



STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

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September 9, 2015

**ADDENDUM NUMBER TWO**

**RFQ # 7549732**

**TITLE: Modifications to the Ventilation System at the Beazley Bldg.,  
Zambarano Hospital, DOA**

**Closing Date and Time: 9/17/15 at 2:30 PM**

**Per the issuance of this ADDENDUM # 2**

**Specification Change /Addition / Clarifications**

**Please include the attached documents in your bid response. There are six (6)  
PDF files attached.**

## **Addendum -Two**

Modification to the Ventilation System at the Beazley Bldg., Zambarano Hospital, DOA

Date 8-31-15

This Addendum modifies, amends and supplements designated parts of the CONTRACT DOCUMENTS for the project identified as Modification to the Ventilation System at (2) Building, DOA, RI and is hereby made a part thereof by reference, and shall be as binding as though inserted in its entirety in the locations designed hereunder. It shall be the responsibility of the General Contractor to notify all subcontractors and suppliers he proposes to use for the various parts of the work of any changes or modifications contained in this Addendum. No claim for additional compensation due to lack of knowledge of the contents of this Addendum will be considered.

### **CHANGES TO THE PROJECT MANUAL**

1. Replace content from specification Section 01010, 01019, 01039, 15010 and 16000 in its entirety with the attached specification section content.

### **CHANGES TO THE CONTRACT DRAWINGS**

1. Replace drawing M-1,M-2,M-3, M-4 and E-1 with attached drawings M-1, M-2 , M-3, M-4 and E-1 dated 10/8/14

# PROJECT SPECIFICATION

Exhaust Riser Upgrade  
at  
Eleanor Slater Hospital  
Zambarano Unit  
Rhode Island

State of Rhode Island  
Department of Administration

Engineer

AKAL Engineering Inc  
44 Central St. Unit 4  
Berlin, MA 01503

September 2014

SECTION 00010

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END OF SECTION

SECTION 00850

LIST OF DRAWINGS

General:

The drawings for this project represent an integral part of the contract documents, and should not be considered as a separate entity. These drawings, along with the technical specifications, form a complete process of disseminating information required to perform the work of this project.

The following schedule indicates the drawings of this project, which are in their respective order for convenience only, and do not obligate the Contractor to perform the work in any specific sequence. Nor is the work indicated on each drawing to be construed as specific work for a specific trade, subcontractor, or supplier.

List of Drawings:

- M-1 South Plan-1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> Floor
- M-2 North Plan -1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> Floor
- M-3 Roof Part Plan
- M-4 Detail
- E-1 Electrical

END OF SECTION

SECTION 01010

SUMMARY OF WORK

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Contractor's duties.
- B. Contractor use of site and premises.
- C. Work sequence.
- D. Owner occupancy.

1.02 CONTRACTOR'S DUTIES

- A. Work of the Project generally includes Fire Damper in exhaust riser, Exhaust Fan and related electrical, structural support work
- B. Except as specifically noted, provide and pay for:
  - 1. Labor, materials, and equipment.
  - 2. Tools, construction equipment, and machinery.
  - 3. Other facilities and services necessary for proper execution and completion of Work.
- C. Pay legally required consumer and use taxes.
- D. Secure and pay for, as necessary for proper execution and completion of work, and as applicable at time of receipt of bids.
  - 1. Permits.
  - 2. Government fees.
  - 3. Licenses.
- E. Give required notices.
- F. Comply with applicable codes, ordinances, rules, regulations, orders, and legal requirements of public authorities having jurisdiction.
- G. Promptly submit written notice to Engineer of observed variance of Contract Documents from legal requirements.
- H. Enforce strict discipline and good order among employees. DO not employ on work:
  - 1. Unfit persons.
  - 2. Persons not skilled in assigned task.
- I. Notify all trades, subcontractors, and suppliers of all designated alternates and be responsible for their coordination.

1.03 WORK PHASES

- A. Before commencing Work of each phase, submit a schedule showing the sequence, commencement and completion dates, and move-out and -in dates of Owner's personnel for all phases of the Work.

1.04 CONTRACTOR USE OF SITE AND PREMISES

- A. Limit use of site and premises to allow for:
  - 1. Owner occupancy.
  - 2. Use of site and premises by public.
- B. Construction operations: Limited to areas noted on Drawings.
- C. Coordinate use of Site and Premises under direction of Owner.

1.05 OWNER'S OCCUPANCY REQUIREMENTS

- A. Full Owner Occupancy: Owner will occupy site and building during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits, unless otherwise indicated.
  - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
  - 2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

1.06 WORK RESTRICTION

- A. Contractor must provide a list of all workers along with the date of birth. A background check will be performed on all employees at no cost to the contractor.

1.07 WORK SEQUENCE

- A. Construction Work to accommodate Owner's occupancy requirements during the construction period, coordinate construction schedule and operations with Engineer and Owner.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION

SECTION 01019

CONTRACT CONSIDERATIONS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Schedule of Values.
- B. Application for Payment.
- C. Change procedures.
- D. Allowances.

1.02 RELATED SECTIONS

- A. Sections:
  - 1. 01300 – Submittals: Submittal procedures.
  - 2. 01400 – Quality Control: Inspection and testing.
  - 3. 01600 – Materials and Equipment: Product substitutions.

1.03 SCHEDULE OF VALUES

- A. Submit typed or printed schedule on AIA Form G703 – application and Certificate for Payment Continuation sheet.
- B. Submit Schedule of Values in duplicate as soon as practicable after notification of selection for the award of a Contract.
- C. Format: Utilize the Table of Contents of this Project Manual. Identify each item with a number and title of the major Specification Section. Identify site mobilization, bonds, and insurance.
- D. Include in each line item the amount of Allowances, if any, specified in this section. For unit cost allowances, identify quantities taken from Contract Documents multiplied by the unit cost to achieve the total for the item.
- E. Include in each line item a directly proportional amount of Contractor's overhead and profit.
- F. Revise schedule to list approved Change Orders, with each Application for Payment.

1.04 APPLICATIONS FOR PAYMENT

- A. Submit one typed original and two copies of each application on AIA Form G702 – application and Certificate for Payment, and on AIA Form G703 Continuation Sheet. Applications typed on copies of AIA Documents are not acceptable.
- B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.
- C. Include, with each monthly application, one copy of the Certified Monthly Payroll Record for the previous month’s pay period.
- D. Beginning with second application for payment, Contractor’s right to payment must be substantiated by documenting that payment of monies due, less maximum retainage of 10 percent, have been paid in full to subcontractors and suppliers for work, materials, or rental of equipment billed for under specific line item numbers in the immediately preceding application.
- E. Accompany applications with substantiating data on subcontractor’s “Waiver of Lien” form -- AIA Document 00640. Use as many reproductions of form as needed.
- F. Accompany applications for payment for asbestos abatement work with invoices for asbestos removal and abatement, along with copies of completed shipping documents which indicate final disposal location and acknowledge receipt of material, as substantiating data to ensure payment. Payment will not be made without inclusion of this data.
- G. Accompany final application with substantiating data on the above form, and on Contractor’s “Affidavit of Release of Liens” – AIA Document 0706A.

#### 1.05 CHANGE PROCEDURES

- A. The Engineer will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time as authorized by AIA A201, 1987 Edition, Article 7.4 by issuing supplemental instructions on AIA Form G710 – Architect’s Supplemental Instructions.
- B. The Engineer may issue a Proposal Request which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change, with stipulation of any overtime Work required, and the period of time during which the requested price will be considered valid. Contractor will prepare and submit an estimate as soon as practicable, but within a period no longer than fifteen days.
- C. The Contractor may propose changes to submitting request for change to the Engineer, describing the proposed change and its full effect on the Work. Include a statement describing the reason for change, and the effect on the Contract Sum and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with section 01600.
- D. Stipulated sum change Order: Based on Proposal Request and Contractor’s fixed price quotation, or Contractor’s request for a Change Order as approved by Engineer.
- E. Construction Change Directive: Engineer may issue a directive on AIA Form G714 – Construction Change Directive, signed by Owner and Engineer, instructing Contractor, in absence of total agreement on terms of a Change Order, to proceed with a change in the Work for subsequent inclusion in a Change Order. Document will describe changes in the Work and

designate method of determining any change in Contract sum and contract Time. Promptly execute the change.

- F. Time and Material Change Order: submit itemized account and supporting data after completion of change, within time limits indicated in Conditions of the Contract. Engineer will determine the change allowable in Contract Sum and Contract Time as provided in the Contract Documents. Work cannot begin until Engineer has approved a cost-not-to exceed proposal.
- G. Maintain detailed records of Work performed on Time and Material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs and time extensions for changes in the Work.
- H. Change Order Form: AIA G701.
- I. Execution of Change Orders: Engineer will issue change Orders for signatures of parties as provided in the Conditions of the Contract.

1.06 ALLOWANCE(S)

- A. Contingency- Include in the contract, a stipulated sum of 2,000 for use upon Owner's instruction.
- B. Contractor's costs for Products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead and profit will be included in Change Orders authorizing expenditure of funds from this Allowance.
- C. Funds will be drawn from Contingency Allowance only by Change order
- D. At close out of Contract, funds remaining in Contingency Allowance will be created to Owner by Change Order.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION

SECTION 01039

CUTTING AND PATCHING

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Cutting and patching.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural attachment of new work being applied or attached.
- C. Verify that utility services are available, of the correct characteristics, and in the correct location.
- D. Examine and verify specific conditions described in individual Specification Sections.

3.02 CUTTING AND PATCHING

- A. Employ original or skilled and experienced installer to perform cutting and patching.
- B. Submit written request in advance of cutting or altering elements which affect:
  - 1. Structural integrity of element.
  - 2. Integrity of weather-exposed or moisture-resistant elements.
  - 3. Efficiency, maintenance, or safety of element.
  - 4. Visual qualities of sight-exposed elements.
  - 4. Work of Owner or separate contractor.
- C. Execute cutting, fitting, and patching including excavation and fill to complete Work, and to:
  - 1. Fit the several parts together to integrate with other work.
  - 2. Uncover Work to install or correct ill-timed Work.
  - 3. Remove and replace defective and non-conforming Work.
  - 4. Remove samples of installed work for testing.
  - 5. Provide openings in elements of work for penetrations of mechanical and electrical work.

- D. Execute Work by methods which will avoid damage to other work, and provide proper surfaces to receive patching and finishing.
- E. Cut rigid materials using masonry saw or core drill.
- F. Restore work with new projects in accordance with requirements of Contract Documents.
- G. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- H. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.
- I. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.
- J. Identify any hazardous substance or condition exposed during the Work to the Engineer for decision or remedy.
- K. Remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring products and finishes to original or specified condition.

END OF SECTION

SECTION 15010

BASIC MECHANICAL REQUIREMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. The provisions of the Instructions to Bidders, General Conditions, Supplementary Conditions, Alternates, Addenda, Division 1 and 16 are a part of this Specification. Contractors and Subcontractors shall examine same as well as other Divisions of the Specifications which affect work under this Division.

1.2 DESCRIPTION OF WORK

- A. Mechanical Electrical and Specifications for all the Divisions are a part of the Contract Documents.
- B. Drawings and Specifications are to be considered as supplementing each other. Work specified but not shown, or shown but not specified, shall be performed or provided as though mentioned in both Specifications and Drawings.

1.3 WORK INCLUDES

- A. Mechanical Contractor shall include in his bid proposal the cost of all labor, material for HVAC, and Electrical as specified, identified or located on the drawings and specifications.

1.4 RELATED WORK SPECIFIED ELSEWHERE

- A. Division 1.
- B. Division 16 - Electrical.

1.5 QUALITY ASSURANCE

- A. Codes and Permits:
  - 1. Comply with rules, regulations of State, County, and City authorities having jurisdiction over the premises, including safety requirements of OSHA. Do not construe this as relieving Contractor from complying with Specifications which exceed Code requirements and not in conflict therewith.

1.6 REFERENCES

- A. Comply with applicable provisions of latest editions of following National Standards:
  - NFPA
  - SMACNA Duct Construction Standards
  - National Electric Code

NFPA Life Safety Code and Standards

1.7 SUBMITTALS

A. Shop Drawings and Product Data:

1. Prepare shop drawings and product data for mechanical equipment with adequate details and scales as necessary to clearly show construction.
3. Shop drawings and product data includes:
  - a. Ductwork, Fire Dampers.
  - b. Exhaust Fan.

1.8 COORDINATION AND SUPERVISION

- A. Examine work of other trades which comes in contact with or is covered by this work. Do not attach to, cover, or finish against any defective work, or install work of this Division in a manner which will prevent other trades from properly installing their work. Consult all drawings, specifications and details of other Divisions included as part of the Contract Documents.

1.9 LOCAL CONDITIONS

- A. Visit site, become familiar with conditions affecting this work. No additional payment will be made on claims that arise from lack of knowledge of existing conditions.
- B. Insulation or materials shall be identified before attempting any demolition. Contractor shall comply with the requirements of EPA regulations, National Emissions Standards and the OSHA regulations, Section 1910.1001 as well as applicable Rhode Island State laws and City Codes and Ordinances. Asbestos insulation if found shall be removed under another contract.
- F. Provide temporary services of any nature required to keep building functioning. Remove temporary services when permanent facilities are completed.

1.10 PROTECTION

- A. At all times keep premises and building in neat and orderly condition, follow explicitly any instructions of Architect in regard to storing of materials, protective measures and disposing of debris.
- B. When setting up pipe shop with cutting and threading machines, protect area against staining and abrasion. Cost of correcting any such condition will be charged against the respective Contractor.
- C. Protect finished floors from chips and cutting oil by use of a chip receiving pan and oil proof cover.
- D. Protect equipment and finished surfaces from welding and cutting spatters with baffles and spatter blankets.
- E. Protect floors from paint droppings, insulation adhesive, etc. by use of drop cloths.

1.11 PRODUCT HANDLING

- A. Provide all scaffolding, tackle, hoists and rigging necessary for placing mechanical materials and equipment in their proper place. Comply with applicable Federal, State, and Local regulations for all scaffolding and hoisting equipment. Remove temporary work when no longer required.

- B. Arrange for packaging of equipment, which must be hoisted, so that there will be no damage or distortion caused by hoisting operation. Protect all coils, bearings, fan shafts and housings from any damage during hoisting operation.

#### 1.12 OPERATING INSTRUCTIONS

- A. This Contractor must schedule all equipment and system demonstrations, including personnel, at an agreeable time with the Owner.

#### 1.13 DAMAGE AND EMERGENCY REPAIRS

- A. Assume responsibility for any damage caused by leaks in the piping system being installed or reworked under this Contract. Repair all damage without extra cost to Owner.

#### 1.14 GUARANTEE AND WARRANTIES

- A. Guarantee against defects in workmanship and materials; make good, repair or replace any defective work, material or equipment within one year from date of acceptance.

### PART 2 PRODUCTS

#### 2.1 FIRE DAMPERS (1 ½ HOUR RATING)

1. Acceptable Manufacturers:
  - a. Ruskin Model D1BD2, Style B (square or rectangular suitable for horizontal or vertical installations)
  - b. Ruskin Model CFD and CFD(R) (suitable for UL rated floor/ceiling and roof/ceiling assemblies)
  - d. Nailor Industries
  - e. Safe-Air
2. Fabricate in accordance with NFPA 90A and UL 555, and as indicated.
3. Ceiling Dampers: Galvanized steel, 20 gage frame and 16 gage flap, two layers 0.125 inch ceramic fiber on top side, and one layer on bottom side for round flaps, with locking clip.
4. Horizontal Dampers: Galvanized steel, 20 gage frame, stainless steel closure spring, and lightweight, heat retardant non-asbestos fabric blanket.
5. Curtain Type Dampers: Galvanized steel with interlocking blades. Provide stainless steel closure springs and latches for horizontal installations and closure under air flow conditions. Configure with blades out of air stream.
6. Fusible Links: UL 33, separate at 165 degrees F with adjustable link straps for combination fire/balancing dampers.

#### 2.2 FIRE STOPPING

1. Seal openings of fire rated construction with a material or product that has been tested at an independent testing laboratory, such as UL, FM, etc. Fire stopping shall conform to ASTM E-814 and UL 1479, with fire ratings equal to or exceeding the fire rating of the construction involved. Fire stopping shall be UL classified, and shall be similar to the 3M brand Fire Barrier Penetration Sealing Systems, or approved equivalent. Fire stopping of this type shall also be utilized for openings through smoke rated construction. To conform with BOCA Basic Building Code Standards.
2. If desired by the Contractor and approved by local codes, the “Pro-Set” piping penetration system also may be utilized. Penetration system shall be UL certified and shall be the “Pro-Set” System A. Firestop coupling (sleeve) shall be filled with ceramic fiber material to provide insulation and fire stopping. System shall be capable of maintaining a 3-hour fire rating. Penetration system shall be secure, waterproofed, fire rated and smoke proof and shall allow for pipe expansion and contraction.

### 2.3 DUCTWORK

- 1 Galvanized Steel Ducts: ASTM A525 and ASTM A527 galvanized steel sheet, lock-forming quality, having G60 zinc coating of in conformance with ASTM A90.

### 2.4 CENTRIFUGAL ROOF EXHAUSTERS

1. Acceptable Manufacturers:
  - a. Greenheck
  - b. Loren Cook
  - c. Penn Ventilator
2. Provide a Centrifugal Roof Exhauster having the capacities as scheduled on the drawings.
3. Performance Ratings: Conform to AMCA 210 and bear the AMCA Certified Rating Seal.
4. Sound Ratings: AMCA 301, tested to AMCA 300 and bear AMCA Certified Sound Rating Seal.
5. Fabrication: Conform to AMCA 99.
6. UL Compliance: UL listed and labeled, designed, manufactured, and tested in accordance with UL 705.
7. Fan Unit: V-belt or direct driven as indicated, with spun aluminum housing; resilient mounted motor; 1/2 inch mesh, 0.62 inch thick aluminum wire birdscreen; square base to suit roof curb with continuous curb gaskets.
8. Roof Curb: 12 inch high self-flashing of galvanized steel with continuously welded seams, built-in cant strips, one inch insulation, curb bottom and factory installed nailer strip.
9. Disconnect Switch: Factory wired, non-fusible, in housing for thermal overload protected motor.
10. Damper: Motor actuated, aluminum multiple blade construction, felt edged with offset hinge pin, nylon bearings, blades linked and line voltage motor drive (voltage to match fan motor voltage), power open, spring return.

11. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheave selected so required rpm is obtained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

### PART 3 EXECUTION

#### 3.1 INSTALLATION REQUIREMENTS

- A. Location, ducts, etc., on the drawings are diagrammatic; indicated positions shall be followed as closely as possible, exact locations shall be subject to building construction and interference's with other work. Difficulties preventing the installation of any part of work as indicated, shall be called to the attention of the Engineer.
- B. All materials and equipment shall be installed in a neat and workmanlike manner by a competent specialist for each subtrade. The installation of any material and equipment not meeting these standards may require removal and reinstallation at no additional cost to the Owner.
- C. Do all cutting and patching in existing construction as necessary for installation of this work. Do not cut any structural member without specific permission from the Architect. Have cutting done by skilled mechanics as carefully as possible, and with as little damage as possible. Have patching done by first-class mechanics as skilled in the several trades.

#### 3.2 OPERATING/MAINTENANCE MANUAL

- A. Furnish three complete bound sets of service manuals containing operating and maintenance instructions for all mechanical equipment and controls.

#### 3.3 CLEANING UP

- A. Upon completion of work, remove all tools, equipment, surplus materials and thoroughly clean all piping, fixtures and equipment removing all dirt, grease and oil.

#### 3.4 MISCELLANEOUS IRON WORK

- A. Furnish and install all miscellaneous iron work including, but not limited to, piping hangers, piping anchors and guides, ductwork supports, unit supports, and all other equipment supports.
- B. Where piping ductwork or other equipment pass through fire or smoke barrier stops, walls, floors or ceilings, this Contractor shall furnish and install sleeves and shall thoroughly seal openings around sleeves, pipes, etc., with fire and smoke resistant materials. Materials shall be provided by this Contractor as required to maintain the fire rating of the walls, partitions, ceiling and floors in accordance with the requirements of NFPA.

END OF SECTION

SECTION 16000

ELECTRICAL WORK

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS, which are hereby made a part of this Section of the Specifications.
- B. Reference Drawings: E-1

1.02 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
  - 1. Providing power to feed new exhaust fan including new circuit breakers in existing electrical panels, safety disconnect switches, raceways, cables, wiring, junction and pull boxes, wireways, and all other components required for complete electrical distribution system.
  - 2. Removing existing wiring, raceways, cables junction and pull boxes, and all other components of existing equipment being removed.
  - 3. Grounding and bonding of all electrical systems and equipment.
  - 4. Testing of all new electrical work.
  - 5. Coordination between electrical and other trades.
  - 6. Cutting and patching of roof.
  - 7. Coordination drawings and record drawings and similar requirements.
- B. Items To Be Installed Only: Install the following items as furnished by the designated Sections:  
Section 15010 - HEATING, VENTILATING AND AIR CONDITIONING:
  - a. Power connections for exhaust fans.
- C. The Electrical Contractor shall be responsible for filing all documents, payment of all fees, and securing of all inspections and approvals necessary for the electrical work.

1.03 SUBMITTALS

- A. Comply with requirements specified in Section 013300 – SUBMITTAL PROCEDURES.
- B. Material and equipment requiring Shop Drawing Submittals shall include but not be limited to:
  - 1. Circuit Breakers.
  - 2. Wiring and cables.
  - 3. Conduits.
  - 4. Boxes and fittings.

5. Safety switches.

1.04 REFERENCES

- A. Except where modified by a specific notation to the contrary, it shall be understood that the indication and/or description of any electrical item in the drawings or specifications for electrical work carries with it the instruction to furnish, install and connect the item as part of the electrical work, regardless of whether or not this instruction is explicitly stated.
- B. It shall be understood that the specifications and drawings for electrical work are complimentary and are to be taken together for a complete interpretation of the electrical work except that indications on the drawings, which refer to an individual element of work, take precedence over the specifications where they conflict with same.

1.05 REGULATORY REQUIREMENTS

- A. Comply with all applicable federal and state laws, and all local codes, by-laws and ordinances.
- B. Where provisions of the Contract Documents conflict with any codes, rules or regulations, the latter shall govern. Where the contract requirements are in excess of applicable codes, rules or regulations, the contract provisions shall govern unless the Designer rules otherwise.
- C. Request inspections from authorities having jurisdiction, obtain all permits and pay for all fees and inspection certificates as applicable and/or required. All permits and certificates shall be turned over to the Owner's Project Manager s at the completion of the work. Copies of permits shall be given to the resident engineer prior to the start of work.
- D. Unless otherwise specified or indicated, materials and workmanship and equipment performance shall conform with the latest edition of the following standards, codes, specifications, requirements and regulations:
  - 1. State Building Code
  - 2. State Electrical Code
  - 3. National Fire Protection Association (NFPA)
  - 4. Local Town Regulations and By-laws
  - 5. Underwriter's Laboratories, Inc. (UL)
  - 6. National Electrical Manufacturer's Association (NEMA)
  - 7. American National Standards Institute (ANSI)
- E. All electrical work shall meet or exceed any other state and local codes and/or authorities having jurisdiction including all other standards indicated herein.

1.06 SURVEYS AND MEASUREMENTS

- A. Base all required measurements, both horizontal and vertical, on reference points established by the General Contractor and be responsible for the correct laying out of the electrical work. In the event of a discrepancy between actual measurements and those indicated, notify the General Contractor in writing, and do not proceed with the work

required until written instructions have been issued by the General Contractor.

#### 1.07 COORDINATION

- A. HVAC and Electrical Drawings are diagrammatic. They indicate general arrangements of mechanical and electrical systems and other work. They do not show all offsets required for coordination nor do they show the exact routings and locations needed to coordinate with structure and other trades and to meet Architectural requirements.
- B. Work shall be performed in cooperation with other trades on the project and so scheduled as to allow speedy and efficient completion of the work.
- C. Furnish to other trades advance information on locations and sizes of all frames, boxes, sleeves and openings needed for their work, and also furnish information and shop drawings necessary to permit trades affected by the work to install same properly and without delay.
- D. In all spaces, prior to installation of visible material and equipment, review Mechanical Drawings for exact locations and where not definitely indicated, request information from Designer. Where the electrical work shall interfere with the work of other trades, assist in working out the space conditions to make satisfactory adjustments before installation. Without extra cost to the Owner, make reasonable modifications to the work as required by normal structural interferences. Maintain maximum headroom at all locations. All piping, duct, conduit, and associated components to be as tight to underside of structure as possible.
- E. If any electrical work has been installed before coordination with other trades so as to cause interference with the work of such trades, all necessary adjustments and corrections shall be made by the electrical trades involved without extra cost to the Owner.
- F. Where conflicts or potential conflicts exist and engineering guidance is desired, submit sketch of proposed resolution to Designer for review and approval.
- G. Protect all materials and work of other trades from damage, which may be caused by the electrical work, and repair all damages without extra cost to the Owner.

#### 1.08 MECHANICAL AND ELECTRICAL COORDINATION

- A. Mechanical contractor shall furnish and install various electrical items relating to the Exhaust Fan and control apparatus. The Electrical contractor shall be required to connect power wiring to this equipment unless noted otherwise.
- B. All power wiring and local disconnect switches will be provided by the Electrical Contractor for the line voltage power. All control and interlocking wiring shall be the responsibility of the Mechanical Contractor.
- C. 120V and above power wiring sources extended and connected to mechanical control panels, transformers and switches shall be the responsibility of the Electrical contractor. All low voltage thermostats, zone valve and any switch wiring shall be the responsibility

of the Heating and Ventilating contractor.

#### 1.09 INSTALLATION REQUIREMENTS

- A. The arrangement of all electrical work shown on the drawings is diagrammatic only and indicates the minimum requirements of the work. Conditions at the building including actual measurements shall determine the details of the installation. All work shall be laid out and installed so as to require the least amount of cutting and patching.
- B. Check the Architectural plans and specifications before ordering any material and equipment. Any discrepancies shall be brought to the attention of the Designer for his determination prior to proceeding with the work.

#### 1.10 TYPICAL DETAILS

- A. Typical details where shown on the drawings shall apply to each and every item of the project where such items are applicable. They are not repeated in full on the drawings, which in many cases are diagrammatic only, but with the intention that such details shall be incorporated in full. Any alternate method proposed for use by the Contractor shall have the prior approval of the Designer.

#### 1.11 SLEEVES, INSERTS

- A. Furnish and install all sleeves, inserts, anchor bolts and similar items to be set into masonry or concrete, as required for mechanical and electrical work. Internal diameter of sleeve shall be 2" larger than the outside diameter of the pipe or insulation covered line passing through it.

#### 1.12 CORING, DRILLING

- A. Core, cut and/or drill all small holes 4.5" diameter or less in walls and floors required for the installation of sleeves and supports for the electrical work.

#### 1.13 ACCESSIBILITY

- A. Install all work such that parts requiring periodic inspection, operation, maintenance and repair are readily accessible.
- B. Furnish all access panels appropriate to particular conditions, to be installed by trades having responsibility for the construction of actual walls, floors or ceilings at required locations.

#### 1.14 TOOLS AND EQUIPMENT

- A. Provide all tools and equipment required for the fabrication and installation of the mechanical and electrical equipment at the site.

#### 1.15 RECORD DRAWINGS, PROJECT CLOSEOUT

- A. Comply with requirements specified in Section 017700 – CONTRACT CLOSEOUT.

1.16 GUARANTEE/WARRANTY

- A. Guarantee Work of this Section in writing for one year following the date of beneficial occupancy by the User Agency. The guarantee shall repair or replace defective materials, equipment, workmanship and installation that develop within this period, promptly and to Designer's satisfaction and correct damage caused in making necessary repairs and replacements under guarantee within Contract Price.

1.17 OPERATING, INSTRUCTION AND MAINTENANCE MANUALS

- A. Refer to SECTION 017700 - CONTRACT CLOSEOUT for submittal procedures pertaining to operating and maintenance manuals.

1.18 QUALITY ASSURANCE

- A. The requirements of the State Building Code and local regulations establish the minimum acceptable quality of workmanship and materials, and all work shall conform thereto.

1.19 PHASING, DEMOLITION AND MAINTAINING EXISTING SERVICES

- A. During the execution of the work, required relocation, etc., of existing equipment and systems in the existing building areas where new work is to be installed or new connections are scheduled to be made, shall be performed by the Electrical contractor, as required by job conditions and as determined by the Designer in the field, to facilitate the installation of the new system, while demolition, relocation work or new tie ins will be performed. Outages required for construction purposes shall be scheduled for the shortest practical periods of time, in coordination with the User Agency's designated representative, for specified, mutually agreeable periods of time, after each of which the interruption shall cease and the service shall be restored.
- B. All deactivation, relocation and temporary tie-ins of electrical systems and equipment shall be provided by the Electrical Contractor. All demolition and removal of electrical systems and equipment designed to be demolished shall be provided by the Electrical Contractor. Place all demolished electrical materials except hazardous materials. As determined by the Authority having jurisdiction in general contractors provided dumpster. All hazardous electrical materials shall be legally disposed by the electrical contractor.
- C. Owner's Project Manger reserves the right to inspect the material scheduled for removal and salvage any items he deems usable as spare parts.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Product specifications are written in such a manner so as to specify what materials may be used in a particular location or application and therefore do not indicate what is not acceptable or suitable for a particular location or application. As an example: non-metallic sheathed cable is not specified; therefore, it is not acceptable.

- B. Where Specifications list manufacturer's names and/or "as approved" or "Equal approved" by Designer, other manufacturers equipment will be considered if equipment meets Specification requirements and has all features of the specified items as are considered essential by Designer.
- C. All materials shall be new and shall be UL listed.

## 2.02 RACEWAYS AND FITTINGS

- A. Raceways - General:
  - 1. No raceway shall be used smaller than 3/4" diameter. No conduit shall have more than three (3) 90° bends in any one run, and where necessary, pull boxes shall be provided. Intermediate metal conduit is not allowed.
  - 2. Rigid metal conduit conforming to, and installed in accordance with, Article 346 of NFPA 70 shall be heavy wall zinc coated steel conforming to American Standard Specifications C80-1 and may be used for service work, exterior work, slab work, and below grade level slab, wet locations, and in mechanical rooms and where raceway may be subject to mechanical damage, i.e., loading docks, work shops, etc.
  - 3. Thin wall conduit (EMT), conforming to, and installed in accordance with, Article 346 of NFPA 70 shall be zinc coated steel, conforming to industry standards, may be used in masonry block walls, stud partitions, above furred ceilings where exposed but not subject to mechanical damage, and shall be used for fire alarm work.
  - 4. Flexible metal conduit shall be used for connections to motors. Liquid tight flexible metal conduit shall be used for the above connections which are located in moist locations. All flexible connections shall include a grounding conductor.
  - 5. Acceptable manufacturers:
    - a. Pittsburgh Standard Conduit Company
    - b. Republic Steel and Tube
    - c. Youngstown Sheet Tube Company
    - d. Carlon
    - e. Perma-Cote Supreme
  - 6. Fittings:
    - a. Provide insulated bushings on all raceways 1 inch diameter or larger.
    - b. Manufacturer's standard fittings shall be used for raceway supports.
    - c. Expansion Fittings: Expansion fittings shall be used where structural and concrete expansion joints occur and shall include a ground strap.
    - d. Couplings for rigid metal conduit shall be threaded type.
    - e. Threadless fittings for EMT shall be watertight compression type. Set-screw type fittings are not acceptable. All fittings shall be concrete tight. No diecast fittings allowed except for raceways larger than 1 inch diameter.
    - f. Cable supports in vertical raceways shall be of the split wedge type. Armored cable supports for vertical runs to be of wire mesh basket design.
    - g. Wall entrance seals shall be equal to O.Z. Gedney type "WSK".
    - h. Couplings, elbows and other fittings used with rigid nonmetallic raceways shall be of the solvent cemented type to secure a waterproof installation.

- i. Acceptable manufacturers:
  - 1) O.Z.
  - 2) Crouse Hinds
  - 3) Appleton
  - 4) EFCOR
  - 5) Steel City

## 2.03 WIRING MATERIALS - 600V OR LESS SYSTEMS

- A. Conductors shall be copper with 600V insulation, THWN for branch circuitry and XHHW for feeders.
- B. Conductors shall be of soft drawn 98% minimum conductivity properly refined copper, solid construction where No. 10 AWG and smaller.
- C. Exterior of wires shall bear repetitive markings along their entire length indicating conductor size, insulation type and voltage rating.
- D. Exterior of wires shall be color coded, so as to indicate a clear differentiation between each phase and between each phase and neutral. In all cases, grounded neutral wires and cables shall be identified by the colors white or gray. In sizes and insulation types where factory applied colors are not available, wires and cables shall be color coded by the application of approved colored plastic tapes in overlapping turns at all terminal points, and in all boxes in which splices are made. Colored tape shall be applied for a distance of 6 inches along the wires and cables, or along their entire extensions beyond raceway ends, whichever is less.
- E. Minimum conductor size shall be No. 12 AWG installed in conduit. Motor control circuit wiring shall be minimum No. 14 AWG installed in conduit.
- F. Other wires and cables required for the various systems described elsewhere in this section of the Specifications shall be as specified herein, as shown on the Contract Drawings, or as recommended by the manufacturer of the specific equipment for which they are used, all installed in conduit.
- G. Wiring materials shall be manufactured by Triangle, Republic, Anaconda, General Cable, or equal.

## 2.04 JUNCTION AND PULL BOXES

- A. Pull and Junction Boxes: Where necessary to terminate, tap off, or redirect multiple raceway runs or to facilitate conductor installation, furnish, and install appropriately designed boxes. Boxes shall be fabricated from code gauge steel assembled with corrosion resistant machine screws. Box size shall be as required by Code. Where intermediate cable supports are necessary because of box dimensions, provide insulated removable core brackets to support conductors. Junction boxes are to be equipped with barriers to separate circuits. Where splices are to be made, boxes shall be large enough to provide ample work space. All conductors in boxes are to be clearly tagged to indicate characteristics. Boxes shall be supported independently of raceways. Junction boxes in moist or wet areas shall be galvanized type. Boxes larger than 4 inches square shall have

hinged covers. Boxes larger than 12 inches in one dimension will be allowed to have screw fastened covers, if a hinged cover would not be capable of being opened a full 90 degrees due to installation location.

2.05 GROUNDING REQUIREMENTS

- A. Ground all systems and equipment in accordance with best industry practice, the requirements of NFPA 70 and RI Electrical code.

2.06 PHASING AND COLOR CODING

- A. The insulation or covering of each wire or cable shall be color coded so as to provide for circuit identification as specified below.

<u>120/208 V Circuits</u>	<u>277/480V</u>	<u>Phase Circuits</u>
1. Black	Brown	A
2. Red	Orange	B
3. Blue	Yellow	C
4. White	Grey	Neutral
5. Green	Green w/yellow tracer	Equipment Ground

- B. Color coding shall be achieved by one of the following methods:
  - 1. The insulation or covering shall be coded during manufacture by use of one of the following methods:
    - a. Colored compounds.
    - b. Colored coatings.
  - 2. In sizes and insulation types where factory applied colors are not available, wires and cables shall be color coded by the application of colored plastic tapes in overlapping turns at all terminal points, and in all boxes in which splices are made.

2.07 MOLDED CASE CIRCUIT BREAKERS

- A. Molded case type circuit breakers shall consist of manually operated quick-make quick-break mechanically trip free operating mechanisms for simultaneous operation of all poles, with contacts, arc interrupters and trip elements for each pole, all enclosed in molded phenolic plastic cases.
  - 1. Their tripping units shall be of the "thermal magnetic" type having bimetallic elements for time delay overload protection and magnetic elements for short circuit protection.
  - 2. They shall be manually operable by means of toggle type operating handles having "tripped" position midway between the "on-off" position.
- B. They shall match existing circuit breakers in existing panels.

2.08 MOTOR CONTROLS.

- A. Disconnect Switches:
  - 1. Disconnect (safety) switches shall conform to industrial standards of NEMA, be UL listed and shall be heavy duty type, quick-make, quick-break type with interlocking cover mechanism and provisions for padlocking switch handle in "OFF" position. Three pole toggle switches are not acceptable as substitute for disconnect switches.
  - 2. Enclosures shall be of proper NEMA type for the intended location and shall be phosphate coated or equivalent code gauge galvanized sheet steel with gray baked enamel finish.
  - 3. Acceptable Manufacturers:
    - a. General Electric
    - b. Cutler Hammer
    - c. Square D

## 2.09 EQUIPMENT GROUNDING REQUIREMENTS

- A. Equipment ground all systems and equipment in accordance with best industry practice.
- B. Each branch circuit and feeder shall have a dedicated equipment grounding conductor, minimum # 12 AWG. Shared or tapped equipment grounding conductor shall not be acceptable.

## PART 3 - EXECUTION

### 3.01 BASIC REQUIREMENTS

- A. Adhere to best industry practice and the following.
- B. Route circuitry runs embedded in concrete to coordinate with structural requirements.
- C. Equip each raceway intended for the future installation of wire or cable with a nylon pulling cord 3/16 inch in diameter and clearly identify both ends of the raceway.
- D. Provide all junction boxes, and pull boxes for proper wire pulling and device installation. Include those omitted from the drawings due to symbolic methods of notation.
- E. Beyond the termination of raceways, fireproof the following:
  - 1. Fireproofing of wires and cables shall be by means of a half-lapped layer of arcproof or by means of sleeving of a type specifically manufactured for the purpose. Ends of tape or sleeving shall be served with twine. Fireproofing shall be extended up into raceways. After conductors have been finally shaped into their permanent configuration, fireproofing tape or sleeving shall be coated with silicate of soda (water glass). Fireproofing shall be applied in an overall manner to raceway groupings of conductors.
- F. Provide all sleeves through fireproof and waterproof slabs, walls, etc. required for electric work.
  - 1. Provide waterproof sealing for the sleeves through waterproof slabs, walls, etc.
  - 2. Provide fireproof sealing for the sleeves through fireproof walls, slabs, etc.

3. Provide fireproof sealing for the openings in fireproof walls, slabs, etc., resulting from removal of existing electrical sleeves, conduits, poke-thru's, etc.
- G. Bundle wiring passing through pull boxes and panel boards in a neat and orderly manner with plastic cable ties. Cable ties shall be Ty-Raps as manufactured by Thomas & Betts, Holub Industries Inc., Quick Wrap, Bundy Unirap or equal.

### 3.02 TESTING REQUIREMENTS AND INSTRUCTIONS

- A. The Electrical Contractor shall provide supervision, labor, materials, tools, test instruments and all other equipment or services and expenses required to test, adjust, set, calibrate, and operationally check work and components of the electrical systems and circuitry throughout the work.

The Electrical Contractor shall pay for all tests that are required by the AHJ, including expenses incident to retests occasioned by defects and failures of equipment to meet specifications, at no additional cost to the Owner. Any defects or deficiencies discovered in any of the electrical work shall be corrected.

The Electrical Contractor shall:

1. Replace wiring and equipment found defective (defined as failing to meet specified requirements) at no additional cost to the Owner.
  2. Submit three copies of test results to the engineer.
- B. Do not void equipment warranties or guarantees by testing and checkout work. Checks and tests shall be supplemental to and compatible with the manufacturer's installation instructions. Where deviations are apparent, obtain the manufacturer's approved review of procedure prior to testing. Where any repairs, modifications, adjustments, tests or checks are to be made, the Contractor shall contact the engineer to determine if the work should be performed by or with the manufacturer's representative.

All checks and tests specified for proper operating and safety of equipment and personnel are to be performed concurrent with progression of the work, prior to Final Acceptance by the Owner.

- C. Test are to:
1. Provide initial equipment/system acceptance.
  2. Provide recorded data for future routine maintenance and trouble shooting.
  3. Provide assurance that each system component is installed satisfactorily and can be expected to perform, and continue to perform, its specified function with reasonable reliability throughout the life of the facility.

### 3.03 BRANCH CIRCUITRY

- A. For all appliance branch circuitry, raceway sizes shall conform to industry standard maximum permissible occupancy requirements except where these are exceeded by other requirements specified elsewhere.
- B. Circuits shall be balanced on phases at their supply as evenly as possible.

- C. For circuitry indicated as being protected at 20 Amps or less, abide by the following:
  - 1. All 20 amp, 120/208 volt, 3 phase, 4 wire combined branch circuit homeruns shall be provided with a #8 AWG neutral conductor.
  - 2. Minimum conductor size shall be No. 12 A.W.G. copper.
  - 3. Conductors operating at 120 volts extending in excess of 100 Ft., the last outlet or fixture tap shall be No. 10 A.W.G. copper throughout.
  - 4. Circuits shall be balanced on phases at their supply point as evenly as possible.

#### 3.04 REQUIREMENTS GOVERNING ELECTRICAL WORK IN DAMP OR WET LOCATIONS

- A. Outlets and outlet size boxes shall be of galvanized cast ferrous metal only.
- B. The finish of threaded steel conduit shall be galvanized only.
- C. Wires for pulling into raceways for lighting and appliance branch circuitry shall be limited to "THWN".
- D. Wires for pulling into raceways for feeders shall be limited to "THWN".
- E. Plates for toggle switches and receptacles shall have gasketed snap shut covers suitable for wet locations while in use.
- F. Final connections of flexible conduit shall be neoprene sheathed.
- G. Apply one layer of half looped plastic electric insulating tape over wire nuts used for joining the conductors of wires.
- H. Enclosures for individually mounted switching and overcurrent devices shall be NEMA Class IV weatherproof construction.
- I. The covers, doors and plates and trims used in conjunction with all enclosures, pull boxes, outlet boxes, junction boxes, cabinets and the like shall be equipped with gaskets.
- J. The following shall be interpreted as damp or wet locations within building confines:
  - 1. Spaces where any designations indicating weatherproof (WP) or vaporproof appear on the drawings.
  - 2. Spaces defined as wet or damp locations by article 100 of the National Electric Code.

#### 3.05 IDENTIFICATION AND TAGGING

- A. Identify individually:
  - 1. Each safety disconnect switch.
  - 2. Each circuit breaker.
  - 3. Each feeder, wire or cable of all systems.
- B. Each wire or cable in a feeder shall be identified at its terminal points of connection and in each pullbox, junction box and panel gutter through which it passes.
- C. The nomenclature used to identify switches or circuit breakers shall:

1. Where they disconnect mains or services designate this fact.
  2. Where they control appliance branch circuitry, designate the name of the space and the load supplied.
- D. Identification for switches or circuit breakers shall be by means of the following:
1. Where individually enclosed -- engraved lamaroid nameplates showing 1/8" high white lettering on a black background fastened on the outside front face of the enclosure.
  2. Where in panelboards or load centers with doors -- typewritten directories mounted behind transparent plastic covers, in metal frames fastened on the inside face of the doors.
- E. Identification for wires and cables shall be by means of wrap around "brady" type labels.
- F. Identify each outlet box, junction box, and cabinet used in conjunction with empty raceway for wires of a future system by means of indelible markings on the inside denoting the system.

### 3.06 LIMITING NOISE PRODUCED BY ELECTRICAL INSTALLATION

- A. Perform the following work, in accordance with field instructions issued by the Designer to assure that minimal noise is produced by electrical installations due to equipment furnished as part of the electrical work.
- B. Check and tighten the fastenings of sheet metal plates, covers, doors and trims used in the enclosures of electrical equipment.
- C. Remove and replace any individual device containing one or more magnetic flux path metallic cores which is found to have a noise output exceeding that of other identical devices installed at the project.

### 3.07 SUPPORTS AND FASTENINGS

- A. Support work in accordance with best industry standards, State Electrical Code and the following:
- B. Nothing (including outlet, pull and junction boxes and fittings) shall depend on electric conduits, raceways or cables for support.
- C. Nothing shall rest on, or depend for support on, suspended ceiling media.
- D. Support less than 2" trade size, vertically run, conduits at intervals no greater than 8 Ft.
- E. Where they are not embedded in concrete, support less than 1" trade size, horizontally run, conduits at intervals no greater than 7 ft..
- F. As a minimum procedure, in suspended ceilings support small runs of circuitry (e.g., conduit not in excess of 1 inch trade size) from ceiling suspension members as defined above. Support larger runs of circuitry directly from structural slabs, decks or framing members.

- G. Fasten electric work to building structure in accordance with the best industry practice.
- H. As a minimum procedure, where weight applied to the attachment points is 100 lbs. or less, fasten to concrete and solid masonry with bolts and expansion shields.

### 3.08 SPLICING AND TERMINATING WIRES AND CABLES

- A. Maintain all splices and joints in removable cover boxes or cabinets where they may be easily inspected.
- B. Locate each completed conductor splice or joint in the outlet box, junction box, or pull box containing it, so that it is accessible from the removal cover side of the box.
- C. Join solid conductors No. 8 AWG and smaller by securely twisting them together and soldering, or by using insulated coiled steel spring "wire nut" type connectors. Exclude "wire nuts" employing non-expandable springs. Terminate conductors No. 8 AWG and smaller by means of a neat and fast holding application of the conductors directly to the binding screws or terminals of the equipment or devices to be connected.
- D. Except where wire nuts are used, build up insulation over conductor joints to a value, equal both in thickness and dielectric strength, to that of the factory applied conductor insulation. Insulation of conductor taps and joints shall be by means of half-lapped layers of rubber tape, with an outer layer of friction tape; by means of half-lapped layers of approved plastic electric insulating tape; or by means of split insulating casings manufactured specifically to insulate the particular connector and conductor, and fastened with stainless steel or non-metallic snaps or clips.

### 3.09 REQUIREMENTS FOR THE INSTALLATION OF JUNCTION BOXES AND PULL BOXES

- A. Locate all boxes so that their removable covers are accessible without necessitating the removal of parts of permanent building structure, including piping, ductwork, and other permanent mechanical elements.
- B. In conjunction with concealed circuitry, abide by one of the following instructions (as may be applicable to the conditions) in order to assure the aforementioned accessibility. (Not required for circuitry concealed by removable suspended ceiling tiles.)
  - 1. For a small (outlet size) box on circuitry concealed in a partition or wall, locate box or fitting so that its removable cover side (or the face of any applied raised cover) penetrates through to within 1/8" a of the exposed surface of the building materials concealing the circuitry and apply a blank or device plate to suit the functional requirements.
  - 2. For a small (outlet size) box on circuitry concealed in a suspended ceiling, and intended as an outlet for a non-demountable type of recessed lighting fixtures or other such electrical items, locate box totally hidden but with its removable cover not more than one foot away from the building construction opening occupied by the demountable items.
- C. Apply junction and pull boxes in accordance with the following:
  - 1. Include pull boxes in long straight runs of raceway to assure that cables are not

- damaged when they are pulled in.
  - 2. Include junction and pull boxes to assure a neat and workmanlike installation of raceways.
  - 3. Include junction and pull boxes to fulfill requirements pertaining to the limitations to the number of bends permitted in raceway between cable access points, the accessibility of cable joints and splices, and the application of cable supports.
  - 4. Include all required junction and pull boxes regardless of indications on the drawings (which, due to symbolic methods of notation, may omit to show some of them).
- D. Install junction boxes, pull boxes and outlet boxes in accordance with the following:
- 1. Exclude surface mounted outlet boxes in conjunction with concealed circuitry.
  - 2. Exclude unused circuitry openings in junction and pull boxes. In larger boxes each such opening shall be closed with a galvanized sheet steel plate fastened with a continuous weld all around. In small outlet type boxes, utilize plugs as specified for such boxes.
  - 3. Close up all unused circuitry openings in outlet boxes. Unused openings in cast boxes shall be closed with approved cast metal threaded plugs. Unused openings in sheet metal boxes shall be closed with sheet metal knock-out plugs.
  - 4. Boxes and plaster covers for duplex receptacles shall be arranged for vertical mounting of the receptacle.
  - 5. Equip outlet boxes used for devices which are connected to wires of systems supplied by more than one set of voltage characteristics with barriers to separate the different systems.

### 3.10 LOCATING AND ROUTING OF CIRCUITRY

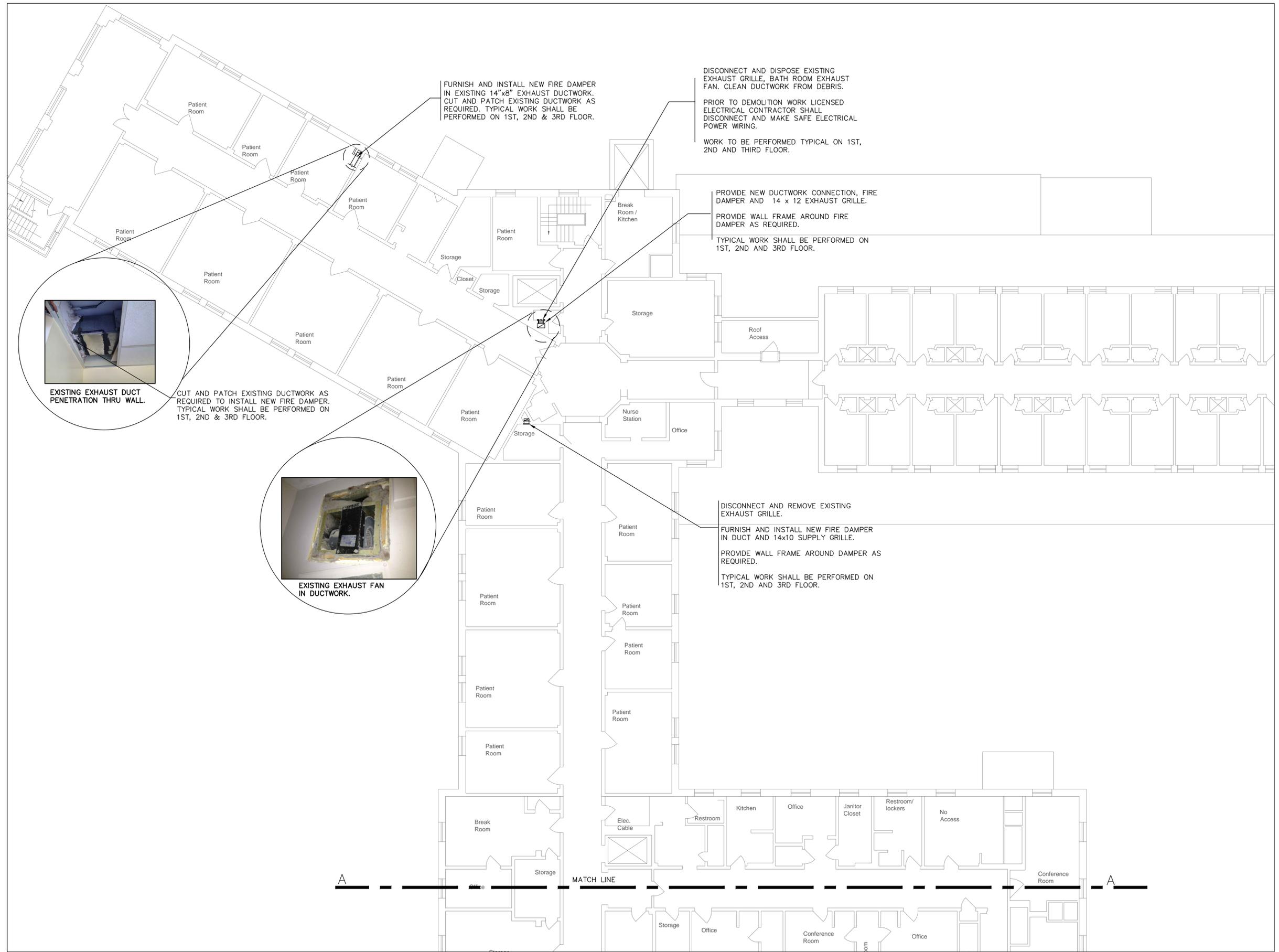
- A. Circuitry run exposed shall be routed parallel to building walls and column lines.
- B. Exposed circuitry located overhead shall be run in a completely accessible manner on the underside of all piping and ductwork.
- C. Circuitry run in suspended ceilings shall be routed parallel to building walls, column lines, etc.
- D. Circuitry shall be routed so as to prevent electric conductors from being subject to high ambient temperature. Minimum clearances from heated lines or surfaces shall be maintained as follows:
  - 1. Crossing where uninsulated 3"
  - 2. Crossing where insulated 1"
  - 3. Running parallel where uninsulated 36"
  - 4. Running parallel where insulated 6"
- E. Circuitry shall not be run in elevator shafts, hoistways, and the like. Where outlets for trail cables, pit lights, run be level lights, and the like, are involved, only the "final connection" outlet boxes themselves shall be located within or open into, the confines of the shaft.
- F. Circuitry for miscellaneous systems indicated without notation as to location and routing

shall be run as per the requirements and notations governing the adjacent light and power circuitry.

### 3.11 INSTALLING CIRCUITRY

- A. The outside surface of circuitry which is to be embedded in cinder concrete shall be coated with asphaltum paint.
- B. In runs of conduit or raceway including flexible limit the number of bends between cable access points to a total which does not exceed the maximum specified for the particular system. Where no such maximum is specified, limit the number to four right angle bends or the equivalent thereof.
- C. In each conduit or raceway assigned for the future pulling in of wires, include a nylon drag cord.
- D. Circuitry shall be arranged such that conductors of one feeder or circuitry carrying "going" current are not separated from conductors of the same feeder or circuitry carrying "return" current by any ferrous or other metal. Where not within raceways, all "going" and "return" current conductors of one feeder or circuit shall be laced together so as to minimize induction heating of adjacent metal components.
- E. Sleeves used where circuitry is to penetrate waterproof slabs, decks and walls, shall be of a type selected to suite the water condition encountered in the field.

END OF SECTION



**NORTH PLAN-FIRST, SECOND AND THIRD FLOOR**

SCALE: 1/8" = 1'-0"

No.	Date	Revisions	By
A	-	-	DEC
-	-	-	-
-	-	-	-
-	-	-	-

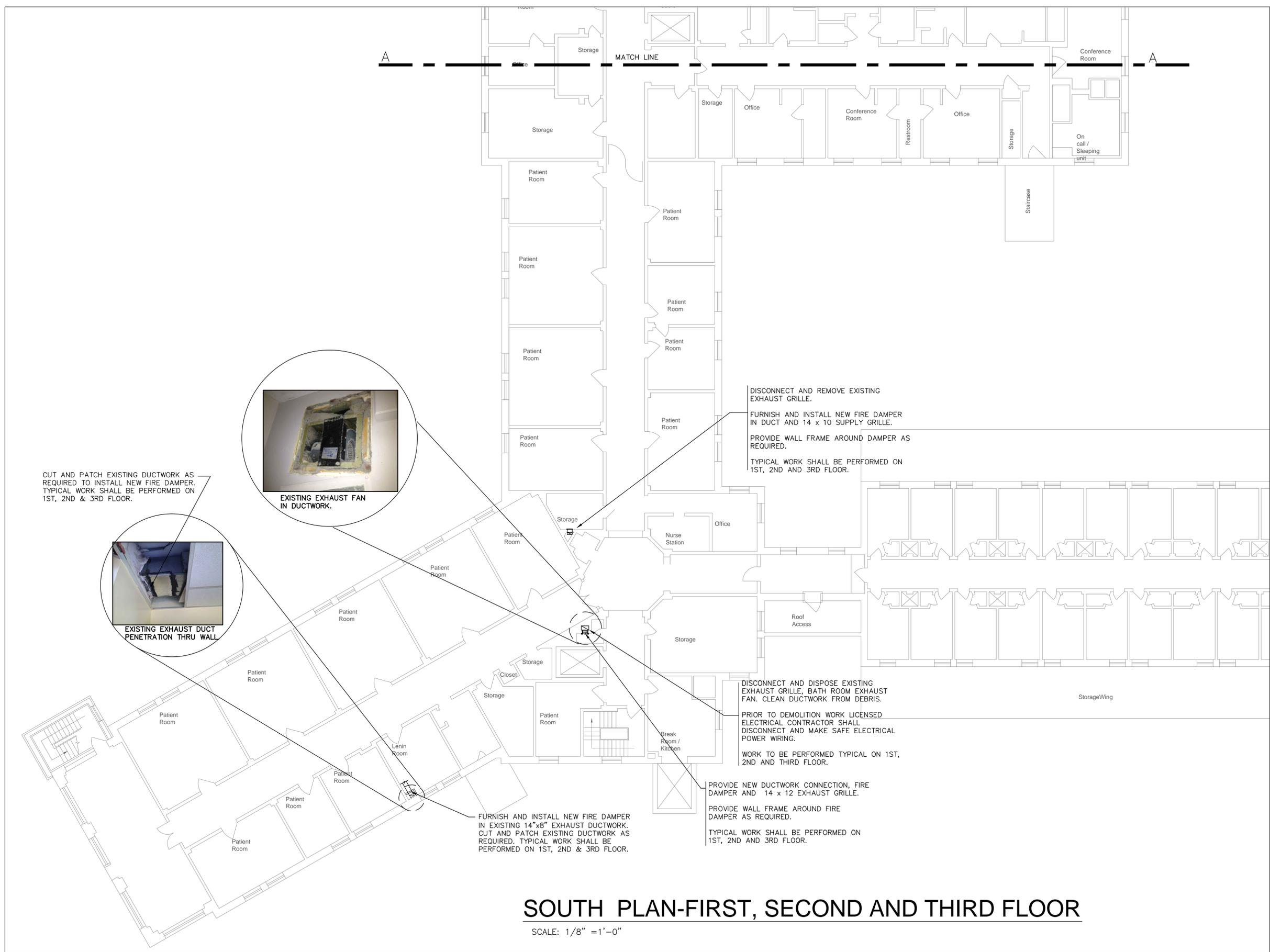
**AKAL ENGINEERING, INC.**  
 44 Central Street, Unit # 4  
 Berlin, MA, 01503  
 Telephone - (508) 869-0403  
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**ELEANOR SLATER HOSPITAL  
 ZAMBARANO UNIT.  
 BURRILLVILLE, RI**  
 SHEET TITLE  
 EXHAUST RISER UPGRADE  
 1ST, 2ND & 3RD FL. PLAN

**Bid Document**  
 North Plan-First, Second  
 and Third Floor

Date	10/8/14
Drawn by	JP
Chkd by	AK

Drawing  
**M-2**  
 of



CUT AND PATCH EXISTING DUCTWORK AS REQUIRED TO INSTALL NEW FIRE DAMPER. TYPICAL WORK SHALL BE PERFORMED ON 1ST, 2ND & 3RD FLOOR.



EXISTING EXHAUST DUCT PENETRATION THRU WALL



EXISTING EXHAUST FAN IN DUCTWORK.

FURNISH AND INSTALL NEW FIRE DAMPER IN EXISTING 14"x8" EXHAUST DUCTWORK. CUT AND PATCH EXISTING DUCTWORK AS REQUIRED. TYPICAL WORK SHALL BE PERFORMED ON 1ST, 2ND & 3RD FLOOR.

DISCONNECT AND REMOVE EXISTING EXHAUST GRILLE.  
 FURNISH AND INSTALL NEW FIRE DAMPER IN DUCT AND 14 x 10 SUPPLY GRILLE.  
 PROVIDE WALL FRAME AROUND DAMPER AS REQUIRED.  
 TYPICAL WORK SHALL BE PERFORMED ON 1ST, 2ND AND 3RD FLOOR.

DISCONNECT AND DISPOSE EXISTING EXHAUST GRILLE, BATH ROOM EXHAUST FAN. CLEAN DUCTWORK FROM DEBRIS.  
 PRIOR TO DEMOLITION WORK LICENSED ELECTRICAL CONTRACTOR SHALL DISCONNECT AND MAKE SAFE ELECTRICAL POWER WIRING.  
 WORK TO BE PERFORMED TYPICAL ON 1ST, 2ND AND THIRD FLOOR.

PROVIDE NEW DUCTWORK CONNECTION, FIRE DAMPER AND 14 x 12 EXHAUST GRILLE.  
 PROVIDE WALL FRAME AROUND FIRE DAMPER AS REQUIRED.  
 TYPICAL WORK SHALL BE PERFORMED ON 1ST, 2ND AND 3RD FLOOR.

# SOUTH PLAN-FIRST, SECOND AND THIRD FLOOR

SCALE: 1/8" = 1'-0"

No.	Date	Revisions	By
A			DEC

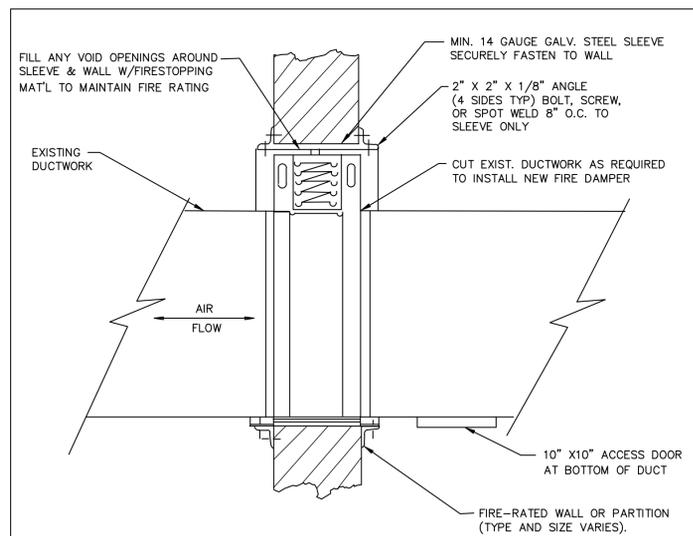
**AKAL Engineering Inc.**  
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**ELEANOR SLATER HOSPITAL  
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 SHEET TITLE  
 EXHAUST RISER UPGRADE  
 1ST, 2ND & 3RD FL. PLAN

**Bid Document**  
 South Plan-First, Second  
 and Third Floor

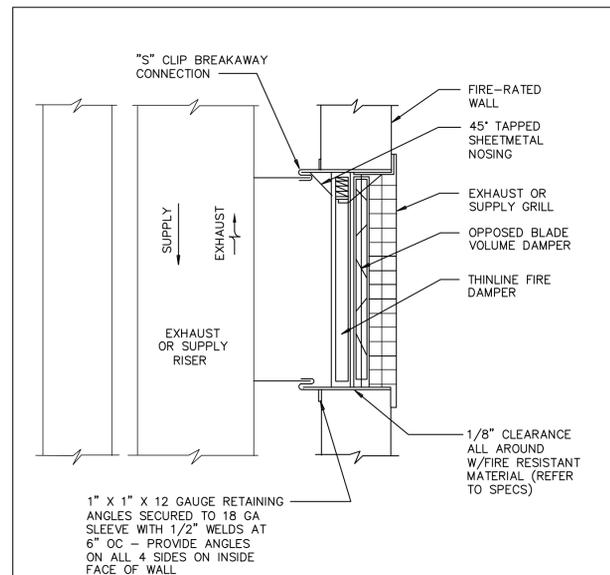
Date	10/8/14
Drawn by	JP
Chkd by	AK

Drawing  
**M-1**  
 of



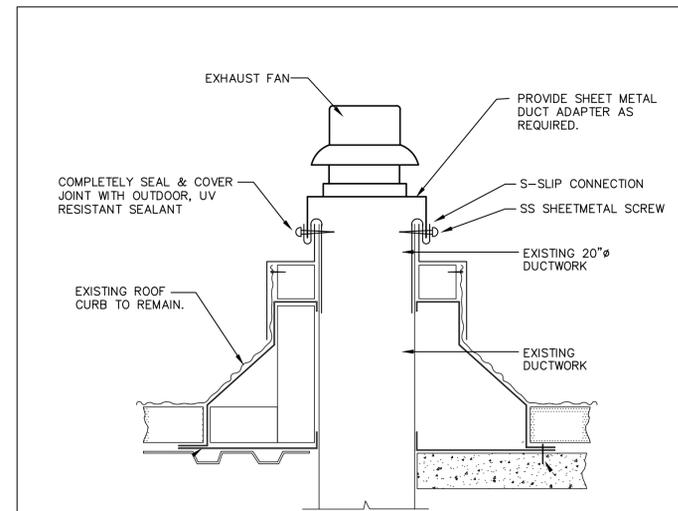
- NOTES:
1. ANY CLEARANCE BETWEEN FIRE-RATED WALL OR PARTITION AND DAMPER SLEEVE OR DAMPER SHALL BE FILLED WITH FIRE-RESISTANT PACKING ON ALL SIDES TO MAINTAIN FIRE RATING.
  2. DAMPER BLADES SHALL BE OUT OF AIRSTREAM TYPE "3A,3B,7 OR 8" (SEE SMACNA FIRE DAMPER AND HEAT STOP GUIDE - 2ND EDITION PAGE 9 OR NEWER VERSION IF APPLICABLE) WHEN OPEN 100% FREE AREA IS REQUIRED. WHEN DUCT DIMENSIONS REQUIRE MULTIPLE DAMPER SECTIONS, TYPE "2" MAY BE USED.
  3. PROVIDE SPRING LOADED CLOSURE FOR ALL FIRE DAMPERS.
  4. WHEN DUCTWORK IS INSULATED OR LINED, PROVIDE INSULATED ACCESS DOOR.
  5. ACCESS DOOR SHALL BE 12" X 12" OR LARGER IF REQUIRED FOR FUSIBLE LINK REPLACEMENT.
  6. TYPE "1" FIRE DAMPERS (BLADES IN AIR STREAM) MAY BE SUBSTITUTED FOR TYPE "3A OR 3B" WHERE VELOCITIES ARE UNDER 500 FPM IN LOW PRESSURE DUCT SYSTEMS ONLY.
  7. INSTALLATION SHOWN AS AN EXAMPLE. SPECIFIC INSTALLATION SHALL CONFORM WITH MANUFACTURER'S, UL APPROVED INSTRUCTIONS.

**1** DUCT MOUNTED FIRE DAMPER  
NOT TO SCALE



- NOTE:  
INSTALLATION SHOWN AS AN EXAMPLE. SPECIFIC INSTALLATION SHALL CONFORM WITH MANUFACTURER'S, UL APPROVED INSTRUCTIONS.

**2** LOW VELOCITY THINLINE FIRE DAMPER  
NOT TO SCALE



**3** EXHAUST FAN MOUNTING DETAIL  
NOT TO SCALE

No.	Date	Revisions	By
A	-	-	DEC
-	-	-	-
-	-	-	-
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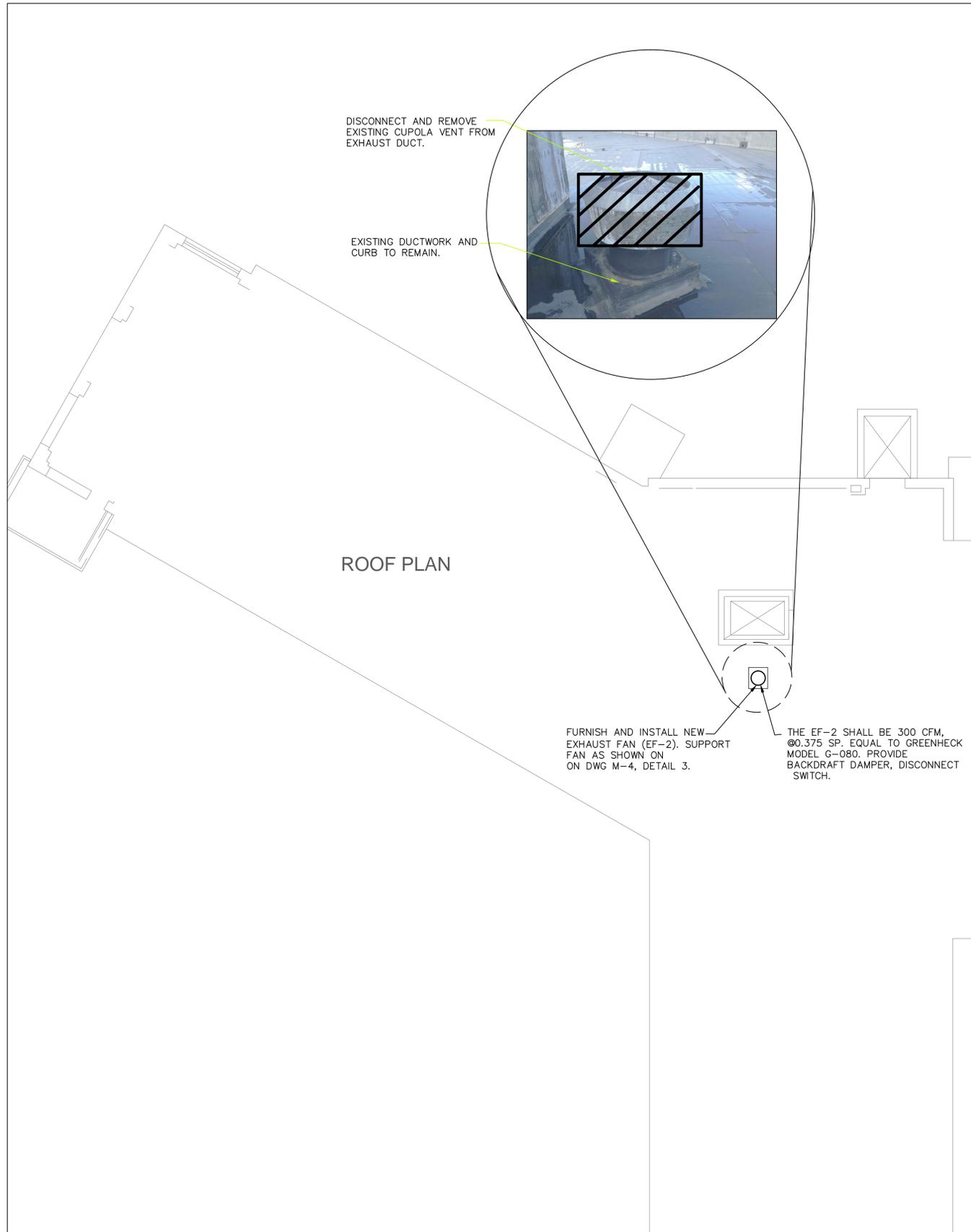
**AKAL ENGINEERING Inc.**  
44 Central Street, Unit # 4  
Berlin, MA, 01503  
Telephone - (508) 869-0403  
Fax - (508) 869-2891  
www.akalengineering.com

**ELEANOR SLATER HOSPITAL  
ZAMBARANO UNIT.  
BURRILLVILLE, RI**  
SHEET TITLE  
EXHAUST RISER UPGRADE  
DETAILS

**Bid Document  
Details**

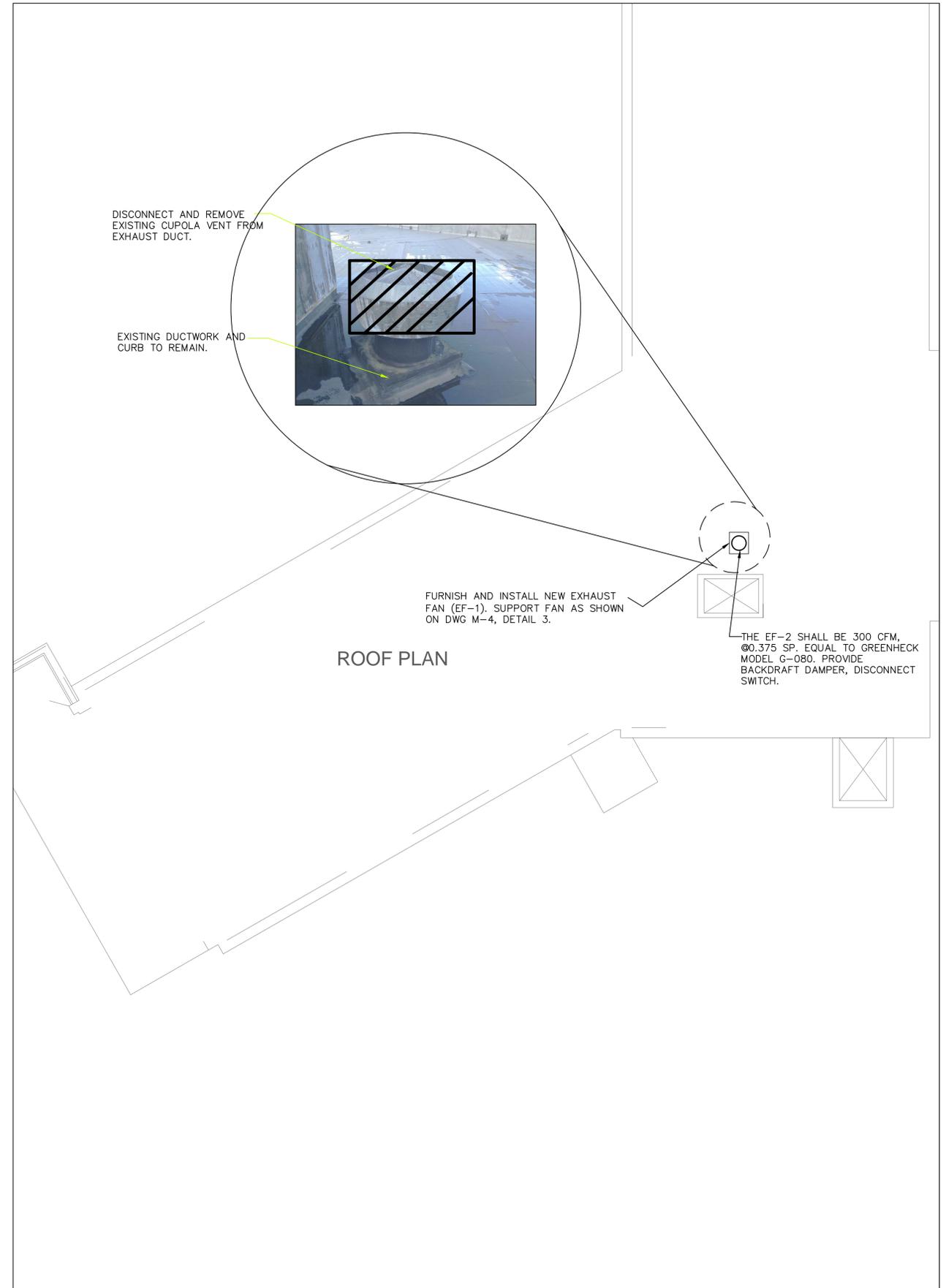
Date	10/8/14
Drawn by	JP
Chkd by	AK

Drawing  
**M-4**  
( of )



### ROOF NORTH PART PLAN

SCALE: 1/8" = 1'-0"



### ROOF SOUTH PART PLAN

SCALE: 1/8" = 1'-0"

No.	Date	Revisions	By
A	-	-	DEC
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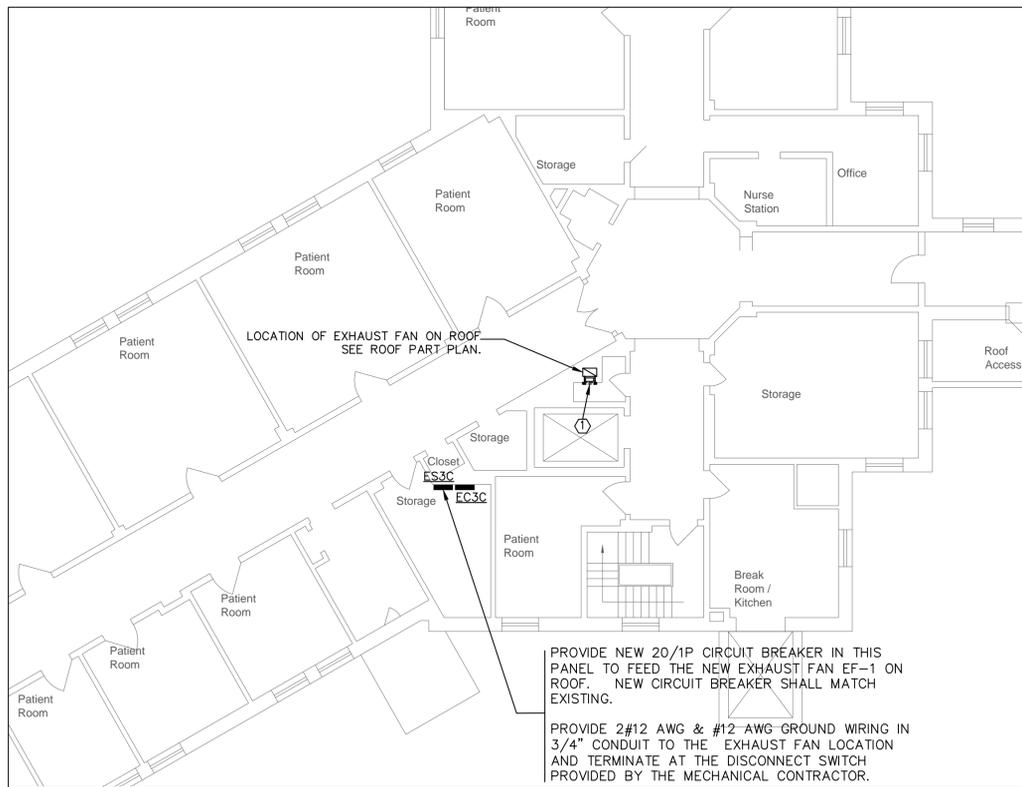
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SHEET TITLE  
**EXHAUST RISER UPGRADE  
 ROOF PLAN**

**Bid Document  
 Roof Part Plan**

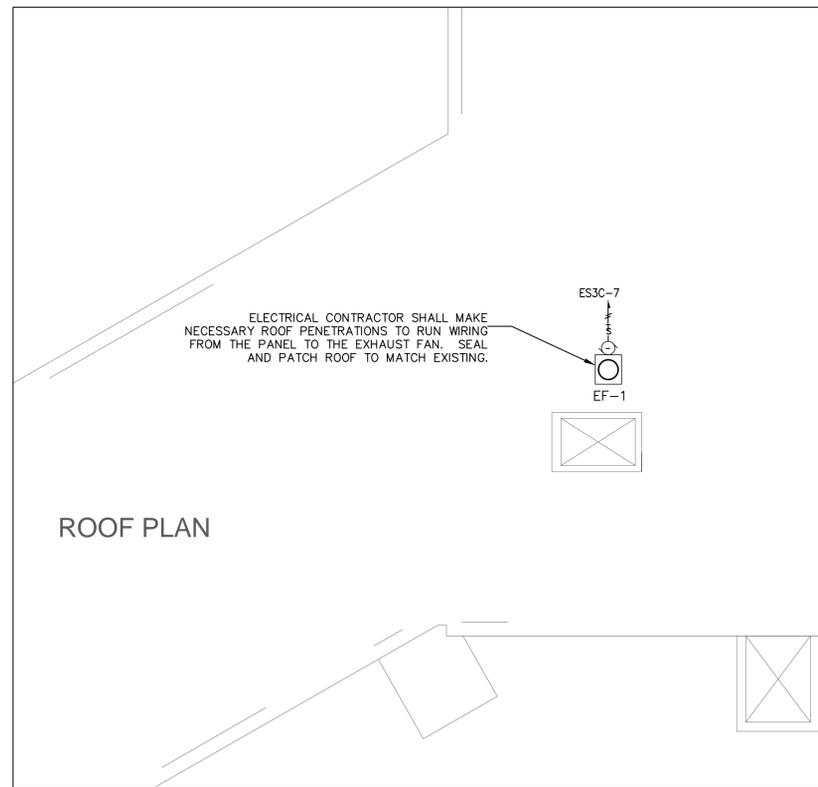
Date	10/8/14
Drawn by	JP
Chkd by	AK

Drawing  
**M-3**  
 of



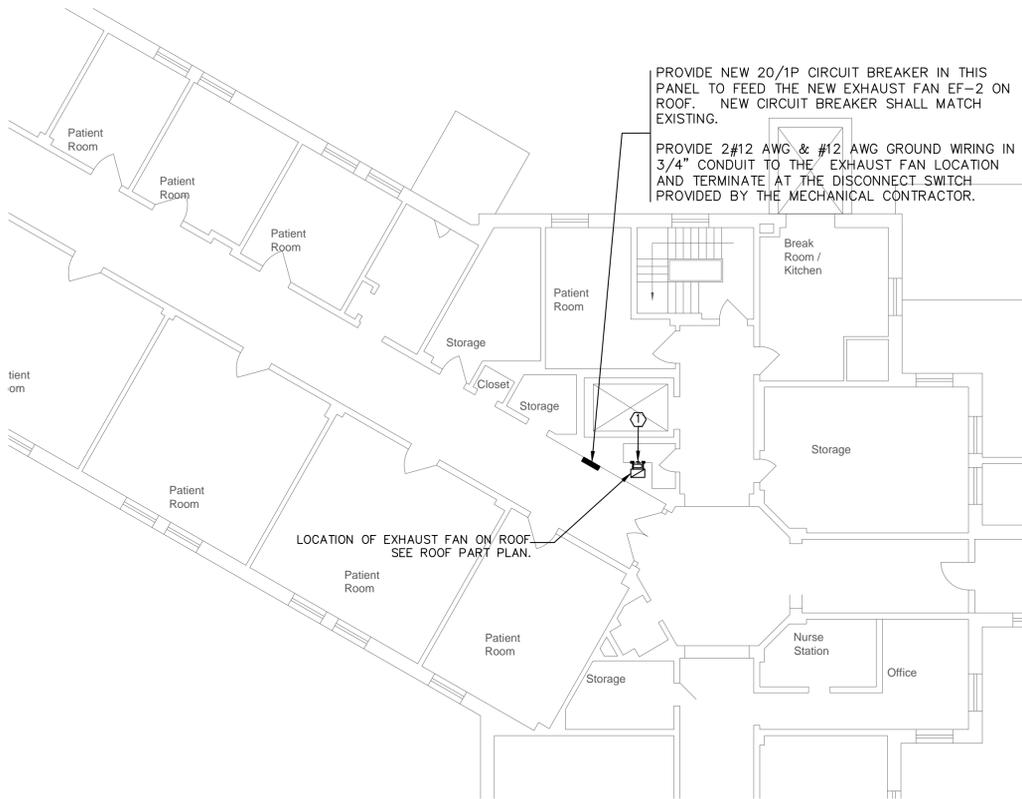
### THIRD FLOOR SOUTH PART PLAN

SCALE: 1/8" = 1'-0"



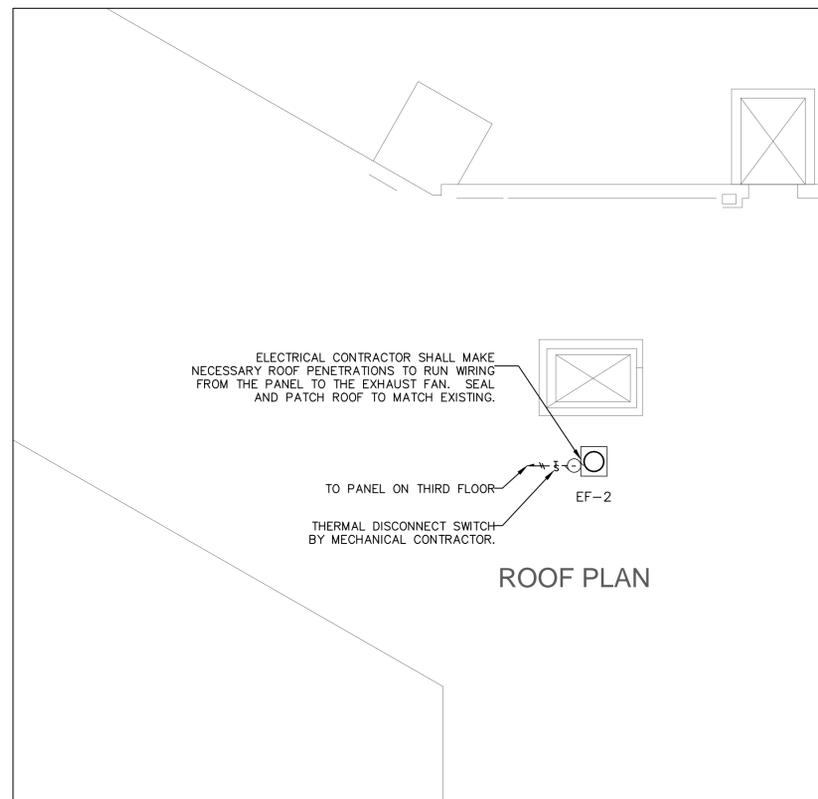
### ROOF SOUTH PART PLAN

SCALE: 1/8" = 1'-0"



### THIRD FLOOR NORTH PART PLAN

SCALE: 1/8" = 1'-0"

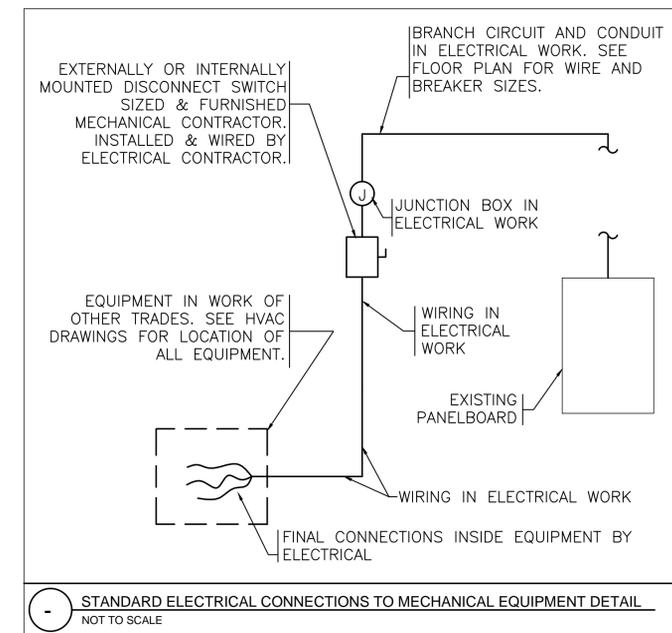


### ROOF NORTH PART PLAN

SCALE: 1/8" = 1'-0"

**KEY NOTE:**

① DISCONNECT AND REMOVE POWER FROM EXISTING BATH ROOM EXHAUST FAN (TYPICAL ON 1ST, 2ND AND THIRD FLOOR). REMOVE WIRING, CONDUIT, ETC. BACK TO THE NEAREST JUNCTION BOX. CONFIRM ALL OTHER DEVICES/EQUIPMENT CONNECTED TO THE CIRCUIT ARE WORKING AS NEEDED.



No.	Date	Revisions	By
A			DEC

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SHEET TITLE  
**EXHAUST RISER UPGRADE  
 ELECTRICAL**

**Bid Document  
 Electrical Power Plan**

Date	10/8/14
Drawn by	JP
Chkd by	AK

Drawing  
**E-1**  
 ( of )