST -15TH FLR.

SCALE: 1 1/2"=1'-0"

REVISED DRAWING 8-12-15

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DRAWN BY:	JS/SV
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

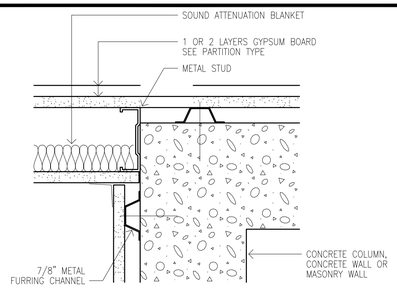
SHEET TITLE:

WALL DETAILS

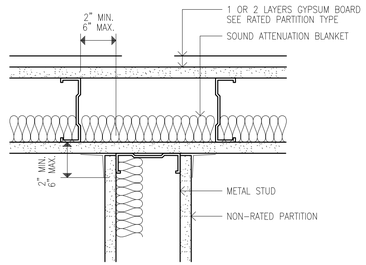
BUILDING NUMBER: 102

DRAWING NUMBER: A-810-2

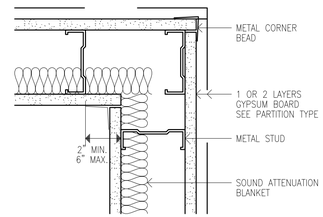
SHEET



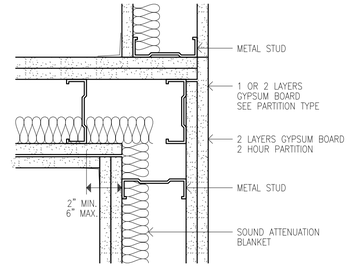
1 INTERSECTION W/ CONC. OR MASONRY
SCALE 3" = 1'0"



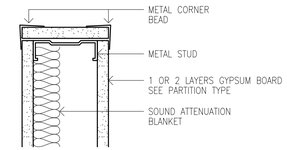
2 DRY WALL INTERSECTION
SCALE 3" = 1'0"



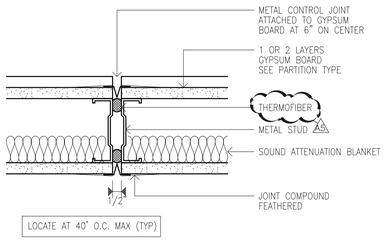
3 DRY WALL CORNER
SCALE 3" = 1'0"



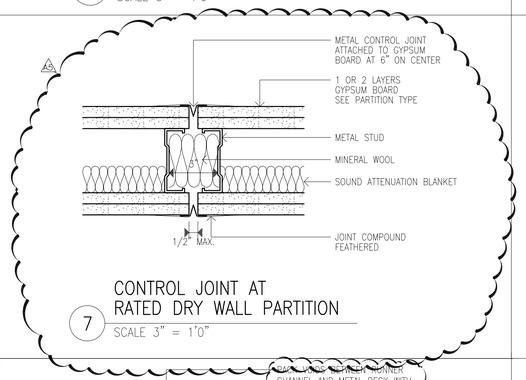
4 DRY WALL INTERSECTION – 2 HOUR TO 1 HOUR (OR NOT RATED)
SCALE 3" = 1'0"



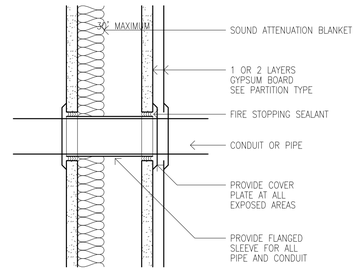
5 PARTITON END
SCALE 3" = 1'0"



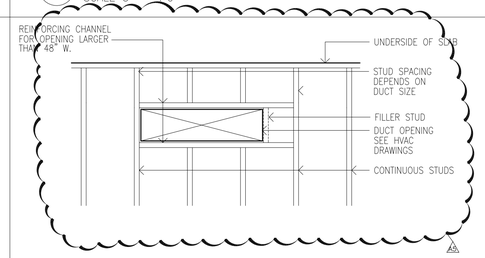
6 CONTROL JOINT AT UNRATED DRY WALL PARTITION
SCALE 3" = 1'0"



7 CONTROL JOINT AT RATED DRY WALL PARTITION
SCALE 3" = 1'0"

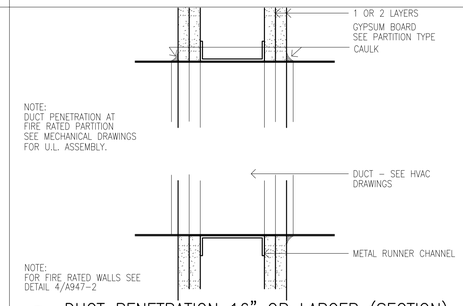


9 PIPE OR CONDUIT PENETRATION
SCALE 3" = 1'0"



NOTE:
FOR FIRE RATED WALLS SEE DETAIL 4/A947-2

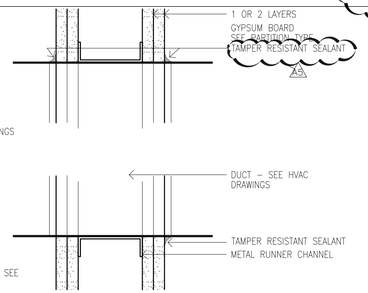
10 DUCT PENETRATION 16" OR LARGER (ELEVATION)
NO SCALE @ NON FIRE RATED PARTITION



NOTE:
DUCT PENETRATION AT FIRE RATED PARTITION SEE MECHANICAL DRAWINGS FOR U.L. ASSEMBLY.

NOTE:
FOR FIRE RATED WALLS SEE DETAIL 4/A947-2

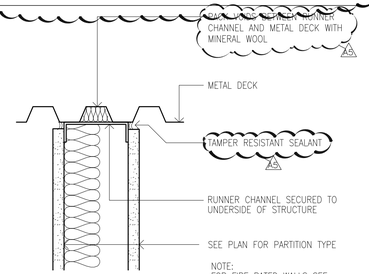
11 DUCT PENETRATION 16" OR LARGER (SECTION)
SCALE 3" = 1'0" @ NON FIRE RATED PARTITION



NOTE:
DUCT PENETRATION AT FIRE RATED PARTITION SEE MECHANICAL DRAWINGS FOR U.L. ASSEMBLY.

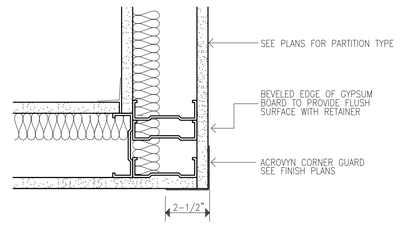
NOTE:
FOR FIRE RATED WALLS SEE DETAIL 4/A947-2

11 DUCT PENETRATION 16" OR LARGER (SECTION)
SCALE 3" = 1'0" @ NON FIRE RATED PARTITION

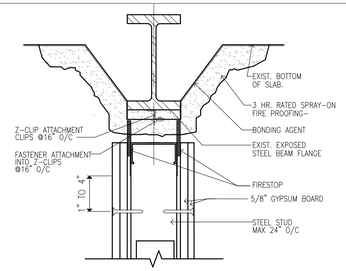


NOTE:
FOR FIRE RATED WALLS SEE DETAIL 4/A946-2

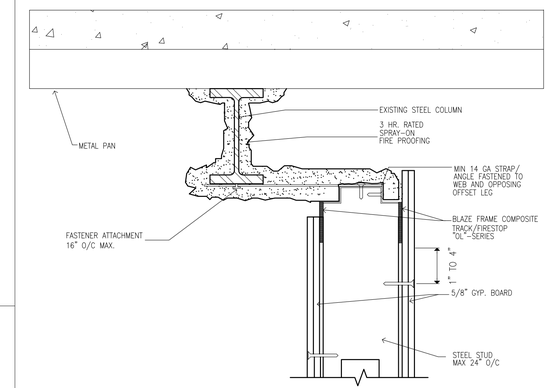
12 PARTITION AT EXPOSED METAL DECK
SCALE: 3" = 1'-0"



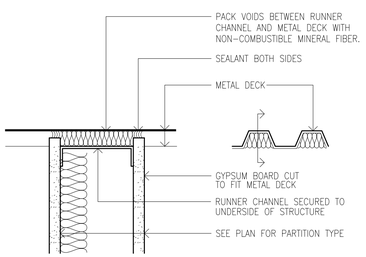
17A CORNER GUARD (SURFACE) MOUNTED APPLIES ONLY TO PATIENT AREA
SCALE: 3" = 1'-0"



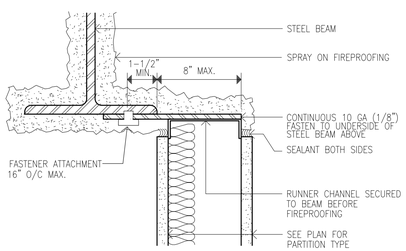
16 TYP. EXIST. STEEL BEAM FIRE PROOFING DETAIL -UL DESIGN NO. HW-D-0502
SCALE 1 1/2"=1'-0"



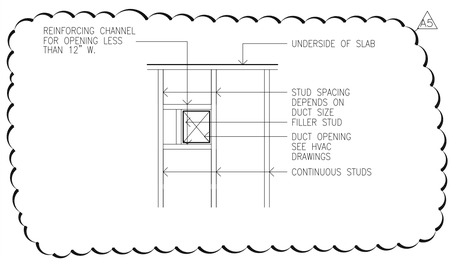
19 TYP. EXIST. CANTILEVERED UNDER STEEL BEAM FIRE PROOFING DETAIL- UL DESIGN NO. HW-D-0502
SCALE 1 1/2"=1'-0"



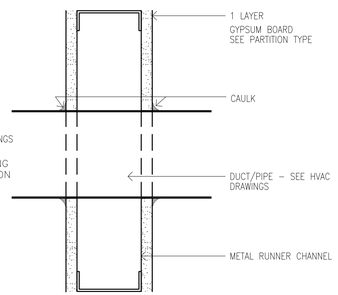
13 PARTITION AT EXPOSED METAL DECK
SCALE: 3" = 1'-0"



15 NONE RATED PARTITION AT OR NEAR BEAM
SCALE: 3" = 1'-0"



20 DUCT PENETRATION 16" OR LESS (ELEVATION)
NO SCALE @ NON FIRE RATED PARTITION



NOTE:
DUCT PENETRATION AT FIRE RATED PARTITION SEE MECHANICAL DRAWINGS FOR U.L. ASSEMBLY.

OMIT FILLER FRAMING AT PIPE PENETRATION

21 DUCT/PIPE PENETRATION 16" OR LESS (SECTION)
SCALE 3" = 1'0" @ NON FIRE RATED PARTITION

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MARK	DATE	DESCRIPTION
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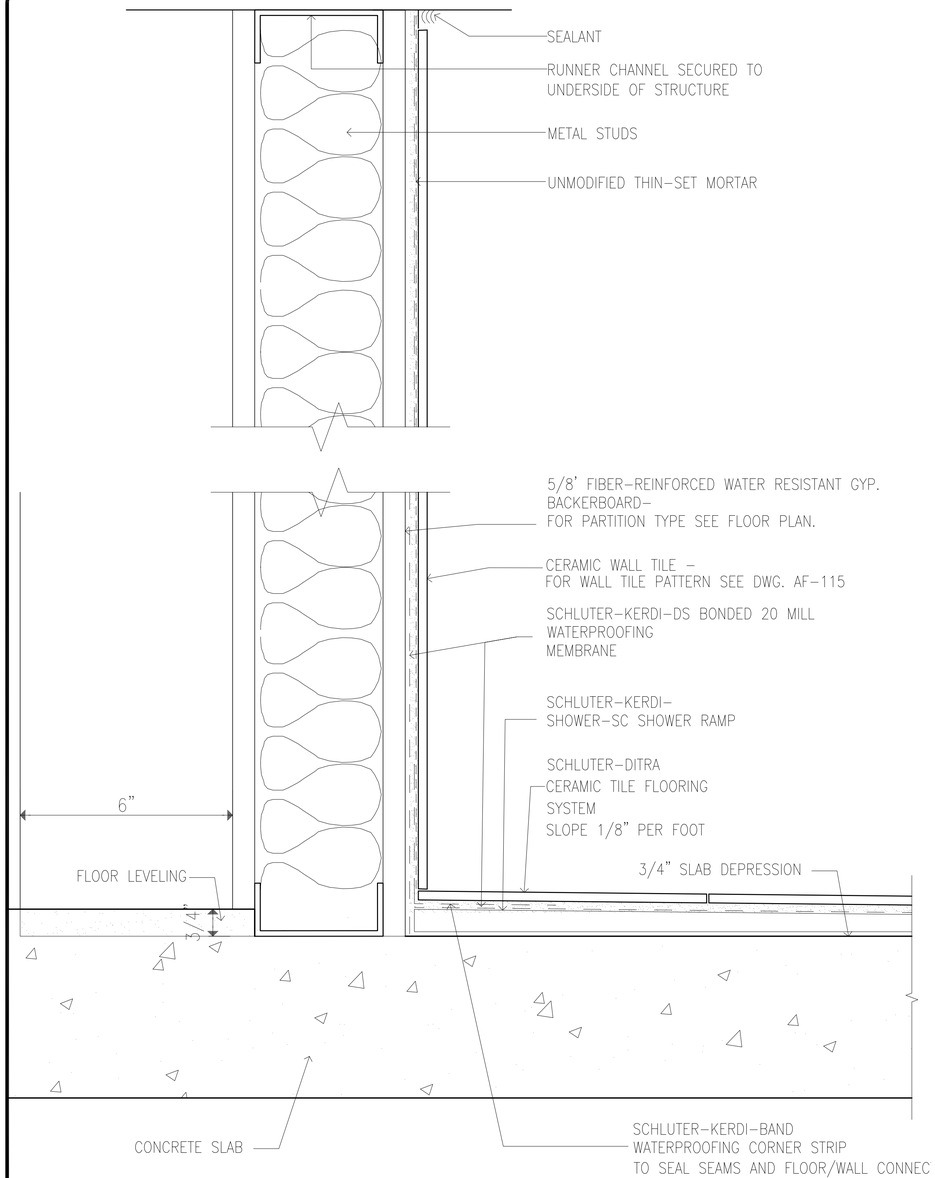
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	JS/SV
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE:
WALL DETAILS

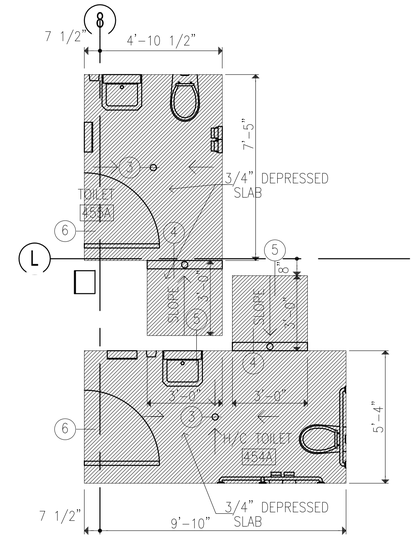
BUILDING NUMBER: 102
DRAWING NUMBER: A-811-2
SHEET



5 SECTION @ TOILET & SHOWER WALL / FLOOR

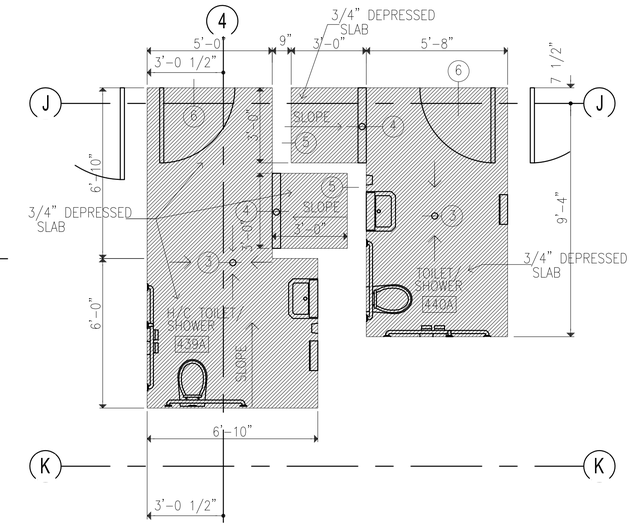
SCALE: 1/2"=1'-0"

*TYPICAL FOR ALL PATIENT AND NON-PATIENT AREAS WHERE DRAIN IS REQUIRED.



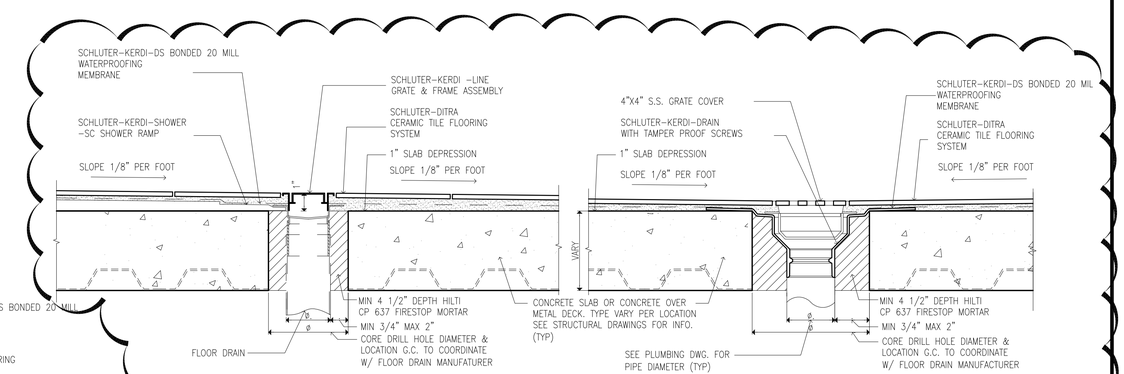
1 TOILET DEPRESSION LAYOUT

ROOM #454A & 455A



2 TOILET DEPRESSION LAYOUT

ROOM #439A & 440A



4 SECTION @ TRENCH DRAIN

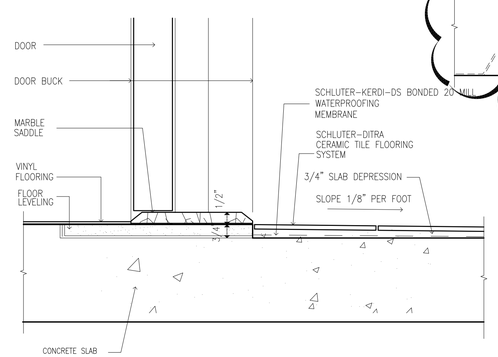
NTS

*TYPICAL FOR ALL PATIENT AND NON-PATIENT AREAS WHERE DRAIN IS REQUIRED.

3 SECTION @ FLOOR DRAIN

NTS

A5



6 SECTION @ DOOR

SCALE: 3"=1'-0"

*TYPICAL FOR ALL PATIENT AND NON-PATIENT AREAS WHERE DRAIN IS REQUIRED.

NOTES:
1. SEE FINISH PLANS FOR CERAMIC TILE SIZE AND PATTERN.
2. WATERPROOFING TO BE INSTALLED IN ALL AREAS SUBJECT TO WATER EXPOSURE. INSTALL SCHLUTER-KERDI SYSTEM OVER MORTAR BEDS AND SCHLUTER-KERDI-SHOWER RAMPS IN ALL TOILET AND/OR TOILET-SHOWERS HAVING FLOOR DRAINS.

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(TYPICAL ALL PATIENT AREAS)
* SCHLUTER SYSTEM TO BE INCORPORATED IN THE ENTIRE FLOORS AND WALLS WITHIN PATIENT TOILETS, PATIENT TOILETS/SHOWERS, GANG-TOILETS AND NON-PATIENT SHOWERS.

REVISED DRAWING 8-12-15

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

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New York, New York 10003

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CONTRACT:
CONSTRUCTION

TITLE:
MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT:
NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM
	6-15-2015	BID DOCUMENT

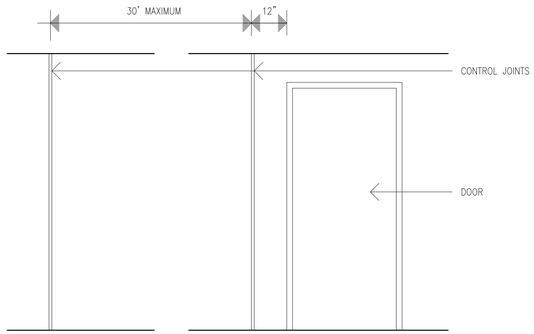
PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	JS/SV
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE:
INTERIOR DETAILS

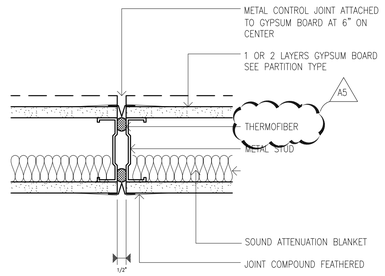
BUILDING NUMBER: 102

DRAWING NUMBER: A-815-2

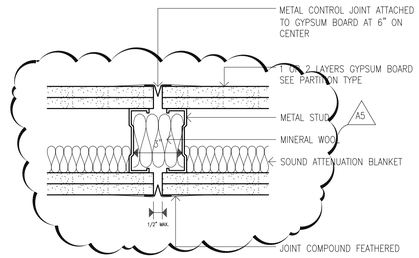
SHEET



1 CONTROL JOINT (ELEVATION) AT DRY WALL PARTITION
NO SCALE

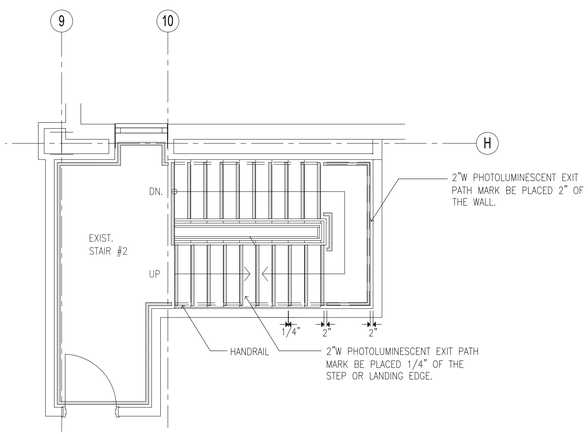


2 CONTROL JOINT AT UNRATED DRY WALL PARTITION
SCALE: 3"=1'-0"



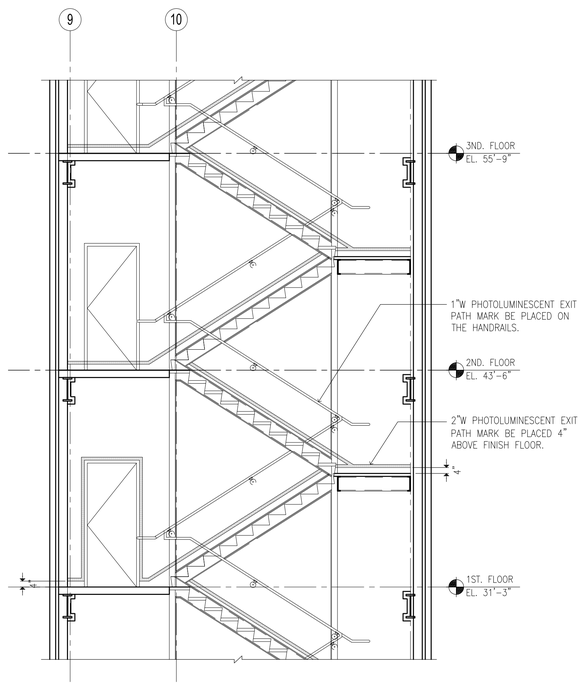
3 CONTROL JOINT AT RATED DRY WALL PARTITION
SCALE: 3"=1'-0"

PHOTOLUMINESCENT PATH NOTES:
1. MANUFACTURE : EVERGLOW TL300 EPOXY COATING KITS.
2. A SOLID AND CONTINUOUS PERIMETER DEMARCATION MARKING STRIPE SHELL BE APPLIED ON THE FLOOR AND THE WALLS AT STAIR LANDINGS, EXIT PASSAGEWAYS, AND OTHER PARTS OF THE FLOOR AREAS WITHIN THE EXIT ENCLOSURE.
3. FINAL DOOR MARKINGS ARE REQUIRED ONLY FOR THE DOOR LEADING DIRECTLY TO AN APPROVED BUILDING EXIT OR FOR DOORS THAT MUST BE PASSED THROUGH IN ORDER TO REACH A FINAL EXIT DOOR.
4. HANDRAIL MARKINGS SHELL BE PLACED ON THE TOP OF THE HANDRAILS FOR THE CONTINUOUS LENGTH OF THE HANDRAILS EXCEPT FOR A 4" GAP ALLOWED AT DIRECTIONAL CHANGES IN TEH HANDRAIL.



4 TYPICAL PHOTOLUMINESCENT PATH PLAN AT EGRESS STAIR
SCALE: 1/4"=1'-0"

P-18 PHOTOLUMINESCENT EXIT PATH MARK /EVERGLOW TL300 EPOXY COATING KITS



5 TYPICAL PHOTOLUMINESCENT PATH ELEVATION AT EGRESS STAIR
SCALE: 1/4"=1'-0"

P-18 PHOTOLUMINESCENT EXIT PATH MARK /EVERGLOW TL300 EPOXY COATING KITS

REVISED DRAWING 8-12-15

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

CONSULTANTS:
RBSD ARCHITECTS P.C. | STV 100 Years
A Joint Venture
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LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035
CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
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	6-15-2015	BID DOCUMENT

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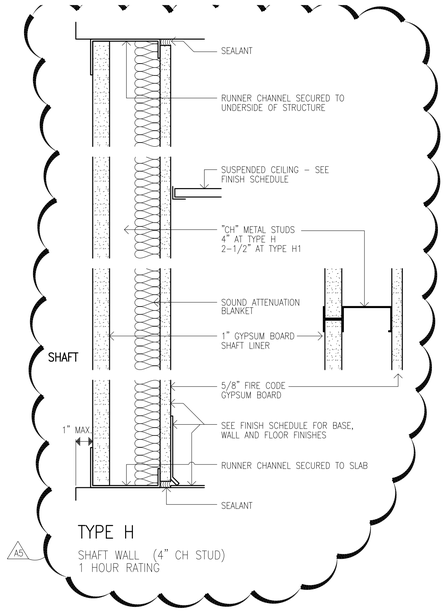
DRAWN BY:	JS/SV
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE:
INTERIOR DETAILS

BUILDING NUMBER: 102
DRAWING NUMBER: A-815A-2
SHEET



TYPE H

A5

SHAFT WALL (4" CH STUD)
1 HOUR RATING

NOTES:
REFER TO DRAWING A-946 AND A-947 FOR SEALING WALL PENETRATION AT FIRE RATED WALLS.

REVISED DRAWING 8-12-15

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

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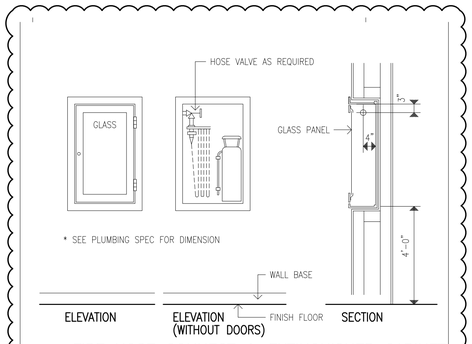
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE:
PARTITION TYPES

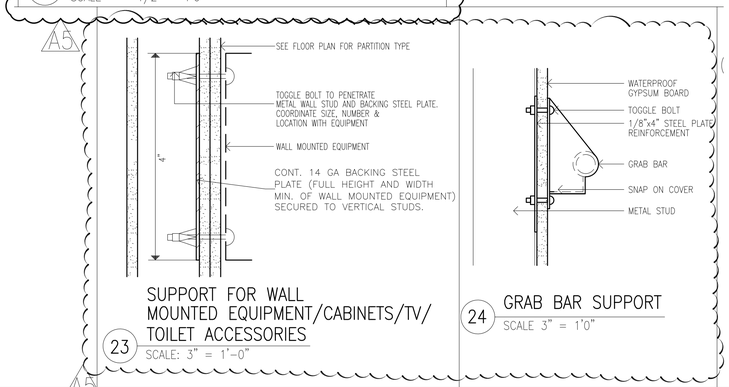
BUILDING NUMBER: 102

DRAWING NUMBER: A-900-2

SHEET



17 FIRE HOSE CONNECT & EXTINGUISHER CABINET
SCALE – 1/2" = 1'0"



23 SUPPORT FOR WALL MOUNTED EQUIPMENT/CABINETS/TV/ TOILET ACCESSORIES
SCALE: 3" = 1'-0"

24 GRAB BAR SUPPORT
SCALE 3" = 1'0"

REVISED DRAWING 8-12-15

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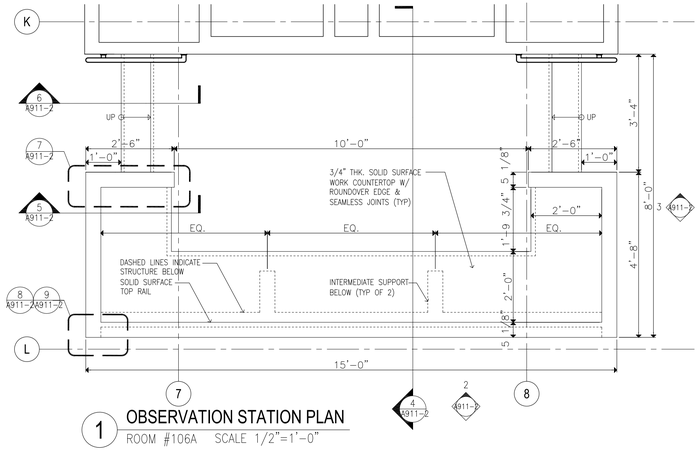
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE:
DOORS, THRESHOLDS, AND MISCELLANEOUS DETAILS

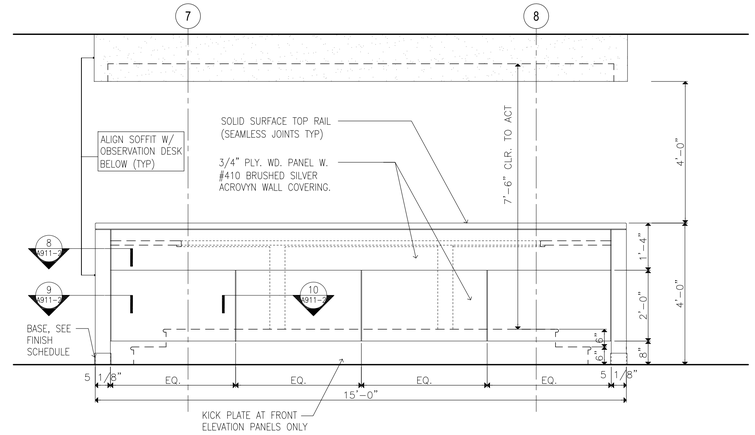
BUILDING NUMBER: 102

DRAWING NUMBER: A-905-2

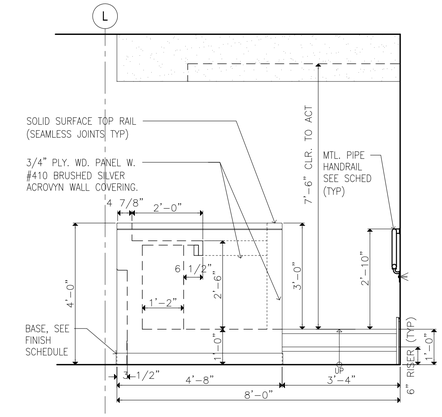
SHEET



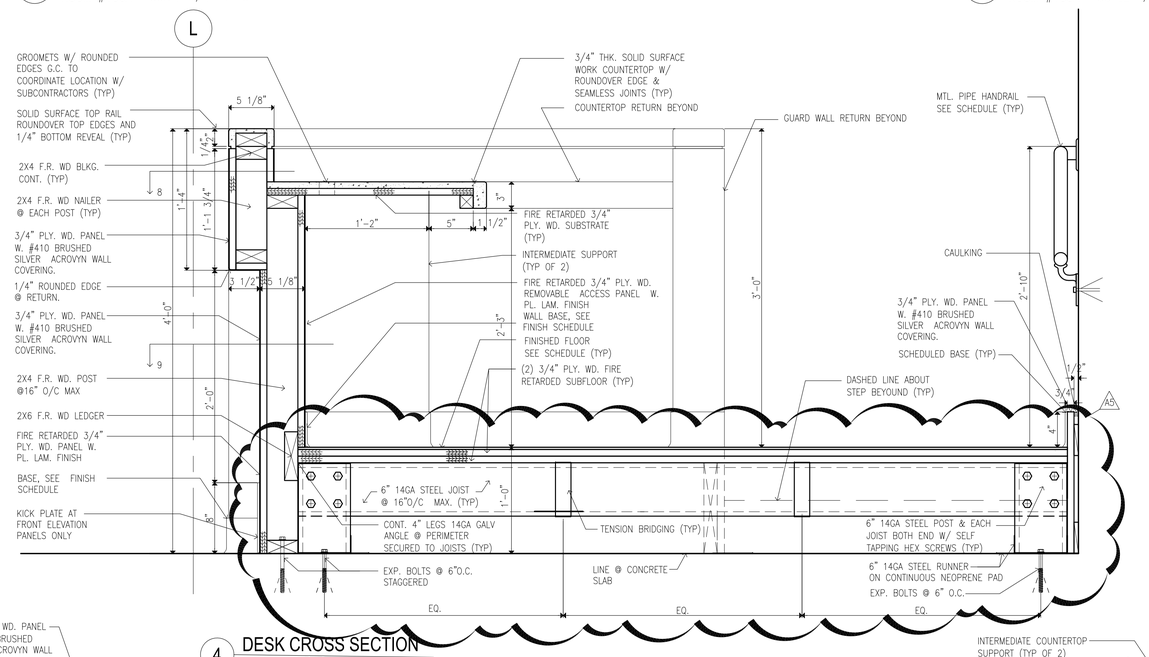
1 OBSERVATION STATION PLAN
ROOM #106A SCALE 1/2"=1'-0"



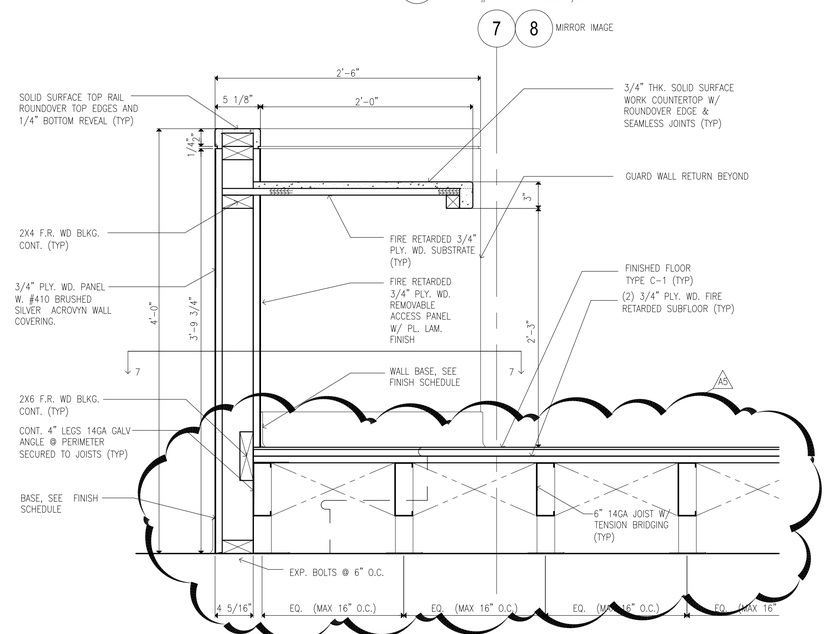
2 OBSERVATION STATION FRONT ELEVATION
ROOM #106A SCALE 1/2"=1'-0"



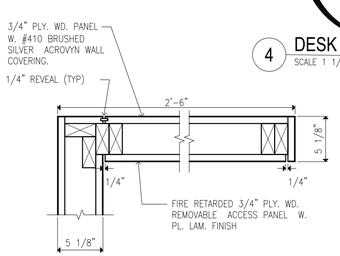
3 OBSERVATION STATION SIDE ELEVATION
ROOM #106A SCALE 1/2"=1'-0"



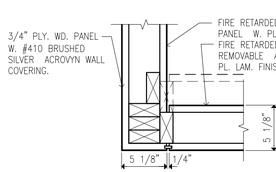
4 DESK CROSS SECTION
SCALE 1 1/2"=1'-0"



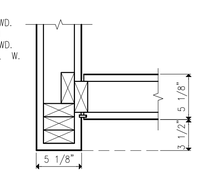
5 DESK PARTIAL SIDE SECTION
SCALE 1 1/2"=1'-0"



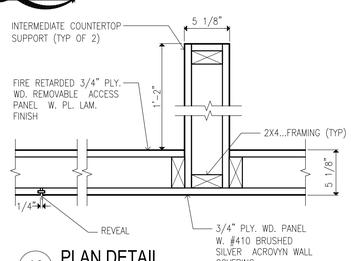
7 PLAN DETAIL
SCALE 1 1/2"=1'-0"



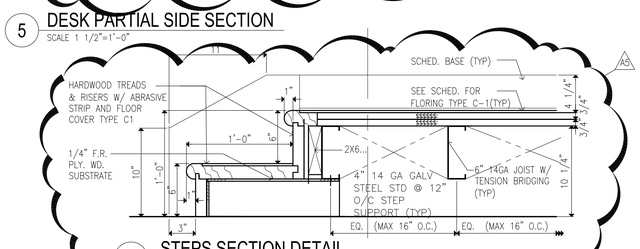
8 PLAN DETAIL
SCALE 1 1/2"=1'-0"



9 PLAN DETAIL
SCALE 1 1/2"=1'-0"



10 PLAN DETAIL
SCALE 1 1/2"=1'-0"



6 STEPS SECTION DETAIL
SCALE 1 1/2"=1'-0"

GENERAL NOTE:
FOR THE RAISED PLATFORM FRAMING USE 6" 14GA GALV. STRUCT. STEEL STUDS @ 16" O/C MAX. G.C. TO PROVIDE SHOP DWG SIGN AND SEALED BY LICENSED ENGINEERS. ALL PLYWOOD, WD. FRAMING AND BLOCKING TO BE FIRE RETARDED (TYP)

REVISED DRAWING 8-12-15

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

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DESIGNED BY:	MAK / WW
DRAWN BY:	JS/SV
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE:
MILLWORK PLAN & ELEVATIONS

BUILDING NUMBER: 102
DRAWING NUMBER: A-911-2
SHEET

ENGINEERING JUDGEMENT FIRE STOP DETAIL

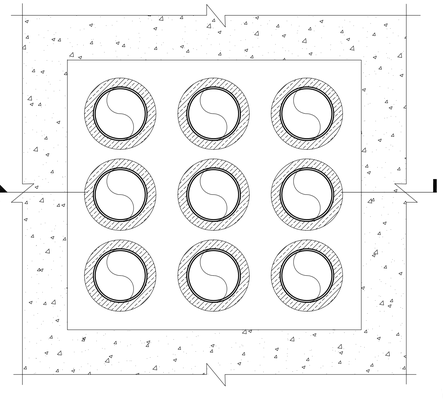
PROJECT: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN PSYCHIATRIC CENTER FORENSIC RELOCATION OGS PROJECT NO. 44578
CONTRACTOR: TDX CONSTRUCTION/RBSD/STV JOINT VENTURE

F-RATING = 2-HR.

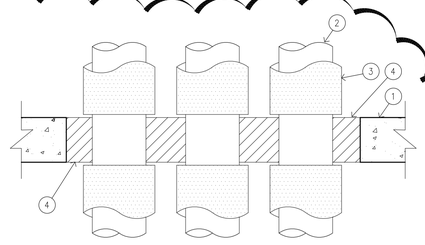
1. CONCRETE FLOOR ASSEMBLY (MINIMUM 4 1/2" THICK) (2HR. FIRE RATING).
2. ONE OR MORE MAXIMUM 12" NOMINAL DIAMETER STEEL PIPE.
3. MAXIMUM 2" THICKNESS CALSS-FIBER PIPE INSULATION (SEE NOTE NO. 3 BELOW).
4. MINIMUM 4 1/2" DEPYH HILTI CP 637 FIRESTOP MORTAR.

NOTES:
1. MAXIMUM SIZE OF OPENING=73" x 66".
2. ANNULAR SPACE=MINIMUM 2", MAXIMUM 12".
3. INSULATION TO BE REMOVED WHERE PASSING THROUGH FLOOR.

THE ENGINEERING JUDGEMENT REPRESENTS A FIRESTOP SYSTEM THAT WOULD BE EXPECTED TO PASS THE STATED RATINGS IF TESTED. (REFERENCE: UL/cUL SYSTEM NO. C-AJ-8143 & C-AJ-8096)



10 TOP VIEW
N.T.S.



11 SECTION
N.T.S.

A5

REVISED DRAWING 8-12-15

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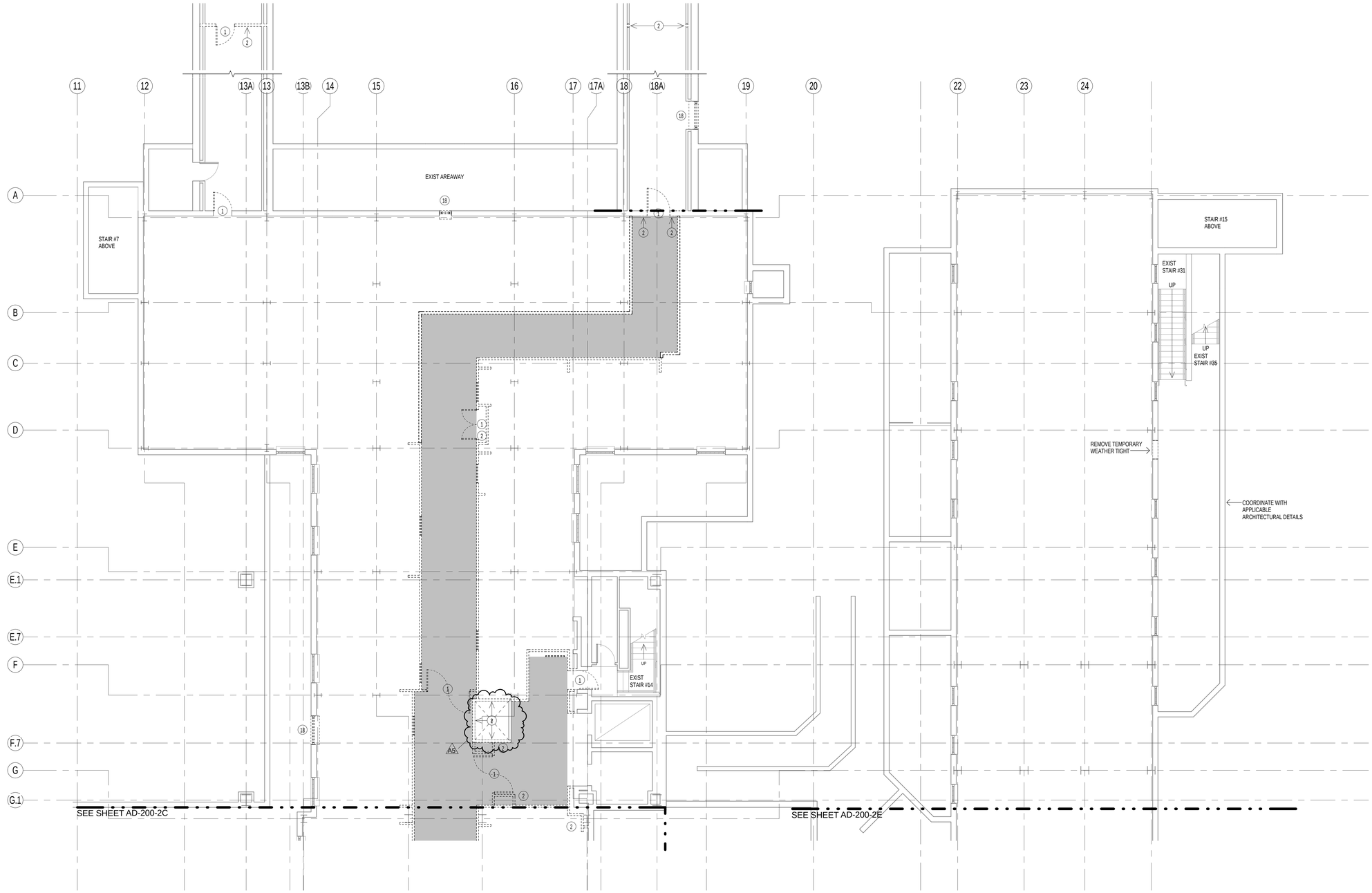
DRAWN BY:	JS/SV
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE:
SPRAY-ON FIREPROOFING DETAILS

BUILDING NUMBER: 102
DRAWING NUMBER: A-945-2
SHEET



1 BASEMENT DEMOLITION2 PLAN, PART "D"

DEMOLITION NOTES

1. ALL EXISTING WALLS LOCATED IN THE NORTH OF LINE 13 ARE MASONRY AS WELL AS ALL STAIR AND ELECTRIC CLOSETS ENCLOSURE. EXTERIOR WALLS ARE MASONRY AND BRICK AS DETAILED.
2. THE CEILINGS IN THE SOUTH OF LINE 14 ABOVE THE FIRST FLOOR ARE ACOUSTICAL TILE.
3. WHEN NEW WINDOWS/LOUVERS OR DOORS ARE INDICATED ON THE DRAWINGS, THE CONTRACTOR SHALL BE RESPONSIBLE TO REMOVE THE TEMPORARY PROTECTION.
4. DEMOLISH AREAS AS INDICATED AND COORDINATE WITH APPLICABLE ARCHITECTURAL DETAILS.
5. REMOVE ANY AND OR ALL REMAINING FURRING ALONG EXTERIOR WALLS, COLUMNS, OR OTHER LOCATIONS.
6. THE GENERAL CONTRACTOR SHALL COORDINATE VERTICAL SHAFT OPENING WITH THE MECHANICAL CONTRACTOR AND SAW CUT WHERE REQUIRED. ALSO COORDINATE WITH DT. A 823 AT BOTTOM OF SHAFTS.
7. DEMOLITION AND REPLACEMENT IN KIND WILL BE REQUIRED SOUTH OF LINE 13B TO ALLOW INSTALLATION OF NEW DUCT WORK AND NEW CEILING WHERE INDICATED ON AR DWGS.
8. THE CEILINGS ON THE BASEMENT CORRIDOR ARE PLASTER ABOVE THE HORIZONTAL SHAFT WALL TEMPORARY CEILING.

KEYED DEMOLITION NOTES

1. REMOVE EXISTING DOOR AND FRAMES AND RELATED HARDWARE. (COORDINATE DOOR REMOVAL WITH ASBESTOS ABATEMENT WORK)
2. REMOVE EXISTING WALL, PARTITIONS, WIRE MESH PARTITIONS SEE STRUCTURAL DWG.
3. REMOVE EXISTING RAILING/FENCE
4. REMOVE EXISTING STAIRCASE
7. REMOVE EXISITNG GYPSUM WALL BOARD PARTITIONS
8. REMOVE EXISTING ROOF
18. REMOVE EXISTING WINDOW
19. MAKE A NEW OPENING FOR NEW WINDOW OR LOUVER OR DOOR REFER DETAIL DWG
23. REMOVE TRANSOM OF THE WINDOW INSTALLED IN BID PACKAGE #1
24. REMOVE TRANSOM OF THE EXISTING WINDOW
25. REMOVE CANOPY
26. REMOVE EXISTING ACOUSTICAL TILE SUSPENDED CEILING, GRID SYSTEM, SUPPORTS, PLASTER CEILING, LATHE, BLACK IRON AND SUPPORTS
27. NEW SHAFT OR PIPE OPENING TO BE CUT OR CORE DRILLED IN NEW OR EXISTING SLAB AFTER COORDINATION WITH ARCHITECTURAL PARTITIONS AND MEP SHOP DRAWINGS(DO NOT CUT OR CORE DRILL THRU RIBS IN EXISTING SLAB). SEE ALSO STRUCTURAL DRAWING FOR NEW FRAMED OPENINGS IN BID PACKAGE 2.

SYMBOLS

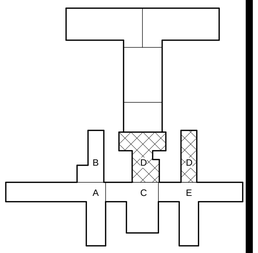
INDICATES EXISTING SPACES TO REMAIN

INDICATES SHAFT OPENINGS TO BE SAW CUT IN THIS CONTRACT: FOR ACTUAL SCOPE & DETAILS, SEE STRUCTURAL DRAWINGS FOR THIS CONTRACT AND BP1 REFERENCE DRAWINGS AND DEMOLITION NOTE 6 BELOW.

INDICATES EXISTING OPENING

REMOVE ALL EXISTING AND TEMPORARY CEILING, WALL, DOORS, LIGHTING, SPRINKLERS, DUCTWORK, AND LIFE SAFETY DEVICES. (SEE HAZARDOUS AND MEP DWGS FOR REMOVAL OF EXISTING WORK ABOVE TEMPORARY CORRIDOR)

S DENOTES BOTTOM OF MECH. SHAFT OPENING, SEE PLANS FOR LOCATIONS (FILL ENTIRE SLAB THICKNESS SOLID AT BOTTOM OF MECH. SHAFT FLOOR OPENINGS WITHOUT STYROFOAM BLOCKOUT); SEE DRAWING 6/S-301-2.



PROJECT NORTH

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

NEW YORK STATE OF OPPORTUNITY. | Office of General Services

DESIGN & CONSTRUCTION

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REGISTERED ARCHITECT WILLIAM G. SEELIN NO. 105 STATE OF NEW YORK

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DRAWN BY:	LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

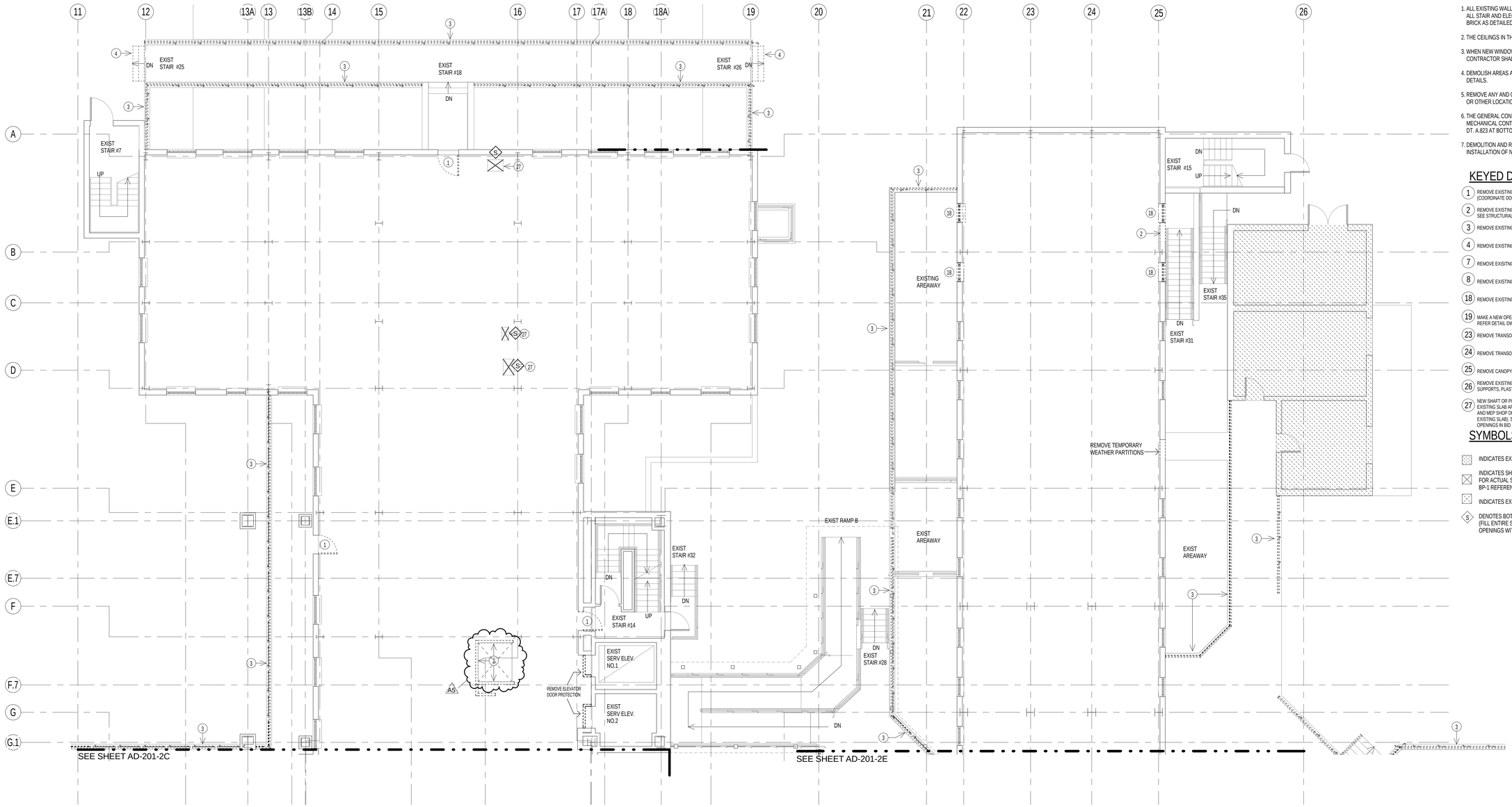
SHEET TITLE:
BASEMENT DEMOLITION PLAN, PART "D"

BUILDING NUMBER: 102

DRAWING NUMBER: AD-200-2D

SHEET

8/25/2015 3:32:10 PM



DEMOLITION NOTES

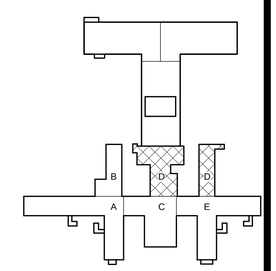
1. ALL EXISTING WALLS LOCATED IN THE NORTH OF LINE 13 ARE MASONRY AS WELL AS ALL STAIR AND ELECTRIC CLOSETS ENCLOSURE. EXTERIOR WALLS ARE MASONRY AND BRICK AS DETAILED.
2. THE CEILINGS IN THE SOUTH OF LINE 14 ABOVE THE FIRST FLOOR ARE ACOUSTICAL TILE.
3. WHEN NEW WINDOWS/LOUVERS OR DOORS ARE INDICATED ON THE DRAWINGS, THE CONTRACTOR SHALL BE RESPONSIBLE TO REMOVE THE TEMPORARY PROTECTION.
4. DEMOLISH AREAS AS INDICATED AND COORDINATE WITH APPLICABLE ARCHITECTURAL DETAILS.
5. REMOVE ANY AND OR ALL REMAINING FURRING ALONG EXTERIOR WALLS, COLUMNS, OR OTHER LOCATIONS.
6. THE GENERAL CONTRACTOR SHALL COORDINATE VERTICAL SHAFT OPENING WITH THE MECHANICAL CONTRACTOR AND SAW CUT WHERE REQUIRED. ALSO COORDINATE WITH DT. A.823 AT BOTTOM OF SHAFTS.
7. DEMOLITION AND REPLACEMENT IN KIND WILL BE REQUIRED SOUTH OF LINE 13B TO ALLOW INSTALLATION OF NEW DUCT WORK AND NEW CEILING WHERE INDICATED ON AR DWGS.

KEYED DEMOLITION NOTES

1. REMOVE EXISTING DOOR AND FRAMES AND RELATED HARDWARE. (COORDINATE DOOR REMOVAL WITH ASBESTOS ABATEMENT WORK)
2. REMOVE EXISTING WALL, PARTITIONS, WIRE MESH PARTITIONS SEE STRUCTURAL DWG.
3. REMOVE EXISTING RALING/FENCE
4. REMOVE EXISTING STAIRCASE
7. REMOVE EXISITNG GYPSUM WALL BOARD PARTITIONS
8. REMOVE EXISTING ROOF
18. REMOVE EXISTING WINDOW
19. MAKE A NEW OPENING FOR NEW WINDOW OR LOUVER OR DOOR REFER DETAIL DWG
23. REMOVE TRANSOM OF THE WINDOW INSTALLED IN BID PACKAGE #1
24. REMOVE TRANSOM OF THE EXISTING WINDOW
25. REMOVE CANOPY
26. REMOVE EXISTING ACOUSTICAL TILE SUSPENDED CEILING, GRID SYSTEM, SUPPORTS, PLASTER CEILING, LATHE, BLACK IRON AND SUPPORTS
27. NEW SHAFT OR PIPE OPENING TO BE CUT OR CORE DRILLED IN NEW OR EXISTING SLAB AFTER COORDINATION WITH ARCHITECTURAL PARTITIONS AND MEP SHOP DRAWINGS(DO NOT CUT OR CORE DRILL THRU RIBS IN EXISTING SLAB). SEE ALSO STRUCTURAL DRAWING FOR NEW FRAMED OPENINGS IN BID PACKAGE 2.

SYMBOLS

- INDICATES EXISTING SPACES TO REMAIN
- INDICATES SHAFT OPENINGS TO BE SAW CUT IN THIS CONTRACT: FOR ACTUAL SCOPE & DETAILS, SEE STRUCTURAL DRAWINGS FOR THIS CONTRACT AND BP-1 REFERENCE DRAWINGS AND DEMOLITION NOTE 6 BELOW.
- INDICATES EXISTING OPENING
- DENOTES BOTTOM OF MECH. SHAFT OPENING, SEE PLANS FOR LOCATIONS (FILL ENTIRE SLAB THICKNESS SOLID AT BOTTOM OF MECH. SHAFT FLOOR OPENINGS WITHOUT STYROFOAM BLOCKOUT); SEE DRAWING 6/S-301-2.



PROJECT NORTH

1 FIRST FLOOR DEMOLITION2 PLAN, PART "D"

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

A Joint Venture
225 Park Avenue South
New York, New York 10003

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.

REGISTERED ARCHITECT WILLIAM B. SEHN NO. 10[illegible] STATE OF NEW YORK

CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER: 44578
DESIGNED BY: MAK / WW
DRAWN BY: LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK: N/A
APPROVED: WS / MAK / LF

SHEET TITLE:
FIRST FLOOR DEMOLITION PLAN, PART "D"

BUILDING NUMBER: 102
DRAWING NUMBER: AD-201-2D
SHEET

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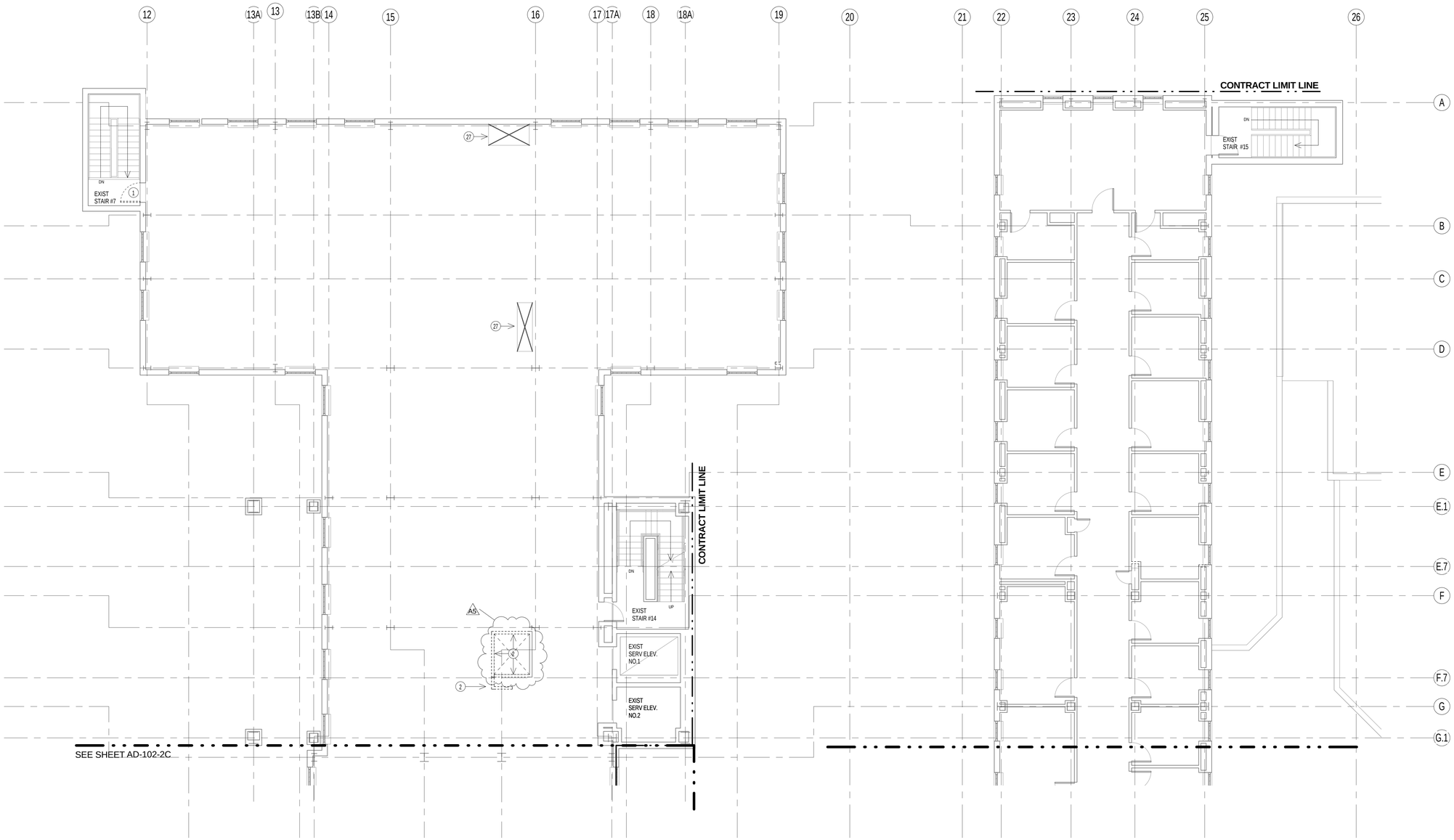

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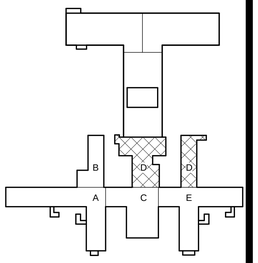

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NEW YORK STATE OF OPPORTUNITY. Office of General Services

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FIELD CHECK: N/A
APPROVED: WS / MAK / LF

SHEET TITLE: SECOND FLOOR DEMOLITION PLAN, PART "D"

BUILDING NUMBER: 102
DRAWING NUMBER: AD-202-2D
SHEET

8/25/2015 3:29:08 PM

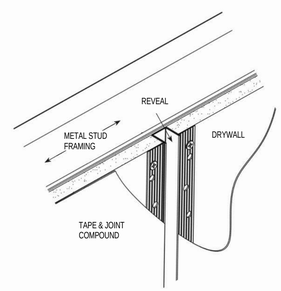
FINISH SCHEDULE

	CODE	PRODUCT	MANUFACTURER	COLLECTION/ MODEL #	COLORS	SIZE & FINISH	REMARKS
	P-1	PAINT	SHERWIN WILLIAMS	HARMONY	SW 7012 CREAMY	EG-SHEL, U.O.N.	FIELD WALL PAINT BASEMENT -9
	P-2	PAINT	SHERWIN WILLIAMS	HARMONY	SW 6107 NOMADIC DESERT	EG-SHEL, U.O.N.	ACCENT WALL PAINT ON FLOORS BASEMENT - 2 / ACTIVITY ROOM ON FLOORS 3-11
	P-3	PAINT	SHERWIN WILLIAMS	HARMONY	SW 6403 ESCAPADE GOLD	EG-SHEL, U.O.N.	ACCENT WALL PAINT ON FLOORS 3-5
	P-4	PAINT	SHERWIN WILLIAMS	HARMONY	SW 6683 BEE	EG-SHEL, U.O.N.	ACCENT WALL PAINT ON FLOORS 6-9
	P-5	PAINT	SHERWIN WILLIAMS	HARMONY	SW 6256 SERIOUS GRAY	EG-SHEL, U.O.N.	ACCENT WALL PAINT ON FLOORS 10-11
	P-6	PAINT	SHERWIN WILLIAMS	HARMONY	SW 6500 OPEN SEAS	EG-SHEL, U.O.N.	ACCENT WALL PAINT ON FLOORS 12-14
	P-7	PAINT	SHERWIN WILLIAMS	HARMONY	SW 7036 ACCESSIBLE BEIGE	EG-SHEL, U.O.N.	FIELD WALL PAINT IN PATIENT ROOM
	P-8	PAINT	SHERWIN WILLIAMS	HARMONY	SW 7012 CREAMY	SEMI-GLOSS	DOOR / DOOR FRAME PAINT BASEMENT -9
	P-9	PAINT	SHERWIN WILLIAMS	HARMONY	SW 6379 JERSEY CREAM	EG-SHEL, U.O.N.	ACCENT WALL PAINT IN VISITING ROOM ON FLOOR 1
	P-10	PAINT	SHERWIN WILLIAMS	HARMONY	SW 0073 CHARTREUSE	EG-SHEL, U.O.N.	ACCENT WALL PAINT IN STAFF LOUNGE
	P-11	PAINT	SHERWIN WILLIAMS	HARMONY	SW 6163 GRASSLAND	EG-SHEL, U.O.N.	ACCENT WALL PAINT IN WAITING ROOM ON FLOOR 1
	P-12	PAINT	SHERWIN WILLIAMS	HARMONY	TBD	EG-SHEL, U.O.N.	ACCENT WALL PAINT AT RECEPTION ON FLOOR 2
	P-13	NOT USED					
	P-14	PAINT	SHERWIN WILLIAMS	HARMONY	SW 0075 HOLIDAY TURQUOISE	EG-SHEL, U.O.N.	FIELD WALL PAINT IN RECREATION ROOM ON FLOORS 12-14
	P-15	PAINT	SHERWIN WILLIAMS	HARMONY	SW 6528 COSMOS	EG-SHEL, U.O.N.	FIELD WALL PAINT IN WEIGHT ROOM ON FLOOR 14
	P-16	PAINT	SHERWIN WILLIAMS	HARMONY	SW 7005 PURE WHITE	EG-SHEL, U.O.N.	FIELD WALL PAINT 10-14
	P-17	PAINT	SHERWIN WILLIAMS	HARMONY	SW 7005 PURE WHITE	SEMI-GLOSS	DOOR / DOOR FRAME PAINT 10-14
	P-18	PHOTOLUMINESCENT PAINT	EVERGLOW	TL300 EPOXY COATING KITS	-	-	PAINT STRIPES APPLIED TO FLOOR, WALLS & HANDRAILS AT EGRESS STAIRS
	Z-1	MULTICOLOR INTERIOR COATING	ZOLATONE	FLEX	FLX 0029		FIELD WALL PAINT IN CORRIDORS 3-9
	Z-2	MULTICOLOR INTERIOR COATING	ZOLATONE	FLEX	PLX-01024		FIELD WALL PAINT IN CORRIDORS 10-14
WALLS	WC-1	WALLCOVERING	TRIKES	LANARK WALLCOVERING	STRAND, TBD		WALLCOVERING IN RECEPTION & CORRIDOR AREAS
WALLS	WC-2	WALLCOVERING	KOROSEAL	PATANA	TBD		WALLCOVERING IN CONFERENCE ROOM
WALLS	WC-3	WALLCOVERING	TRIKES	LANARK WALLCOVERING	CAPULET, TBD		WALLCOVERING IN EXECUTIVE OFFICES
WALLS	WP-1	HIGH IMPACT WALL PROTECTION	C/S ACROVYN		#704, BRAZILIAN NUT		PATIENT ROOM DOORS ON FLOORS 3-11/ VERTICAL SURFACE FOR RECEPTION DESK
WALLS	WP-2	HIGH IMPACT WALL PROTECTION	C/S ACROVYN	ACROVYN BY DESIGN	CUSTOM PRINTED		ACCENT WALL IN ELEVATOR LOBBY, OBSERVATION POSTS & YOGA RM; IMAGES WILL VARY
WALLS	WP-3	HIGH IMPACT WALL PROTECTION	C/S ACROVYN		#410, BRUSHED SILVER		APPLIED TO VERTICAL SURFACE OF NURSES' STATION
WALLS	CG	HIGH IMPACT CORNER GUARD	C/S ACROVYN	ACROVYN 4000, VA SERIES 250N	#934, PEARL	SUEDE TEXTURE	
WALLS	PE	HIGH IMPACT PARTITION END	C/S ACROVYN	ACROVYN 4000, VA SERIES 250N	#934, PEARL	SUEDE TEXTURE	
WALLS	WG-1	HIGH IMPACT WALL PROTECTION	C/S ACROVYN	ACROVYN 4000, FR-225	#934, PEARL	SUEDE TEXTURE	CRASH RAIL WALL GUARD APPLIED TO OBSERVATION POSTS DESK & IN DINING ROOM
WALLS	PW-1	PADDED WALL	MARATHON ENG. CORP.	GOLD MEDAL SAFETY PADDING	TBD		PADDED WALL & FLOORS IN SECLUSION ROOMS
WALLS	PW-2	GYM PAD WALL	DRAPER	ECOVISION CLASS A FLAME RETARDANT WALL PADS	NAVY BLUE	MATCH WITH WN HEIGHT	APPLIED WALL PAD CUT OUT TRIM FOR OUTLET IF NECESSARY
WALLS	PWT-1	PORCELAIN WALL TILE	DALTILE	EVER	EV01, MOON	16" x 24", LIGHT POLISHED	FIELD WALL TILE IN TOILET (A)
WALLS	PWT-3	PORCELAIN WALL TILE	DALTILE	EVER	EV05, EARTH	8" x 24" x 0.313", LIGHT POLISHED	ACCENT WALL TILE IN STAFF TOILET (B)
WALLS	PWT-2	PORCELAIN WALL TILE	DALTILE	EVER	EV04, ROCK	8" x 24" x 0.313", LIGHT POLISHED	ACCENT WALL TILE IN PATIENT TOILET (C)
WALLS	WB-1	RUBBER WALL BASE	ROPPE	PINNACLE PLUS, #35	122, NATURAL	4-9/16" X 1/4"	TYPICAL WALL BASE IN OFFICE ON FLOOR 2
WALLS	WB-2	RUBBER WALL BASE	ROPPE	PINNACLE PLUS, #35	114, LUNAR DUST	4-9/16" X 1/4"	TYPICAL WALL BASE IN STORAGE, FILE & IT ROOM
WALLS	WB-3	RUBBER WALL BASE	ROPPE	PINNACLE PLUS, #35	140, FAWN	4-9/16" X 1/4"	TYPICAL WALL BASE IN COURT ROOM
WALLS	WB-4	WOOD WALL BASE	C/S ACROVYN	SARATOGA SERIES, WALL BASE TRIM, MITERED	#372 CLASSIC MAPLE		TYPICAL WALL BASE IN EXECUTIVE AREA ON FLOOR 2
WALLS	WB-5	RUBBER WALL BASE	ROPPE	PINNACLE PLUS, #35	193, BLACK BROWN	4-9/16" X 1/4"	TYPICAL WALL BASE FOR RECEPTION DESK & OBSERVATAION POST
FLOORS	FT-1	TERRAZZO TILE	FRITZTILE		CS21590, SHEER GRAY FLAT	12" x 12" x 0.18"(3/16")	TYPICAL FLOORING IN ELEVATOR AREA
FLOORS	FT-2	TERRAZZO TILE	FRITZTILE		CS21595, ROMAN GRAY FLAT	12" x 12" x 0.18"(3/16")	TYPICAL FLOORING BORDER IN 1ST/2ND FL. LOBBY AREAS
FLOORS	VT-1	VINYL TILE	ROPPE	SAFETCORK	#W198, WHITE IVORY	36" x 36" x 0.08"	TYPICAL FLOORING IN CORRIDORS ON FLOORS 3-9
FLOORS	VT-2	VINYL TILE	ROPPE	SAFETCORK	#W197, WHITE ICEBERG	36" x 36" x 0.08"	TYPICAL FLOORING IN CORRIDORS ON FLOORS 1, 10-14
FLOORS	VT-3	VINYL TILE	ROPPE	SAFETCORK	#W154, SALEM BLUE	36" x 36" x 0.08"	ACCENT FLOORING IN CORRIDORS ON FLOORS 12-14
FLOORS	VT-4	VINYL TILE	ARMSTRONG	STRIATIONS BBT	T3614, BISQUE	12" x 24" x 0.125"	TYPICAL FLOORING IN EXAM & TREATMENT ROOM/ STUDENT LOUNGE
FLOORS	VT-5	VINYL TILE	ARMSTRONG	STRIATIONS BBT	T3612, STARDUST	12" x 24" x 0.125"	TYPICAL FLOORING IN STORAGE, FILE, IT ROOM, LOCKER & PATIENT LAUNDRY
FLOORS	VT-6	VINYL TILE	ROPPE	STATDEFEND	#702, ELECTRON BEIGE	36" x 36" x 0.08"	TYPICAL FLOORING IN CORRIDOR ON BASEMENT
FLOORS	VT-7	VINYL TILE	ROPPE	STATDEFEND	#753, STRATUS BLUE	36" x 36" x 0.08"	TYPICAL FLOORING IN BUILDING 106
FLOORS	VT-8	METAL STUDDED RUBBER TILE	CANAL RUBBER	STAINLESS STEEL STUDDED RUBBER TILE		12" x 12" x 1/8"	TYPICAL FLOORING IN NEW ELEVATOR CABS
FLOORS	VS-1	VINYL SHEET	MANNINGTON	BIOSPEC	15397, PALM	x 0.08"	ACCENT FLOORING IN CORRIDORS ON FLOORS 3-5
FLOORS	VS-2	VINYL SHEET	MANNINGTON	BIOSPEC	15356, JONQUIL	x 0.08"	ACCENT FLOORING IN CORRIDORS ON FLOORS 6-9
FLOORS	VS-3	VINYL SHEET	MANNINGTON	BIOSPEC	15349, STEEL BLUE	x 0.08"	ACCENT FLOORING IN CORRIDORS ON FLOORS 10-11/ BARBER SHOP
FLOORS	GF-1	GYM FLOOR	LONSEAL	LONWOOD WITH FOAM	TBD		TYPICAL FLOORING IN EXERCISE/YOGA & WEIGHT ROOMS
FLOORS	GF-2	GYM FLOOR	LONSEAL	LONCOURT I	1 MAPLE		TYPICAL FLOORING IN GYMNASIUM
FLOORS	LVT-1	LUXURY VINYL PLANK	ADORE	DECORIA	MA-M001	7" X 48" x 0.12"	TYPICAL FLOORING IN ALL PATIENT BEDROOMS
FLOORS	LVT-2	LUXURY VINYL PLANK	ADORE	DECORIA	MA-M003	7" X 48" x 0.12"	TYPICAL OFFICE FLOORING ON FLOOR 3-14
FLOORS	LVT-3	LUXURY VINYL TILE	MANNINGTON	NATURE'S PATH PARALLELS	# 12203, LINEN	18" X 18" x 0.10"	TYPICAL FLOORING IN STAFF LOUNGE AND CONFERENCE ROOM
FLOORS	LVT-4	LUXURY VINYL TILE	MANNINGTON	NATURE'S PATH PARALLELS	# 12204, STONEWASHED	18" X 18" x 0.10"	TYPICAL FLOORING ON FLOOR 2, CORRIDOR
FLOORS	LVT-5	LUXURY VINYL TILE	MANNINGTON	NATURE'S PATH PARALLELS	# 12205, BEACH GRASS	18" X 18" x 0.10"	TYPICAL FLOORING IN OFFICES ON BASEMENT AND FLOOR 2
FLOORS	TT-1	FLOOR TRANSITION	ROPPE	PART #59	TBD	1/8" - 0.08""	VINYL TILE - VINYL TILE/ MATCH COLOR WITH ADJACENT FINISHES
FLOORS	TT-2	FLOOR TRANSITION	ROPPE	PART #65	184 ALMOND	1/4" - 1/8"	VINYL TILE - FRITZTILE
FLOORS	TT-3	FLOOR TRANSITION	SCHLUTER SYSTEMS	RENO - U ALUMINUM TRANSITION STRIP - SCHIENE	STAINLESS STEEL		CARPET - FRITZTILE
FLOORS	TT-4	FLOOR TRANSITION	SCHLUTER SYSTEMS	MARBLE SADDLE	WHITE MARBLE	- -	PORCELAIN TILES TO VINYL TILE/ APPLIED TO TOILET TRANSITION
FLOORS	TT-5	FLOOR TRANSITION	ROPPE	PART #22	184 ALMOND		VINYL TILE - CONCRETE
FLOORS	TT-6	EXPANSION JOINT SYSTEM	INPRO		TBD		MATCH COLOR WITH ADJACENT FINISHES. SEE A-810 FOR DETAILS
FLOORS	RT-1	RUBBER STAIR TREAD	ROPPE				ALL STAIRS TO HAVE RUBBER TREADS
FLOORS	EP-1	EPOXY	SHERWIN WILLIAMS	GENERAL POLYMERS 3745- SELF-LEVELING EPOXY			APPLIED TO MECH. ROOM/ ELEC. ROOM/ STAIRS/ EX. SERV ELEV CORR
FLOORS	HC-1	HARDENED CONCRETE					
FLOORS	WM-1	WALK-OFF MAT	C/S ACROVYN	GRIDLINE	MILL (STANDARD)	1-1/8"" DEPTH	APPLIED TO 101A & 165B VESTIBULES
FLOORS	PFT-1	PORCELAIN FLOOR TILE	DALTILE	COLOR SCHEME/ LINEAR	B903, BISCUIT SOLID STD	6" X 18" x 0.313"	FIELD FLOOR TILE IN TOILET
FLOORS	PFT-2	PORCELAIN FLOOR TILE	DALTILE	COLOR BODY / KEYSTONES	D161, URBAN PUTTY	2" X 2" x 0.25"	ACCENT FLOOR TILE IN TOILET
FLOORS	PW-1	PADDED FLOOR	MARATHON ENG. CORP.	GOLD MEDAL SAFETY PADDING	TBD		PADDED WALL & FLOORS IN SECLUSION ROOMS
FLOORS	C-1	CARPET	INTERFACE	3000 SERIES COLLECTION - S303	100146 DOVE	19.6" X 19.6" X 0.11" (50CM X 50CM X 2.8MM)	FLOORING IN COURT ROOM & JUDGE'S CHAMBERS
FLOORS	C-2	CARPET	INTERFACE	TONGUE IN GROOVE	100726 SYCAMORE	19.6" X 19.6" X 0.142" (50CM X 50CM X 3.6MM)	FLOORING IN 1st FL & 2nd FL CONFERENCE ROOMS
FLOORS	C-3	CARPET	INTERFACE	2000 SERIES COLLECTION - S201	9798 SAGE	19.6" X 19.6" X 0.142" (50CM X 50CM X 3.6MM)	FLOORING IN EXECUTIVE OFFICES
FLOORS	C-4	CARPET	INTERFACE	1000 SERIES COLLECTION - S102	9541 SAGE	19.6" X 19.6" X 0.086" (50CM X 50CM X 2.2MM)	FLOORING IN EXECUTIVE CORRIDOR & RECEPTION
MISC.	SS-1	SOLID SURFACE MATERIAL	DUPONT CORIAN	PRIVATE COLLECTION	CAMEO WHITE	1/4" THICKNESS	LIMITED COLORS AVAILABLE IN 1/4" THICK
MISC.	SS-2	SOLID SURFACE MATERIAL	DUPONT CORIAN	PRIVATE COLLECTION	CLAM SHELL		APPLIED TO COUNTERTOP AT PANTRY / EXAM ROOM
MISC.	HW-1	MAPLE WOOD VENEER STAIN	SHERWIN WILLIAMS	WOOD CLASSICS	PEARWOOD SW 3121-B		APPLIED TO COURT ROOM JUDGE STATION MAPLE VENEER, TOP RAIL & STAIR TREADS
MISC.	PL-2	PLASTIC LAMINATE	NEVAMAR	ARMORED PROTECTION	W8325T - SOVEREIGN CHERRY		APPLIED TO WRITING COUNTER OF RECEPTION DESK, OBSERV STATION & DISP COUNTER
MISC.	PL-3	PLASTIC LAMINATE	MIDMARK	WOODGRAINS	HAYWOOD CHERRY		APPLIED TO CABINETRY AT PANTRY / EXAM ROOM

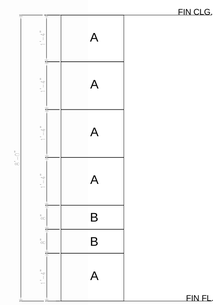
FINISH SCHEDULE

	CODE	PRODUCT	MANUFACTURER	COLLECTION/ MODEL #	COLORS	SIZE & FINISH	REMARKS
CEILINGS	ACT-1	ACOUSTIC CEILING TILE	ARMSTRONG OR	OPTIMA TEGULAR	WHITE	24" X 24"	9/16" SUPRAFINE, SQUARE LAY IN TEGULAR FIELD PANEL (FINE TEXTURE)
CEILINGS			USG	HALCYON 98221	WHITE	24" X 24"	DONN DXT CENTRICITEE 9/16" SUSPENSION GRID
CEILINGS	ACT-2	ACOUSTIC CEILING TILE	ARMSTRONG	METALWORKS CLIP-ON	WHITELUME	24" X 24"	1. SUSPENSION SYSTEM : 15/16" PRELUDE XL CROSS TEE AND 7301 MAIN BEAM, HEAVY DUTY (HD) 2. PERFORATION OPTIONS : M(6/R 1607), NRC 0.70 WITH ACOUSTICAL FLEECE AND 1" FIBERGLASS INFILL 8200100 3. PANEL : METALWORKS WHITELUME (WHA), BUTT JOINT 7110. ACCESSIBLE PANELS WILL BE 1/8" REAVEAL 7140. THE ACCESSIBLE HOLE AT THE ACCESSIBLE PANEL TO BE FITTED WITH SET IN SCREWS COUNTERSUNK, PROVIDED BY GC. SCREWS SHOULD BE 5/16" IN DEPTH OR SHORTER. 4. ACCESSORIES : (a) PROVIDE 7119 OR 7120 FIXTURE FRAME FOR LIGHT FIXTURES AND DIFFUSERS. (b) WALL MOLDING TO BE 7112 BOX MOLDING WITH 7113 SPREADER HOLD DOWN. (c) ALL ACCESSORIES SHELL BE WHITE. (d) ALL SUSPENSION GRID SHELL BE HEAVY DUTY (HD).
CEILINGS			ROCKFON	SPANAIR CLIP-IN PANELS			
CEILINGS	ACT-4	ACOUSTIC CEILING TILE	ARMSTRONG	DUNE	WHITE	24" X 48"	SQUARE LAY IN (FINE TEXTURE), 15/16" PRELUDE XL, HEAVY DUTY 7301
CEILINGS	ACT-5	ACOUSTIC CEILING TILE	ARMSTRONG	OPTIMA TEGULAR	WHITE	12" X 48", 24" X 48"	
CEILINGS	ACT-9	ACOUSTIC CEILING TILE	ARMSTRONG	TECHZONE OPTIMA/3257,3257PB	WHITE	24" X 48"	9/16" SUPRAFINE XL, SQUARE TAGULAR
CEILINGS				TECHZONE OPTIMA/1403	WHITE	6" X 48"	9/16" SUPRAFINE XL, SQUARE TAGULAR
CEILINGS			USG	HALCYON 98198, 98245	WHITE	24" X 48", 6" X 48"	DONN DXT CENTRICITEE 9/16" SUSPENSION GRID
CEILINGS	GWB-1	GYPSUM BOARD					APPLIED TO STAFF AREA
CEILINGS	GWB-2	VERY HIGH IMPACT GYPSUM BOARD	USG	SHEETROCK MOLD TOUGH VERY HIGH IMPACT (VHI)			APPLIED TO PATIENT AREA

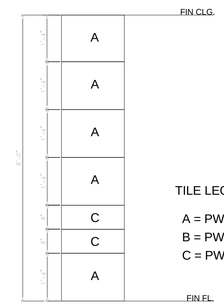
NOTES:
1. ALL EXISTING CONDITIONS TO BE PATCHED AND CLEANED
2. REMOVE ALL EXISTING FLOOR, WALL BASE, WALL AND CEILING FINISHES AND REPLACE WITH NEW.
3. ALL WALL BASE TO BE CONTINUOUS WITHOUT CUTS IN BETWEEN DOOR JAMS
4. SCHLUTER SYSTEMS TO BE INCORPORATED IN ENTIRE FLOORS AND WALLS WITHIN PATIENT TOILETS, PATIENT TOILETS/ SHOWERS, GANG - TOILETS AND NON-PATIENT SHOWERS. SCHLUTER SYSTEMS SHELL BE APPLIED TO FLOOR AND TO FULL HEIGHT WALL. SEE DRAWING A-815 FOR DETAIL INFORMATION.
5. SELF LEVELING COMPOUND THROUGHOUT TO PREPARE ALL NEW FINISHES. SHOT BLAST EXISTING AND PREP/PRIME AS PER MANUFACTURER'S RECOMMENDATION. NO LESS THAN 1/4"; AVERAGE 1/2" REFER TO SPECIFICATION FOR PREPARATION DETAILS.
6. ALL PORCELAIN TILE GROUT JOINTS SHALL MATCH PWT-1.
7. ALL EXAM ROOMS AND TREATMENT ROOMS SHALL INCLUDE PRIVACY CURTAIN: ARC COM LUNAR-X AC-33162X (SPRING #3). ALL PRIVACY CURTAINS SHALL BE INSTALLED WITH INPRO POP OUT CARRIERS.
8. FOR WG-1 OBSERVATION POST INSTALLATION HEIGHTS, REFER TO DRAWINGS A-908-2/3 . WG-1 INSTALLATION HEIGHT IN DINING ROOMS IS 36" A.F.F.
9. WG-1 SHALL BE INSTALLED WITH TAMPER PROOF SCREWS.
10. WG-1 SHALL BE INSTALLED ON OBSERVATION POST DESKS, IN PASSAGE WAY FROM THE ELEVATOR BANKS TO THE DINING ROOMS, IN THE DINING ROOMS & IN CART NICHES.
11. ENDURA GAME LINE GYM FLOOR PAINTS SHALL BE USED FOR COURT LINE MARKINGS ON THE GYM FLOOR, AS RECOMMENDED BY LONSEAL. ENDURA PAINT SHALL BE APPLIED BY A CERTIFIED LINE PAINTER. NAMES OF CERTIFIED PAINTERS TO BE PROVIDED BY ENDURA LOCAL MANUFACTURER'S REPRESENTATIVE. GAME LINES ARE SCHEMATIC. THE GYM 1420A ROOM SIZE IS NOT LARGE ENOUGH TO SUPPORT A REGULATION BASKETBALL COURT; THEREFORE, THE GAME LINES ARE CLOSER IN DISTANCE.
12. REVEAL SHALL BE INSTALLED WITH TAMPER PROOF SCREWS. APPLIED TO CORRIDORS AND COURT ROOM WALLS.
13. CG-1 SHALL BE INSTALLED WITH SELF ADHESIVE TAPE.
14. PW-2 SHALL BE INSTALLED WITH TAMPER PROOF SCREWS.
15. ALL PAINT SHALL BE PAINTED ONE PRIMER AND TWO COATS OF PAINT.
16. ALL SHEETROCK SHALL BE LEVEL 4 FINISH.
17. ALL EXISTING PAINTED WALLS IN STAIRS AND OTHER LOCATIONS TO BE PROPERLY PREPARED BEFORE RECEIVING NEW PAINT. CRACKS TO BE FILLED WITH JOINT COMPOUND AND SANDED SMOOTH -THIS PROCEDURE TO BE REPEATED WHILE DESIRED SMOOTHNESS IS ACHIEVED. SURROUNDING WALLS TO BE SANDED SMOOTH AND SPACKLE AS WELL BEFORE RECEIVING PRIME COAT. REFER TO SPEC. SECTION 099101.
18. WM-1 SHALL BE INSTALLED WITH TAMPER PROOF SCREWS.



1 REVEAL MOLDING DETAIL
SCALE: NOT IN SCALE



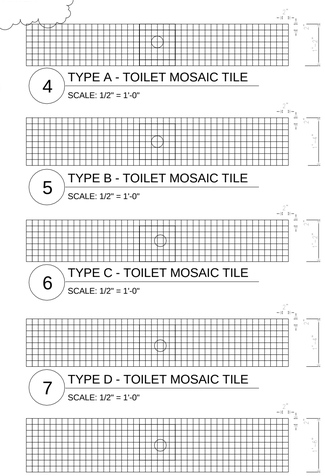
2 STAFF TOILET WALL TILE PATTERN
SCALE: 1/2" = 1'-0"



3 PATIENT TOILET WALL TILE PATTERN
SCALE: 1/2" = 1'-0"

TILE LEGEND

A = PWT-1
B = PWT-2
C = PWT-3



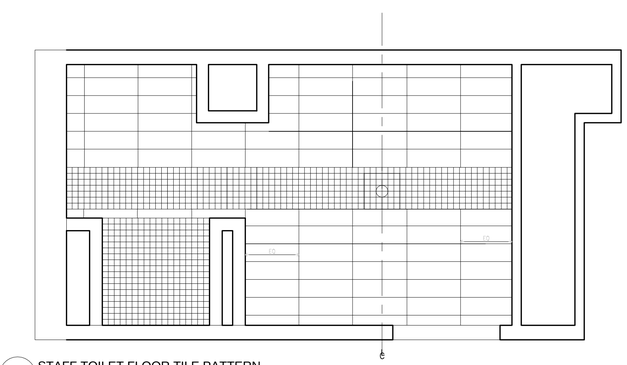
4 TYPE A - TOILET MOSAIC TILE
SCALE: 1/2" = 1'-0"

5 TYPE B - TOILET MOSAIC TILE
SCALE: 1/2" = 1'-0"

6 TYPE C - TOILET MOSAIC TILE
SCALE: 1/2" = 1'-0"

7 TYPE D - TOILET MOSAIC TILE
SCALE: 1/2" = 1'-0"

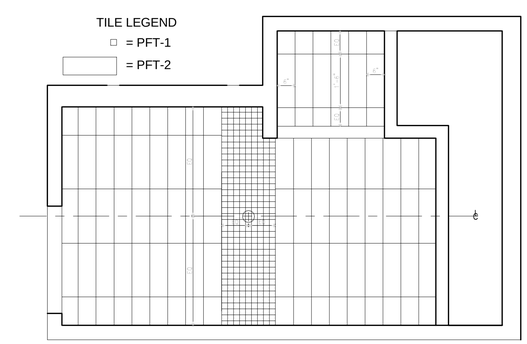
8 TYPE E - TOILET MOSAIC TILE
SCALE: 1/2" = 1'-0"



9 STAFF TOILET FLOOR TILE PATTERN
SCALE: 1/2" = 1'-0"

TILE LEGEND

□ = PFT-1
▭ = PFT-2



10 PATIENT TOILET FLOOR TILE PATTERN
SCALE: 1/2" = 1'-0"

0 8' 16' 32'
SCALE: As indicated

REVISED DRAWING 8/12/2015

8/27/2015 12:10:23 PM

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

A Joint Venture
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New York, New York 10003

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CONTRACT:
CONSTRUCTION

TITLE:
MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION:
MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT:
NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER: 44578
DESIGNED BY: MAK / WW
DRAWN BY: LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK: N/A
APPROVED: WS / MAK / LF

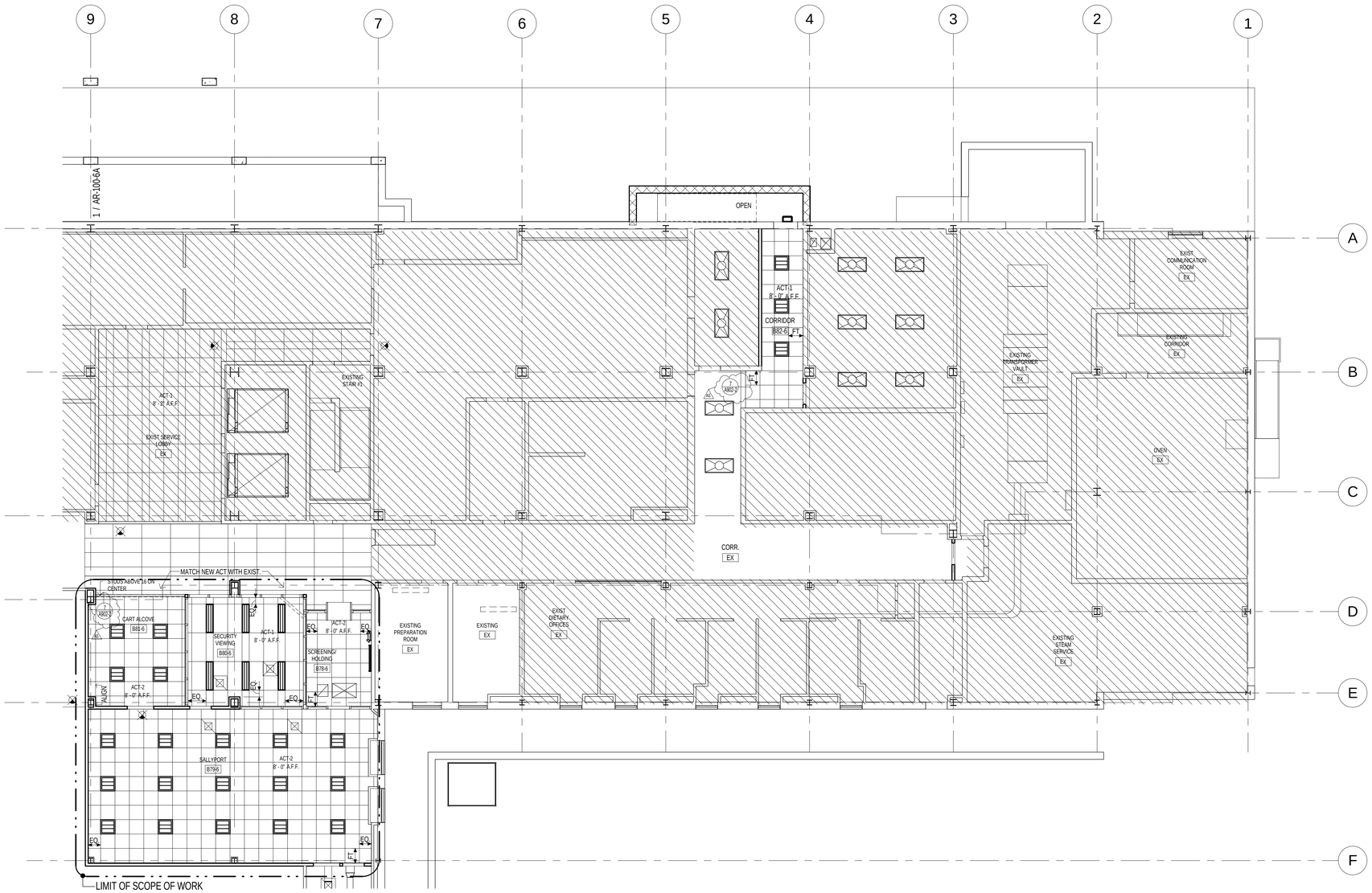
SHEET TITLE:
FINISH SCHEDULE

BUILDING NUMBER: 102
DRAWING NUMBER: AF-115
SHEET

LEGEND:

- 2'X2' RECESSED NOM. FLOURESCENT LAMP
- 2'X2' RECESSED FLOURESCENT LAMP
- 4' SURFACE/ PENDANT MOUNTED FLOURESCENT LAMP
- 4' WALL MOUNTED FLOURESCENT LAMP FOR WET AREAS
- 1'X4' RECESSED NOM. FLOURESCENT LAMP
- 1'X4' RECESSED NOM. FLOURESCENT LAMP
- 2'X4' RECESSED NOM. FLOURESCENT LAMP
- 2'X4' RECESSED FLOURESCENT LAMP
- 2'X4' RECESSED NOM. FLOURESCENT LAMP
- 2'X2' RECESSED NOM. FLOURESCENT LAMP
- SURFACE MOUNTED LED LAMP
- 9" DIA. RECESSED NOM. LED DOWNLIGHT LAMP
- 4" DIA. RECESSED NOM. LED DOWNLIGHT LAMP
- 4'X1' PENDENT MOUNTED NOM. FLOURESCENT LAMP
- 4'X2.5" RECESSED NOM. LED LAMP
- 4'-6" WALL SURFACE MOUNTED LED LAMP
- 4.625"X 4' CORNER SURFACE MOUNTED FLOURESCENT LAMP
- 6"X4' RECESSED NOM. FLOURESCENT LAMP
- 6"X9" LED LENSED STEPLIGHT
- 4"X2.75" LED LENSED STEPLIGHT
- 2' WALL SURFACE MOUNTED FLOURESCENT LAMP
- JUNCTION BOX
- ILLUMINATED EXIT SIGN SINGLE FACE
- ILLUMINATED EXIT LIGHT DOUBLE FACE WITH DIRECTIONAL ARROWS AS INDICATED
- RETURN AIR
- SUPPLY AIR
- EXHAUST AIR
- ACCESS DOOR
- PENDENT QUICK RESPONSE SPRINKLER (ALL AREAS WITH HUNG CEILING)
- UPRIGHT QUICK RESPONSE SPRINKLER (ALL AREAS WITHOUT HUNG CEILING)
- SIDE WALL QUICK RESPONSE SPRINKLER
- CAMERA
- REC PAS RECEIVER
- IM INTERFACE MODULE
- WWA WAVE WARE ANNUNCIATOR
- MOTION DETECTOR
- DOOR LOCKING HARDWARE
- MUTI-TAP PAGING SPEAKER
- INTERCOM STATION
- NDU NETWORK DISPLAY UNIT
- FACP FIRE ALARM CONTROL PANEL
- AUX PS AUXILIARY POWER SUPPLY
- F MANUAL PULL STATION (INSTITUTIONAL)
- SD SMOKE DETECTOR
- DD DUCT SMOKE DETECTOR
- HD 135°F FIXED TEMPERATURE/ FOR HEAT DETECTOR
- IAM RELAY
- DH MAGNETIC DOOR HOLDER
- FS FLOW SWITCH
- WALL MOUNTED SPEAKER/ VISUAL APPLIANCE WITH CANDELA RATING
- WALL MOUNTED SPEAKER APPLIANCE
- CEILING MOUNTED SPEAKER/ VISUAL APPLIANCE WITH CANDELA RATING
- CEILING MOUNTED SPEAKER APPLIANCE
- POKE-THRU COMMUNICATIONS OUTLET
- WLAN ACCESS POINT (AP) CEILING OUTLET
- CEILING OCCUPANCY SENSOR
- TV CATV OUTLET
- SB SMARTBOARD OUTLET
- INDICATES EXISTING SPACES TO REMAIN

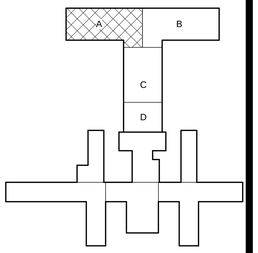
NOTE : FOR CEILING MATERIAL, SEE AF-115 FOR DETAILS.



1 BASEMENT REFLECTED CEILING PLAN PART B

★ FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS REFER TO BUILDING 102 NOTES

REVISED DRAWING 8/12/2015



PROJECT NORTH

0 8' 16' 32'

SCALE: 1/8" = 1'-0"

NEW YORK STATE OF OPPORTUNITY. | Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

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LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE:

BASEMENT REFLECTED CEILING PLAN PART B

BUILDING NUMBER: 106

DRAWING NUMBER: AR-100-6B

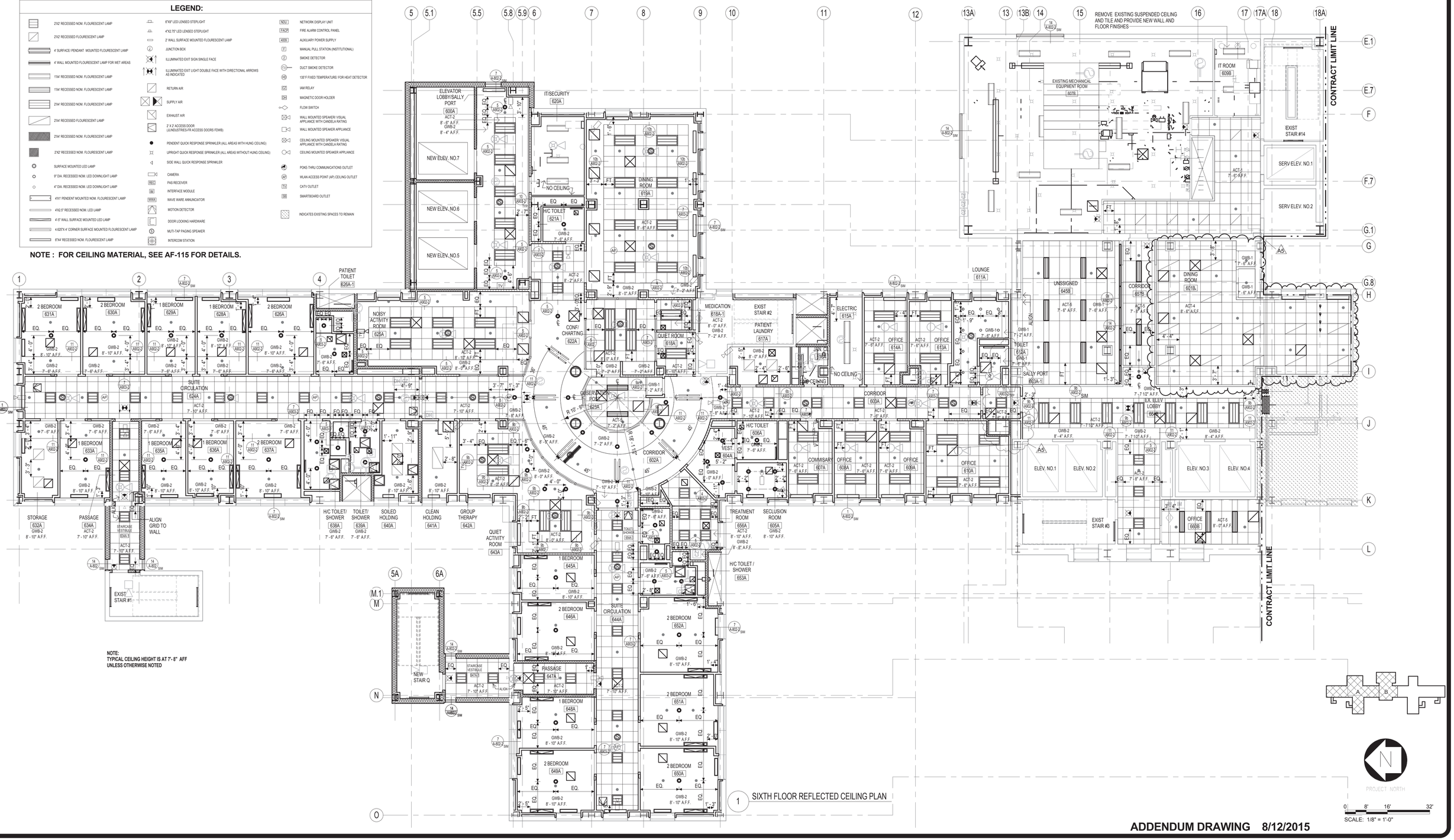
SHEET

8/25/2015 12:02:14 PM

LEGEND:

- 2'X2' RECESSED NOM. FLOURESCENT LAMP
- 2'X2' RECESSED FLOURESCENT LAMP
- 4' SURFACE/ PENDANT MOUNTED FLOURESCENT LAMP
- 4' WALL MOUNTED FLOURESCENT LAMP FOR WET AREAS
- 1'X4' RECESSED NOM. FLOURESCENT LAMP
- 1'X4' RECESSED NOM. FLOURESCENT LAMP
- 2'X4' RECESSED NOM. FLOURESCENT LAMP
- 2'X4' RECESSED FLOURESCENT LAMP
- 2'X4' RECESSED NOM. FLOURESCENT LAMP
- 2'X2' RECESSED NOM. FLOURESCENT LAMP
- SURFACE MOUNTED LED LAMP
- 9" DIA. RECESSED NOM. LED DOWNLIGHT LAMP
- 4" DIA. RECESSED NOM. LED DOWNLIGHT LAMP
- 4'X1' PENDENT MOUNTED NOM. FLOURESCENT LAMP
- 4'X2.5' RECESSED NOM. LED LAMP
- 4'-0' WALL SURFACE MOUNTED LED LAMP
- 4.625"X 4' CORNER SURFACE MOUNTED FLOURESCENT LAMP
- 6"X4' RECESSED NOM. FLOURESCENT LAMP
- 6"X4" LED LENSED STEPLIGHT
- 4"X2.75" LED LENSED STEPLIGHT
- 2' WALL SURFACE MOUNTED FLOURESCENT LAMP
- JUNCTION BOX
- ILLUMINATED EXIT SIGN SINGLE FACE
- ILLUMINATED EXIT LIGHT DOUBLE FACE WITH DIRECTIONAL ARROWS AS INDICATED
- RETURN AIR
- SUPPLY AIR
- EXHAUST AIR
- 2' X 2' ACCESS DOOR (LAUNDUSTRIES-FR ACCESS DOORS FDWB)
- PENDENT QUICK RESPONSE SPRINKLER (ALL AREAS WITH HUNG CEILING)
- UPRIGHT QUICK RESPONSE SPRINKLER (ALL AREAS WITHOUT HUNG CEILING)
- SIDE WALL QUICK RESPONSE SPRINKLER
- CAMERA
- PAS RECEIVER
- INTERFACE MODULE
- WWA — WAVE WARE ANNUNCIATOR
- MOTION DETECTOR
- DOOR LOCKING HARDWARE
- MUTI-TAP PAGING SPEAKER
- INTERCOM STATION
- NDU — NETWORK DISPLAY UNIT
- FACP — FIRE ALARM CONTROL PANEL
- AOS — AUXILIARY POWER SUPPLY
- F — MANUAL PULL STATION (INSTITUTIONAL)
- SMOKE DETECTOR
- DUCT SMOKE DETECTOR
- 135°F FIXED TEMPERATURE) FOR HEAT DETECTOR
- IAM RELAY
- DH — MAGNETIC DOOR HOLDER
- FLOW SWITCH
- WALL MOUNTED SPEAKER/ VISUAL APPLIANCE WITH CANDELA RATING
- WALL MOUNTED SPEAKER APPLIANCE
- CEILING MOUNTED SPEAKER/ VISUAL APPLIANCE WITH CANDELA RATING
- CEILING MOUNTED SPEAKER APPLIANCE
- POKE-THRU COMMUNICATIONS OUTLET
- AP — WLAN ACCESS POINT (AP) CEILING OUTLET
- TV — CATV OUTLET
- SB — SMARTBOARD OUTLET
- INDICATES EXISTING SPACES TO REMAIN

NOTE : FOR CEILING MATERIAL, SEE AF-115 FOR DETAILS.



1 SIXTH FLOOR REFLECTED CEILING PLAN

ADDENDUM DRAWING 8/12/2015

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DESIGN & CONSTRUCTION

CONSULTANTS:

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MARK	DATE	DESCRIPTION
A5	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	MAK / WW
DRAWN BY:	LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK:	N/A
APPROVED:	WS / MAK / LF

SHEET TITLE:

TYPICAL DININGROOM REFLECTED CEILING PLAN FOR 3 - 11

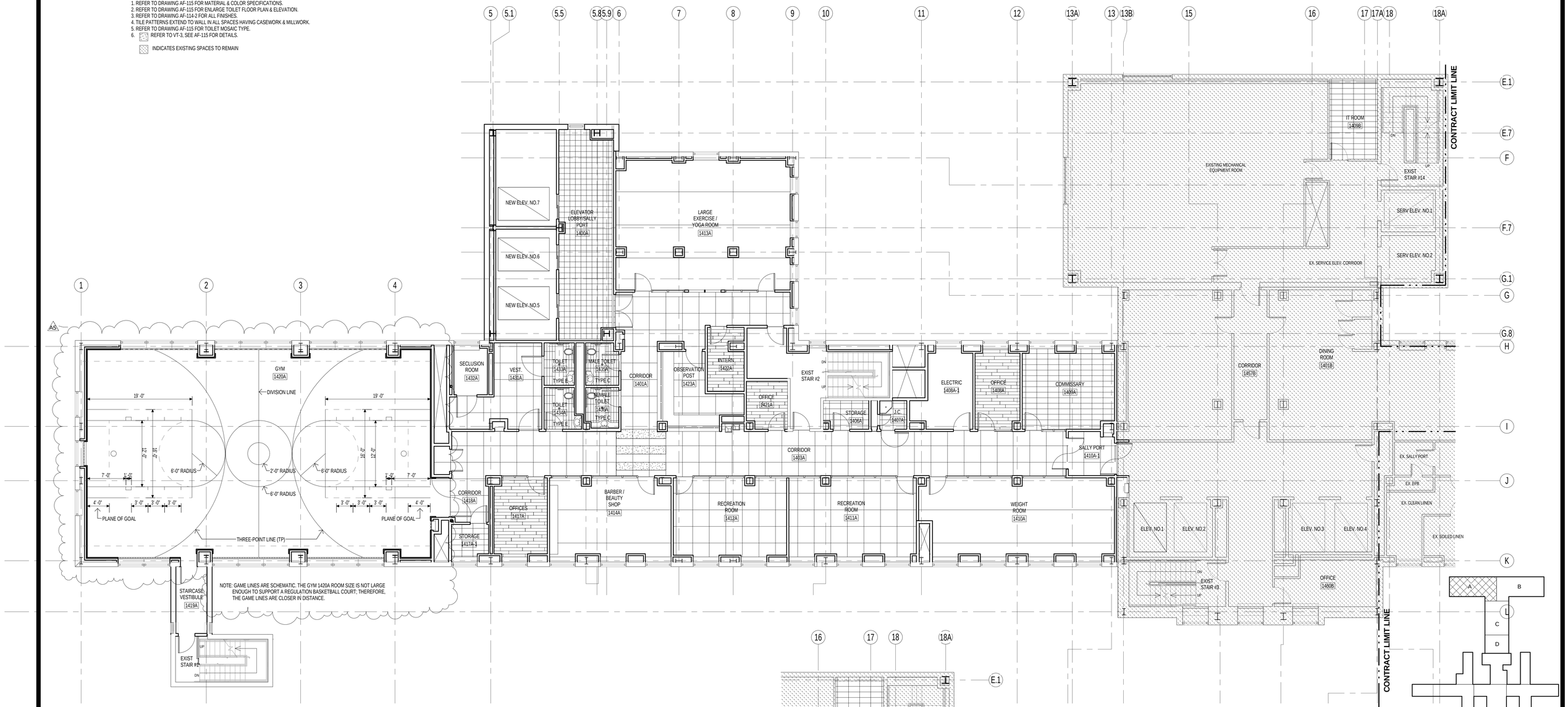
BUILDING NUMBER:	DRAWING NUMBER:
102	AR-106-2
SHEET	

8/25/2015 10:19:16 AM

FOURTEENTH FLOOR PATTERN PLAN NOTES

1. REFER TO DRAWING AF-115 FOR MATERIAL & COLOR SPECIFICATIONS.
2. REFER TO DRAWING AF-115 FOR ENLARGE TOILET FLOOR PLAN & ELEVATION.
3. REFER TO DRAWING AF-114-2 FOR ALL FINISHES.
4. TILE PATTERNS EXTEND TO WALL IN ALL SPACES HAVING CASEWORK & MILLWORK.
5. REFER TO DRAWING AF-115 FOR TOILET MOSAIC TYPE.
6. REFER TO VT-3, SEE AF-115 FOR DETAILS.

INDICATES EXISTING SPACES TO REMAIN



1 FOURTEENTH FLOOR PATTERN PLAN

2 FIFTEENTH FLOOR PATTERN PLAN

REVISED DRAWING 8/12/2015

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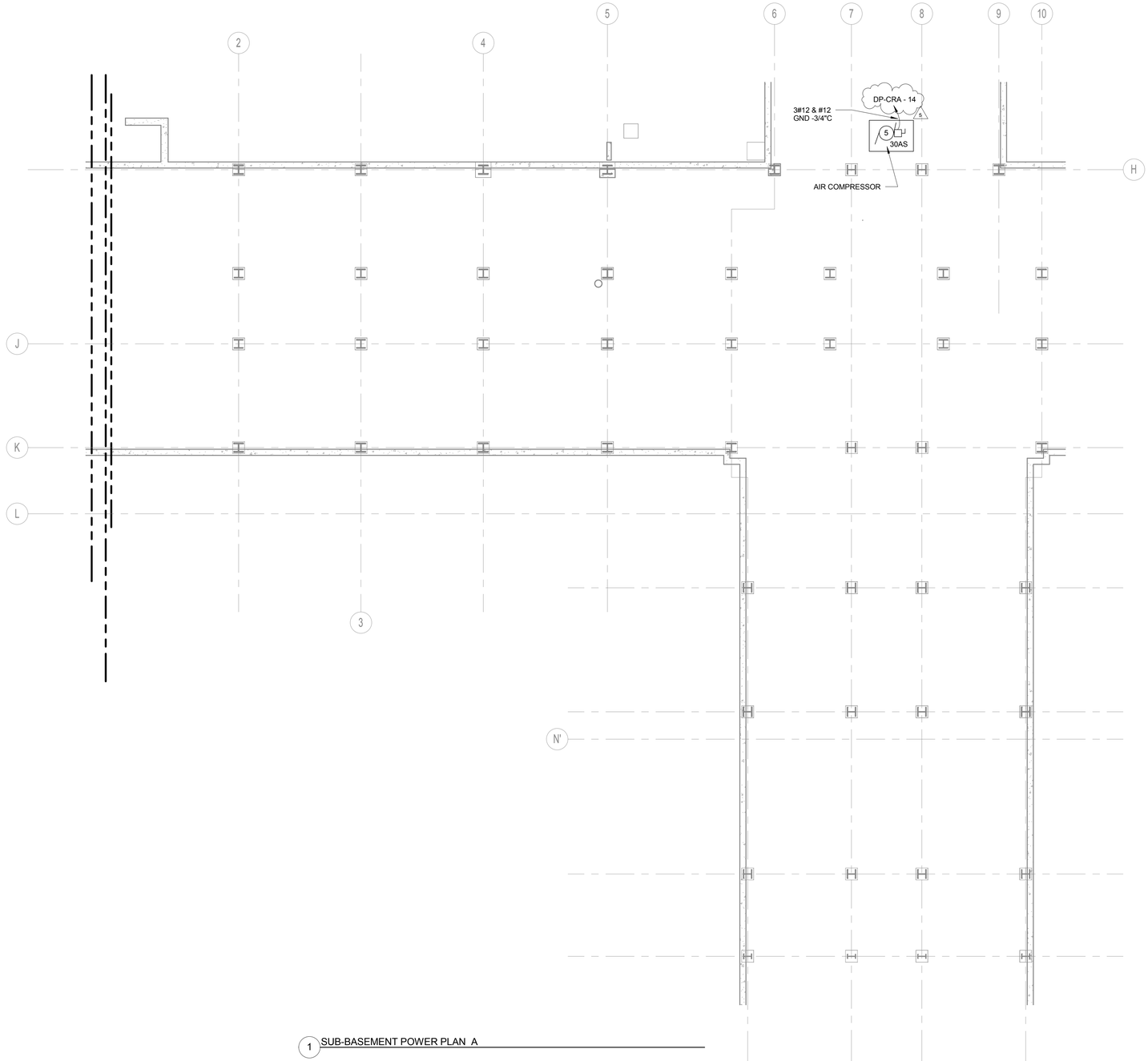
DESIGNED BY: MAK / WW
DRAWN BY: LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK: N/A
APPROVED: WS / MAK / LF

SHEET TITLE:
FOURTEENTH & FIFTEENTH FLOOR PATTERN PLAN

BUILDING NUMBER: 106
DRAWING NUMBER: AT-107-2
SHEET

8/25/2015 3:58:55 PM

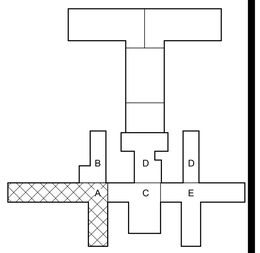


1 SUB-BASEMENT POWER PLAN A

NOTES:

1. FOR SYMBOLS AND ABBREVIATIONS, SEE DRAWING E-001.
2. FOR PANEL SCHEDULES, SEE DRAWINGS IN THE E500 SERIES.
3. REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR EXACT EQUIPMENT SIZE AND LOCATION.
4. EXISTING COMPRESSOR WAS TEMPORARILY CONNECTED TO PANEL DPA-2 PROVIDED DURING THE DEMOLITION PHASE ELECTRICAL CONTRACTOR SHALL RECONNECT TO PANEL DP-CRA REUSE EXISTING CABLE AND EXTEND CONDUIT TO NEW SOURCE.

5



PROJECT NORTH

0 8' 16' 32'

SCALE: 1/8" = 1'-0"

ADDENDUM DRAWING 08/12/2015

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

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TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
7.2	8-12-2015	BULLETIN 7.2

PROJECT NUMBER:	44578
DESIGNED BY:	NP
DRAWN BY:	NP
FIELD CHECK:	FT
APPROVED:	FT

SHEET TITLE:

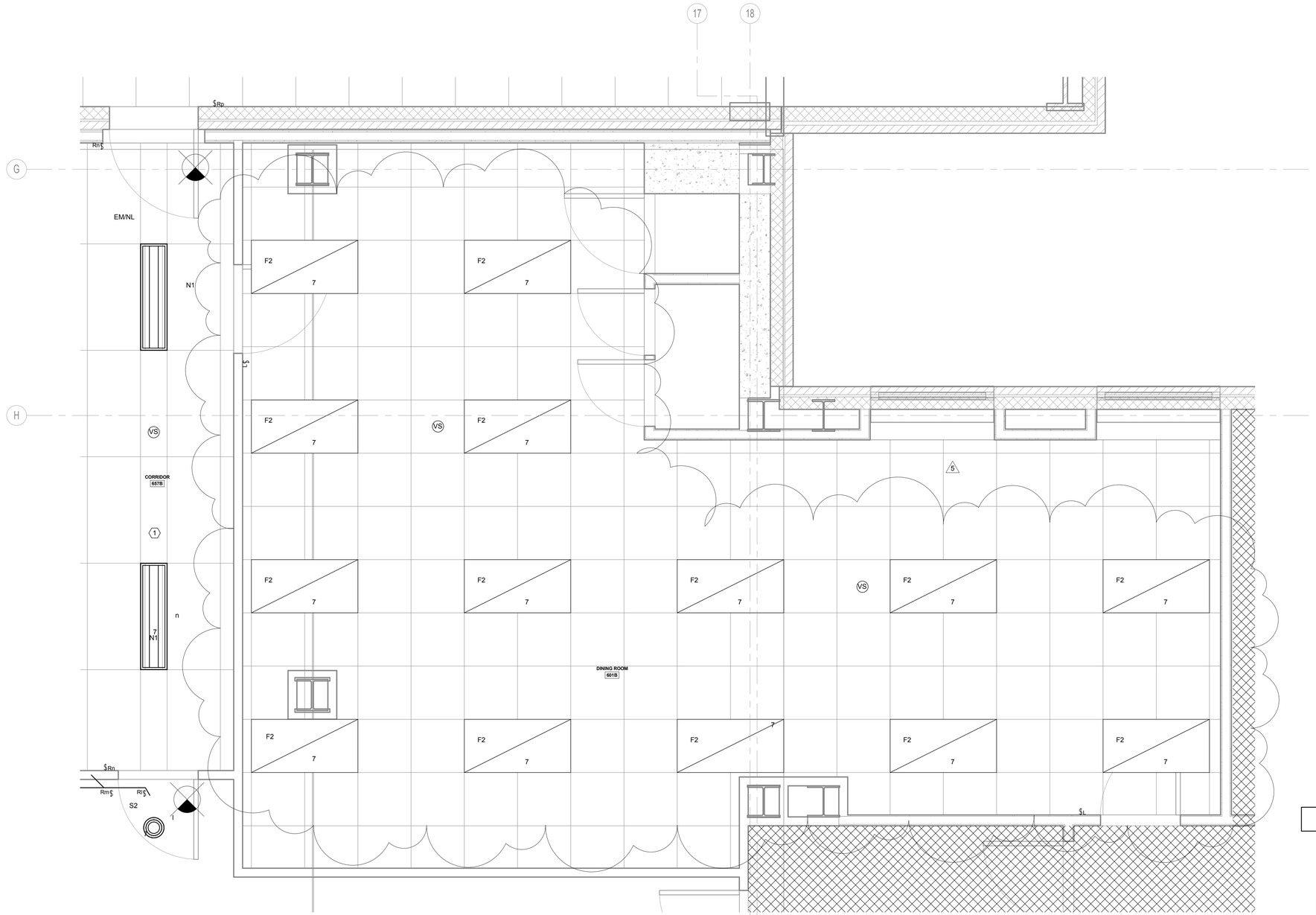
ELECTRICAL SUB-BASEMENT POWER PLAN, PART A

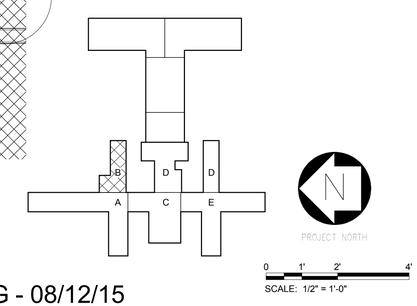
BUILDING NUMBER: 102

DRAWING NUMBER: E-099-2A

SHEET

8/24/2015 5:54:27 PM





PART PLAN - DINING ROOM AREA TYPICAL 3RD THRU 11TH FLOOR LIGHTING

ADDENDUM DRAWING - 08/12/15

NEW YORK STATE OF OPPORTUNITY. | Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

A Joint Venture

225 Park Avenue South
New York, New York 10003

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600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	REVISED DRAWING
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	AN
DRAWN BY:	AN
FIELD CHECK:	FT
APPROVED:	FT

SHEET TITLE:

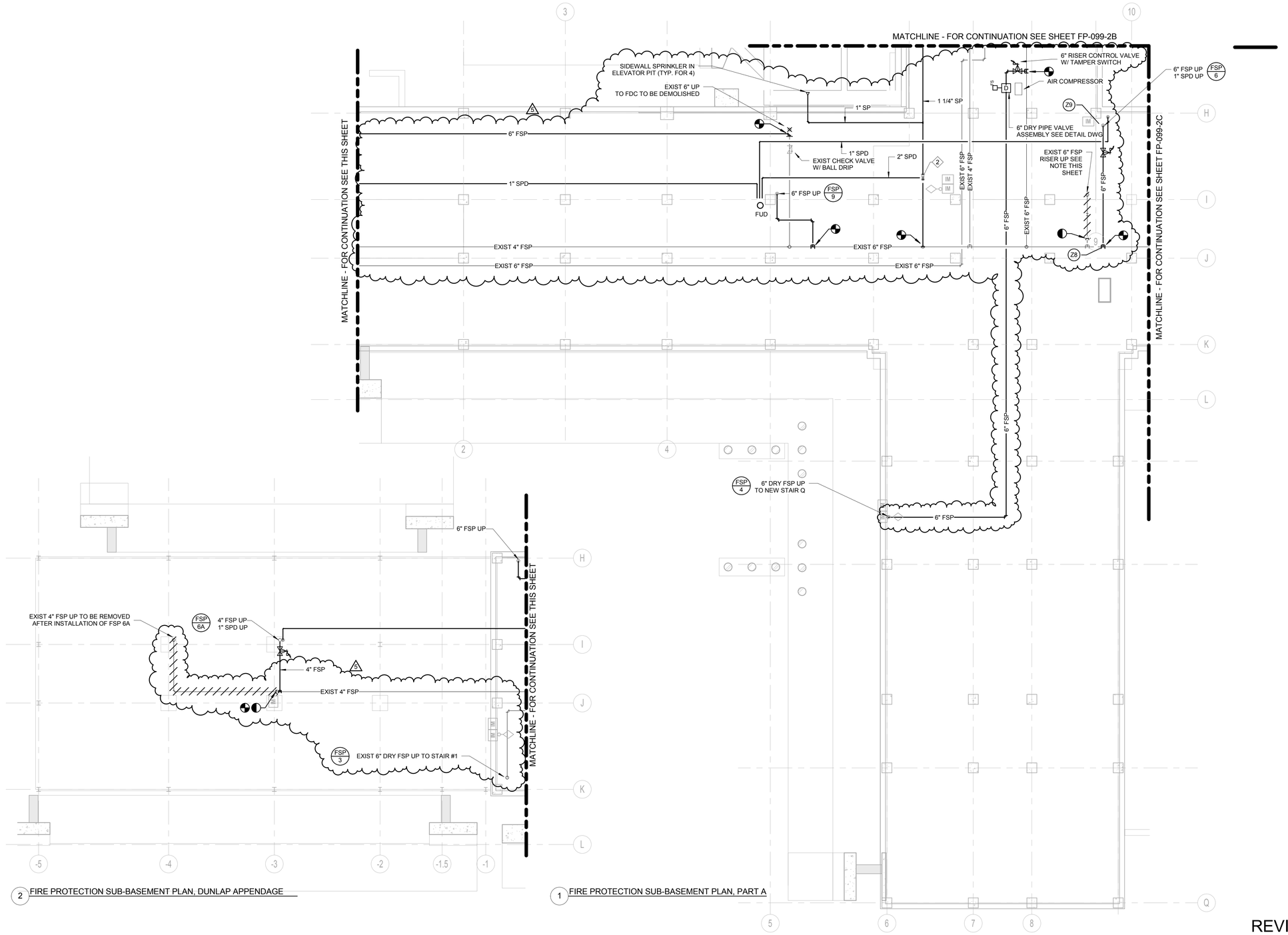
AREA B DINING ROOM LIGHTING REVISIONS

BUILDING NUMBER: 102

DRAWING NUMBER: E-305-2

SHEET

8/24/2015 3:36:27 PM



2 FIRE PROTECTION SUB-BASEMENT PLAN, DUNLAP APPENDAGE

1 FIRE PROTECTION SUB-BASEMENT PLAN, PART A

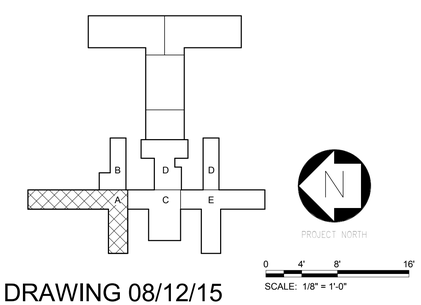
GENERAL NOTES:

1. FOR FIRE PROTECTION ABBREVIATIONS, SYMBOLS, NOTES & SCHEDULES, REFER TO DRAWING FP-001.
2. FOR FIRE PROTECTION DETAILS, REFER TO DRAWING FP-501-2 & FP-502-2.
3. EXISTING SPRINKLER SYSTEM (PARTIALLY SPRINKLERED) IN SUB-BASEMENT TO REMAIN

Keynote Legend	
Key Value	Keynote Text
2	FLOOR CONTROL VALVE ASSEMBLY W/FLOW SWITCH, PRESSURE REGULATOR, TAMPER SWITCH

SHEET NOTE:

EXISTING FIRE STANDPIPES AND ANGLE VALVES TO BE REMOVED AFTER THE INSTALLATION AND TESTING OF NEW FSP-6. CAP THE EXISTING PIPING AT THE NEAREST MAIN.



REVISED DRAWING 08/12/15

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DESIGN & CONSTRUCTION

CONSULTANTS:

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LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	TW
DRAWN BY:	JR
FIELD CHECK:	N/A
APPROVED:	JP

SHEET TITLE: FIRE PROTECTION SUB-BASEMENT PLAN, PART A

BUILDING NUMBER: 102

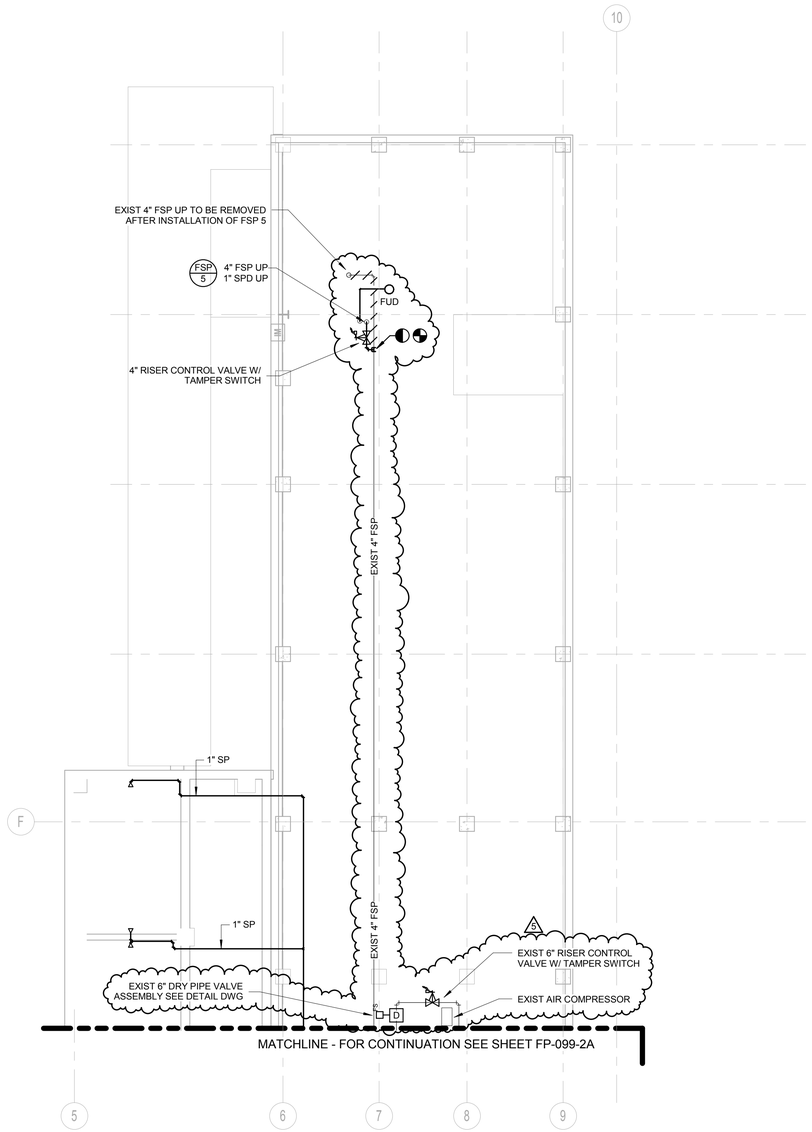
DRAWING NUMBER: FP-099-2A

SHEET

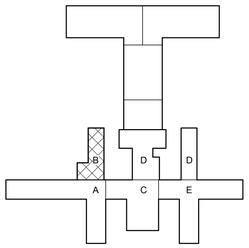
8/24/2015 2:22:14 PM

GENERAL NOTES:

1. FOR FIRE PROTECTION ABBREVIATIONS, SYMBOLS, NOTES & SCHEDULES, REFER TO DRAWING FP-001.
2. FOR FIRE PROTECTION DETAILS, REFER TO DRAWING FP-501-2.
3. EXISTING SPRINKLER SYSTEM (PARTIALLY SPRINKLERED) IN SUB-BASEMENT TO REMAIN



1 FIRE PROTECTION SUB-BASEMENT PLAN, PART B



PROJECT NORTH

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

REVISED DRAWING 08/12/15

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

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CONTRACT:
CONSTRUCTION

TITLE:
MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT:
NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	TW
DRAWN BY:	JR
FIELD CHECK:	N/A
APPROVED:	JP

SHEET TITLE:
FIRE PROTECTION SUB-BASEMENT PLAN, PART B

BUILDING NUMBER: 102

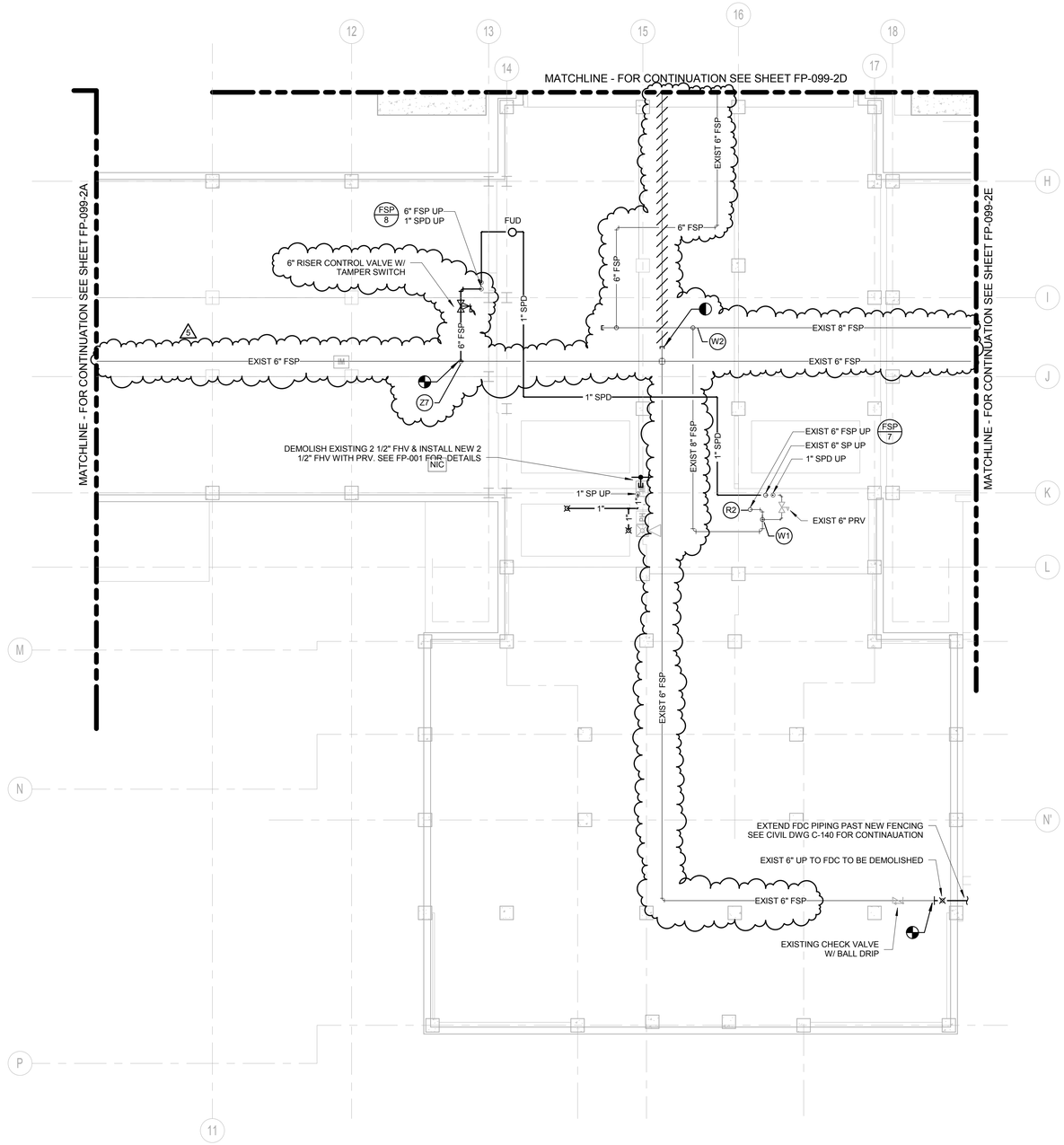
DRAWING NUMBER: FP-099-2B

SHEET

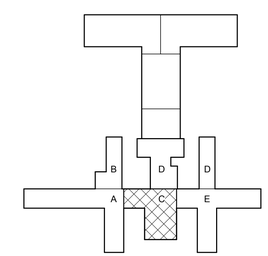
8/24/2015 2:22:14 PM

GENERAL NOTES:

1. FOR FIRE PROTECTION ABBREVIATIONS, SYMBOLS, NOTES & SCHEDULES, REFER TO DRAWING FP-001.
2. FOR FIRE PROTECTION DETAILS, REFER TO DRAWING FP-501-2.
3. EXISTING SPRINKLER SYSTEM (PARTIALLY SPRINKLERED) IN SUB-BASEMENT TO REMAIN



1 FIRE PROTECTION SUB-BASEMENT PLAN, PART C



PROJECT NORTH

0 4' 8' 16'

SCALE: 1/8" = 1'-0"

REVISED DRAWING 08/12/15

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LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	TW
DRAWN BY:	JR
FIELD CHECK:	N/A
APPROVED:	JP

SHEET TITLE: FIRE PROTECTION SUB-BASEMENT PLAN, PART C

BUILDING NUMBER: 102

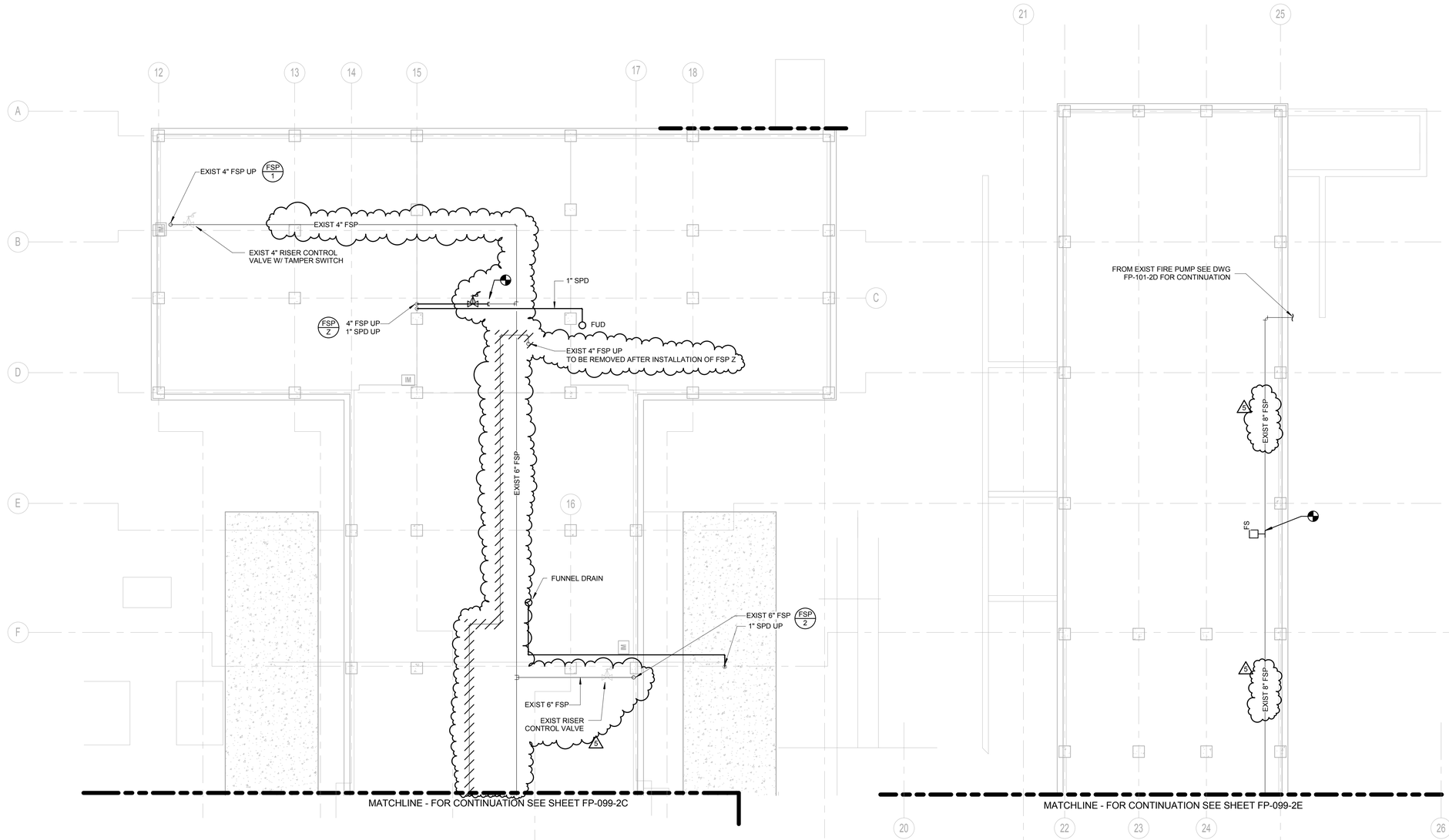
DRAWING NUMBER: FP-099-2C

SHEET

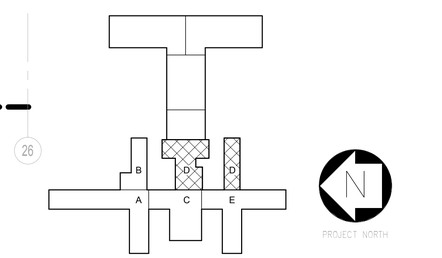
8/24/2015 2:22:15 PM

GENERAL NOTES:

1. FOR FIRE PROTECTION ABBREVIATIONS, SYMBOLS, NOTES & SCHEDULES, REFER TO DRAWING FP-001.
2. FOR FIRE PROTECTION DETAILS, REFER TO DRAWING FP-501-2.
3. EXISTING SPRINKLER SYSTEM (PARTIALLY SPRINKLERED) IN SUB-BASEMENT TO REMAIN



1 FIRE PROTECTION SUB-BASEMENT PLAN, PART D



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CONSTRUCTION

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600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT:
NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	TW
DRAWN BY:	JR
FIELD CHECK:	N/A
APPROVED:	JP

SHEET TITLE:
FIRE PROTECTION SUB-BASEMENT PLAN, PART D

BUILDING NUMBER: 102

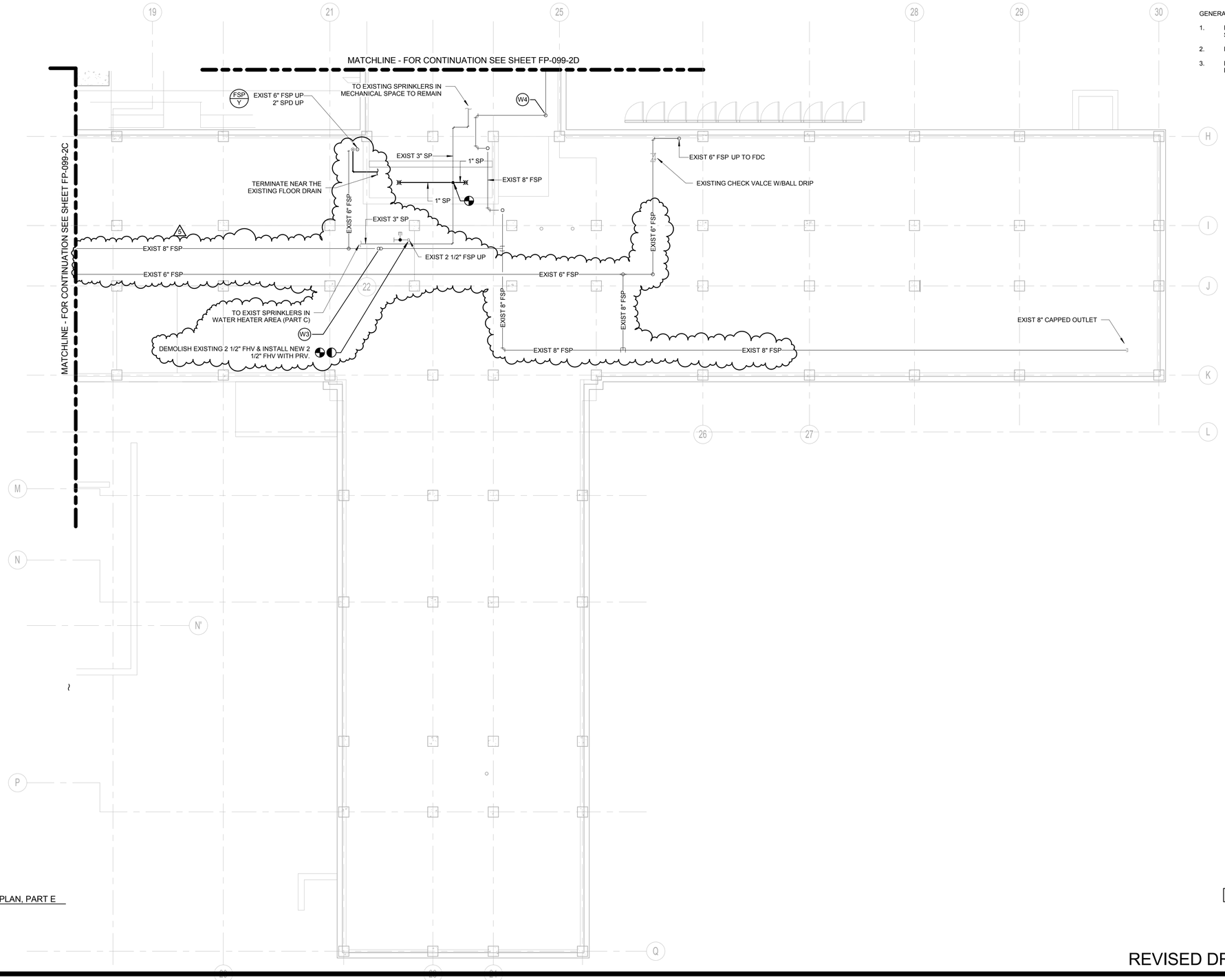
DRAWING NUMBER: FP-099-2D

SHEET

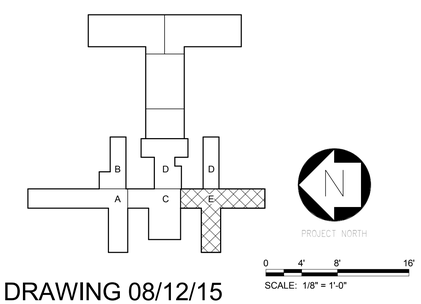
8/24/2015 2:22:15 PM

GENERAL NOTES:

1. FOR FIRE PROTECTION ABBREVIATIONS, SYMBOLS, NOTES & SCHEDULES, REFER TO DRAWING FP-001.
2. FOR FIRE PROTECTION DETAILS, REFER TO DRAWING FP-501-2.
3. EXISTING SPRINKLER SYSTEM (PARTIALLY SPRINKLERED) IN SUB-BASEMENT TO REMAIN



1 FIRE PROTECTION SUB-BASEMENT PLAN, PART E



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CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	TW
DRAWN BY:	JR
FIELD CHECK:	N/A
APPROVED:	JP

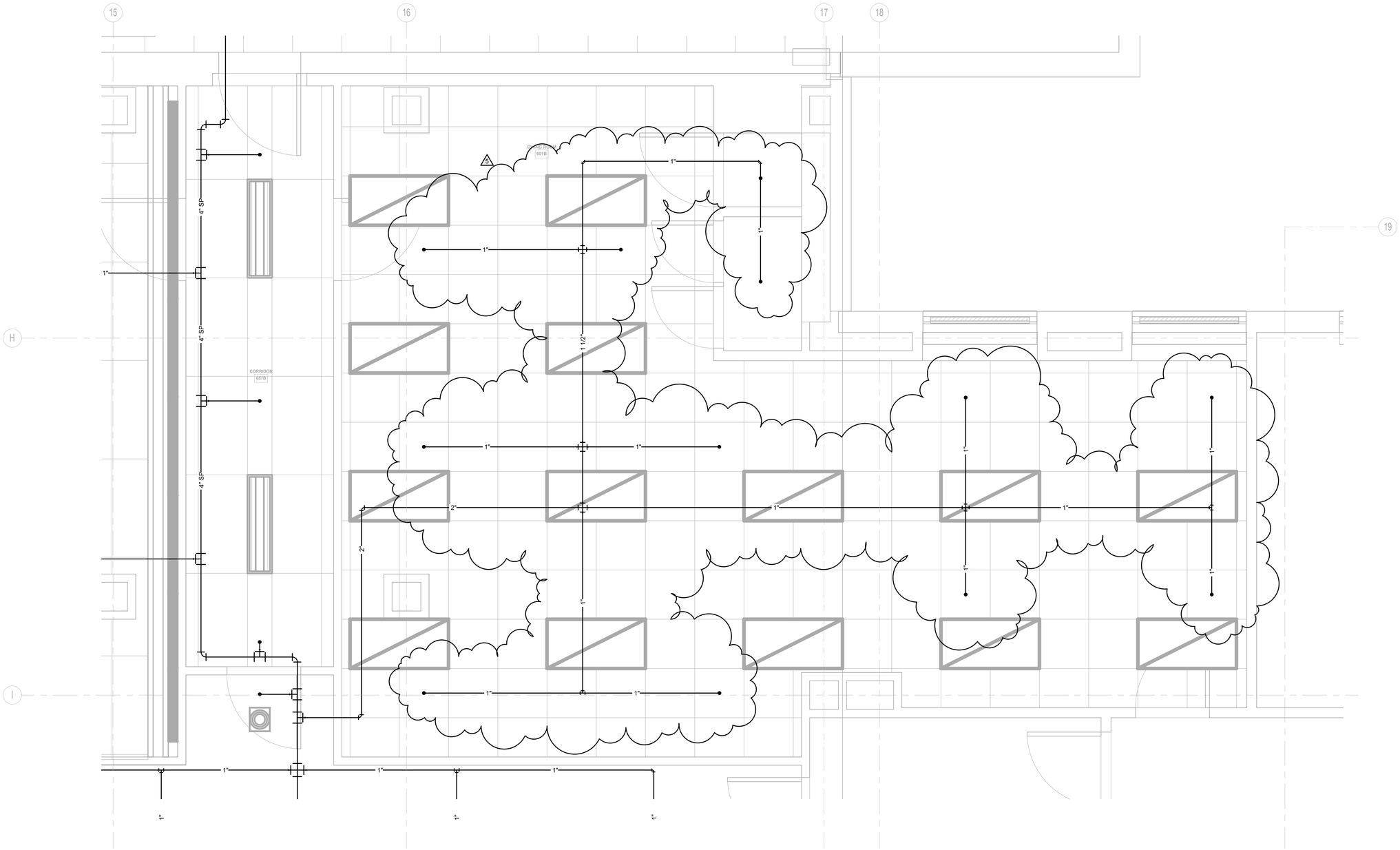
SHEET TITLE: FIRE PROTECTION SUB-BASEMENT PLAN, PART E

BUILDING NUMBER: 102

DRAWING NUMBER: FP-099-2E

SHEET

8/24/2015 2:22:15 PM



1 PART PLAN DINING ROOM TYPICAL FOR 3RD THRU 11TH FLOOR

PROJECT NORTH

0 8' 16' 32'

ADDENDUM DRAWING 08/12/15

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

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CONTRACT:
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CLIENT:
NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5

PROJECT NUMBER:	44578
DESIGNED BY:	JR
DRAWN BY:	JR
FIELD CHECK:	TW
APPROVED:	BG

SHEET TITLE:
FIRE PROTECTION B-SIDE DINING ROOM REVISIONS

BUILDING NUMBER: 102

DRAWING NUMBER: FP-402-2

SHEET

8/24/2015 2:54:46 PM

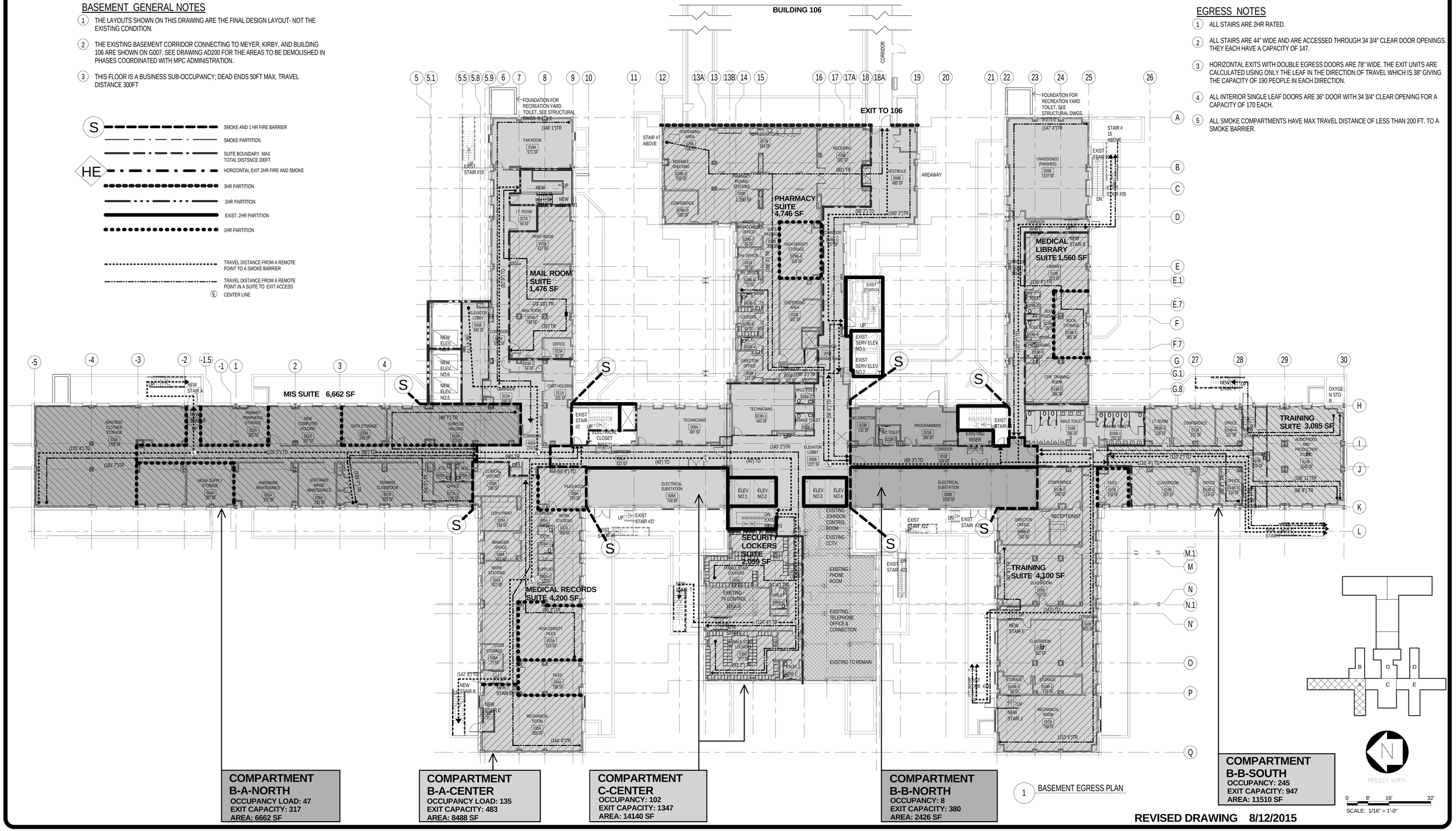
BASEMENT GENERAL NOTES

1. THE LAYOUTS SHOWN ON THIS DRAWING ARE THE FINAL DESIGN LAYOUT- NOT THE EXISTING CONDITION.
2. THE EXISTING BASEMENT CORRIDOR CONNECTING TO MEYER, KIRBY, AND BUILDING 106 ARE SHOWN ON G007. SEE DRAWING AD200 FOR THE AREAS TO BE DEMOLISHED IN PHASES COORDINATED WITH MPC ADMINISTRATION.
3. THIS FLOOR IS A BUSINESS SUB-OCCUPANCY; DEAD ENDS 50FT MAX, TRAVEL DISTANCE 300FT

S — SMOKE AND 1 HR FIRE BARRIER
SMOKE PARTITION
SUITE BOUNDARY, MAX TOTAL DISTSNCE 200FT
HE — HORIZONTAL EXIT 2HR FIRE AND SMOKE
3HR PARTITION
2HR PARTITION
EXIST. 2HR PARTITION
1HR PARTITION
TRAVEL DISTANCE FROM A REMOTE POINT TO A SMOKE BARRIER
TRAVEL DISTANCE FROM A REMOTE POINT IN A SUITE TO EXIT ACCESS
℄ CENTER LINE

EGRESS NOTES

1. ALL STAIRS ARE 2HR RATED.
2. ALL STAIRS ARE 44" WIDE AND ARE ACCESSED THROUGH 34 3/4" CLEAR DOOR OPENINGS. THEY EACH HAVE A CAPACITY OF 147.
3. HORIZONTAL EXITS WITH DOUBLE EGRESS DOORS ARE 78" WIDE. THE EXIT UNITS ARE CALCULATED USING ONLY THE LEAF IN THE DIRECTION OF TRAVEL WHICH IS 38" GIVING THE CAPACITY OF 190 PEOPLE IN EACH DIRECTION.
4. ALL INTERIOR SINGLE LEAF DOORS ARE 36" DOOR WITH 34 3/4" CLEAR OPENING FOR A CAPACITY OF 170 EACH.
5. ALL SMOKE COMPARTMENTS HAVE MAX TRAVEL DISTANCE OF LESS THAN 200 FT. TO A SMOKE BARRIER.



1 BASEMENT EGRESS PLAN

REVISED DRAWING 8/12/2015

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

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CONTRACT: CONSTRUCTION

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LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
AS	8-12-2015	ADDENDUM # 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER: 44578
DESIGNED BY: MAK / WW
DRAWN BY: LR / LM / WW / JS / JM / DF / YB / YK
FIELD CHECK: N/A
APPROVED: WS / MAK / LF

SHEET TITLE: BASEMENT EGRESS PLAN

BUILDING NUMBER: 102
DRAWING NUMBER: G-100-2
SHEET AS

8/25/2015 10:37:34 AM

MECHANICAL INDEX SHEET

GENERAL NOTES

1. ALL WORK SHALL BE PERFORMED IN A CLEAN AND WORKMANLIKE MANNER. CARE SHALL BE EXERCISED TO MINIMIZE ANY INCONVENIENCE OR DISTURBANCE TO OTHER AREAS OF THE BUILDING WHICH ARE TO REMAIN IN OPERATION. ISOLATE WORK AREAS BY MEANS OF TEMPORARY PARTITIONS AND/OR TARPS TO KEEP DUST AND DIRT WITHIN THE CONSTRUCTION AREA.
2. NO PIPING, EQUIPMENT, ETC. SHALL BE REMOVED, DISCONNECTED OR SHUT DOWN WITHOUT PRIOR REVIEW WITH THE OWNER AND/OR ENGINEER TO CONFIRM THAT AREAS TO REMAIN IN OPERATION WILL NOT BE AFFECTED. IF ANY AREAS NOT WITHIN THE SCOPE OF WORK ARE AFFECTED BY ANY SHUTDOWN, REMOVAL OR DISCONNECTION, 72 HOURS ADVANCE NOTICE MUST BE GIVEN TO THE OWNER INDICATING WHICH AREAS WILL BE AFFECTED, WHEN THE PROPOSED SHUTDOWN WILL OCCUR, AND FOR HOW LONG A PERIOD OF TIME.
3. PRIOR TO PREPARATION OF SHOP DRAWINGS HVAC CONTRACTOR IS REQUIRED TO PERFORM A FIELD SURVEY/FIELD MEASURE OF ALL EXISTING CONDITIONS INCLUDING HVAC INSTALLATIONS, STRUCTURES AND PARTITIONS THAT ARE TO REMAIN AND/OR BE REMOVED INCLUDING BUT NOT LIMITED TOO: SHAFT WALLS, STAIRWAY WALLS, BEAM ELEVATIONS, FLOOR ELEVATIONS DUCTWORK, PIPING,CEILINGS, ETC. WHERE DISCREPANCIES OCCUR BETWEEN THESE DOCUMENTS AND EXISTING CONDITIONS, THE DISCREPANCY SHALL BE REPORTED BY SUBMITTING AN RFI TO THE OWNER AND/OR ENGINEER FOR EXPEDITING AND RESOLUTION.
4. ALL SHUT DOWNS OF EXISTING SYSTEMS SHALL BE SCHEDULED AND APPROVED BY THE OWNER PRIOR TO COMMENCING WITH WORK.
5. CLEAN THE JOB SITE DAILY AND REMOVE FROM THE PREMISES ANY DIRT AND DEBRIS CAUSED BY THE PERFORMANCE OF THE WORK INCLUDED IN THIS CONTRACT.
6. USE OF THE OWNER'S BUILDING CORRIDORS FOR HANDLING OF REMOVED EQUIPMENT AND MATERIALS SHALL BE AT THE DIRECTION OF THE OWNER AND SHALL BE COORDINATED WITH HIS OPERATIONS. USE OF THE OWNER'S ELEVATORS SHALL NOT BE PERMITTED.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFEKEEPING OF HIS OWN PROPERTY ON THE JOB SITE. THE OWNER ASSUMES NO RESPONSIBILITY FOR PROTECTION OF PROPERTIES AGAINST FIRE, THEFT AND ENVIRONMENTAL CONDITIONS.
8. SUCCESSFULLY PRESSURE TEST ALL REROUTED PIPING SYSTEMS. FOR ADDITIONAL INFORMATION REFER TO SPECIFICATION 230-593
9. EXISTING MATERIALS THAT ARE REMOVED SHALL NOT BE REUSED IN NEW SYSTEMS, EXCEPT WHERE INDICATED AS BEING RELOCATED.
10. PROVIDE ALL NECESSARY TEMPORARY OR PERMANENT CAPS OR PLUGS FOR PIPING. DO NOT LEAVE PIPING OPEN ENDED.
11. WHERE USED, THE TERM "PROVIDE" SHALL MEAN "FURNISH AND INSTALL"
12. THIS CONTRACTOR SHALL COORDINATE HIS WORK WITH ALL OTHERS
13. WHERE APPLICABLE, BALANCING CONTRACTOR SHALL TAKE FLOW (CFM/GPM) READINGS ON ALL EXISTING EXHAUST, SUPPLY & RETURN AIR SYSTEMS & SUPPLY & RETURN WATER SYSTEMS SERVING SIDE B OF 3RD THROUGH 11TH FLOOR BEFORE THE START OF COMPLETION. AFTER COMPLETION OF CONSTRUCTION, AS PART OF THE BALANCING FOR NEW WORK, BALANCING CONTRACTOR SHALL RE-BALANCE EXISTING SYSTEMS TO RESTORE ORIGINAL FLOW (CFM/GPM) QUANTITIES. FOR TESTING LOCATIONS REFER TO TABLE ON MD2-001-2 AND DEMOLITION AND NEW WORK DRAWINGS.
14. IF CONTRACTOR ENCOUNTERS WHAT APPEARS TO BE A HAZARDOUS OR QUESTIONABLE MATERIAL, HE SHALL DISCONTINUE WORK IMMEDIATELY AND CONTACT THE OWNERS REPRESENTATIVE.
15. IN EVENT THAT ANY ASBESTOS IS FOUND ON THE JOB SITE, REMOVAL SHALL TAKE PLACE IN ACCORDANCE WITH ALL APPLICABLE CODES, OSHA REGULATION 1910.1, INCLUDING STATE AND FEDERAL DUMPING GROUNDS. COORDINATE WITH HAZARDOUS MATERIAL DRAWINGS.
16. PROVIDE AIRFLOW ISOLATION/BALANCING DAMPERS AS SHOWN ON PLANS, AND AS OTHERWISE REQUIRED FOR BALANCING AND/OR ISOLATION ON EVERY BRANCH/TAKE OFF FOR EXHAUST DUCTWORK, RETURN DUCTWORK, AND SUPPLY DUCTWORK DOWNSTREAM OF VAV BOXES. 5
17. NO SEISMIC REQUIREMENTS FOR MECHANICAL COMPONENTS IN SEISMIC DESIGN CATEGORY B AS PER ASCE-7-2010 13.1.4 EXEMPTIONS # 4.
18. COORDINATE WITH THE STRUCTURAL AND ARCHITECTURAL DRAWINGS FOR PROVISION OF FLOOR OPENINGS AND SHAFTS FOR MECHANICAL DUCTWORK, PIPING, AND SYSTEMS, IN THE CORRECT LOCATIONS AND OF CORRECT INSIDE CLEAR DIMENSIONS.
19. PROVIDE ACCESS DOORS IN DUCTWORK UPSTREAM OF ALL DAMPERS AND DUCT MOUNTED EQUIPMENT. COORDINATE WITH THE ARCHITECTURAL DIVISION AND WITH THE "GENERAL CONTRACTOR" TO PROVIDE ACCESS DOORS IN ARCHITECTURAL WALLS, SOFFITS, AND CEILING CONSTRUCTION IN INSTANCES WHERE DUCT MOUNTED VOLUME DAMPERS, CONTROL INSTRUMENTATION, MOTORIZED DAMPERS, SMOKE DAMPERS, FIRE DAMPERS, AND / OR PACKAGED HVAC EQUIPMENT ARE INSTALLED CONCEALED BEHIND OR ABOVE THE ARCHITECTURAL WALL, SOFFIT, OR CEILING CONSTRUCTION. FURNISH THE ARCHITECTURAL DIVISION WITH THE APPROVED SHEETMETAL SHOP DRAWINGS, FOR COORDINATION OF ACCESS DOORS LOCATIONS. WHERE NECESSARY, ACCESS DOORS WITHIN FIRE-RATED CONSTRUCTION SHALL BE FIRE-RATED.
20. UNUSED SECTIONS OF LOUVERS SHALL BE BLANKED OFF WITH G90 GLAVANIZED 4" THICKNESS DOUBLE-WALL INSULATED PANEL.

GENERAL PHASING NOTES:

1. CONTRACTOR SHALL PROVIDE PHASING PLAN OF DEMOLITION AND NEW WORK. CONTRACTOR SHALL COORDINATE AND PHASE ALL SERVICE SHUT-DOWNS, DEMOLITION WORK, AND CONSTRUCTION WORK OF HVAC SYSTEMS TO MAINTAIN UNINTERRUPTED SERVICE TO OCCUPIED AREAS OF THE BUILDINGS AND SURROUNDING PREMISES THROUGHOUT ALL WORK AND TO NOT INTERFERE WITH THE UNINTERRUPTED OCCUPANCY, SAFETY, AND BENEFICIAL USE OF OCCUPIED AREAS OF THE BUILDINGS AND SURROUNDING PREMISES BY OWNER. COORDINATE AND PHASE ALL SERVICE SHUT-DOWNS, DEMOLITION AND NEW WORK WITH OWNER AND CONSTRUCTION MANAGER. CONTRACTOR SHALL IDENTIFY AND NOTIFY OWNER OF ANY AND ALL WORK AFFECTING OCCUPIED AREAS OF THE BUILDINGS AND SURROUNDING AREAS FOR APPROVAL BY OWNER AND OWNER'S REPRESENTATIVE.

LINE DESIGNATIONS

A	COMPRESSED AIR	PGR	PROPYLENE GLYCOL RETURN
BF	BOILER FEEDWATER	PGS	PROPYLENE GLYCOL SUPPLY
BD	BOILER BLOWDOWN	R	RELIEF PIPING
CF	CHEMICAL FEED	RL OR RLL	REFRIGERANT LIQUID
CWS	CONDENSER WATER SUPPLY	RS OR RSL	REFRIGERANT SUCTION
CWR	CONDENSER WATER RETURN	RD	REFRIGERANT DISCHARGE
CHWS	CHILLED WATER SUPPLY	V	VENT PIPING
CHWR	CHILLED WATER RETURN		
COND	CONDENSATE		
D	DRAIN		
E	EXPANSION		
EXH	EXHAUST		
HWS	HOT WATER SUPPLY		
HWR	HOT WATER RETURN		
LPR	LOW PRESSURE RETURN		
LPS	LOW PRESSURE STEAM		
MPS	MEDIUM PRESSURE STEAM		
PC	PUMPED CONDENSATE		

PIPING LINE SYMBOLS, ELEMENTS/VALVING

EXISTING PIPING TO REMAIN
EXISTING PIPING TO BE REMOVED
NEW PIPING
GATE VALVE
GLOBE VALVE
OR — BUTTERFLY VALVE
BALL VALVE
OS&Y GATE VALVE
SWING CHECK VALVE
TRIPLE DUTY VALVE
GATE VALVE, ANGLE
DIAPHRAGM VALVE
AUTO FLOW CONTROL VALVE
CBV — CIRCUIT SETTING BALANCING VALVE
THREE WAY CONTROL VALVE
TWO WAY CONTROL VALVE
S — SOLENOID VALVE
PRESSURE REDUCING VALVE (PRV)
NEEDLE VALVE
VALVE-QUICK CLOSING
RELIEF/SAFETY VALVE
MV — MANUAL AIR VENT
AV — AUTOMATIC AIR VENT (EXTEND DISCHARGE TO DRAIN)
VALVE-SLOW OPENING
VB — VACUUM BREAKER
DIRECTION OF FLOW
R D — DIRECTION OF PITCH-RISE OR DROP
STRAINER
STRAINER WITH BLOW OFF VALVE
PIPE RISING UP
PIPE DROPPING DOWN
TEE OUTLET UP
TEE OUTLET DOWN
CONCENTRIC REDUCER
ECCENTRIC REDUCER
UNION
A — ANCHOR
G — GUIDE
EJ — EXPANSION JOINT
T1 OR — THERMOMETER
P1 OR — GAUGE WITH GAUGE COCK & SYPHON (STEAM)
AQUASTAT
GAS PRESSURE REGULATOR
FLOAT OPERATED CONTROL VALVE
ELECTRICALLY TRACED PIPING
H W — EXPANSION LOOP (WxH)
FLEXIBLE CONNECTION
OR — PIPE CAP
DRAIN

ABBREVIATIONS

AAV	AUTOMATIC AIR VENT			PS	PRESSURE SWITCH
ABV	ABOVE	FO	FAIL OPEN	PSI	POUNDS PER SQUARE INCH GAUGE
AD	ACCESS DOOR	FP	FIRE PROTECTION	PSIG	POUNDS PER SQUARE INCH GAUGE
ADR	AREA DRAIN (SEE SYMBOLS)	FPH	FEET PER HOUR	PT	PRESSURE TRANSMITTER
AFF	ABOVE FINISHED FLOOR	FPM	FEET PER MINUTE	PV	PLUG VALVE
AHU	AIR HANDLING UNIT			QUAN	QUANTITY
AMD	AUTOMATIC MOTORIZED DAMPER	FPS	FEET PER SECOND	RA	RETURN AIR
AP	ACCESS PANEL	FRICT	FRICTION	RD	ROOF DRAIN
ATC	AUTOMATIC TEMPERATURE CONTROL	FS	FLOW SWITCH	REL	RELIEF
AVER	AVERAGE	FSD/AD	COMBINATION FIRE AND SMOKE WITH ACCESS DOOR	REQD	REQUIRED
AWT	AVERAGE WATER TEMPERATURE			RET	RETURN
BDD	BACK DRAFT DAMPER	FT	FEET	RH	RELATIVE HUMIDITY
BFP	BACK FLOW PREVENTER	FTR	FINNED TUBE RADIATION	RLA	RATED LOAD AMPS
BD	BLAST DAMPER	FV	FACE VELOCITY	RM	ROOM
BLDG	BUILDING	GA	GAUGE	RPM	REVOLUTIONS PER MINUTE
BLW	BELOW	GAL	GALLON		
BSMT	BASEMENT	GALV	GALVANIZED	RR	RETURN REGISTER - PLENUM
BTU	BRITISH THERMAL UNIT	GC	GENERAL CONTRACTOR	RRD	RETURN REGISTER DUCTED
CAF	COMBUSTION AIR FAN	GEF	GENERAL EXHAUST FAN		
CAP	CAPACITY	GPD	GALLONS PER DAY	SA	SUPPLY AIR
CAV	CONSTANT AIR VOLUME	GPH	GALLONS PER HOUR	SCH	SCHEDULE
CBV	CIRCUIT BALANCING VALVE	GPM	GALLONS PER MINUTE	SCHEM	SCHEMATIC
CENTRIF.	CENTRIFUGAL	GR	GRILLE	SD	SMOKE DAMPER
CF	INLINE EXHAUST FAN	GRS/LB	GRAINS PER POUND	SF	SQUARE FEET
CFH	CUBIC FEET PER HOUR	HT	HEIGHT	SP	STATIC PRESSURE
CFM	CUBIC FEET PER MINUTE	HO	WATER	SPEC	SPECIFICATION
CHP	CONCRETE HOUSEKEEPING PAD	HD	HEAD (SEE SCHEDULES)	SQ	SQUARE
CIP	CLEAN IN PLACE	HP	HORSEPOWER	SR	STEAM RADIATOR
C	CENTER LINE	HR	HOUR	SS	STAINLESS STEEL
CLG	CEILING	HTR	HEATER	SST	SUPPORT STEEL
CO	CLEAN OUT	HZ	HERTZ	STD	STANDARD
COMP	COMPRESSOR	ID	INSIDE DIMENSION	STL	STEEL
CON	CONCENTRIC	IFB	INTEGRAL FACE AND BYPASS	STM	STEAM
COND	CONDENSATE	IN	INCHES	STR	STRUCTURAL
CONN	CONNECTION	KW	KILOWATT	SUCT	SUCTION
CONTN	CONTINUATION	L	LENGTH	SUP	SUPPLY
CSB	CENTRAL SERVICES BUILDING	LAT	LEAVING AIR TEMPERATURE	SYS	SYSTEM
CUH	CABINET UNIT HEATER	LBS	POUNDS	TAD	TRANSFER AIR DUCT
CVS	CONTROL VALVE STATION	LBS/HR	POUNDS PER HOUR (#/HR)	TDH	TOTAL DYNAMIC HEAD
DB	DRY BULB	LD	LINEAR DIFFUSER	TEMP	TEMPERATURE
DIA	DIAMETER	LDR	LINEAR DIFFUSER (PLENUM RETURN)	TEF	TOILET EXHAUST FAN
DIFF	DIFFERENTIAL	LEF	LAUNDRY EXHAUST FAN	TP	TOTAL PRESSURE
DL	DOOR LOUVER	LP	LINEAR PLENUM	TS	TEMPERATURE SWITCH
DN	DOWN	LPC	LOW PRESSURE CONDENSAT	TSP	TOTAL STATIC PRESSURE
DO	DUCT OPENING	LPS	LOW PRESSURE STEAM	TT	TEMPERATURE TRANSMITTER
DVF	DRYER VENT FAN			TYP	TYPICAL
DWG	DRAWING	LRA	LOCK ROTOR AMPS	UC	UNDERCUT
DX	DIRECT EXPANSION	LVG	LEAVING	V	VOLTS
E OR (E)	EXISTING	LVR	LOUVER	VA	VALVE
EA	EACH	LWT	LEAVING WATER TEMPERATURE	VAV	VARIABLE AIR VOLUME BOX
EAT	ENTERING AIR TEMPERATURE	MBH	THOUSANDS OF BTU PER HOUR	VB	VACUUM BREAKER
ECC	ECCENTRIC	MD	AUTOMATIC MOTORIZED DAMPER	VD	VOLUME DAMPER
ECH	ELECTRIC CABINET HEATER	MER	MECHANICAL EQUIPMENT ROOM	VEL	VELOCITY
EFF	EFFICIENCY	MIN	MINIMUM	VI	VIBRATION ISOLATOR
EJ	EXPANSION JOINT	MISC	MISCELLANEOUS	VOLT	VOLTAGE
EL	ELEVATION	MOCP	MIN. OVERCURRENT PROTECTION AMPS	VTR	VENT THRU ROOF
ELEC	ELECTRIC	MTD	MOUNTED	W	WIDTH
ENT	ENTERING	VD	MANUAL VOLUME DAMPER	WMS	WIRE MESH SCREEN
EQ	EQUAL	NC	NORMALLY CLOSED OR NOISE CRITERIA	W/	WITH
EQUIP	EQUIPMENT	NIC	NOT IN CONTRACT	W/O	WITHOUT
ER	ELECTRIC RADIATOR	No	NUMBER	WB	WET BULB
ERD	EXHAUST REGISTER - DUCTED	NO	NORMALLY OPEN	WC	WATER COLUMN
ES	END SWITCH	NPW	NOT POTABLE WATER	WG	WATER GAUGE
ESP	EXTERNAL STATIC PRESSURE	NTS	NOT TO SCALE		
EWT	ENTERING WATER TEMPERATURE	OA	OUTSIDE AIR		
EXH	EXHAUST	OD	OUTSIDE DIMENSION		
EXPAN	EXPANSION	OPG	OPENING		
EXT	EXTERNAL	OV	OUTLET VELOCITY		
°F	DEGREES FAHRENHEIT	PART	PARTIAL		
FC	FLEXIBLE CONNECTION OR FAIL CLOSED	PD	PRESSURE DROP (SEE SCHEDULE)		
FCV	FLOW CONTROL VALVE	PH	PHASE		
FD/AD	FIRE DAMPER WITH ACCESS DOOR	PNEU	PNEUMATIC		
FIN	FINISHED	POS	POSITIVE		
FLA	FULL LOAD AMPS	PPH	POUNDS PER HOUR		
FLD	FLOOR DRAIN	PRESS	PRESSURE		
FLR	FLOOR				

DUCTWORK

DOUBLE LINE / SINGLE LINE

EXISTING DUCTWORK TO REMAIN
EXISTING DUCTWORK TO BE REMOVED
SIZE OR SIZE — NEW DUCTWORK - DUCT SIZES INDICATED ARE INSIDE CLEAR DIMENSIONS
TRANSITION
RADIUS ELBOW
VANED ELBOW
BRANCH DUCT TAKE-OFF
D R — RISE OR DROP DIRECTION OF AIR FLOW
TAG CFM — DIFFUSER
TAG CFM — CEILING RETURN/EXHAUST REGISTER (R) OR GRILLE (G)
TAG/SIZE CFM — SUPPLY AIR GRILLE (G) OR SUPPLY AIR REGISTER (R)
TAG/SIZE CFM — RETURN AND/OR EXHAUST AIR GRILLE (G) OR REGISTER (R)
DUCTWORK UP
DUCTWORK DOWN
TAG NECK SIZE CFM
NUMBER NECK SIZE CFM
SUPPLY AIR
RETURN OR OUTSIDE AIR
EXHAUST AIR
PROPORTIONAL SPLIT (DOUBLE LINE)
PROPORTIONAL SPLIT (SINGLE LINE)
OR — FLEXIBLE DUCT (DOUBLE LINE)
FD/AD — FIRE DAMPER WITH ACCESS DOOR
FSD/AD — FIRE SMOKE DAMPER WITH ACCESS DOOR
SD/AD — SMOKE DAMPER WITH ACCESS DOOR
TAG/SIZE CFM — RETURN REGISTER (NOT DUCTED)
ACCESS DOOR

EQUIPMENT ABBREVIATIONS

AC	AIR CONDITIONING UNIT	GMU	GLYCOL MAKE-UP UNIT
ACC	AIR CONDITIONING CONDENSER UNIT	HC	HEATING COIL
AHU	AIR HANDLING UNIT	HE	HEAT EXCHANGER
AS	AIR SEPARATOR	HP	HEAT PUMP
B	BOILER	HWP	HOT WATER PUMP
CC	COOLING COIL	KEF	KITCHEN EXHAUST FAN
CD	CEILING DIFFUSER	P-DC	PUMP - DRY COOLER
CF	CHEMICAL FEED UNIT	P-ER	PUMP - ENERGY RECLAIM
CH	CHILLER	P-FO	PUMP - FUEL OIL
CHWP	CHILLED WATER PUMP	PCHWP	PRIMARY CHILLED WATER PUMP
CP	CONDENSATE PUMP	PRV	PRESSURE REDUCING VALVE
CT	COOLING TOWER	PS	PRESSURE SWITCH
CTF	COOLING TOWER FILTER	R	LOUVERED GRAVITY RELIEF
CRU	CONDENSATE RETURN UNIT	RF	RETURN AIR FAN
CU	CONDENSING UNIT	RH	REHEAT COIL
CUH	CABINET UNIT HEATER	RV	RELIEF VALVE
CV	AUTOMATIC CONTROL VALVE	SCHWP	SECONDARY CHILLED WATER PUMP
CWP	CONDENSER WATER PUMP	SHWP	SECONDARY HOT WATER PUMP
D	AUTOMATIC DAMPER	TEF	TOILET EXHAUST FAN
DA	DEAERATOR	SF	SUPPLY FAN
DAC	DRY AIR COOLER	SPF	STAIR PRESSURIZATION FAN
(E)	EXISTING (POSTSCRIPT)	SR	SUPPLY REGISTER
EF	EXHAUST FAN	SRV	SAFETY RELIEF VALVE
ER	EXHAUST REGISTER	ST	STORAGE TANK
ET	EXPANSION TANK	STP	SOUND TRAP
EUH	ELECTRIC UNIT HEATER	VAV	VARIABLE AIR VOLUME BOX
ERV	ENERGY RECOVERY VENTILATOR	UH	UNIT HEATER
F	FILTER	WF	WATER FILTER
FOT	FUEL OIL TANK	WS	WATER SOFTENER
FM	FLOW METER		
FOP	FUEL OIL PUMP		
FPV	FAN POWERED VARIABLE AIR VOLUME BOX		
GEF	GENERAL EXHAUST FAN		
GFU	GLYCOL FEED UNIT		

REFERENCE SYMBOLS

X / X-X — EQUIPMENT IDENTITY (SEE EQUIPMENT ABBREVIATIONS LIST AND SCHEDULES)
EQUIPMENT NUMBER
SYSTEM NUMBER (IF APPLICABLE)
X / X — INDICATES DETAIL LETTER (APPLIES ONLY WHERE INDICATED ON DRAWINGS)
INDICATES DRAWING ON WHICH DETAIL APPEARS
INDICATES SECTION NUMBER
INDICATES ON WHICH DRAWING SECTION APPEARS
INDICATES REVISION & NUMBER
CONNECT NEW TO EXISTING
TERMINATION POINT OF DEMOLITION
CONNECT TO MANUFACTURER'S PREPIPED CONNECTION
SHEET NOTE NUMBER
TO/FROM DWG

AIR FLOW DIAGRAM SYMBOLS

IN-LINE FAN
CENTRIFUGAL FAN
PLENUM FAN
EXHAUST FAN (MUSHROOM TYPE)
UPBLAST EXHAUST FAN
SOUND TRAP
PROP FAN
UNIT HEATER
HC — HEATING COIL
CC — COOLING COIL
VAV-AHU-1-1-1 — VAV TERMINAL BOX WITH REHEAT COIL (AHU #, VAV #)
OAI / RELIEF — AIR INTAKE/RELIEF LOUVER
AIR FLOW MEASURING STATION
SUPPLY DIFFUSER
RETURN/EXHAUST REGISTER/GRILL
VOLUME DAMPER
S — SOLENOID ACTUATOR
CYLINDRICAL ACTUATOR
DIAPHRAGM ACTUATOR
AMD — AUTOMATIC MOTORIZED DAMPER WITH CYLINDRICAL ACTUATOR
S — DUCT SMOKE DETECTOR (PROVIDED BY FIRE ALARM, INSTALLED BY MECHANICAL CONTRACTOR)
MOTOR
T — THERMOSTAT
TS — TEMPERATURE SENSOR
CO2 — CARBON DIOXIDE SENSOR
(CFM) / (SF, CFM) — DOOR UNDERCUT
DOOR LOUVER
(CFM) / TR — TRANSFER DUCT

PIPING DIAGRAM/P&ID SYMBOLS

FINNED TUBE RADIATION
CENTRIFUGAL PUMP (TYPE) INLINE END SECTION SPLIT CASE HORIZONTAL
EXPANSION TANK
AIR SEPARATOR
CHEMICAL FEED TANK
SUCTION DIFFUSER

CONTROL SIGNALS

COMPUTER SIGNAL
ELECTRICAL SIGNAL

DUCT ACOUSTICAL LINING GENERAL NOTES:

A. THE FOLLOWING ITEMS SHALL BE ACOUSTICALLY LINED. WHERE DISTANCES OF LINING ARE INDICATED, THE INTENT IS THAT ALL DUCTWORK IN ANY DIRECTION BE ACOUSTICALLY LINED:

1. ALL SUPPLY AIR DUCTWORK A DISTANCE OF 40 FEET FROM FAN DISCHARGE.IF THE DISTANCE FROM FAN DISCHARGE TO MECHANICAL EQUIPMENT ROOM WALL IS MORE THAN 40 FEET CONTINUE ACOUSTICAL LINING OUTSIDE OF THE MECHANICAL EQUIPMENT ROOM WALL.
2. ALL CONDITIONED AIR SUPPLY DUCTWORK FROM ROOF TOP UNITS TO A DISTANCE OF 40 FEET FROM FAN DISCHARGE. IF THE DISTANCE FROM FAN DISCHARGE TO ROOF OR WALL PENETRATION IS LESS THAN 40 FEET, CONTINUE ACOUSTIC LINING O A DISTANCE OF 40 FEET FROM FAN DISCHARGE.
3. UPSTREAM OF RETURN FANS, A MINIMUM DISTANCE OF 25 FEET.
4. DOWNSTREAM OF THE TERMINAL UNIT VAV BOXES, A MINIMUM OF 10 FEET, AND ENTIRE SUPPLY DUCT FROM DISCHARGE OF FPVAV BOX UP TO FINAL CONNECTION TO CEILING AIR OUTLET, INCLUDING ANY TAPS TAKEN FROM THE MAIN DISCHARGE WITHIN THIS RANGE.

5 REVISED DRAWING 8/12/15

NOTE:
NOT ALL SYMBOLS AND ABBREVIATIONS MAY BE USED ON THIS PROJECT AND ARE SHOWN FOR CONVENIENCE ONLY.

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

CONSULTANTS:
RBSD ARCHITECTS P.C. | STV 100 Years
A Joint Venture
225 Park Avenue South
New York, New York 10003

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STATE OF NEW YORK · JAMES PERISE · LICENSED PROFESSIONAL ENGINEER · 089294

CONTRACT: CONSTRUCTION
TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION
LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102, 600 EAST 125TH STREET WARDS ISLAND, NY 10035
CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	IL
DRAWN BY:	YD
FIELD CHECK:	N/A
APPROVED:	PL

SHEET TITLE:
HVAC SYMBOLS, LEGENDS & GENERAL NOTES-1

BUILDING NUMBER: 102
DRAWING NUMBER: M-001
SHEET

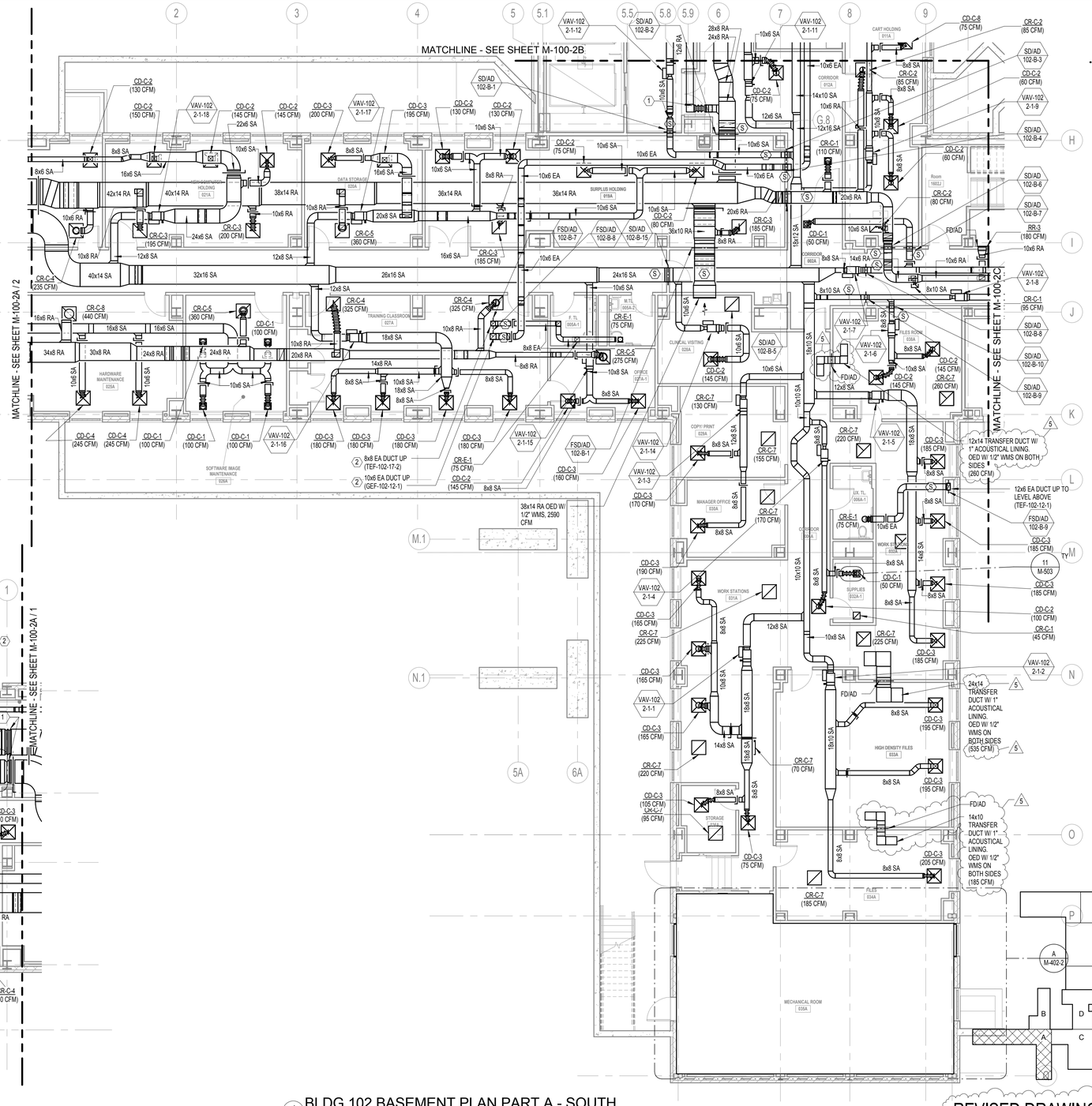
8/25/2015 10:31:04 AM

GENERAL SHEET NOTES

1. FOR LEGEND AND ABBREVIATIONS REFER TO SHEET M-001 AND M-002.
2. PLENUM SIZES FOR LINEAR DIFFUSERS VARIES & DEPENDS ON DUCTWORK LAYOUT & COORDINATION IN FIELD.
3. PROVIDE BALANCING DAMPER ON EVERY BRANCHTAKE OFF FOR EXHAUST, RETURN AND SUPPLY DUCTWORK.

KEY NOTES

1. PROVIDE FLEXIBLE CONNECTION FOR DUCTWORK, MINIMUM 3" INSTALLED LENGTH AND 6" NOMINAL LENGTH WITH MATERIAL TAUT, AT EACH POINT WHERE DUCTWORK CROSSES A BUILDING EXPANSION JOINT. COORDINATE WITH ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR EXPANSION JOINT SIZES LOCATIONS.
2. SLAB OPENING AT HORIZONTAL SHAFT ASSEMBLY. REFER TO DETAILS ON ARCHITECTURAL DRAWING A-823.



2 BLDG 102 BASEMENT PLAN PART A - NORTH
1/8" = 1'-0"

1 BLDG 102 BASEMENT PLAN PART A - SOUTH
1/8" = 1'-0"

REVISED DRAWING 8/12/15

SCALE: As indicated

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

A Joint Venture

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New York, New York 10003

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	IL
DRAWN BY:	FG
FIELD CHECK:	N/A
APPROVED:	PL

SHEET TITLE:

HVAC BASEMENT FLOOR PLAN, PART A

BUILDING NUMBER:	DRAWING NUMBER:
102	M-100-2A

SHEET

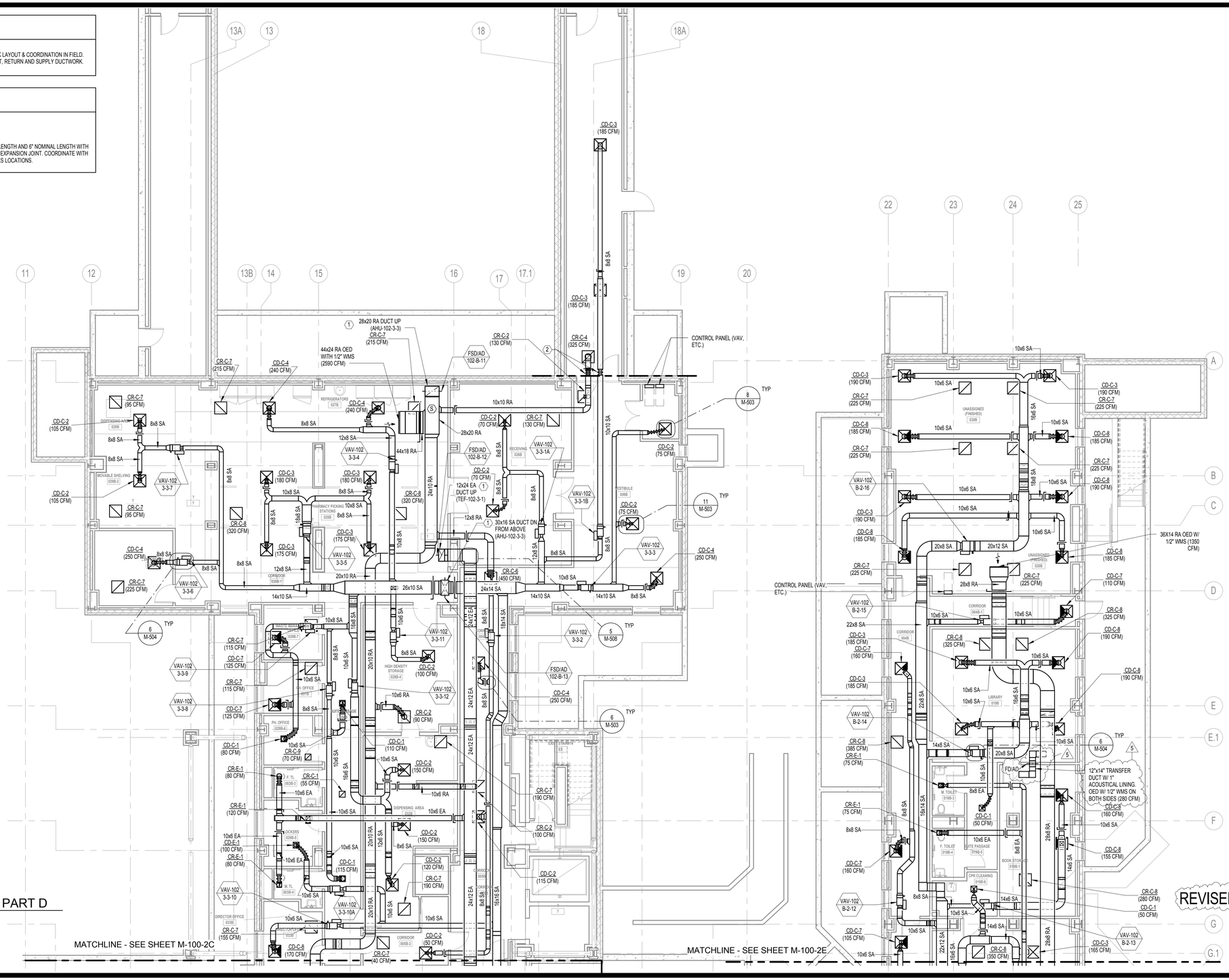
8/25/2015 10:35:28 AM

GENERAL SHEET NOTES

1. FOR LEGEND AND ABBREVIATIONS REFER TO SHEET M-001 AND M-002.
2. PLENUM SIZES FOR LINEAR DIFFUSERS VARIES & DEPENDS ON DUCTWORK LAYOUT & COORDINATION IN FIELD.
3. PROVIDE BALANCING DAMPER ON EVERY BRANCH/TAKE OFF FOR EXHAUST, RETURN AND SUPPLY DUCTWORK.

KEY NOTES

1. SLAB OPENING AT HORIZONTAL SHAFT ASSEMBLY. REFER TO DETAILS ON ARCHITECTURAL DRAWING A-823.
2. PROVIDE FLEXIBLE CONNECTION FOR DUCTWORK, MINIMUM 3" INSTALLED LENGTH AND 6" NOMINAL LENGTH WITH MATERIAL TAUT, AT EACH POINT WHERE DUCTWORK CROSSES A BUILDING EXPANSION JOINT. COORDINATE WITH ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR EXPANSION JOINT SIZES LOCATIONS.



1 BLDG 102 BASEMENT PLAN PART D
1/8" = 1'-0"

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

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LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	IL
DRAWN BY:	FG
FIELD CHECK:	N/A
APPROVED:	PL

SHEET TITLE:

HVAC BASEMENT FLOOR PLAN, PART D

BUILDING NUMBER:	DRAWING NUMBER:
102	M-100-2D

SHEET

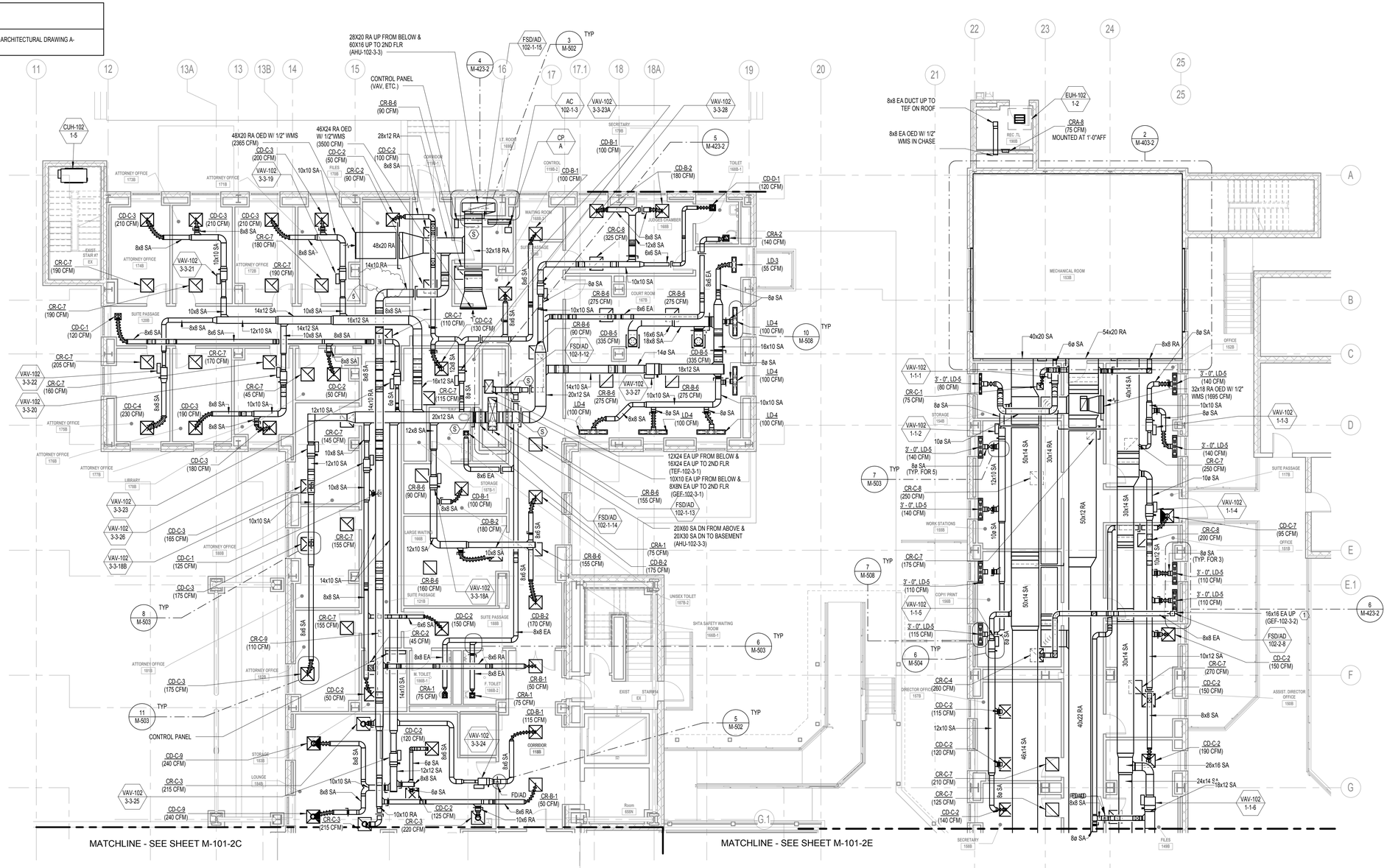
8/25/2015 11:02:28 AM

GENERAL SHEET NOTES

1. FOR LEGEND AND ABBREVIATIONS REFER TO SHEET M-001 AND M-002.
2. PLENUM SIZES FOR LINEAR DIFFUSERS VARIES & DEPENDS ON DUCTWORK LAYOUT & COORDINATION IN FIELD.
3. PROVIDE BALANCING DAMPER ON EVERY BRANCH/TAKE OFF FOR EXHAUST, RETURN AND SUPPLY DUCTWORK.

KEY NOTES

1. SLAB OPENING AT HORIZONTAL SHAFT ASSEMBLY. REFER TO DETAILS ON ARCHITECTURAL DRAWING A-823.



1 BLDG 102 1ST FLOOR PLAN PART D
1/8" = 1'-0"

5 REVISED DRAWING 8/12/15

0 4' 8' 16'
SCALE: As indicated

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

A Joint Venture
225 Park Avenue South
New York, New York 10003

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CONTRACT:
CONSTRUCTION

TITLE:
MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION:
MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT:
NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	IL
DRAWN BY:	FG
FIELD CHECK:	N/A
APPROVED:	PL

SHEET TITLE:
HVAC FIRST FLOOR PLAN, PART D

BUILDING NUMBER: 102
DRAWING NUMBER: M-101-2D
SHEET

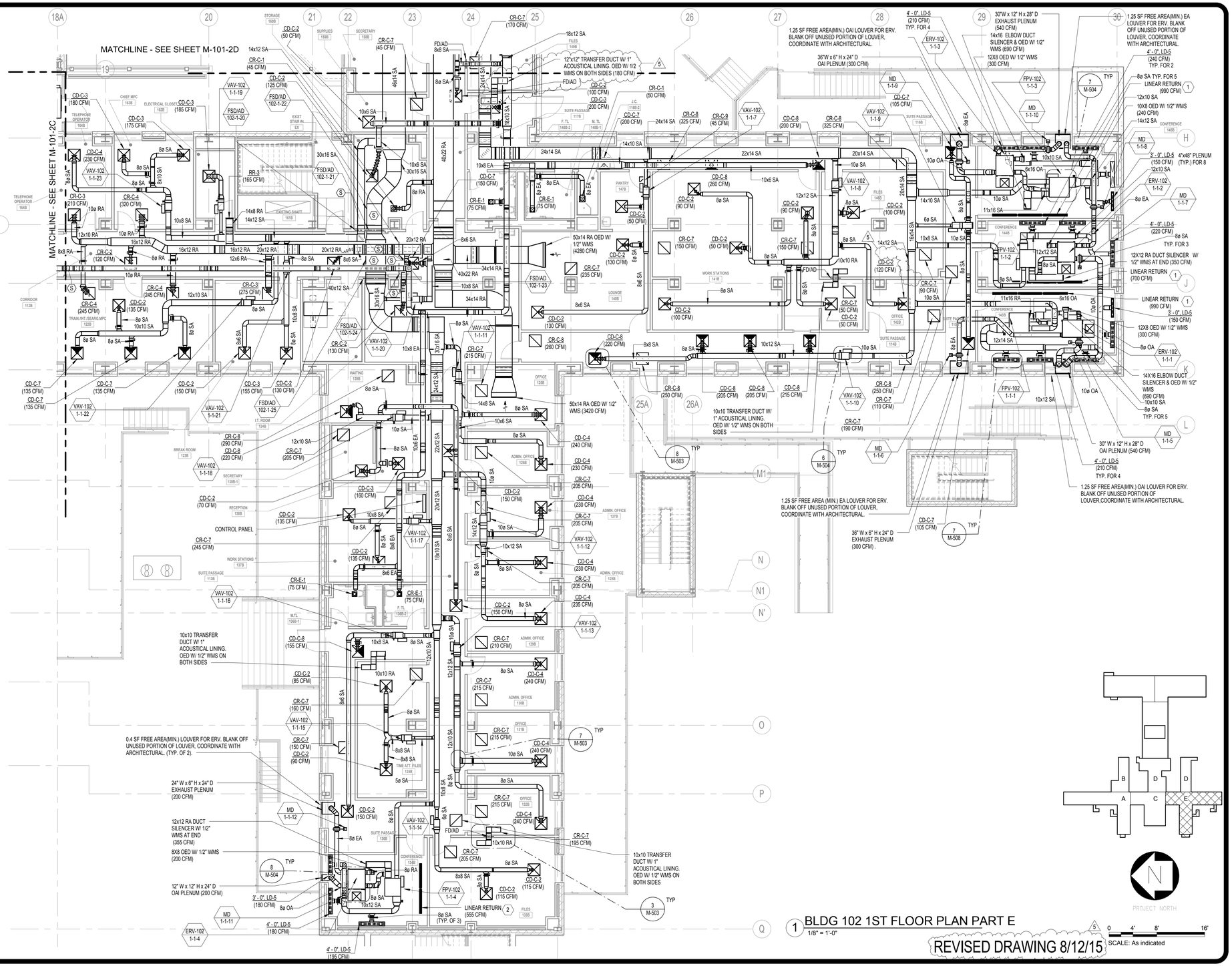
8/25/2015 10:31:25 AM

GENERAL SHEET NOTES

1. FOR LEGEND AND ABBREVIATIONS REFER TO SHEET M-001 AND M-002.
2. PLENUM SIZES FOR LINEAR DIFFUSERS VARIES & DEPENDS ON DUCTWORK LAYOUT & COORDINATION IN FIELD.
3. PROVIDE BALANCING DAMPER ON EVERY BRANCHTAKE OFF FOR EXHAUST, RETURN AND SUPPLY DUCTWORK.

KEY NOTES

1. PROVIDE 12'-0" CONTINUOUS LD-5 LINEAR RETURN, NO PLENUM TO BE INSTALLED ON LINEAR DIFFUSER.
2. PROVIDE 8'-0" CONTINUOUS LD-5 LINEAR RETURN, NO PLENUM TO BE INSTALLED ON LINEAR DIFFUSER.



1 BLDG 102 1ST FLOOR PLAN PART E
1/8" = 1'-0"

REVISED DRAWING 8/12/15

SCALE: As indicated

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

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LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	IL
DRAWN BY:	FG
FIELD CHECK:	N/A
APPROVED:	PL

SHEET TITLE: HVAC FIRST FLOOR PLAN, PART E

BUILDING NUMBER: 102

DRAWING NUMBER: M-101-2E

SHEET

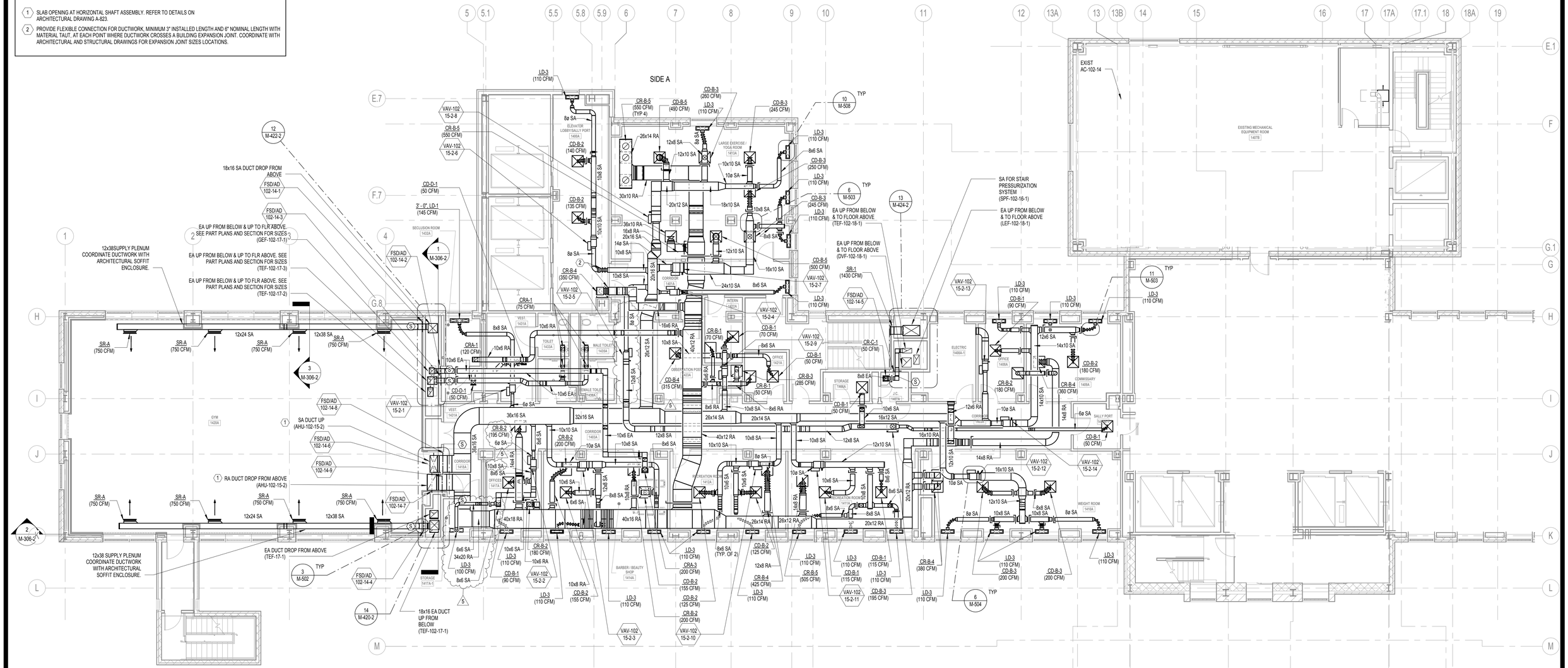
8/25/2015 10:31:33 AM

GENERAL SHEET NOTES

1. FOR LEGEND AND ABBREVIATIONS REFER TO SHEET M-001 AND M-002.
2. PLENUM SIZES FOR LINEAR DIFFUSERS VARIES & DEPENDS ON DUCTWORK LAYOUT & COORDINATION IN FIELD.
3. PROVIDE BALANCING DAMPER ON EVERY BRANCH/TAKE OFF FOR EXHAUST, RETURN AND SUPPLY DUCTWORK.

KEY NOTES

1. SLAB OPENING AT HORIZONTAL SHAFT ASSEMBLY. REFER TO DETAILS ON ARCHITECTURAL DRAWING A-823.
2. PROVIDE FLEXIBLE CONNECTION FOR DUCTWORK, MINIMUM 3" INSTALLED LENGTH AND 6" NOMINAL LENGTH WITH MATERIAL TAUT, AT EACH POINT WHERE DUCTWORK CROSSES A BUILDING EXPANSION JOINT. COORDINATE WITH ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR EXPANSION JOINT SIZES LOCATIONS.



1 BLDG 102 14TH FLOOR PLAN
1/8" = 1'-0"

REVISED DRAWING 8/12/15

SCALE: As indicated

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CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	IL
DRAWN BY:	FG
FIELD CHECK:	N/A
APPROVED:	PL

SHEET TITLE:

HVAC FOURTEENTH FLOOR PLAN

BUILDING NUMBER: 102

DRAWING NUMBER: M-114-2

SHEET

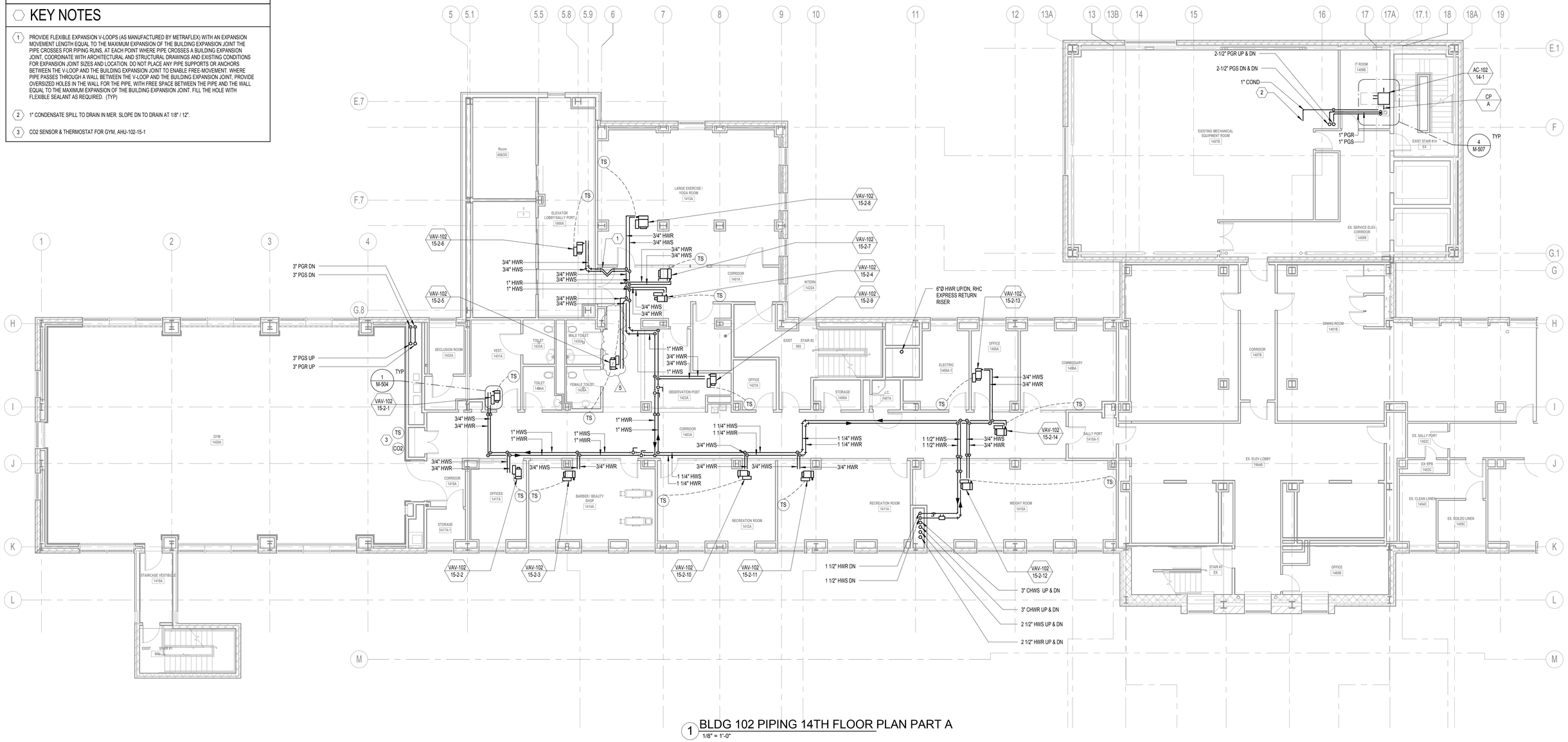
8/25/2015 10:31:40 AM

GENERAL SHEET NOTES

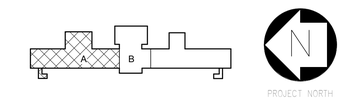
1. FOR LEGEND AND ABBREVIATIONS REFER TO SHEET M-001 AND M-002
2. FOR VALVE LOCATIONS ON 7TH-11TH FLOORS REFER TO M-206-2.
3. COIL PIPING VALVE ASSEMBLIES SHALL BE LOCATED SUCH THAT VALVE ASSEMBLIES DO NOT INTERFERE WITH THE ACCESS SPACE FOR COIL PULL.

KEY NOTES

1. PROVIDE FLEXIBLE EXPANSION V-LOOPS (AS MANUFACTURED BY METRAFLEX) WITH AN EXPANSION MOVEMENT LENGTH EQUAL TO THE MAXIMUM EXPANSION OF THE BUILDING EXPANSION JOINT THE PIPE CROSSES FOR PIPING RUNS, AT EACH POINT WHERE PIPE CROSSES A BUILDING EXPANSION JOINT. COORDINATE WITH ARCHITECTURAL AND STRUCTURAL DRAWINGS AND EXISTING CONDITIONS FOR EXPANSION JOINT SIZES AND LOCATION. DO NOT PLACE ANY PIPE SUPPORTS OR ANCHORS BETWEEN THE V-LOOP AND THE BUILDING EXPANSION JOINT TO ENABLE FREE-MOVEMENT. WHERE PIPE PASSES THROUGH A WALL BETWEEN THE V-LOOP AND THE BUILDING EXPANSION JOINT, PROVIDE OVERSIZED HOLES IN THE WALL FOR THE PIPE. WITH FREE SPACE BETWEEN THE PIPE AND THE WALL EQUAL TO THE MAXIMUM EXPANSION OF THE BUILDING EXPANSION JOINT. FILL THE HOLE WITH FLEXIBLE SEALANT AS REQUIRED. (TYP)
2. 1" CONDENSATE SPILL TO DRAIN IN MER. SLOPE DN TO DRAIN AT 1/8" / 12".
3. CO2 SENSOR & THERMOSTAT FOR GYM, AHU-102-15-1



1 BLDG 102 PIPING 14TH FLOOR PLAN PART A
1/8" = 1'-0"



REVISED DRAWING 8/12/15

5 0 4' 8' 16'
SCALE: As indicated

NEW YORK STATE OF OPPORTUNITY. Office of General Services

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CONSULTANTS:

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600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT:
NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	JN
DRAWN BY:	YD
FIELD CHECK:	N/A
APPROVED:	PL

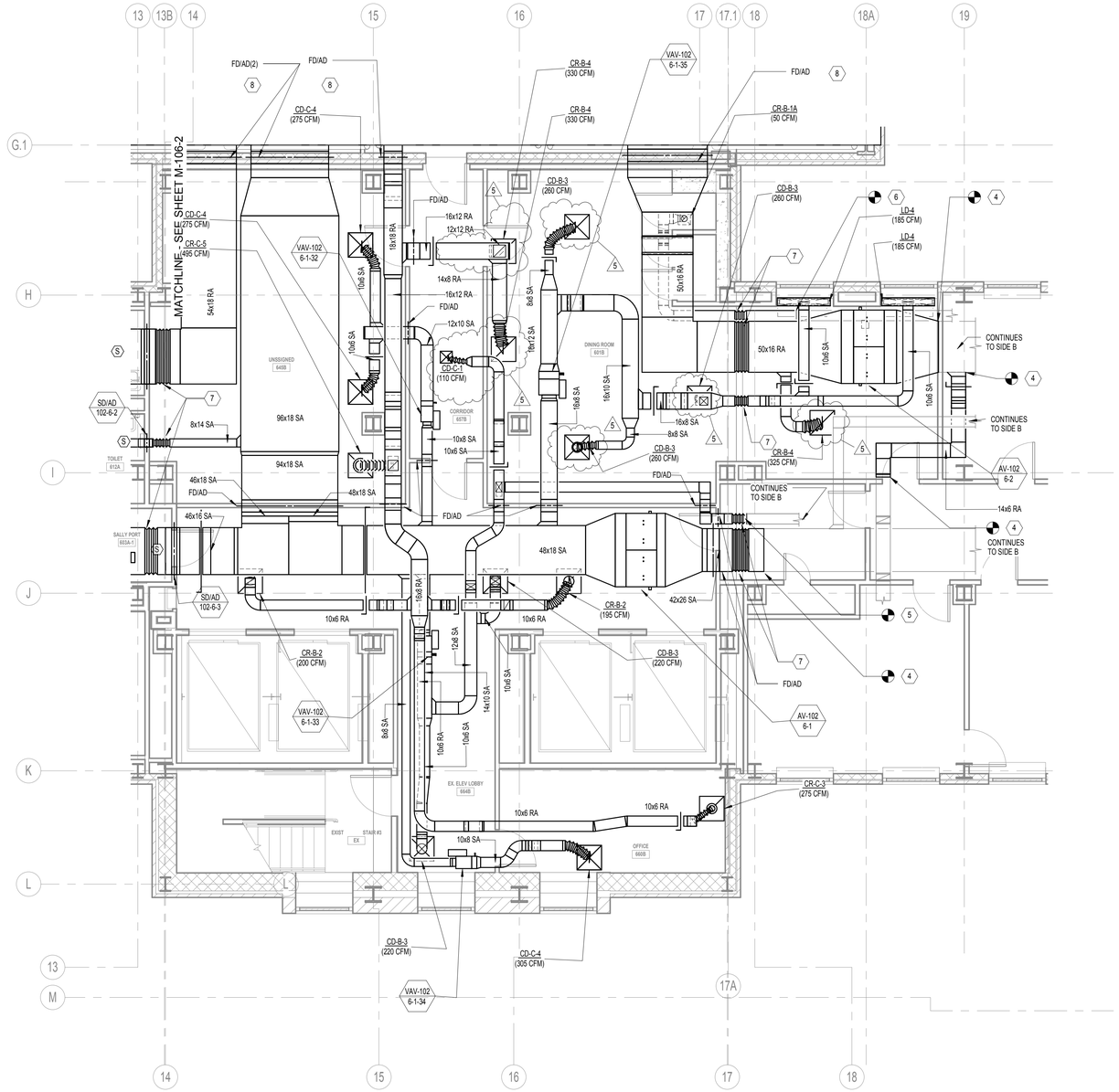
SHEET TITLE:
HVAC FOURTEENTH FLOOR PIPING PLAN

BUILDING NUMBER: 102

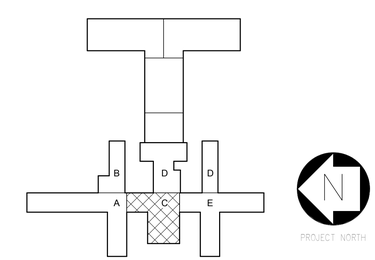
DRAWING NUMBER: M-214-2

SHEET

8/25/2015 10:31:46 AM



1 PART PLAN SIDE-B DINING ROOM TYPICAL FOURTH THROUGH ELEVENTH FLOORS
3/16" = 1'-0"



NOTE:
THIS LAYOUT APPLIES TO FLOORS 4TH THRU 11TH.

ADDENDUM DRAWING 8/12/15

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CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5

PROJECT NUMBER:	44578
DESIGNED BY:	IL
DRAWN BY:	NM
FIELD CHECK:	NA
APPROVED:	NA

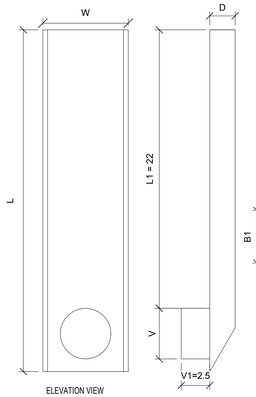
SHEET TITLE:
HVAC B-SIDE DINING ROOM REVISIONS

BUILDING NUMBER: 102

DRAWING NUMBER: M-430-2

SHEET

8/25/2015 10:31:50 AM

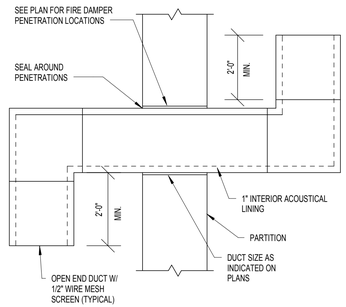


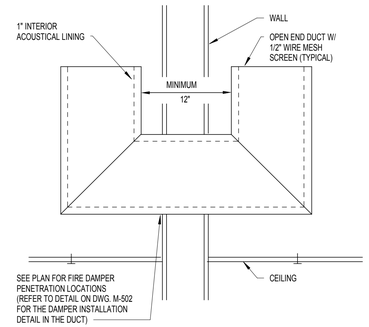
	**VENT CONNECTION (V)	OVERALL LENGTH (L)	WIDTH (W)	DEPTH (D)	MAIN RISER SIZE MINIMUM (IN)			EQUIV. LENGTH
					A1	B1	A2	
LSR10	10 IN.	33.0 IN.	15.75 IN.	6.0 IN.	20	20	34	27 FT

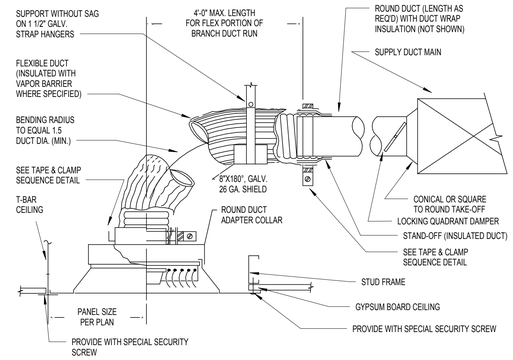
* B1- SIZE IS A FUNCTION OF THE CFM OF THE MAIN RISER
** SIZE INDICATED CORRESPONDS TO SINGLE CONNECTION WITH VARIOUS CAPACITY, VERIFY CONNECTION SIZE WITH MANUFACTURE IF MULTIPLE UNITS ARE CONNECTED TO COMMON VENT.

1. THE LOW-PROFILE SUBDUCT RISER (LSR) SHALL BE MANUFACTURED BY S.R.M MANUFACTURING.
2. THE LSR SHALL COMPLY WITH SECTION 716.5.3 OF THE 2010 INTERNATIONAL BUILDING CODE. SECTION 607.5.5 OF 2010 NYS MECHANICAL CODE AND SECTION 924.8 OF 2012 INTERNATIONAL MECHANICAL CODE.
3. THE LSR'S RISER SHALL BE 26 GAUGE GALVANIZED STEEL. THE LSR'S COLLAR SHALL BE 30 GAUGE GALVANIZED STEEL OR BETTER.
4. THE LSR SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND ANY PERTINENT LOCAL, STATE, AND/OR NATIONAL CODES.
5. FOR CLOTHES DRYER: LOCATE MAIN DUCT RISER AS CLOSE AS POSSIBLE TO CLOTHES DRYER (CLOTHES DRYER TRANSITION DUCTS USED TO CONNECT THE DRYER TO EXHAUST DUCT SYSTEM SHALL BE LIMITED TO A SINGLE LENGTH NOT TO EXCEED 8 FT. IN LENGTH

SUBDUCT RISER DETAIL

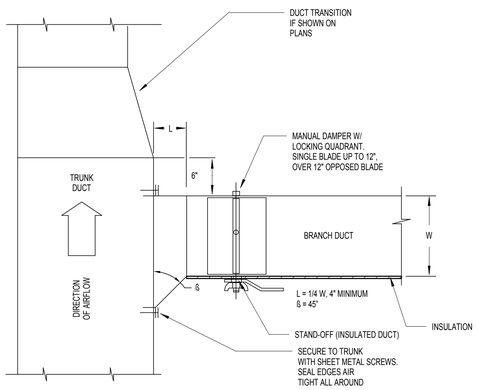






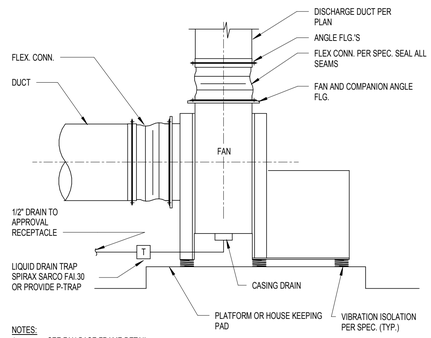
NOTE:
PROVIDE TWO STAINLESS STEEL BANDS. ONE FOR INNER DUCT AND ONE FOR OUTER DUCT.

10 DRYER VENT SUBDUCT EXHAUST CONNECTION TAP
NTS



6 BRANCH DUCT TAKE-OFF (SQUARE)
NTS

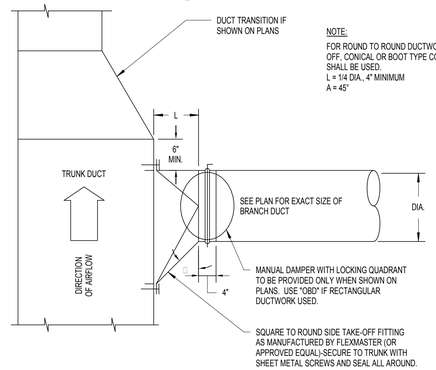
3 TRANSFER DUCT -2
NTS



NOTES:
1. SEE FAN BASE FRAME DETAIL
2. SEE PLANS FOR CORRECT ARRANGEMENT/CASING DRAIN PIPING.

4 EXHAUST FAN MOUNTING DETAIL
NTS

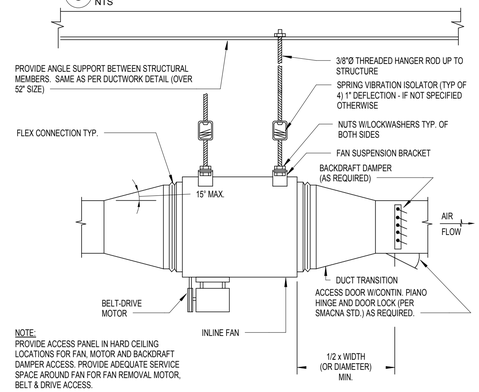
2 TRANSFER DUCT -1
NTS



NOTE:
FOR ROUND TO ROUND DUCTWORK TAKE-OFF, CONICAL OR BOOT TYPE CONNECTION SHALL BE USED.
L = 1/4 DIA., 4" MINIMUM
A = 45°

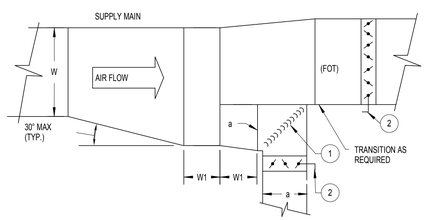
7 DUCT BRANCH TAKE-OFF (ROUND)
NTS

8 CEILING DIFFUSER INSTALLATION
NTS



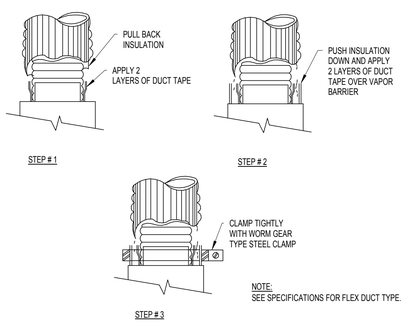
NOTE:
PROVIDE ACCESS PANEL IN HARD CEILING LOCATIONS FOR FAN, MOTOR AND BACKDRAFT DAMPER ACCESS. PROVIDE ADEQUATE SERVICE SPACE AROUND FAN FOR FAN REMOVAL MOTOR, BELT & DRIVE ACCESS.

12 INLINE FAN DETAIL



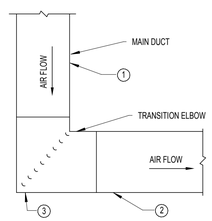
1. ADJUSTABLE RAIL TURNING VANES.
2. OBD ON EACH BRANCH FOR BALANCING WHERE SHOWN ON PLANS. DAMPER BLADES SHALL BE PERPENDICULAR TO TURNING VANES.

9 SPLIT ELBOW SUPPLY MAIN BRANCH
NTS



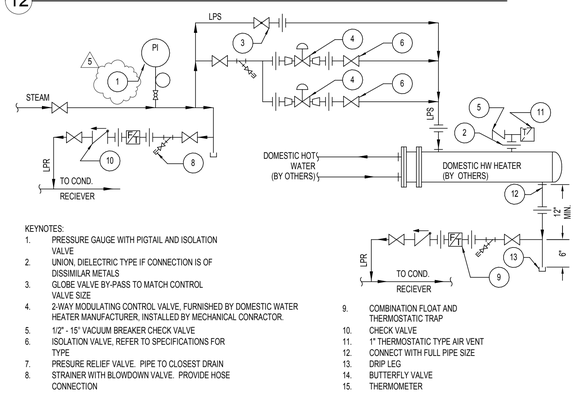
NOTE:
SEE SPECIFICATIONS FOR FLEX DUCT TYPE.

11 FLEX DUCT TAPE AND CLAMP INSTALLATION DETAIL
NTS



1. INLET DUCT SIZE PER PLAN.
2. OUTLET DUCT SIZE PER PLAN.
3. WHEN OUTLET DOES NOT EQUAL INLET OF ELBOW, PROVISIONS SHALL BE MADE TO ADJUST VANE RADIUS AND ANGLE OF ENTRY AND EXIT TO SUIT ELBOW CONSTRUCTION. QUANTITY OF VANES SHALL BE REDUCED AS NECESSARY TO ACHIEVE 3 1/4" VANE SPACING. REFER TO SMACNA FIGURES 2-3 AND 2-4 FOR ADDITIONAL INFORMATION.

5 RECTANGULAR ELBOW WITH UNEQUAL INLET AND OUTLET DETAIL
NTS



KEYNOTES:
1. PRESSURE GAUGE WITH PIGTAIL AND ISOLATION VALVE
2. UNION, DIELECTRIC TYPE IF CONNECTION IS OF DISSIMILAR METALS
3. GLOBE VALVE BY-PASS TO MATCH CONTROL VALVE SIZE
4. 2-WAY MODULATING CONTROL VALVE, FURNISHED BY DOMESTIC WATER HEATER MANUFACTURER, INSTALLED BY MECHANICAL CONRACTOR.
5. 1/2" - 15° VACUUM BREAKER CHECK VALVE
6. ISOLATION VALVE, REFER TO SPECIFICATIONS FOR TYPE
7. PRESURE RELIEF VALVE. PIPE TO CLOSEST DRAIN
8. STRAINER WITH BLOWDOWN VALVE. PROVIDE HOSE CONNECTION
9. COMBINATION FLOAT AND THERMOSTATIC TRAP
10. CHECK VALVE
11. 1" THERMOSTATIC TYPE AIR VENT
12. CONNECT WITH FULL PIPE SIZE
13. DRIP LEG
14. BUTTERFLY VALVE
15. THERMOMETER

1 DOMESTIC HW HEATER STEAM & CONDENSATE PIPING DETAIL

5 REVISED DRAWING 8/12/15

NEW YORK STATE OF OPPORTUNITY. Office of General Services

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CONTRACT: CONSTRUCTION

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	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	IL
DRAWN BY:	YD
FIELD CHECK:	N/A
APPROVED:	PL

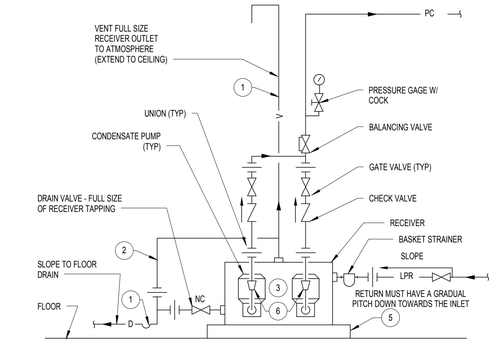
SHEET TITLE: HVAC DETAILS-3

BUILDING NUMBER: 102

DRAWING NUMBER: M-503

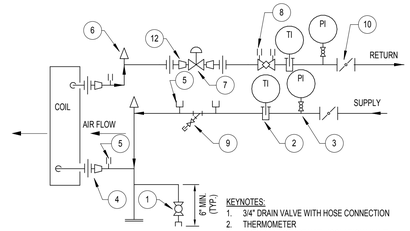
SHEET

8/25/2015 10:31:54 AM



KEY NOTES:
1. PRIME P-TRAP EVERY 3 WEEKS AS REQUIRED TO PREVENT FLASHING STEAM ESCAPING INTO THE ROOM.
2. PROVIDE A VENT HEAD AND DRAIN INTO OPEN SIGHT DRAIN.
3. PROVIDE SIGHT GLASS MOUNTED ON THE TANK.
4. PROVIDE REDUCER AT EACH PUMP DISCHARGE WHERE REDUCED. ALL VALVES SHALL BE LINE SIZE,
5. INSTALL ON 4" HIGH HOUSEKEEPING PAD.
6. PROVIDE REDUCER AT EACH PUMP DISCHARGE WHERE REDUCED. ALL VALVES SHALL BE LINE SIZE,

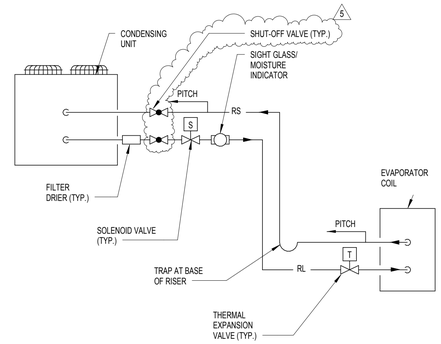
1 CONDENSATE RETURN UNIT PIPING DIAGRAM
NTS



GENERAL NOTES:
A. LOCATE PIPE UNIONS AND ARRANGE PIPING TO FACILITATE COIL REMOVAL
B. UNIONS (OR FLANGED BODY) REQUIRED TO PERMIT REMOVAL OF CONTROL VALVES
C. PROVIDE SIMILAR PIPING ARRANGEMENTS ON EACH SIDE FOR TWO SECTION WIDE COIL ASSEMBLY.
D. SUPPLY WATER SHALL BE CONNECTED TO AIR LEAVING SIDE OF COIL

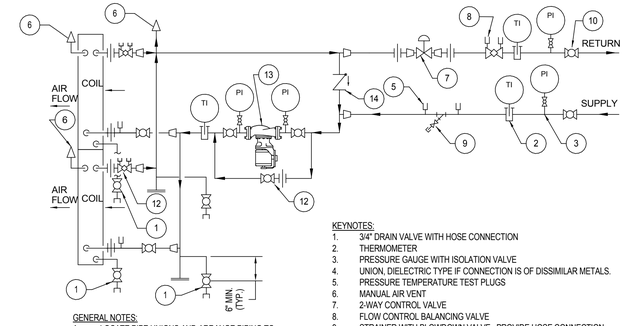
KEYNOTES:
1. 3/4" DRAIN VALVE WITH HOSE CONNECTION
2. THERMOMETER
3. PRESSURE GAUGE WITH ISOLATION VALVE
4. UNION, DIELECTRIC TYPE IF CONNECTION IS OF DISSIMILAR METALS.
5. PRESSURE TEMPERATURE TEST PLUGS
6. AUTOMATIC AIR VENT
7. 2-WAY CONTROL VALVE
8. FLOW CONTROL BALANCING VALVE
9. STRAINER WITH BLOWDOWN VALVE. PROVIDE HOSE CONNECTION
10. BUTTERFLY OR BALL VALVE IF PIPE SIZE IS LESS THAN 3"
11. NOT USED
12. REDUCER

2 AHU COOLING COIL PIPING WITH 2-WAY CONTROL VALVE
NTS



NOTE:
ACCESSORIES & PIPE SIZING SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS AND REQUIREMENTS.

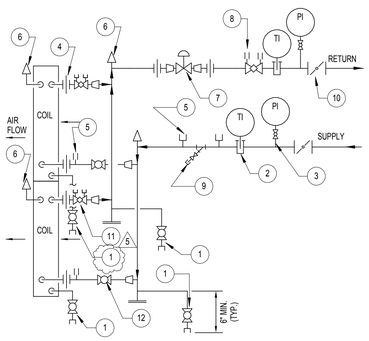
7 REFRIGERANT PIPING DIAGRAM (ACC/ACS)
NTS



GENERAL NOTES:
A. LOCATE PIPE UNIONS AND ARRANGE PIPING TO FACILITATE COIL REMOVAL
B. UNIONS (OR FLANGED BODY) REQUIRED TO PERMIT REMOVAL OF CONTROL VALVES
C. PROVIDE SIMILAR PIPING ARRANGEMENTS ON EACH SIDE FOR TWO SECTION WIDE COIL ASSEMBLY.
D. SUPPY WATER SHALL BE CONNECTED TO AIR LEAVING SIDE OF COIL
E. RUNOUTS SHALL BE SAME SIZE AS COIL CONNECTIONS

KEYNOTES:
1. 3/4" DRAIN VALVE WITH HOSE CONNECTION
2. THERMOMETER
3. PRESSURE GAUGE WITH ISOLATION VALVE
4. UNION, DIELECTRIC TYPE IF CONNECTION IS OF DISSIMILAR METALS.
5. PRESSURE TEMPERATURE TEST PLUGS
6. MANUAL AIR VENT
7. 2-WAY CONTROL VALVE
8. FLOW CONTROL BALANCING VALVE
9. STRAINER WITH BLOWDOWN VALVE. PROVIDE HOSE CONNECTION
10. BUTTERFLY OR BALL VALVE IF PIPE SIZE IS LESS THAN 3"
11. NOT IN USE
12. FULL SIZE BY-PASS AROUND COIL CIRCULATION PUMP
13. IN-LINE COIL CIRCULATION PUMP
14. CHECK VALVE
15. COIL COMBINATION FLOW BALANCING AND SHUT-OFF VALVE

3 STACKED AHU PREHEAT COIL WITH RECIRCULCATION PUMP 2-WAY CONTROL VALVE PIPING



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6. MANUAL AIR VENT
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8. FLOW CONTROL BALANCING VALVE
9. STRAINER WITH BLOWDOWN VALVE. PROVIDE HOSE CONNECTION
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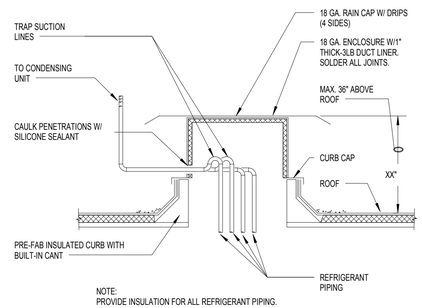
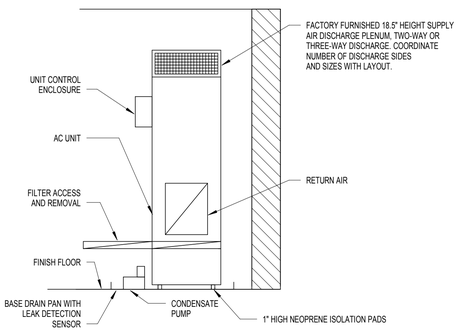
11. NOT IN USE
12. FULL SIZE BY-PASS AROUND COIL CIRCULATION PUMP
13. IN-LINE COIL CIRCULATION PUMP
14. CHECK VALVE

5 AHU CHILLED WATER STACK COIL PIPING WITH 2-WAY CONTROL VALVE



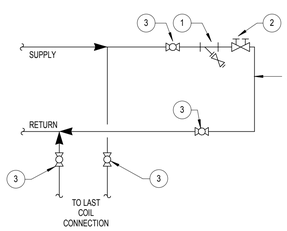
NOTE:
PROVIDE INSULATION FOR ALL REFRIGERANT PIPING.

6 REFRIGERANT PIPING THRU ROOF
NTS



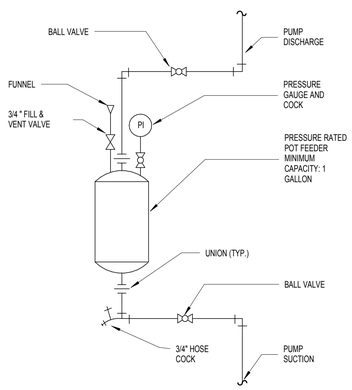
NOTES:
FOR PIPING REFER TO SELF-CONTAINED GLYCOL-COOLED INDOOR AC UNIT PIPING DETAIL

9 VERTICAL MOUNTED AC UNIT

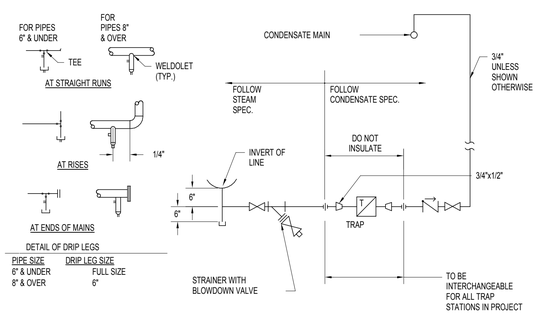


NOTES:
1. STRAINER WITH BLOWDOWN VALVE
2. AUTOFLOW CONTROL VALVE, MANUFACTURED BY GRISWOLD. 2-32 PSI SET AT 3 GPM CALIBRATED ORIFICE TYPE BALANCING VALVE SIMILAR TO MANUFACTURED BY ARMSTRONG CVB.
3. BALL ISOLATION VALVE

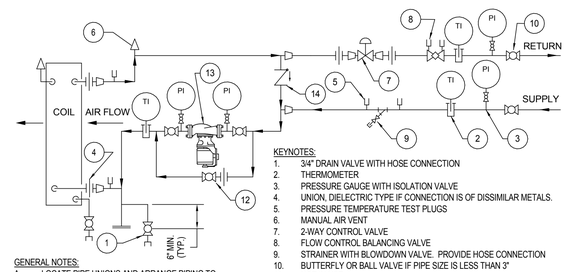
8 END OF LOOP - BYPASS
NTS



4 CHEMICAL SHOT FEEDER
NTS



10 STEAM DRIP LEG ASSEMBLY
12" = 1'-0"



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13. IN-LINE COIL CIRCULATION PUMP
14. CHECK VALVE

11 PREHEAT COIL WITH RECIRCULATION PUMP WITH 2-WAY CONTROL VALVE
12" = 1'-0"

REVISED DRAWING 8/12/15 (5)

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:
RBSD ARCHITECTS P.C. | STV 100 Years
A Joint Venture
225 Park Avenue South
New York, New York 10003

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

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	IL
DRAWN BY:	YD
FIELD CHECK:	N/A
APPROVED:	PL

SHEET TITLE: HVAC DETAILS-5

BUILDING NUMBER: 102

DRAWING NUMBER: M-505

SHEET

8/25/2015 10:31:59 AM

VARIABLE AIR VOLUME BOX SCHEDULE BUILDING 102 - 7

UNIT TAG	FLOOR NO.	VAV LOCATION	ROOM(S) SERVED	ASSOCIATED AIR HANDLER	PRIMARY AIR			ASSEMBLY PRESSURE DROP (IN. W.G.)	HEATING WATER COIL									SOUND DATA (dB)			MFR	MODEL No.	REMARKS
					MIN. INLET SIZE (IN)	MAX CFM	MIN CFM		HEATING CFM	No. OF ROWS	HEATING CAPACITY (Btu/hr)	EAT (°F)	LAT (°F)	GPM	EWT (°F)	LWT (°F)	WATER PRESSURE DROP (FT. W.G.)	RADIATED SOUND POWER	DISCHARGE SOUND POWER	ROOM SOUND POWER			
VAV-102-12-1-1	TWELFTH	1200A	1200A	AHU-102-12-1	8	420	150	0.15	320	1	12,620	55	91.5	1.3	180	160	1.71	20	32	32	ANEMOSTAT	EZTS	
VAV-102-12-1-2A	TWELFTH	1201A	1201A, 1202A, 1206A, 1218A	AHU-102-12-1	10	585	585	0.17	585	1	14,974	55	78.7	1.5	180	160	4.97	20	33	33	ANEMOSTAT	EZTS	
VAV-102-12-1-2B	TWELFTH	1203A	1203A, 1223A	AHU-102-12-1	6	290	290	0.14	290	1	9,512	55	85.4	1.0	180	160	0.90	20	31	31	ANEMOSTAT	EZTS	
VAV-102-12-1-3	TWELFTH	1204A	1204A	AHU-102-12-1	10	570	235	0.17	460	1	15,445	55	86.1	1.6	180	160	4.97	20	33	33	ANEMOSTAT	EZTS	
VAV-102-12-1-4	TWELFTH	1205A	1205A	AHU-102-12-1	10	730	235	0.17	585	1	16,116	55	80.5	1.6	180	160	4.97	20	33	33	ANEMOSTAT	EZTS	
VAV-102-12-1-5	TWELFTH	1209A	1209A	AHU-102-12-1	8	350	150	0.15	250	1	6,122	55	77.7	0.6	180	160	1.71	20	32	32	ANEMOSTAT	EZTS	
VAV-102-12-1-8	TWELFTH	1212A	1212A	AHU-102-12-1	6	205	85	0.14	165	1	5,638	55	86.7	0.6	180	160	0.90	20	31	31	ANEMOSTAT	EZTS	
VAV-102-12-1-10	TWELFTH	1214A	1214A,1215A,1217A	AHU-102-12-1	8	540	160	0.15	265	1	10,458	55	91.6	1.0	180	160	1.71	20	32	32	ANEMOSTAT	EZTS	
VAV-102-12-1-11	TWELFTH	1216A	1216A	AHU-102-12-1	5	160	50	0.15	160	1	6,307	55	91.5	0.6	180	160	0.47	20	25	25	ANEMOSTAT	EZTS	
VAV-102-12-1-12	TWELFTH	1217A	1219A, 1220A, 1221A, 1222A	AHU-102-12-1	12	960	315	0.15	530	1	20,976	55	91.7	2.1	180	160	0.63	20	33	33	ANEMOSTAT	EZTS	
VAV-102-12-1-13	TWELFTH	1231A	1231A, 1232A	AHU-102-12-1	6	225	85	0.14	225	1	6,035	55	79.9	0.6	180	160	0.90	20	31	31	ANEMOSTAT	EZTS	
VAV-102-13-1-1	THIRTEENTH	1300A	1300A	AHU-102-13-1	8	420	150	0.15	320	1	12,608	55	91.5	1.3	180	160	1.71	20	32	32	ANEMOSTAT	EZTS	
VAV-102-13-1-2	THIRTEENTH	1301A	1301A, 1302A, 1306A	AHU-102-13-1	8	370	275	0.15	370	1	10,313	55	80.8	1.0	180	160	1.71	20	32	32	ANEMOSTAT	EZTS	
VAV-102-13-1-3	THIRTEENTH	1304A	1304A	AHU-102-13-1	10	770	235	0.17	620	1	18,422	55	82.5	1.8	180	160	4.97	20	33	33	ANEMOSTAT	EZTS	
VAV-102-13-1-4	THIRTEENTH	1305A	1305A	AHU-102-13-1	10	730	235	0.17	585	1	16,070	55	80.5	1.6	180	160	4.97	20	33	33	ANEMOSTAT	EZTS	
VAV-102-13-1-5	THIRTEENTH	1309A	1309A	AHU-102-13-1	8	365	150	0.15	150	1	4,289	55	81.5	0.4	180	160	1.71	20	32	32	ANEMOSTAT	EZTS	
VAV-102-13-1-6	THIRTEENTH	1310A	1310A	AHU-102-13-1	10	585	235	0.17	470	1	14,528	55	83.6	1.5	180	160	4.97	20	33	33	ANEMOSTAT	EZTS	
VAV-102-13-1-7	THIRTEENTH	1311A	1311A	AHU-102-13-1	10	645	235	0.17	520	1	14,131	55	80.2	1.4	180	160	4.97	20	33	33	ANEMOSTAT	EZTS	
VAV-102-13-1-8	THIRTEENTH	1312A	1312A, 1313A, 1314A, 1315A	AHU-102-13-1	10	720	235	0.17	580	1	18,573	55	84.7	1.9	180	160	4.97	20	33	33	ANEMOSTAT	EZTS	
VAV-102-13-1-9	THIRTEENTH	1317A	1317A, 1319A	AHU-102-13-1	8	320	150	0.15	260	1	8,523	55	85.4	0.9	180	160	1.71	20	32	32	ANEMOSTAT	EZTS	
VAV-102-13-1-10	THIRTEENTH	1321A	1321A, 1322A	AHU-102-13-1	8	360	150	0.15	290	1	9,622	55	85.7	1.0	180	160	1.71	20	32	32	ANEMOSTAT	EZTS	
VAV-102-13-1-11	THIRTEENTH	1324A	1318A	AHU-102-13-1	5	115	50	0.15	90	1	3,397	55	90.0	0.3	180	160	0.47	20	25	25	ANEMOSTAT	EZTS	
VAV-102-13-1-12	THIRTEENTH	1325A	1320A	AHU-102-13-1	8	515	155	0.15	415	1	12,069	55	82.0	1.2	180	160	1.71	20	32	32	ANEMOSTAT	EZTS	
VAV-102-13-1-13	THIRTEENTH	1326A	1324A	AHU-102-13-1	10	740	235	0.17	590	1	18,010	55	83.3	1.8	180	160	4.97	20	33	33	ANEMOSTAT	EZTS	
VAV-102-13-1-14	THIRTEENTH	1328A	1325A	AHU-102-13-1	10	660	235	0.17	530	1	17,651	55	85.9	1.8	180	160	4.97	20	33	33	ANEMOSTAT	EZTS	
VAV-102-13-1-15	THIRTEENTH	1329A	1326A	AHU-102-13-1	10	740	235	0.17	590	1	18,604	55	84.2	1.9	180	160	4.97	20	33	33	ANEMOSTAT	EZTS	
VAV-102-13-1-16	THIRTEENTH	1330A	1325A	AHU-102-13-1	8	350	150	0.15	280	1	8,606	55	83.5	0.9	180	160	1.71	20	32	32	ANEMOSTAT	EZTS	
VAV-102-13-1-17	THIRTEENTH	1331A	1327A	AHU-102-13-1	10	760	235	0.17	610	1	18,305	55	82.8	1.8	180	160	4.97	20	33	33	ANEMOSTAT	EZTS	
VAV-102-13-1-18	THIRTEENTH	1331A	1328A	AHU-102-13-1	5	100	50	0.15	80	1	2,354	55	82.3	0.2	180	160	0.47	20	25	25	ANEMOSTAT	EZTS	
VAV-102-13-1-19	THIRTEENTH	1334A	1332A,1331A	AHU-102-13-1	6	200	85	0.14	200	1	6,360	55	84.5	0.6	180	160	0.90	20	31	31	ANEMOSTAT	EZTS	
VAV-102-13-1-20	THIRTEENTH	1303A	1303A&1323A	AHU-102-13-1	8	420	155	0.15	420	1	11,374	55	80.1	1.1	180	160	1.71	20	32	32	ANEMOSTAT	EZTS	
VAV-102-15-2-1	FOURTEENTH	1423A	1430A, 1431A, 1432A	AHU-102-15-2	8	245	185	0.14	185	1	5,710	55	83.6	0.6	180	160	0.90	20	31	31	ANEMOSTAT	EZTS	
VAV-102-15-2-2	FOURTEENTH	1417A	1417A	AHU-102-15-2	6	300	120	0.14	150	1	5,874	55	91.3	0.6	180	160	0.90	20	31	31	ANEMOSTAT	EZTS	
VAV-102-15-2-3	FOURTEENTH	1414A	1414A	AHU-102-15-2	10	640	260	0.17	530	1	15,338	55	81.8	1.5	180	160	4.97	20	33	33	ANEMOSTAT	EZTS	
VAV-102-15-2-4	FOURTEENTH	1401A	1401A	AHU-102-15-2	5	110	110	0.15	110	1	3,939	55	88.2	0.4	180	160	0.47	20	25	25	ANEMOSTAT	EZT	
VAV-102-15-2-5	FOURTEENTH	1401A	1401A, 1403A, 1406A, 1410A-1	AHU-102-15-2	8	425	245	0.15	305	1	11,826	55	90.9	1.2	180	160	1.71	20	32	32	ANEMOSTAT	EZTS	
VAV-102-15-2-6	FOURTEENTH	1400A	1400A	AHU-102-15-2	8	385	155	0.15	300	1	9,666	55	84.9	1.0	180	160	1.71	20	32	32	ANEMOSTAT	EZTS	
VAV-102-15-2-7	FOURTEENTH	1401A	1413A	AHU-102-15-2	14	1,215	490	0.13	430	1	12,358	55	81.6	1.2	180	160	1.63	20	34	34	ANEMOSTAT	EZTS	
VAV-102-15-2-8	FOURTEENTH	1413A	1413A	AHU-102-15-2	14	1,215	490	0.13	430	1	12,483	55	81.9	1.3	180	160	1.63	20	34	34	ANEMOSTAT	EZTS	
VAV-102-15-2-9	FOURTEENTH	1423A	1421A,1422A,1423A	AHU-102-15-2	8	435	175	0.15	165	1	4,500	55	80.3	0.5	180	160	1.71	20	32	32	ANEMOSTAT	EZTS	
VAV-102-15-2-10	FOURTEENTH	1412A	1412A	AHU-102-15-2	8	470	190	0.15	375	1	11,188	55	82.7	1.1	180	160	1.71	20	32	32	ANEMOSTAT	EZTS	
VAV-102-15-2-11	FOURTEENTH	1411A	1411A	AHU-102-15-2	10	560	235	0.17	450	1	14,056	55	83.9	1.4	180	160	4.97	20	33	33	ANEMOSTAT	EZTS	
VAV-102-15-2-12	FOURTEENTH	1404A	1410A	AHU-102-15-2	10	840	340	0.17	520	1	17,649	55	86.5	1.8	180	160	4.97	20	33	33	ANEMOSTAT	EZTS	
VAV-102-15-2-13	FOURTEENTH	1408A	1408A-1	AHU-102-15-2	8	350	150	0.15	150	1	3,781	55	78.4	0.4	180	160	1.71	20	32	32	ANEMOSTAT	EZTS	
VAV-102-15-2-14	FOURTEENTH	1403A	1409A, 1408A	AHU-102-15-2	10	600	240	0.17	520	1	15,667	55	82.9	1.6	180	160	4.97	20	33	33	ANEMOSTAT	EZTS	
VAV-102-15-2-15	FIFTEENTH	1501A	1501A	AHU-102-15-2	8	400	150	0.15	0	1		55	82.9	1.6	180	160	1.71	20	32	32	ANEMOSTAT	EZTS	VAV ONLY, NO REHEAT COIL.

NOTES:

1. SELECTION BASED ON 0.5" INLET PRESSURE.
2. CONTROLS MOUNTED ON BOX. CONTROLLERS FURNISHED BY CONTROLS CONTRACTOR AND SHIPPED TO VAV BOX FACTORY FOR ASSEMBLY.
3. 120v TO 24v TRANSFORMERS ARE PROVIDED WITHIN BMS PANELS TO SERVE GROUP OF VAV BOXES. 120 VOLTS TO THE PANELS SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR, 24 VOLTS BY BMS CONTRACTOR.
4. LOCATE CONTROL BOX AND RHC CONNECTIONS ON THE SAME SIDE.BASIS OF DESIGN IS ANEMOSTAT. NUMBER OF ROWS DEPENDS ON MANUFACTURER SELECTED.
5. PROVIDE DISCONNECT TOGGLE SWITCH.

REVISED DRAWING 8/12/15

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

A Joint Venture

225 Park Avenue South
New York, New York 10003

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	IL
DRAWN BY:	YD
FIELD CHECK:	N/A
APPROVED:	PL

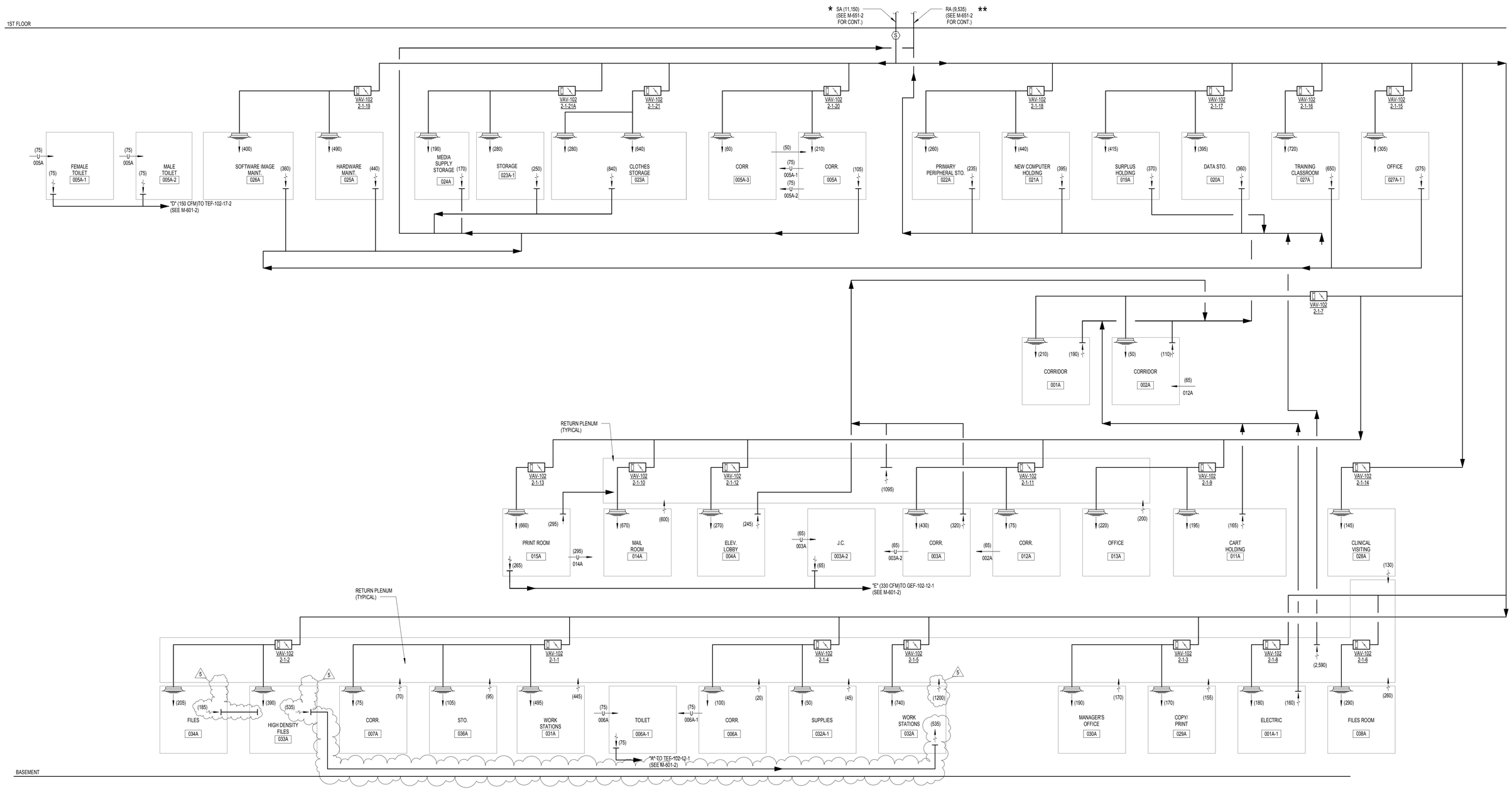
SHEET TITLE: HVAC SCHEDULES

BUILDING NUMBER: 102

DRAWING NUMBER: M-641-2

SHEET

8/25/2015 10:32:05 AM



AHU-102-2-1 AIRFLOW DIAGRAMS-SHEET 2

REFERENCE DWG#: M-100-2A, 2B & 2C

NOTE: *SUPPLY CFM INDICATED IS SUM OF MAXIMUM VAV's CFM.
**RETURN CFM INDICATED BASED ON SUPPLY CFM INDICATED.

REVISED DRAWING 8/12/15

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

A Joint Venture

225 Park Avenue South
New York, New York 10003

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CONTRACT:
CONSTRUCTION

TITLE:
MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT:
NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	IL
DRAWN BY:	GI
FIELD CHECK:	N/A
APPROVED:	PL

SHEET TITLE:
HVAC AIR FLOW DIAGRAM

BUILDING NUMBER: 102

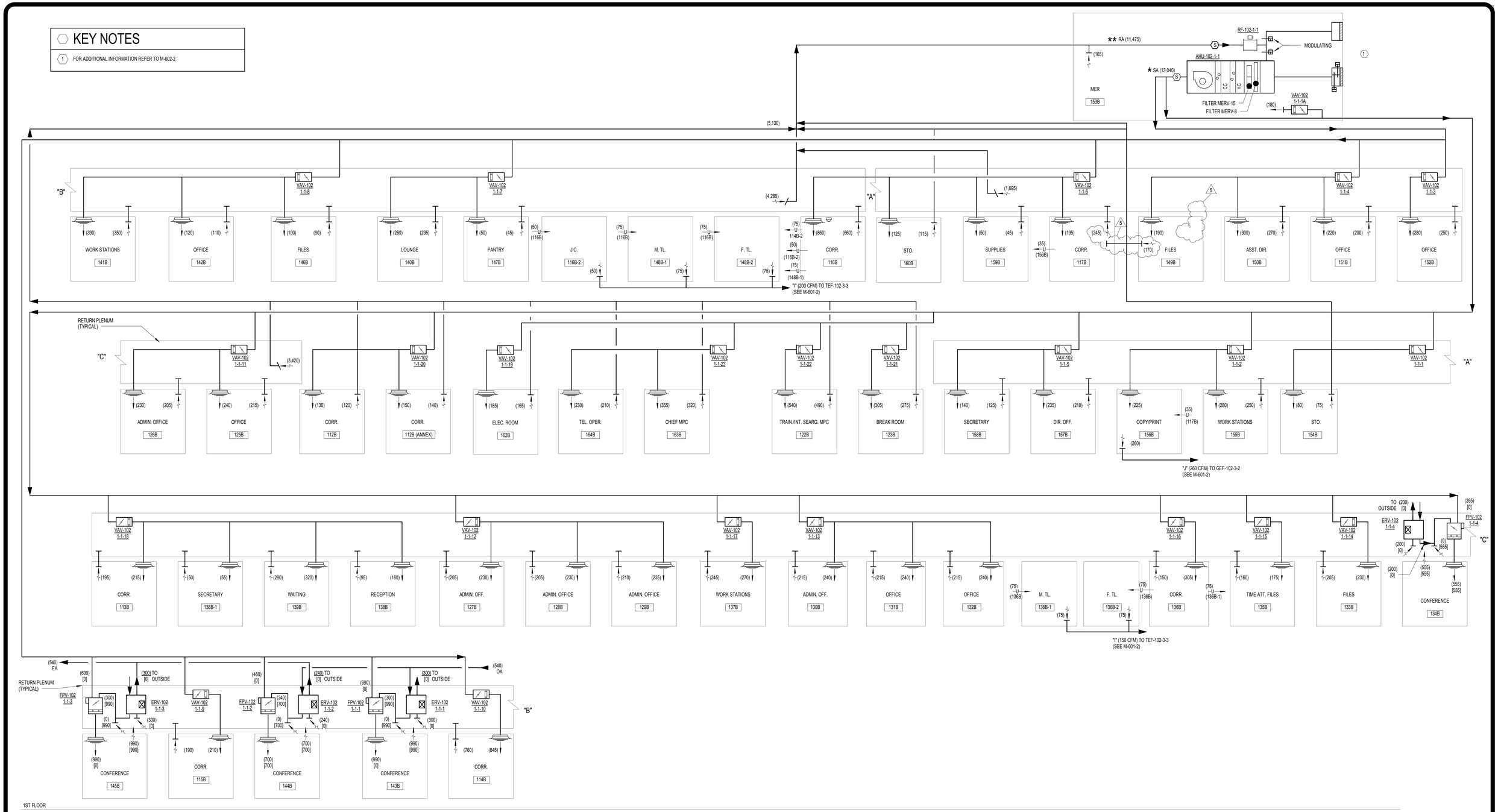
DRAWING NUMBER: M-652-2

SHEET

8/25/2015 10:32:08 AM

KEY NOTES

1. FOR ADDITIONAL INFORMATION REFER TO M-602-2



AHU-102 -1-1 AIRFLOW DIAGRAM

REFERENCE DWG#: M-101-2D & 2E

NOTE: . SUPPLY CFM INDICATED IS SUM OF MAXIMUM VAV's CFM.
** RETURN CFM INDICATED BASED ON SUPPLY CFM INDICATED.

REVISED DRAWING 8/12/15 (5)

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	IL
DRAWN BY:	GI
FIELD CHECK:	N/A
APPROVED:	PL

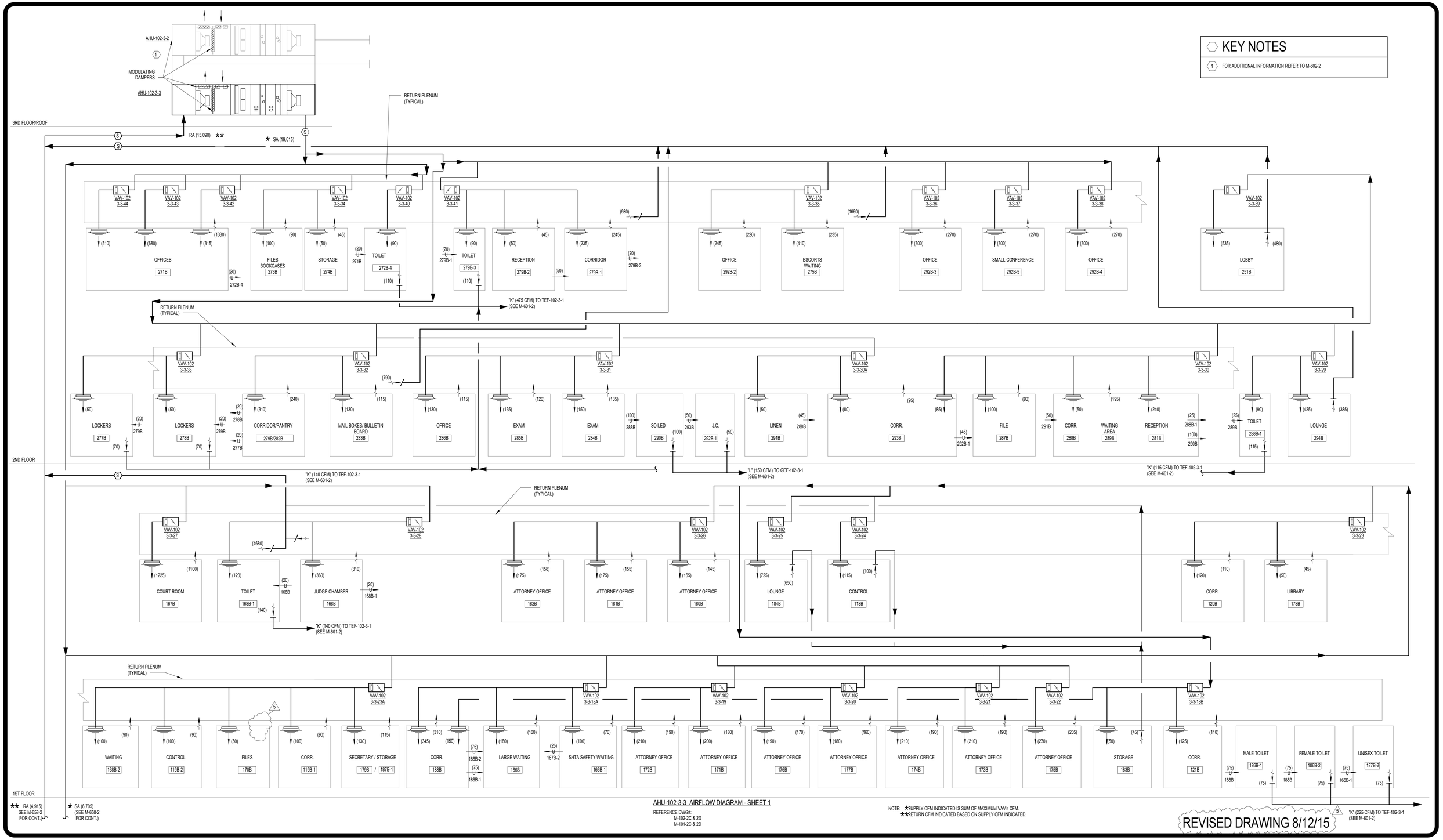
SHEET TITLE: HVAC AIR FLOW DIAGRAM

BUILDING NUMBER: 102

DRAWING NUMBER: M-656-2

SHEET

8/25/2015 10:32:11 AM



AHU-102-3-3 AIRFLOW DIAGRAM - SHEET 1

REFERENCE DWG#:
M-102-2C & 2D
M-101-2C & 2D

NOTE: *SUPPLY CFM INDICATED IS SUM OF MAXIMUM VAV's CFM.
**RETURN CFM INDICATED BASED ON SUPPLY CFM INDICATED.

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	IL
DRAWN BY:	GI
FIELD CHECK:	N/A
APPROVED:	PL

SHEET TITLE:

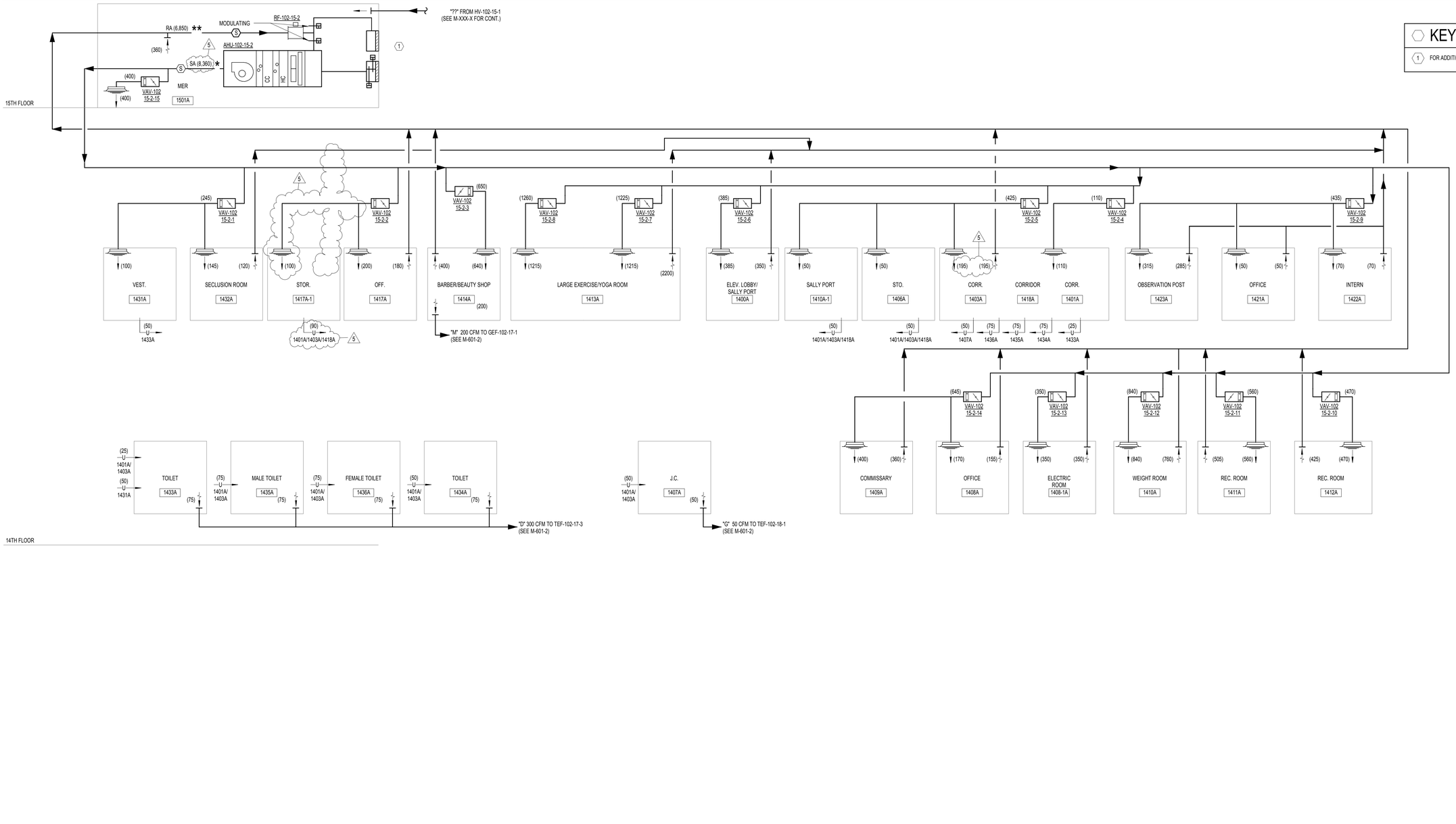
HVAC AIR FLOW DIAGRAM

BUILDING NUMBER: 102

DRAWING NUMBER: M-657-2

SHEET

8/25/2015 10:32:14 AM



KEY NOTES

1. FOR ADDITIONAL INFORMATION REFER TO M-602-2

AHU-102-15-2 AIR FLOW DIAGRAM

REFERENCE DWG#:
M-114-2
M-115-2

NOTE: *SUPPLY CFM INDICATED IS SUM OF MAXIMUM VAV's CFM.
** RETURN CFM INDICATED BASED ON SUPPLY CFM INDICATED.

REVISED DRAWING 8/12/15 (5)

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	IL
DRAWN BY:	GI
FIELD CHECK:	N/A
APPROVED:	PL

SHEET TITLE: HVAC AIR FLOW DIAGRAM

BUILDING NUMBER: 102

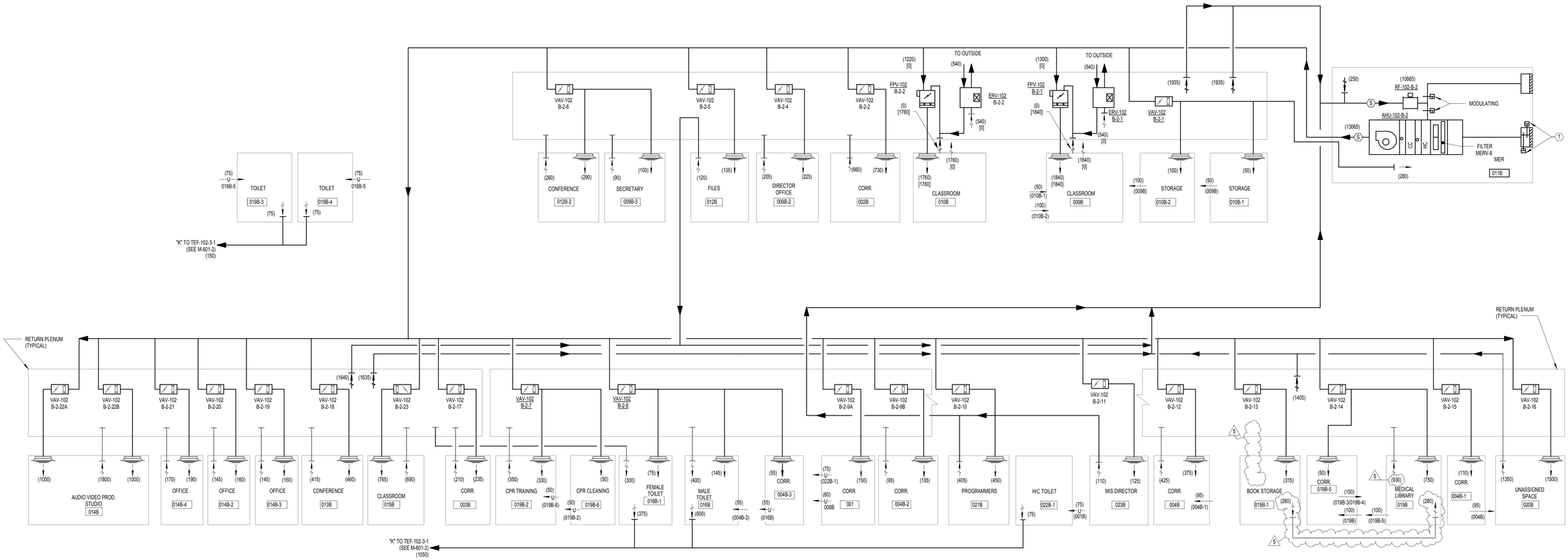
DRAWING NUMBER: M-662-2

SHEET

8/25/2015 10:32:16 AM

KEY NOTES

1. FOR ADDITIONAL INFORMATION REFER TO M-802-2



AHU-102 -B-2 AIRFLOW DIAGRAM

REFERENCE DWG#: M-100-2C, 2D & 2E

REVISED DRAWING 8/12/15

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	IL
DRAWN BY:	YD
FIELD CHECK:	N/A
APPROVED:	PL

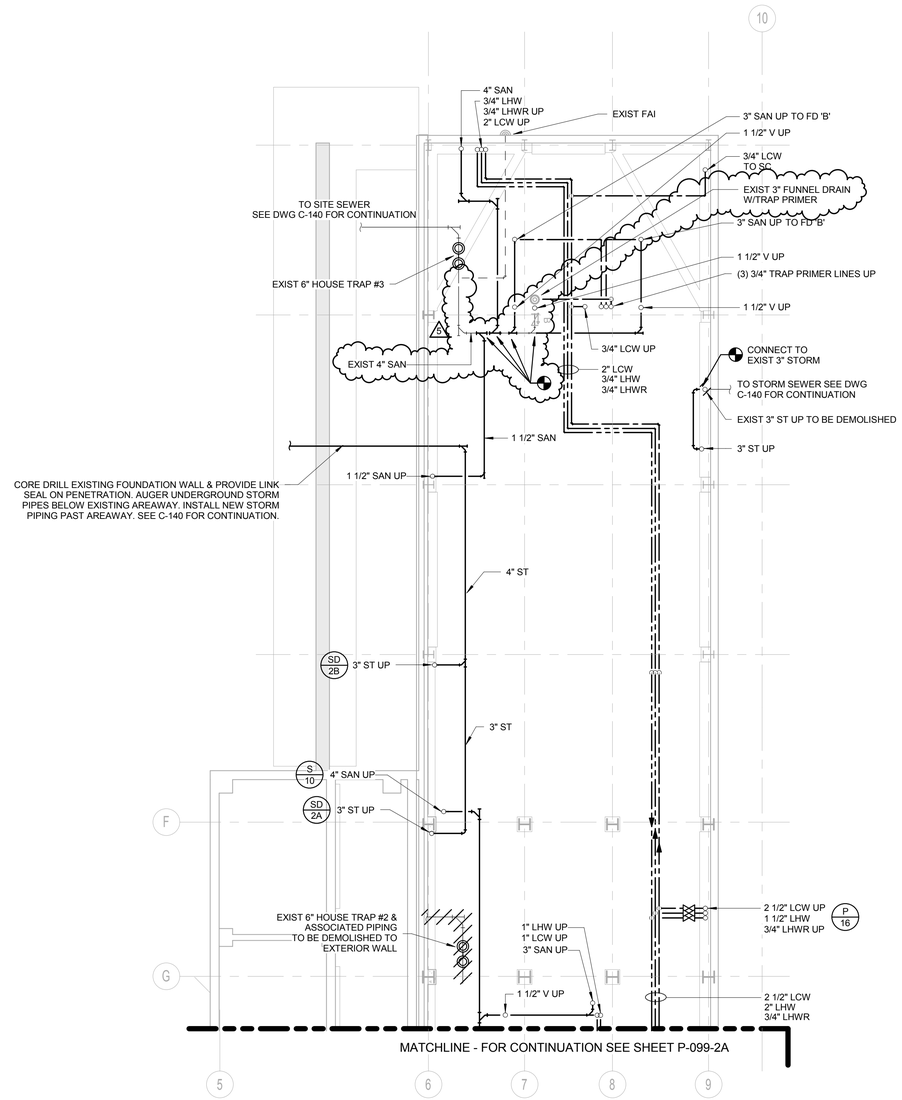
SHEET TITLE: HVAC AIR FLOW DIAGRAM

BUILDING NUMBER: 102

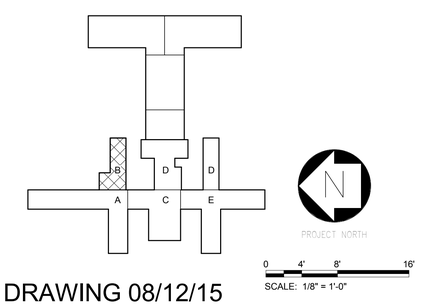
DRAWING NUMBER: M-664-2

SHEET

8/25/2015 10:39:18 AM



1 PLUMBING SUB-BASEMENT PLAN, PART B



REVISED DRAWING 08/12/15

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DESIGN & CONSTRUCTION

CONSULTANTS:

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CONTRACT:
CONSTRUCTION

TITLE:
MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION:
MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT:
NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	TW
DRAWN BY:	JR
FIELD CHECK:	N/A
APPROVED:	JP

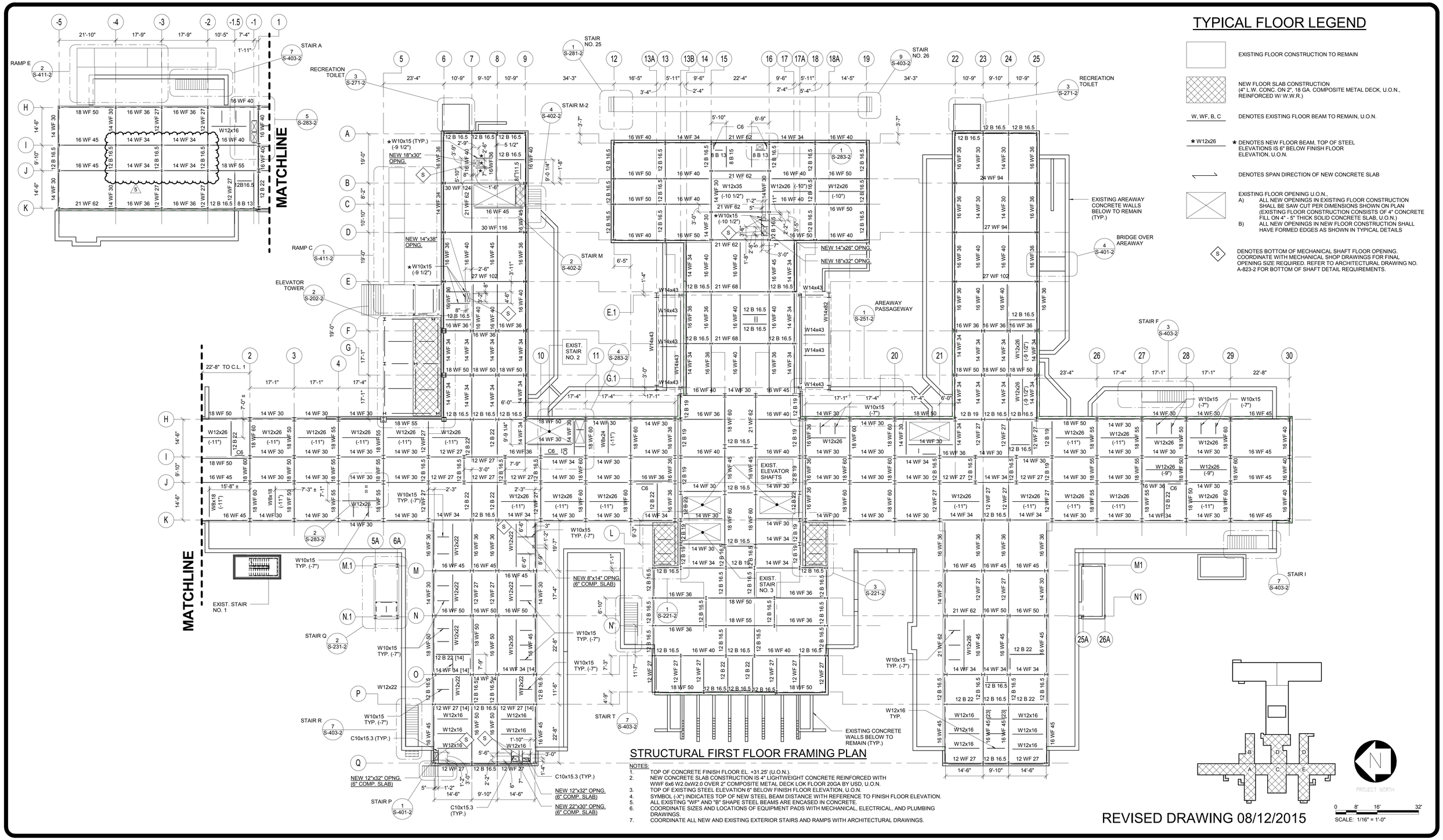
SHEET TITLE:
PLUMBING SUB-BASEMENT PLAN, PART B

BUILDING NUMBER: 102

DRAWING NUMBER: P-099-2B

SHEET

8/24/2015 2:22:15 PM



TYPICAL FLOOR LEGEND

- EXISTING FLOOR CONSTRUCTION TO REMAIN
- NEW FLOOR SLAB CONSTRUCTION (4" L.W. CONC. ON 2", 18 GA. COMPOSITE METAL DECK, U.O.N., REINFORCED W/ W.W.R.)
- W, WF, B, C — DENOTES EXISTING FLOOR BEAM TO REMAIN, U.O.N.
- ★ W12x26 — ★ DENOTES NEW FLOOR BEAM, TOP OF STEEL ELEVATIONS IS 6" BELOW FINISH FLOOR ELEVATION, U.O.N.
- DENOTES SPAN DIRECTION OF NEW CONCRETE SLAB
- EXISTING FLOOR OPENING U.O.N.,
  A) ALL NEW OPENINGS IN EXISTING FLOOR CONSTRUCTION SHALL BE SAW CUT PER DIMENSIONS SHOWN ON PLAN (EXISTING FLOOR CONSTRUCTION CONSISTS OF 4" CONCRETE FILL ON 4" - 5" THICK SOLID CONCRETE SLAB, U.O.N.)
  B) ALL NEW OPENINGS IN NEW FLOOR CONSTRUCTION SHALL HAVE FORMED EDGES AS SHOWN IN TYPICAL DETAILS
- (S) DENOTES BOTTOM OF MECHANICAL SHAFT FLOOR OPENING. COORDINATE WITH MECHANICAL SHOP DRAWINGS FOR FINAL OPENING SIZE REQUIRED. REFER TO ARCHITECTURAL DRAWING NO. A-823-2 FOR BOTTOM OF SHAFT DETAIL REQUIREMENTS.

STRUCTURAL FIRST FLOOR FRAMING PLAN

NOTES:

1. TOP OF CONCRETE FINISH FLOOR EL. +31.25' (U.O.N.).
2. NEW CONCRETE SLAB CONSTRUCTION IS 4" LIGHTWEIGHT CONCRETE REINFORCED WITH WWF 6x6 W2.0xW2.0 OVER 2" COMPOSITE METAL DECK LOK FLOOR 20GA BY USD, U.O.N.
3. TOP OF EXISTING STEEL ELEVATION 6" BELOW FINISH FLOOR ELEVATION, U.O.N.
4. SYMBOL (-X") INDICATES TOP OF NEW STEEL BEAM DISTANCE WITH REFERENCE TO FINISH FLOOR ELEVATION.
5. ALL EXISTING "WF" AND "B" SHAPE STEEL BEAMS ARE ENCASED IN CONCRETE.
6. COORDINATE SIZES AND LOCATIONS OF EQUIPMENT PADS WITH MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS.
7. COORDINATE ALL NEW AND EXISTING EXTERIOR STAIRS AND RAMPS WITH ARCHITECTURAL DRAWINGS.

REVISED DRAWING 08/12/2015

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	MR
DRAWN BY:	CJL
FIELD CHECK:	NA
APPROVED:	ACC

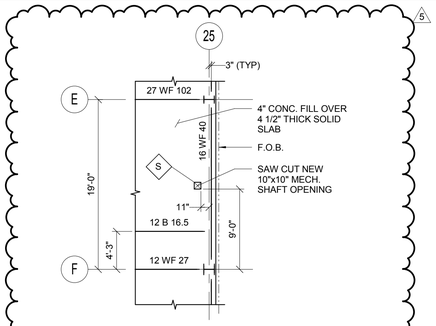
SHEET TITLE: STRUCTURAL FIRST FLOOR FRAMING PLAN

BUILDING NUMBER: 102

DRAWING NUMBER: S-101-2

SHEET

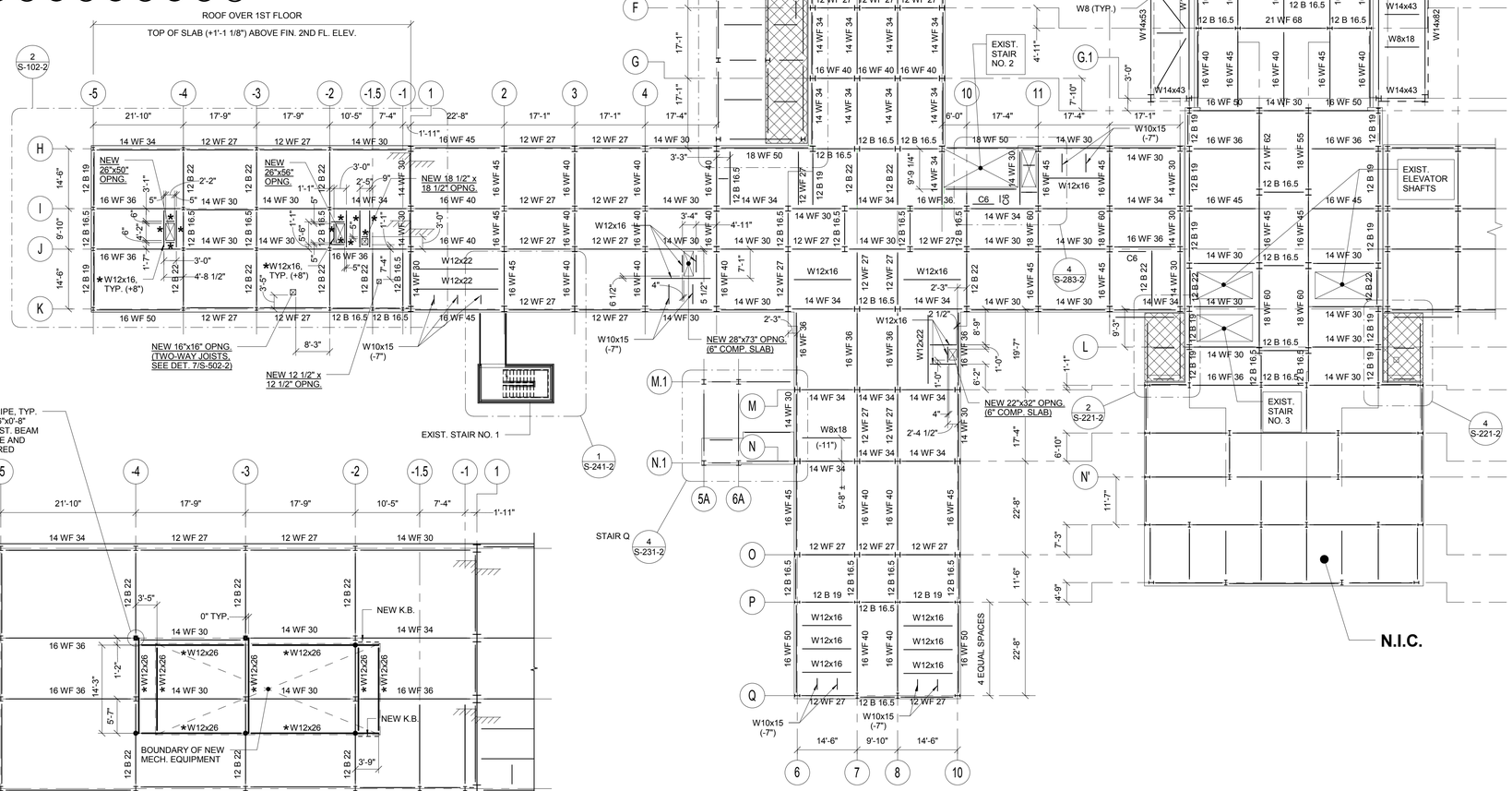
8/25/2015 9:15:37 AM



3 SECOND FLOOR PART FRAMING PLAN

1/8" = 1'-0"

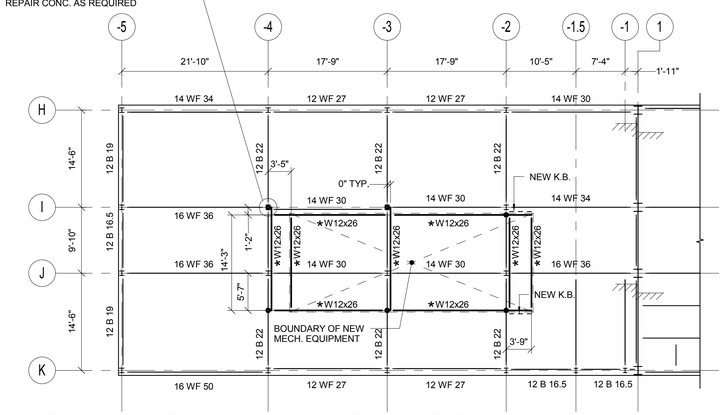
NOTES:
1. TOP OF CONCRETE FINISH FLOOR EL. +43.50' (U.O.N.)
2. TOP OF EXISTING STEEL ELEVATION 6" BELOW FINISH FLOOR ELEVATION, U.O.N.



1 STRUCTURAL SECOND FLOOR FRAMING PLAN

1/16" = 1'-0"

NOTES:
1. TOP OF CONCRETE FINISH FLOOR EL. +43.50' (U.O.N.)
2. NEW CONCRETE SLAB CONSTRUCTION IS 4" LIGHTWEIGHT CONCRETE REINFORCED WITH WWF6x6 W2.0xW2.0 OVER 2" COMPOSITE METAL DECK LOK FLOOR 20GA BY USD.
3. TOP OF EXISTING STEEL ELEVATION 6" BELOW FINISH FLOOR ELEVATION, U.O.N.
4. SYMBOL (-X") INDICATES TOP OF NEW STEEL BEAM DISTANCE WITH REFERENCE TO FINISH FLOOR ELEVATION.
5. ALL EXISTING "WF" AND "B" SHAPE STEEL BEAMS ARE ENCASED IN CONCRETE.
6. COORDINATE SIZES AND LOCATIONS OF EQUIPMENT PADS WITH MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS.



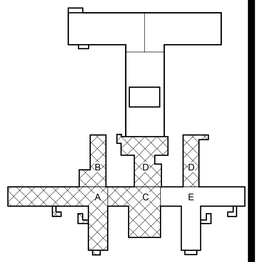
2 SECOND FLOOR ROOF DUNNAGE FRAMING PART PLAN

3/32" = 1'-0"

NOTES:
1. ★ DENOTES NEW STEEL MEMBER. TOP OF ALL NEW STEEL IS 4'-0" ABOVE TOP OF ROOF SLAB (U.O.N.). GC TO COORDINATE FINAL LOCATIONS OF NEW STEEL WITH MECHANICAL EQUIPMENT VENDOR.
2. ALL NEW STEEL SHALL BE HOT-DIPPED GALVANIZED.

TYPICAL FLOOR LEGEND

- EXISTING FLOOR CONSTRUCTION TO REMAIN
- NEW FLOOR SLAB CONSTRUCTION (4" L.W. CONC. ON 2", 18 GA. COMPOSITE METAL DECK, U.O.N., REINFORCED W/ W.W.R.)
- W, WF, B, C — DENOTES EXISTING FLOOR BEAM TO REMAIN, U.O.N.
- ★ W12x26 — ★ DENOTES NEW FLOOR BEAM, TOP OF STEEL ELEVATIONS IS 6" BELOW FINISH FLOOR ELEVATION, U.O.N.
- DENOTES SPAN DIRECTION OF NEW CONCRETE SLAB
- EXISTING FLOOR OPENING U.O.N.,
  - A) ALL NEW OPENINGS IN EXISTING FLOOR CONSTRUCTION SHALL BE SAW CUT PER DIMENSIONS SHOWN ON PLAN (EXISTING FLOOR CONSTRUCTION CONSISTS OF 4" CONCRETE FILL ON 4" - 5" THICK SOLID CONCRETE SLAB, U.O.N.)
  - B) ALL NEW OPENINGS IN NEW FLOOR CONSTRUCTION SHALL HAVE FORMED EDGES AS SHOWN IN TYPICAL DETAILS
- (S) DENOTES BOTTOM OF MECHANICAL SHAFT FLOOR OPENING. COORDINATE WITH MECHANICAL SHOP DRAWINGS FOR FINAL OPENING SIZE REQUIRED. REFER TO ARCHITECTURAL DRAWING NO. A-823-2 FOR BOTTOM OF SHAFT DETAIL REQUIREMENTS.



PROJECT NORTH

REVISED DRAWING 08/12/2015

SCALE: As indicated

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	MR
DRAWN BY:	CJL
FIELD CHECK:	NA
APPROVED:	ACC

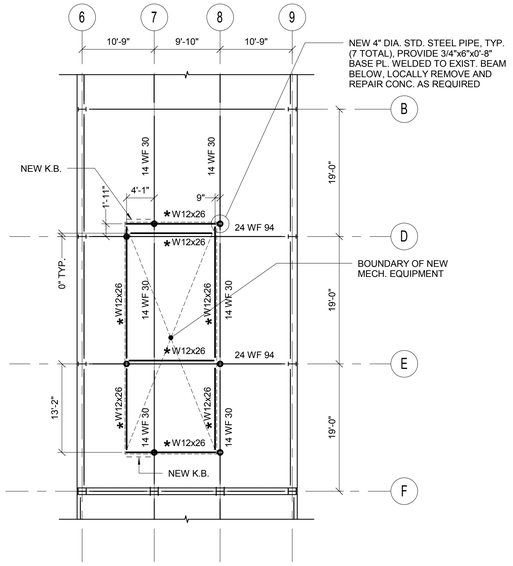
SHEET TITLE: STRUCTURAL SECOND FLOOR FRAMING PLAN

BUILDING NUMBER: 102

DRAWING NUMBER: S-102-2

SHEET

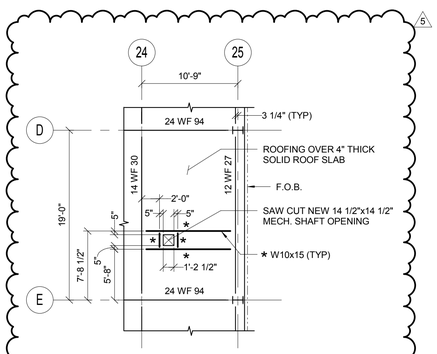
8/25/2015 9:15:38 AM



2 THIRD FLOOR ROOF DUNNAGE FRAMING PART PLAN

3/32" = 1'-0"

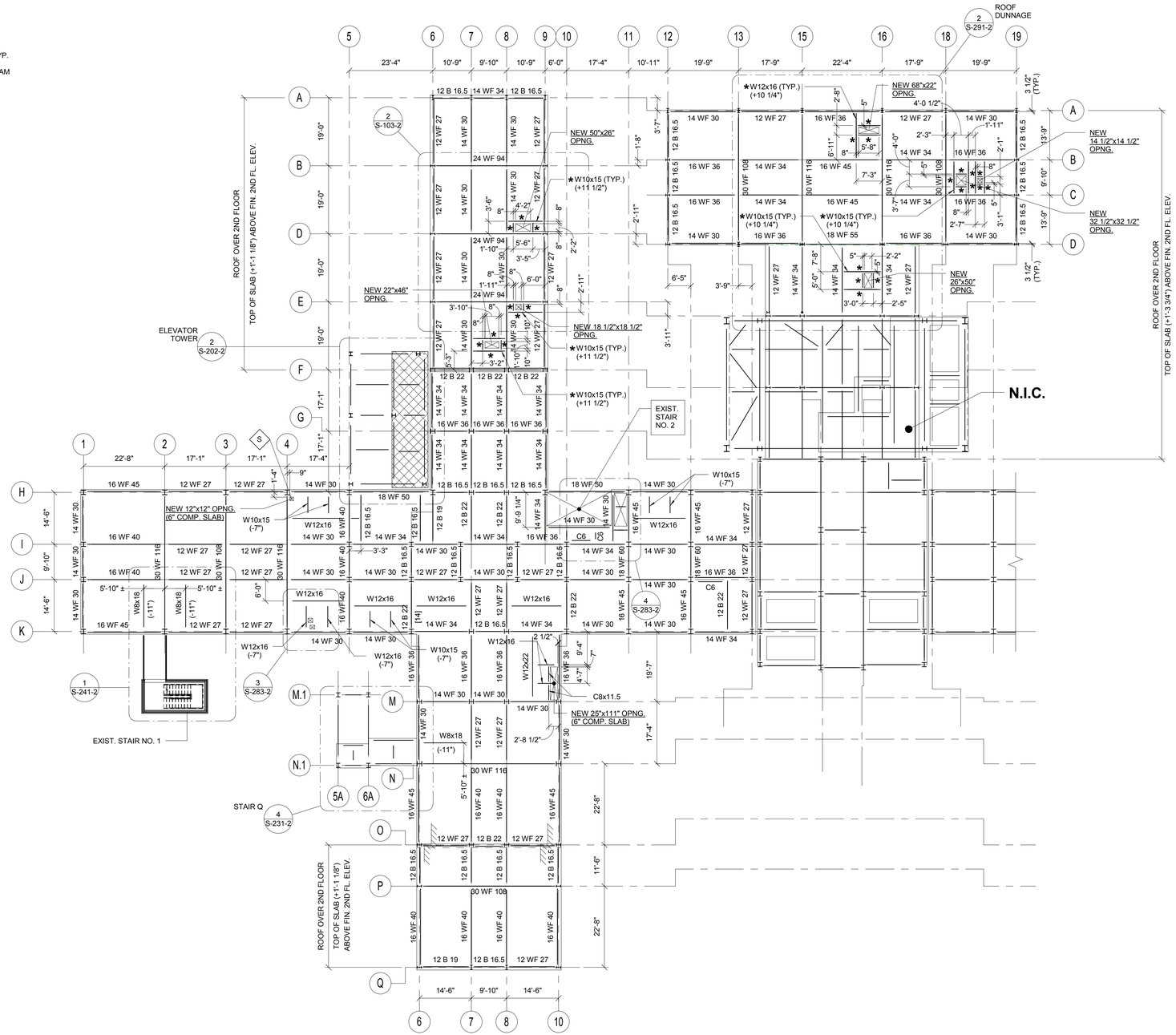
NOTES:
1. ★ DENOTES NEW STEEL MEMBER. TOP OF ALL NEW STEEL IS 4'-0" ABOVE TOP OF ROOF SLAB (U.O.N.). GC TO COORDINATE FINAL LOCATIONS OF NEW STEEL WITH MECHANICAL EQUIPMENT VENDOR.
2. ALL NEW STEEL SHALL BE HOT-DIPPED GALVANIZED.



3 THIRD FLOOR PART FRAMING PLAN

1/8" = 1'-0"

NOTES:
1. TOP OF ROOF SLAB EL. +56.84' (V.I.F.)
2. TOP OF EXISTING STEEL ELEVATION IS 2" BELOW TOP OF SLAB ELEVATION, U.O.N.
3. ★ DENOTES NEW STEEL MEMBER. TOP OF ALL NEW STEEL IS 5" BELOW TOP OF ROOF SLAB ELEVATION.



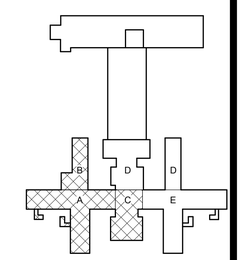
1 STRUCTURAL THIRD FLOOR FRAMING PLAN

1/16" = 1'-0"

NOTES:
1. TOP OF CONCRETE FINISH FLOOR EL. +55.75' (U.O.N.)
2. NEW CONCRETE SLAB CONSTRUCTION IS 4" LIGHTWEIGHT CONCRETE REINFORCED WITH WWF6x6 W2.0xW2.0 OVER 2" COMPOSITE METAL DECK LOK FLOOR 20GA BY USD.
3. TOP OF EXISTING STEEL ELEVATION 6" BELOW FINISH FLOOR ELEVATION, U.O.N.
4. SYMBOL (-X") INDICATES TOP OF NEW STEEL BEAM DISTANCE WITH REFERENCE TO FINISH FLOOR ELEVATION.
5. ALL EXISTING "WF" AND "B" SHAPE STEEL BEAMS ARE ENCASED IN CONCRETE.
6. COORDINATE SIZES AND LOCATIONS OF EQUIPMENT PADS WITH MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS.

TYPICAL FLOOR LEGEND

- EXISTING FLOOR CONSTRUCTION TO REMAIN
- NEW FLOOR SLAB CONSTRUCTION (4" L.W. CONC. ON 2", 18 GA. COMPOSITE METAL DECK, U.O.N., REINFORCED W/ W.W.R.)
- W, WF, B, C — DENOTES EXISTING FLOOR BEAM TO REMAIN, U.O.N.
- ★ W12x26 — ★ DENOTES NEW FLOOR BEAM, TOP OF STEEL ELEVATIONS IS 6" BELOW FINISH FLOOR ELEVATION, U.O.N.
- DENOTES SPAN DIRECTION OF NEW CONCRETE SLAB
- EXISTING FLOOR OPENING U.O.N.,
  A) ALL NEW OPENINGS IN EXISTING FLOOR CONSTRUCTION SHALL BE SAW CUT PER DIMENSIONS SHOWN ON PLAN (EXISTING FLOOR CONSTRUCTION CONSISTS OF 4" CONCRETE FILL ON 4" - 5" THICK SOLID CONCRETE SLAB, U.O.N.)
  B) ALL NEW OPENINGS IN NEW FLOOR CONSTRUCTION SHALL HAVE FORMED EDGES AS SHOWN IN TYPICAL DETAILS
- (S) DENOTES BOTTOM OF MECHANICAL SHAFT FLOOR OPENING. COORDINATE WITH MECHANICAL SHOP DRAWINGS FOR FINAL OPENING SIZE REQUIRED. REFER TO ARCHITECTURAL DRAWING NO. A-823-2 FOR BOTTOM OF SHAFT DETAIL REQUIREMENTS.



PROJECT NORTH

REVISED DRAWING 08/12/2015

SCALE: As indicated

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

A Joint Venture

225 Park Avenue South
New York, New York 10003

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CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	BID DOCUMENT

PROJECT NUMBER:	44578
DESIGNED BY:	MR
DRAWN BY:	CJL
FIELD CHECK:	NA
APPROVED:	ACC

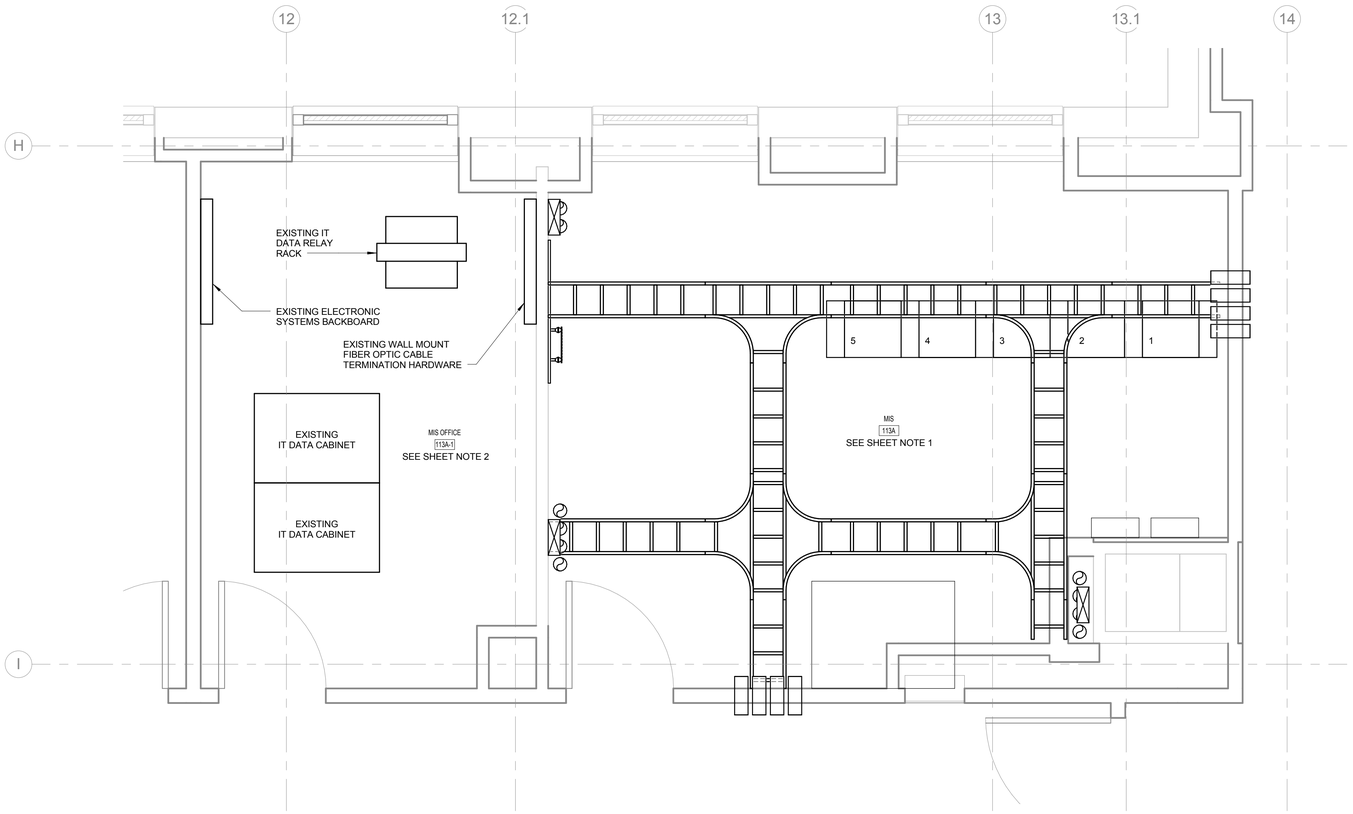
SHEET TITLE: STRUCTURAL THIRD FLOOR FRAMING PLAN

BUILDING NUMBER: 102

DRAWING NUMBER: S-103-2

SHEET

8/25/2015 9:15:38 AM



1 MIS OFFICE 113A-1 AND MIS ROOM 113A - ENLARGED PLAN

GENERAL SHEET NOTES:

1. FOR TELECOMMUNICATIONS DRAWING LIST, LEGEND, ELEVATION COMPONENT SCHEDULE, ABBREVIATIONS AND GENERAL NOTES SEE DRAWING NUMBER T-001.
2. FOR M.I.S. ROOM AND I.T. ROOM SERVING AREA BOUNDARIES SEE DRAWING NUMBER T-200-2 THRU T-216-2.
3. FOR TELECOMMUNICATIONS RISER DIAGRAM SEE DRAWING NUMBER T-601 THRU T-607.
4. FOR M.I.S. OFFICE 113A-1 AND M.I.S. ROOM 113A PHASING PLAN SEE DRAWING NUMBER T-405A-2.

SHEET NOTES:

1. SEE PROJECT DRAWING T-405-2 FOR ENLARGED, DETAILED M.I.S. ROOM 113A PLANS.
2. TELECOM CABLING, NETWORK HARDWARE, DATA CABINETS, THE DATA RACK, WALL MOUNT TERMINALS AND ALL OTHER TELECOM COMPONENTS WILL BE REMOVED FROM ROOM 113A-1 AND DECOMISSIONED OR RELOCATED BY THE MPC IT DEPARTMENT AND/OR OTHER OMH-ITS RESOURCES.

PHASING NOTES:

1. ROOM 113A-1 CURRENTLY HOUSES EXISTING INFORMATION TECHNOLOGY (IT) SYSTEM NETWORK AND CABLE TERMINATION HARDWARE. ROOM 113A-1 IS SCHEDULED TO BECOME AN M.I.S. OFFICE AS A PART OF THIS CONSTRUCTION PROJECT. THE SPACE ADJOINING M.I.S. OFFICE 113A-1 WILL BECOME NEW M.I.S. EQUIPMENT ROOM 113A. TO RELOCATE EXISTING IT NETWORK AND CABLE TERMINATION HARDWARE AND FIT ROOM 113A-1 OUT AS AN OFFICE SPACE NEW CONSTRUCTION IN THESE AREAS MUST BE COMPLETED IN FOUR (4) PHASES.
2. PHASE I:. PERFORM SCHEDULED DEMOLITION OF ROOM 113A IN ACCORDANCE WITH ASSOCIATED PROJECT DEMOLITION PLANS AND SPECIFICATIONS.
3. PHASE II: THE PROJECT 44578 BP-2 CONTRACTOR TO ADVANCE ALL CONSTRUCTION ACTIVITIES RELATED TO M.I.S. ROOM 113A, SO THAT IT VENDOR ACTIVITY BUHO-INSTALL HEAD END IN SERVER ROOM-IT VENDOR, CAN BEGIN PER PROJECT SCHEDULE. SEE PROJECT DRAWING T-405-2 FOR ENLARGED, DETAILED M.I.S. ROOM 113A PLANS. THIS WORK IS TO BE PERFORMED BY THE VARIOUS TRADES AS REQUIRED PER THE ASSOCIATED CONSTRUCTION PLANS AND SPECIFICATIONS. PROVIDE THE FOLLOWING IN M.I.S. ROOM 113A:
   - A. INSTALL AND ACTIVATE SPECIFIED HVAC SCHEDULED TO SUPPORT M.I.S. ROOM 113A.
   - B. INSTALL SCHEDULED CEILING, WALL AND FLOOR FINISHES.
   - C. INSTALL SPECIFIED OVERHEAD CABLETRAY.
   - D. INSTALL SPECIFIED CONVENIENCE AND IT NETWORK EQUIPMENT ELECTRICAL POWER RECEPTACLES.
   - E. INSTALL SPECIFIED ELECTRICAL LIGHTING.
   - F. CORE CEILING, WALLS AND FLOOR AS SPECIFIED AND INSTALL CORE SLEEVES.
   - G. INSTALL SPECIFIED TELECOM MAIN GROUND BUSBAR (TMGB) AND THE BONDING CONDUCTOR FOR TELECOMMUNICATIONS (BCT). CONNECT THE BCT TO THE BUILDING MAIN ELECTRICAL SERVICE GROUND.
   - H. INSTALL SPECIFIED DATA RELAY RACKS.
   - I. NOTIFY MANHATTAN PSYCHIATRIC CENTER INFORMATION TECHNOLOGY (IT) DEPARTMENT ROOM 113A CONSTRUCTION IS COMPLETE AND PREPARED TO SUPPORT ACTIVE ELECTRONIC NETWORK HARDWARE.
4. PHASE III: THIS WORK IS TO BE PERFORMED BY THE MANHATTAN PSYCHIATRIC CENTER INFORMATION TECHNOLOGY (IT) DEPARTMENT AND OR OTHER OMH-ITS RESOURCES:
   - A. DISCONNECT BACKBONE PATCH CABLES AND RELOCATE EXISTING ELECTRONIC NETWORK HARDWARE FROM ROOM 113A-1 TO ASSIGNED M.I.S. ROOM 113A DATA RACKS.
   - B. DE-TERMINATE EXISTING BACKBONE COMMUNICATIONS CABLES IN ROOM 113A-1, REROUTE CABLES TO ASSIGNED MIS ROOM 113A DATA RACKS AND RE-TERMINATE.
   - C. RE-INSTALL NETWORK HARDWARE BACKBONE PATCH CABLES.
   - D. AT ROOM 113A-1 REMOVE EXISTING DATA CABINETS, WALL MOUNT ENCLOSURES, ALL OTHER TELECOM COMPONENTS AND ALL REMAINING TELECOM CABLING.
   - E. NOTIFY CONSTRUCTION MANAGEMENT ROOM 113A-1 IS CLEAR OF EXISTING TELECOMMUNICATIONS CABLING AND COMPONENTS AND READY FOR DEMOLITION AND FIT-OUT AS AN MIS OFFICE.
5. PHASE IV: COMMENCE ROOM 113A-1 SPECIFIED DEMOLITION AND M.I.S. OFFICE CONSTRUCTION. THIS WORK IS TO BE PERFORMED BY THE VARIOUS TRADES AS REQUIRED PER THE ASSOCIATED CONSTRUCTION PLANS AND SPECIFICATIONS.

ADDENDUM DRAWING 08/12/2015 (5)

PROJECT NORTH

0 1' 2' 4'
SCALE: 1/2" = 1'-0"

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

A Joint Venture

225 Park Avenue South
New York, New York 10003

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STATE OF NEW YORK · FREDDY E. TAMAYO · LICENSED PROFESSIONAL ENGINEER · LIC. No. 071106

CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	Bid Document

PROJECT NUMBER:	44578
DESIGNED BY:	S. McCLURE
DRAWN BY:	D. BAVER
FIELD CHECK:	NA
APPROVED:	F. TAMAYO

SHEET TITLE:
TELECOM ENLARGED M.I.S. OFFICE AND M.I.S. ROOM PHASING PLAN

BUILDING NUMBER: 102

DRAWING NUMBER: T-405A-2

SHEET

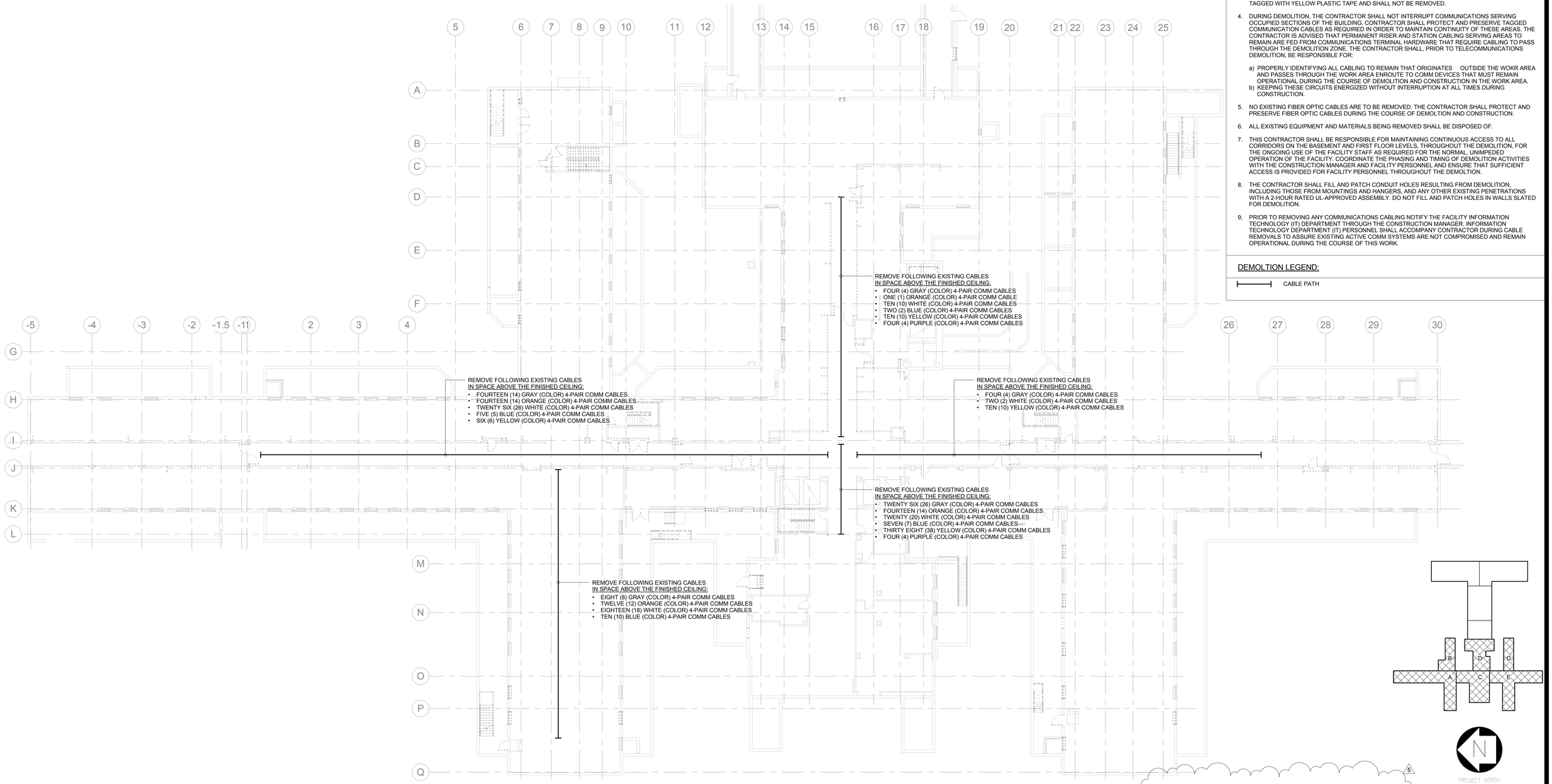
8/24/2015 1:23:44 PM

DEMOLTION NOTES:

1. SURVEY AND FIELD VERIFY ALL EXISTING CONDITIONS. REFER TO ARCHITECTURAL DRAWINGS FOR DEMOLITION AREAS.
2. ALL EXISTING CABLING TO COMM OUTLETS AND BACKBONE CABLING TO BE REMOVED UNDER THIS CONTRACT SHALL BE REMOVED BACK TO THE DISTRIBUTION FRAME TERMINATION PANEL.
3. EXISTING COMM CABLING THAT SERVES CIRCUITS THAT ARE TO REMAIN ACTIVE HAVE BEEN TAGGED WITH YELLOW PLASTIC TAPE AND SHALL NOT BE REMOVED.
4. DURING DEMOLITION, THE CONTRACTOR SHALL NOT INTERRUPT COMMUNICATIONS SERVING OCCUPIED SECTIONS OF THE BUILDING. CONTRACTOR SHALL PROTECT AND PRESERVE TAGGED COMMUNICATION CABLES AS REQUIRED IN ORDER TO MAINTAIN CONTINUITY OF THESE AREAS. THE CONTRACTOR IS ADVISED THAT PERMANENT RISER AND STATION CABLING SERVING AREAS TO REMAIN ARE FED FROM COMMUNICATIONS TERMINAL HARDWARE THAT REQUIRE CABLING TO PASS THROUGH THE DEMOLITION ZONE. THE CONTRACTOR SHALL, PRIOR TO TELECOMMUNICATIONS DEMOLITION, BE RESPONSIBLE FOR:
   a) PROPERLY IDENTIFYING ALL CABLING TO REMAIN THAT ORIGINATES OUTSIDE THE WOKR AREA AND PASSES THROUGH THE WORK AREA ENROUTE TO COMM DEVICES THAT MUST REMAIN OPERATIONAL DURING THE COURSE OF DEMOLITION AND CONSTRUCTION IN THE WORK AREA.
   b) KEEPING THESE CIRCUITS ENERGIZED WITHOUT INTERRUPTION AT ALL TIMES DURING CONSTRUCTION.
5. NO EXISTING FIBER OPTIC CABLES ARE TO BE REMOVED. THE CONTRACTOR SHALL PROTECT AND PRESERVE FIBER OPTIC CABLES DURING THE COURSE OF DEMOLTION AND CONSTRUCTION.
6. ALL EXISTING EQUIPMENT AND MATERIALS BEING REMOVED SHALL BE DISPOSED OF.
7. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CONTINUOUS ACCESS TO ALL CORRIDORS ON THE BASEMENT AND FIRST FLOOR LEVELS, THROUGHOUT THE DEMOLITION, FOR THE ONGOING USE OF THE FACILITY STAFF AS REQUIRED FOR THE NORMAL, UNIMPEDED OPERATION OF THE FACILITY. COORDINATE THE PHASING AND TIMING OF DEMOLITION ACTIVITIES WITH THE CONSTRUCTION MANAGER AND FACILITY PERSONNEL AND ENSURE THAT SUFFICIENT ACCESS IS PROVIDED FOR FACILITY PERSONNEL THROUGHOUT THE DEMOLTION.
8. THE CONTRACTOR SHALL FILL AND PATCH CONDUIT HOLES RESULTING FROM DEMOLITION, INCLUDING THOSE FROM MOUNTINGS AND HANGERS, AND ANY OTHER EXISTING PENETRATIONS WITH A 2-HOUR RATED UL-APPROVED ASSEMBLY. DO NOT FILL AND PATCH HOLES IN WALLS SLATED FOR DEMOLITION.
9. PRIOR TO REMOVING ANY COMMUNICATIONS CABLING NOTIFY THE FACILITY INFORMATION TECHNOLOGY (IT) DEPARTMENT THROUGH THE CONSTRUCTION MANAGER. INFORMATION TECHNOLOGY DEPARTMENT (IT) PERSONNEL SHALL ACCOMPANY CONTRACTOR DURING CABLE REMOVALS TO ASSURE EXISTING ACTIVE COMM SYSTEMS ARE NOT COMPROMISED AND REMAIN OPERATIONAL DURING THE COURSE OF THIS WORK.

DEMOLTION LEGEND:

CABLE PATH



1 TELECOM BASEMENT DEMOLTION PLAN

ADDENDUM DRAWING 08/12/2015

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

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

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STATE OF NEW YORK · FREDDY E. TAMAYO · LICENSE No. 071108 · LICENSED PROFESSIONAL ENGINEER

CONTRACT: CONSTRUCTION

TITLE: MAJOR BUILDING RENOVATIONS FOR THE MANHATTAN FORENSIC RELOCATION

LOCATION: MANHATTAN PSYCHIATRIC CENTER, BUILDING No. 102
600 EAST 125TH STREET WARDS ISLAND, NY 10035

CLIENT: NYS OFFICE OF MENTAL HEALTH

MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	Bid Document

PROJECT NUMBER:	44578
DESIGNED BY:	S. McCLURE
DRAWN BY:	D. BAVER
FIELD CHECK:	NA
APPROVED:	F. TAMAYO

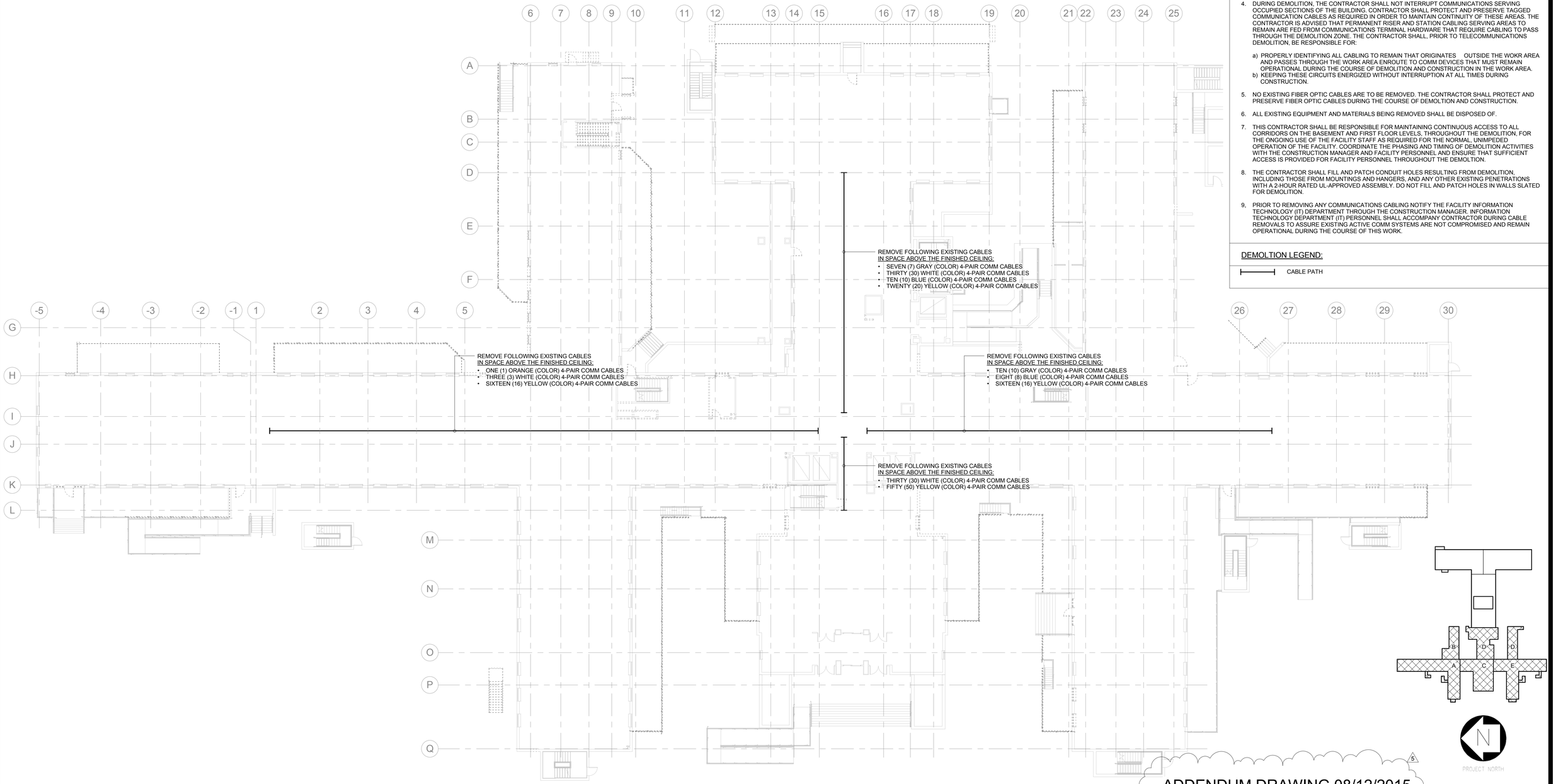
SHEET TITLE: TELECOM BASEMENT DEMOLTION PLAN

BUILDING NUMBER: 102

DRAWING NUMBER: TD-100-2

SHEET

8/24/2015 1:23:48 PM



1 TELECOM FIRST FLOOR DEMOLITION PLAN

ADDENDUM DRAWING 08/12/2015

DEMOLTION NOTES:

1. SURVEY AND FIELD VERIFY ALL EXISTING CONDITIONS. REFER TO ARCHITECTURAL DRAWINGS FOR DEMOLITION AREAS.
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DEMOLTION LEGEND:

CABLE PATH

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANTS:

RBSD ARCHITECTS P.C. | STV 100 Years

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STATE OF NEW YORK · REDDY E. TAMAYO · LICENSED P.E. No. 071108 · PROFESSIONAL ENGINEER

CONTRACT:
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CLIENT:
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MARK	DATE	DESCRIPTION
5	8-12-2015	ADDENDUM 5
	6-15-2015	Bid Document

PROJECT NUMBER:	44578
DESIGNED BY:	S. McCLURE
DRAWN BY:	D. BAVER
FIELD CHECK:	NA
APPROVED:	F. TAMAYO

SHEET TITLE:
TELECOM FIRST FLOOR DEMOLITION PLAN

BUILDING NUMBER: 102

DRAWING NUMBER: TD-101-2

SHEET

8/24/2015 1:23:53 PM