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State of New Hampshire

DEPARTMENT OF ADMINISTRATIVE SERVICES
25 Capitol Street
Concord, New Hampshire 03301
(603) 271-3201 Office@das.nh.gov

Charles M. Arlinghaus
Commissioner

Catherine A. Keane
Deputy Commissioner

Sheri L. Rockburn
Assistant Commissioner

August 1, 2025

Her Excellency, Governor Kelly A. Ayotte
and the Honorable Council
State House
Concord, New Hampshire 03301

REQUESTED ACTION

1) Authorize the Department of Administrative Services to enter into a contract with CDS Unlimited LLC (VC#422357), Bennington, NH, in an amount up to and not to exceed $417,980.00 for building rewiring services at the Concord Main Building at 105 Pleasant Street, Concord, NH, with the option to extend for an additional three months, effective upon Governor and Executive Council approval, through January 20, 2027. **Funding is 100% Capital Funds.**

2) Further authorize that a contingency in the amount of $20,000.00 be approved for unanticipated site expenses. **Funding is 100% Capital Funds.**

3) Further authorize the amount of $24,000.00 be approved for payment to the Department of Administrative Services, Division of Public Works Design and Construction (VC#311152) for engineering and project management services provided. **Funding is 100% Capital Funds.**

Funding is available in account title Department of Administrative Services as follows:

	FY 2026
01-14-14-149030-92720000 – L21:1IB2-Main Bldg Rewrng	
034-500162 - Repair / Renovation Buildings	$417,980.00
034-500162 - Contingency	$20,000.00
034-500162 - DPW Fees	$ 24,000.00
Project Total	$461,980.00

EXPLANATION

At the request of the Department of Administrative Services, Division of Plant & Property (DPP), the Bureau of Purchase and Property (BoPP), issued request for bid (RFB) 3049-25 on June 19, 2025, for Concord Main Building Rewiring Services at the Concord Main Building at 105 Pleasant Street, Concord, NH, with responses due on July 11, 2025. This bid reached one-hundred-nineteen (119) vendors through the NIGP registry with an additional twenty-five (25) directly sourced. There were two (2) responses received with CDS Unlimited LLC providing the lowest cost bid response.

Upon approval this contract shall facilitate the required building rewiring work at the Concord Main Building in Concord, NH. The full scope of this project represents a requested price limitation up to and not to exceed $417,980.00 and includes a project allowance amount of $100,000.00 for any unforeseen issues. CDS Unlimited LLC has submitted all required and certified payment and performance bond paperwork. The payment and performance bond is certified at $417,980.00 or 100% of the project cost. The total cost, including DPW fees, is $461,980.00. The DPW estimate for the project is $630,000.00 and includes the project allowance and all applicable fees. When compared against the DPW estimate this represents a cost savings to the State of $168,020.00, or 26.67%.

Contract financials	
Vendor base bid	$317,980.00
Vendor project allowance	$100,000.00
Requested project price limitation	$417,980.00
Project contingency	$20,000.00
Total project fees	$24,000.00
Project total (vendor bid, allowance, and all fees)	$461,980.00
DPW estimate cost	$630,000.00
Cost savings	$168,020.00

Based on the foregoing, I am respectfully recommending approval of the contract with CDS Unlimited LLC.

Respectfully submitted,

Catherine A. Keane
For

Charles M. Arlinghaus
Commissioner

Division of Procurement Support Services
Bureau of Purchase Property

Gary S. Lunetta
Director
(603) 271-2201

RFB Bid Summary

Bid Description	Concord Main Building Rewiring Services	Agency	Department of Administrative Services
RFB#	3049-25	Requisition#	N/A
Agent Name	Ryan Fuller	Bid Closing	July 11, 2025 at 10:30AM EST

Indicates Award:

Qty.	UOM	Product Description	CDS Unlimited LLC	Gerard A. LaFlamme	DPW Estimate
1	EA	Concord Main Building Rewiring Services Vendor Base Bid	$317,980.00	$371,000.00	$630,000.00
1	EA	Concord Main Building Rewiring Services Project Allowance	$100,000.00	$100,000.00	
		Total Amount	**$417,980.00**	**$471,000.00**	**$630,000.00**

Recommendation Summary	
Price Limitation	$417,980.00
Number of Solicitations Received	2
Number of Sourced bidders	25
Number of NIGP Vendors Sourced	119
Number of non-responsive bidders	142
P-37 Checklist Complete	Yes
D&B Report Attached	Yes
Method of Payment (P-card/ACH)	ACH
FOB Delivered	Yes
Special Notes:	

Notice: This agreement and all of its attachments shall become public upon submission to Governor and Executive Council for approval. Any information that is private, confidential or proprietary must be clearly identified to the agency and agreed to in writing prior to signing the contract.

AGREEMENT

The State of New Hampshire and the Contractor hereby mutually agree as follows:

GENERAL PROVISIONS

1. IDENTIFICATION.

1.1 State Agency Name Department of Administrative Services Bureau of Purchase and Property		1.2 State Agency Address 25 Capitol Street Concord, NH 03301	
1.3 Contractor Name CDS Unlimited LLC		1.4 Contractor Address 279 Bible Hill Road Bennington, NH 03442	
1.5 Contractor Phone Number 603-714-5974	1.6 Account Unit and Class	1.7 Completion Date January 20, 2027	1.8 Price Limitation $417,980.00
1.9 Contracting Officer for State Agency Ryan Fuller		1.10 State Agency Telephone Number 603-271-2201	
1.11 Contractor Signature Jordan Widger Digitally signed by Jordan Widger Date: 2025.07.21 08:26:17 -04'00' Date: 07-21-2025		1.12 Name and Title of Contractor Signatory Jordan Widger, Owner	
1.13 State Agency Signature Catherine A. Keane Date: 8/19/25		1.14 Name and Title of State Agency Signatory pp Charles M. Arlinghaus, Commissioner	
1.15 Approval by the N.H. Department of Administration, Division of Personnel *(if applicable)* By: Director, On:			
1.16 Approval by the Attorney General (Form, Substance and Execution) *(if applicable)* By: Christine Wilson On: 9/17/25			
1.17 Approval by the Governor and Executive Council *(if applicable)* G&C Item number: G&C Meeting Date:			

Contractor Initials JW

Date 07-21-25

2. SERVICES TO BE PERFORMED. The State of New Hampshire, acting through the agency identified in block 1.1 ("State"), engages contractor identified in block 1.3 ("Contractor") to perform, and the Contractor shall perform, the work or sale of goods, or both, identified and more particularly described in the attached EXHIBIT B which is incorporated herein by reference ("Services").

3. EFFECTIVE DATE/COMPLETION OF SERVICES.

3.1 Notwithstanding any provision of this Agreement to the contrary, and subject to the approval of the Governor and Executive Council of the State of New Hampshire, if applicable, this Agreement, and all obligations of the parties hereunder, shall become effective on the date the Governor and Executive Council approve this Agreement, unless no such approval is required, in which case the Agreement shall become effective on the date the Agreement is signed by the State Agency as shown in block 1.13 ("Effective Date").

3.2 If the Contractor commences the Services prior to the Effective Date, all Services performed by the Contractor prior to the Effective Date shall be performed at the sole risk of the Contractor, and in the event that this Agreement does not become effective, the State shall have no liability to the Contractor, including without limitation, any obligation to pay the Contractor for any costs incurred or Services performed.

3.3 Contractor must complete all Services by the Completion Date specified in block 1.7.

4. CONDITIONAL NATURE OF AGREEMENT.

Notwithstanding any provision of this Agreement to the contrary, all obligations of the State hereunder, including, without limitation, the continuance of payments hereunder, are contingent upon the availability and continued appropriation of funds. In no event shall the State be liable for any payments hereunder in excess of such available appropriated funds. In the event of a reduction or termination of appropriated funds by any state or federal legislative or executive action that reduces, eliminates or otherwise modifies the appropriation or availability of funding for this Agreement and the Scope for Services provided in EXHIBIT B, in whole or in part, the State shall have the right to withhold payment until such funds become available, if ever, and shall have the right to reduce or terminate the Services under this Agreement immediately upon giving the Contractor notice of such reduction or termination. The State shall not be required to transfer funds from any other account or source to the Account identified in block 1.6 in the event funds in that Account are reduced or unavailable.

5. CONTRACT PRICE/PRICE LIMITATION/ PAYMENT.

5.1 The contract price, method of payment, and terms of payment are identified and more particularly described in EXHIBIT C which is incorporated herein by reference.

5.2 Notwithstanding any provision in this Agreement to the contrary, and notwithstanding unexpected circumstances, in no event shall the total of all payments authorized, or actually made hereunder, exceed the Price Limitation set forth in block 1.8. The payment by the State of the contract price shall be the only and the complete reimbursement to the Contractor for all expenses, of whatever nature incurred by the Contractor in the performance hereof and shall be the only and the complete compensation to the Contractor for the Services.

5.3 The State reserves the right to offset from any amounts otherwise payable to the Contractor under this Agreement those liquidated amounts required or permitted by N.H. RSA 80:7 through RSA 80:7-c or any other provision of law.

5.4 The State's liability under this Agreement shall be limited to monetary damages not to exceed the total fees paid. The Contractor agrees that it has an adequate remedy at law for any breach of this Agreement by the State and hereby waives any right to specific performance or other equitable remedies against the State.

6. COMPLIANCE BY CONTRACTOR WITH LAWS AND REGULATIONS/EQUAL EMPLOYMENT OPPORTUNITY.

6.1 In connection with the performance of the Services, the Contractor shall comply with all applicable statutes, laws, regulations, and orders of federal, state, county or municipal authorities which impose any obligation or duty upon the Contractor, including, but not limited to, civil rights and equal employment opportunity laws and the Governor's order on Respect and Civility in the Workplace, Executive order 2020-01. In addition, if this Agreement is funded in any part by monies of the United States, the Contractor shall comply with all federal executive orders, rules, regulations and statutes, and with any rules, regulations and guidelines as the State or the United States issue to implement these regulations. The Contractor shall also comply with all applicable intellectual property laws.

6.2 During the term of this Agreement, the Contractor shall not discriminate against employees or applicants for employment because of age, sex, sexual orientation, race, color, marital status, physical or mental disability, religious creed, national origin, gender identity, or gender expression, and will take affirmative action to prevent such discrimination, unless exempt by state or federal law. The Contractor shall ensure any subcontractors comply with these nondiscrimination requirements.

6.3 No payments or transfers of value by Contractor or its representatives in connection with this Agreement have or shall be made which have the purpose or effect of public or commercial bribery, or acceptance of or acquiescence in extortion, kickbacks, or other unlawful or improper means of obtaining business.

6.4. The Contractor agrees to permit the State or United States access to any of the Contractor's books, records and accounts for the purpose of ascertaining compliance with this Agreement and all rules, regulations and orders pertaining to the covenants, terms and conditions of this Agreement.

7. PERSONNEL.

7.1 The Contractor shall at its own expense provide all personnel necessary to perform the Services. The Contractor warrants that all personnel engaged in the Services shall be qualified to perform the Services and shall be properly licensed and otherwise authorized to do so under all applicable laws.

7.2 The Contracting Officer specified in block 1.9, or any successor, shall be the State's point of contact pertaining to this Agreement.

Contractor Initials JW

Date 07-21-25

8. EVENT OF DEFAULT/REMEDIES.

8.1 Any one or more of the following acts or omissions of the Contractor shall constitute an event of default hereunder ("Event of Default"):

8.1.1 failure to perform the Services satisfactorily or on schedule;

8.1.2 failure to submit any report required hereunder; and/or

8.1.3 failure to perform any other covenant, term or condition of this Agreement.

8.2 Upon the occurrence of any Event of Default, the State may take any one, or more, or all, of the following actions:

8.2.1 give the Contractor a written notice specifying the Event of Default and requiring it to be remedied within, in the absence of a greater or lesser specification of time, thirty (30) calendar days from the date of the notice; and if the Event of Default is not timely cured, terminate this Agreement, effective two (2) calendar days after giving the Contractor notice of termination;

8.2.2 give the Contractor a written notice specifying the Event of Default and suspending all payments to be made under this Agreement and ordering that the portion of the contract price which would otherwise accrue to the Contractor during the period from the date of such notice until such time as the State determines that the Contractor has cured the Event of Default shall never be paid to the Contractor;

8.2.3 give the Contractor a written notice specifying the Event of Default and set off against any other obligations the State may owe to the Contractor any damages the State suffers by reason of any Event of Default; and/or

8.2.4 give the Contractor a written notice specifying the Event of Default, treat the Agreement as breached, terminate the Agreement and pursue any of its remedies at law or in equity, or both.

9. TERMINATION.

9.1 Notwithstanding paragraph 8, the State may, at its sole discretion, terminate the Agreement for any reason, in whole or in part, by thirty (30) calendar days written notice to the Contractor that the State is exercising its option to terminate the Agreement.

9.2 In the event of an early termination of this Agreement for any reason other than the completion of the Services, the Contractor shall, at the State's discretion, deliver to the Contracting Officer, not later than fifteen (15) calendar days after the date of termination, a report ("Termination Report") describing in detail all Services performed, and the contract price earned, to and including the date of termination. In addition, at the State's discretion, the Contractor shall, within fifteen (15) calendar days of notice of early termination, develop and submit to the State a transition plan for Services under the Agreement.

10. PROPERTY OWNERSHIP/DISCLOSURE.

10.1 As used in this Agreement, the word "Property" shall mean all data, information and things developed or obtained during the performance of, or acquired or developed by reason of, this Agreement, including, but not limited to, all studies, reports, files, formulae, surveys, maps, charts, sound recordings, video recordings, pictorial reproductions, drawings, analyses, graphic representations, computer programs, computer printouts, notes, letters, memoranda, papers, and documents, all whether finished or unfinished.

10.2 All data and any Property which has been received from the State, or purchased with funds provided for that purpose under this Agreement, shall be the property of the State, and shall be returned to the State upon demand or upon termination of this Agreement for any reason.

10.3 Disclosure of data, information and other records shall be governed by N.H. RSA chapter 91-A and/or other applicable law. Disclosure requires prior written approval of the State.

11. CONTRACTOR'S RELATION TO THE STATE. In the performance of this Agreement the Contractor is in all respects an independent contractor, and is neither an agent nor an employee of the State. Neither the Contractor nor any of its officers, employees, agents or members shall have authority to bind the State or receive any benefits, workers' compensation or other emoluments provided by the State to its employees.

12. ASSIGNMENT/DELEGATION/SUBCONTRACTS.

12.1 Contractor shall provide the State written notice at least fifteen (15) calendar days before any proposed assignment, delegation, or other transfer of any interest in this Agreement. No such assignment, delegation, or other transfer shall be effective without the written consent of the State.

12.2 For purposes of paragraph 12, a Change of Control shall constitute assignment. "Change of Control" means (a) merger, consolidation, or a transaction or series of related transactions in which a third party, together with its affiliates, becomes the direct or indirect owner of fifty percent (50%) or more of the voting shares or similar equity interests, or combined voting power of the Contractor, or (b) the sale of all or substantially all of the assets of the Contractor.

12.3 None of the Services shall be subcontracted by the Contractor without prior written notice and consent of the State.

12.4 The State is entitled to copies of all subcontracts and assignment agreements and shall not be bound by any provisions contained in a subcontract or an assignment agreement to which it is not a party.

13. INDEMNIFICATION. The Contractor shall indemnify, defend, and hold harmless the State, its officers, and employees from and against all actions, claims, damages, demands, judgments, fines, liabilities, losses, and other expenses, including, without limitation, reasonable attorneys' fees, arising out of or relating to this Agreement directly or indirectly arising from death, personal injury, property damage, intellectual property infringement, or other claims asserted against the State, its officers, or employees caused by the acts or omissions of negligence, reckless or willful misconduct, or fraud by the Contractor, its employees, agents, or subcontractors. The State shall not be liable for any costs incurred by the Contractor arising under this paragraph 13. Notwithstanding the foregoing, nothing herein contained shall be deemed to constitute a waiver of the State's sovereign immunity, which immunity is hereby reserved to the State. This covenant in paragraph 13 shall survive the termination of this Agreement.

14. INSURANCE.

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14.1 The Contractor shall, at its sole expense, obtain and continuously maintain in force, and shall require any subcontractor or assignee to obtain and maintain in force, the following insurance:

14.1.1 commercial general liability insurance against all claims of bodily injury, death or property damage, in amounts of not less than $1,000,000 per occurrence and $2,000,000 aggregate or excess; and

14.1.2 special cause of loss coverage form covering all Property subject to subparagraph 10.2 herein, in an amount not less than 80% of the whole replacement value of the Property.

14.2 The policies described in subparagraph 14.1 herein shall be on policy forms and endorsements approved for use in the State of New Hampshire by the N.H. Department of Insurance, and issued by insurers licensed in the State of New Hampshire.

14.3 The Contractor shall furnish to the Contracting Officer identified in block 1.9, or any successor, a certificate(s) of insurance for all insurance required under this Agreement. At the request of the Contracting Officer, or any successor, the Contractor shall provide certificate(s) of insurance for all renewal(s) of insurance required under this Agreement. The certificate(s) of insurance and any renewals thereof shall be attached and are incorporated herein by reference.

15. WORKERS' COMPENSATION.

15.1 By signing this agreement, the Contractor agrees, certifies and warrants that the Contractor is in compliance with or exempt from, the requirements of N.H. RSA chapter 281-A *("Workers' Compensation")*.

15.2 To the extent the Contractor is subject to the requirements of N.H. RSA chapter 281-A, Contractor shall maintain, and require any subcontractor or assignee to secure and maintain, payment of Workers' Compensation in connection with activities which the person proposes to undertake pursuant to this Agreement. The Contractor shall furnish the Contracting Officer identified in block 1.9, or any successor, proof of Workers' Compensation in the manner described in N.H. RSA chapter 281-A and any applicable renewal(s) thereof, which shall be attached and are incorporated herein by reference. The State shall not be responsible for payment of any Workers' Compensation premiums or for any other claim or benefit for Contractor, or any subcontractor or employee of Contractor, which might arise under applicable State of New Hampshire Workers' Compensation laws in connection with the performance of the Services under this Agreement.

16. WAIVER OF BREACH. A State's failure to enforce its rights with respect to any single or continuing breach of this Agreement shall not act as a waiver of the right of the State to later enforce any such rights or to enforce any other or any subsequent breach.

17. NOTICE. Any notice by a party hereto to the other party shall be deemed to have been duly delivered or given at the time of mailing by certified mail, postage prepaid, in a United States Post Office addressed to the parties at the addresses given in blocks 1.2 and 1.4, herein.

18. AMENDMENT. This Agreement may be amended, waived or discharged only by an instrument in writing signed by the parties hereto and only after approval of such amendment, waiver or discharge by the Governor and Executive Council of the State of New Hampshire unless no such approval is required under the circumstances pursuant to State law, rule or policy.

19. CHOICE OF LAW AND FORUM.

19.1 This Agreement shall be governed, interpreted and construed in accordance with the laws of the State of New Hampshire except where the Federal supremacy clause requires otherwise. The wording used in this Agreement is the wording chosen by the parties to express their mutual intent, and no rule of construction shall be applied against or in favor of any party.

19.2 Any actions arising out of this Agreement, including the breach or alleged breach thereof, may not be submitted to binding arbitration, but must, instead, be brought and maintained in the Merrimack County Superior Court of New Hampshire which shall have exclusive jurisdiction thereof.

20. CONFLICTING TERMS. In the event of a conflict between the terms of this P-37 form (as modified in EXHIBIT A) and any other portion of this Agreement including any attachments thereto, the terms of the P-37 (as modified in EXHIBIT A) shall control.

21. THIRD PARTIES. This Agreement is being entered into for the sole benefit of the parties hereto, and nothing herein, express or inplied, is intended to or will confer any legal or equitable right, benefit, or remedy of any nature upon any other person.

22. HEADINGS. The headings throughout the Agreement are for reference purposes only, and the words contained therein shall in no way be held to explain, modify, amplify or aid in the interpretation, construction or meaning of the provisions of this Agreement.

23. SPECIAL PROVISIONS. Additional or modifying provisions set forth in the attached EXHIBIT A are incorporated herein by reference.

24. FURTHER ASSURANCES. The Contractor, along with its agents and affiliates, shall, at its own cost and expense, execute any additional documents and take such further actions as may be reasonably required to carry out the provisions of this Agreement and give effect to the transactions contemplated hereby.

25. SEVERABILITY. In the event any of the provisions of this Agreement are held by a court of competent jurisdiction to be contrary to any state or federal law, the remaining provisions of this Agreement will remain in full force and effect.

26. ENTIRE AGREEMENT. This Agreement, which may be executed in a number of counterparts, each of which shall be deemed an original, constitutes the entire agreement and understanding between the parties, and supersedes all prior agreements and understandings with respect to the subject matter hereof.

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EXHIBIT A - SPECIAL PROVISIONS

There are no special provisions of this contract.

Contractor Initials JW

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EXHIBIT B - SCOPE OF SERVICES

1. **INTRODUCTION:**
   1.1. CDS Unlimited LLC (hereinafter referred to as the "Contractor") hereby agrees to provide the State of New Hampshire (hereinafter referred to as the "State"), Department of Administrative Services, with Main Building Rewiring Services at the Concord Main Building, Concord, NH in accordance with the bid submission in response to State Request for Bid #3049-25 and as described herein.

2. **CONTRACT DOCUMENTS:**
   2.1. This Contract consists of the following documents ("Contract Documents"):
   - State of New Hampshire Terms and Conditions, General Provisions Form P-37
   - EXHIBIT A Special Provisions
   - EXHIBIT B Scope of Services
   - EXHIBIT C Method of Payment

   2.2. In the event of any conflict among the terms or provisions of the documents listed above, the following order of priority shall indicate which documents control: (1), Form Number P-37 as modified by EXHIBIT A "Special Provisions", (2) EXHIBIT B "Scope of Services", (3) EXHIBIT C "Method of Payment".

3. **TERM OF CONTRACT:**
   3.1. The term of the contract shall commence upon execution by Governor & Executive Council (the "effective date") and issuance of a Notice to Proceed (NTP) by the Division of Public Works (DPW) and shall continue thereafter until the DPW is provided documentation of successful completion. The term of the contract shall be through January 20, 2027, a period of approximately sixteen (16) months.

   3.2. The contract may be extended under the same terms, conditions, and pricing structure at the sole discretion of the State and approval of the Governor & Executive Council for up to an additional three (3) months.

4. **SCOPE OF WORK:**
   4.1. General

   4.1.1. Contractor shall perform building rewiring services at the Concord Main Building in Concord, NH. This includes, but is not limited to, electrical rewiring services, and all required tasks to complete as noted in detail within the Project Specifications in Appendix A and supported by Project Drawings in Appendix B.

   4.1.2. Examine all other sections of the specifications for requirements, which affect the work of this Section, whether or no such requirements are particularly mentioned herein.

   4.1.3. Coordinate the work of this section with the related work of other trades, if applicable, and coordinate with such trades to assure the steady progress of all work of this Contract.

   4.1.4. Where construction and trades codes appear in this specification, it shall be interpreted to mean the latest edition.

   4.2. Summary

   4.2.1. The work covered by this Section consists of furnishing all labor, materials, equipment, supplies, etc., the installation of the materials and equipment and the performance of all operations necessary to perform building rewiring services at:

Department of Administrative Services

Main Building

105 Pleasant Street

Concord, NH 03301

as indicated on the Project Drawings and/or as described within the Project Specifications. See Appendices A and B for additional information.

   4.2.2. This work shall include all costs involved in providing building rewiring services as indicated, and any costs involved with any other special controls for the project. Without limiting the work required under this specification section, the following is included as noted:

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4.2.2.1. Provide all materials to perform building rewiring services.

4.2.2.2. Any and all work required to leave the facility as a fully operable project per the Contract.

4.2.2.3. Obtain and pay for all required permits, inspections, etc.

4.2.2.4. Provide any testing and commissioning for the project.

4.3. Appendices

4.3.1. Specific project requirements are incorporated into Appendix A as part of Exhibit B.

4.3.1.1. Appendix A incorporates the following project requirements into this document:

4.3.1.1.1. General Conditions

4.3.1.1.2. Supplementary Conditions

4.3.1.1.3. Summary

4.3.1.1.4. Price and Payment Procedures

4.3.1.1.5. Administrative Requirements

4.3.1.1.6. Submittal Procedures

4.3.1.1.7. Sustainable Project Requirements

4.3.1.1.8. Quality Requirements

4.3.1.1.9. Temporary Facilities and Controls

4.3.1.1.10. Construction Waste Management and Disposal

4.3.1.1.11. Product Requirements

4.3.1.1.12. Execution Requirements

4.3.1.1.13. Commissioning

4.3.1.1.14. Selective Structure Demolition

4.3.1.1.15. Miscellaneous Rough Carpentry

4.3.1.1.16. Firestopping

4.3.1.1.17. Joint Sealers

4.3.1.1.18. Hollow Metal Doors and Frames

4.3.1.1.19. Gypsum Board

4.3.1.1.20. Painting

4.3.1.1.21. Water-Based Fire Suppression Systems

4.3.1.1.22. Low-Voltage Electrical Power Conductors and Cables

4.3.1.1.23. Grounding and Bonding for Electrical Systems

4.3.1.1.24. Hangers and Supports for Electrical Systems

4.3.1.1.25. Raceways and Boxes for Electrical Systems

4.3.1.1.26. Identification for Electrical Systems

4.3.1.1.27. Panelboards

4.3.1.1.28. Enclosed Switches and Circuit Breakers

4.3.2. All project drawings are incorporated into Appendix B as part of Exhibit B.

4.3.3. The Contractor and any/all subcontractors shall abide by all project requirements and drawings set forth in Appendices A and B.

5. COMMERCIAL REQUIREMENTS:

5.1. The State of New Hampshire reserves the right to add or delete locations/equipment throughout the term of the contract. For the addition of a new location or new equipment, a requesting agency through the Division of Procurement and Support Services shall submit a request for quote (RFQ) including a detailed scope of work to the contractor. Quotes shall be in accordance with pricing and service requirements contained herein and no

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service shall be performed until documented acceptance by the State is received. The Contract may be amended, by agreement of the parties, effective upon approval of the commissioner of the Department of Administrative Services, without further approval needed by the Governor and Executive Council as long as the price limitation is unchanged or decreased as a result of the new or deleted locations/equipment.

5.2. Except as otherwise provided in this Scope of Services, all services performed under this Contract shall be performed between the hours of 7:00 A.M. and 4:00 P.M. unless other arrangements are made in advance with the State. Any deviation in work hours shall be pre-approved by the Contracting Officer. The State requires ten-day advance knowledge of said work schedules to provide security and access to respective work areas.

5.3. The Contractor shall not commence work until a conference is held with each State agency intending to utilize the Contractor's services, at which representatives of the Contractor and the State are present. The conference will be arranged by the State agency.

5.4. The State shall require correction of any defective work and the repair of any damages to any part of a building or its appurtenances caused by the Contractor or its employees, subcontractors, equipment or supplies. The Contractor shall correct, repair, or replace all defective work, as needed, to complete said work in satisfactory condition, and damages so caused in order to restore the building and its appurtenances to their previous condition. Upon failure of the Contractor to proceed promptly with the necessary corrections or repairs, the State may withhold any amount necessary to correct all defective work or repair all damages from payments to the Contractor.

5.5. The work staff shall consist of qualified persons completely familiar with the products and equipment that they will use. The Contracting Officer may require the Contractor to dismiss from the work such employees as the Contracting Officer deems incompetent, careless, insubordinate, or otherwise objectionable, or whose continued employment on the work is deemed to be contrary to the public interest or inconsistent with the best interest of security and the State.

5.6. Neither the Contractor nor its employees or subcontractors shall represent themselves as employees or agents of the State.

5.7. While on State property the Contractor, its employees, and its sub-contractors shall be subject to the authority and control of the State, but under no circumstances shall such persons be deemed to be employees of the State.

5.8. All personnel shall observe all regulations or special restrictions in effect at any State agency location at which services are to be provided.

5.9. The Contractor's personnel shall be allowed only in areas where services are to be provided. The use of State telephones by the Contractor, its employees, or its sub-contractors is prohibited.

5.10. If sub-contractors are to be utilized, Contractor shall provide information regarding the proposed sub-contractors including the name of the company, their address, contact person and three references for clients they are currently servicing. Approval by the State must be received prior to a sub-contractor starting any work.

6. OBLIGATIONS AND LIABILITY OF THE CONTRACTOR:

6.1. The Contractor shall provide all building rewiring services, strictly pursuant to, and in conformity with, the specifications described in State RFB 3049-25, as described herein, and under the terms of this Contract.

6.2. It is the responsibility of the Contractor to maintain this contract and New Hampshire Vendor Registration with up to date contact information.

6.3. Contract specific contact information (Sales contact, Contractor contract manager, etc.) shall be sent to the State's Contracting Office listed in Box 1.9 of Form P-37.

6.4. Additionally, all updates i.e., telephone numbers, contact names, email addresses, W9, tax identification numbers are required to be current through a formal electronic submission to the Bureau of Purchase and Property at: https://das.nh.gov/purchasing/vendorregistration/(S(q0fzcv55qhaeqs45jpyq5i45))/welcome.aspx.

6.5. The Contractor shall agree to hold the State of NH harmless from liability arising out of injuries or damage caused while performing this work. The Contractor shall agree that any damage to building(s), materials, equipment, or other property during the performance of the service shall be repaired at its own expense, to the State's satisfaction.

Contractor Initials JW

Date 07-21-25

6.6. Successful Contractor shall not be allowed to require any other type of order, nor shall the successful Contractor or be allowed to require the filling out or signing of any other document by State of New Hampshire personnel.

7. DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION LOWER TIER COVERED TRANSACTIONS:

7.1. The Contractor certifies, by signature of this contract, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal Department or Agency.

8. CONFIDENTIALITY & CRIMINAL RECORD:

8.1. If requested by the using agency, the Contractor and its employees, and Sub-Contractors (if any), shall be required to sign and submit a Confidential Nature of Department Records Form and a Criminal Authorization Records Form. These forms shall be submitted to the individual using agency prior to the start of any work.

8.2. The Department of Administrative Services, Courts Facilities, will complete required background checks for all personnel, including subcontractors, that will be working on the site premises prior to beginning the project.

8.3. Instructions for completing background checks and blank copies for the State of New Hampshire are located at Criminal History Record Requests | NH State Police.

8.4. All completed forms and additional questions can be sent to Brian Young at brian.g.young@das.nh.gov.

Contractor Initials JW

Date 07-21-25

EXHIBIT C - METHOD OF PAYMENT

9. CONTRACT PRICE:

9.1. The Contractor hereby agrees to provide building rewiring services in strict compliance with the terms and conditions specified in Exhibit B for an amount up to and not to exceed a price of $417,980.00; this figure shall not be considered a guaranteed or minimum figure; however, it shall be considered a maximum figure from the effective date through the expiration date as indicated in Form P-37 Block 1.7.

9.2. The Contractor shall provide the requested building rewiring services under a fixed-fee, percentage-based payment arrangement as defined herein.

10. PRICING STRUCTURE:

10.1. Project pricing structure is as follows:

CONTRACT 8003709 CONCORD MAIN BUILDING REWIRING SERVICES	
CONCORD MAIN BUILDING CONTRACTOR BASE AMOUNT	**$317,980.00**
PROJECT ALLOWANCE	**$100,000.00**

10.2. The Project Allowance is to be used at the State's discretion for any unforeseen issues or changes during construction work. This is not a guaranteed amount, and contractors shall not consider this as part of final payments. Utilizing the Project Allowance is subject to all change order provisions and procedures as listed in Appendix A.

11. CONTRACT BOND:

11.1. The Contractor, at the time of the execution of this Contract shall submit a Payment and Performance Bond in the sum equal to one hundred percent (100%) of the amount of the Contract as required by RSA 447:16. The Payment and Performance Bond must be written by a company licensed to do business in New Hampshire at the time the policy is issued. In addition, the company issuing the payment and performance bond shall be listed on the current list of "Surety Companies Acceptable on Federal Bonds" as published by the U.S. Department of the Treasury, Financial Management Services, Circular Number 570. See Surety Bonds – Circular 570 (treasury.gov).

11.2. Release of Claims and Final Payment:

11.2.1. The final payment shall not become due until the Contractor delivers a complete release of all claims arising under and by virtue of this Contract, including claims for all subcontractors and suppliers of either materials or labor, plus a release of the Contract Bond and a statement that all subcontractors and suppliers have been paid.

11.2.2. Application for Final Payment received from the Contractor will be processed for payment after project acceptance and final completion unless accompanied by a release of the Contract Bond. This payment shall be the amount of the Contract, less previous payments. All prior partial payments shall be subject to correction in the final estimate and payment.

11.3. Acceptance of Final Payment Constitutes Release:

11.3.1. The acceptance of the Final Payment by the Contractor shall be and shall operate as a release to the Contractor of all claims and of all liability to the State for all things done or furnished in connection with this work. No payment, however, final or otherwise, shall operate to release the Contractor and its Sureties from any obligations under this Contract or the Contract Bond. Acceptance of Final Payment shall not impact any warrantees provided by the Contractor with respect to this project.

12. INVOICE:

Contractor Initials JW

Date 07-21-25

12.1. Invoices shall be submitted on a monthly basis to the State Project Manager based on the percentage of work completed. The Contractor shall submit invoices on AIA forms subject to review and approval by the State Project Manager. The percentage of work completed shall be determined by the State Project Manager.

12.2. Payment requisition forms, change order forms, and invoicing questions can be sent to Wyatt Porter-Brown at james.a.porter-brown@das.nh.gov.

13. PAYMENT:

13.1. Specifications for all payment provisions and procedures are found in Appendix A, General Conditions.

13.2. Payments shall be made on a monthly basis based on the percentage of work completed. Payments shall be made within thirty (30) days after receipt of the invoice and acceptance of the corresponding goods and/or services to the State's satisfaction.

13.3. A 5% retainage shall be withheld from each Progress Payment until issuance of a Certificate of Substantial Completion. The balance remaining after the specified percentage has been retained, less all previous payments, will be certified for payment on each partial estimate.

13.4. Payments may be made via ACH or P-Card. Use the following link to enroll with the State Treasury for ACH payments: https://www.nh.gov/treasury.

13.5. Contractor shall be paid within 30 days after receipt of properly documented invoice and acceptance of the work to the State's satisfaction.

Contractor Initials JW

Date 07-21-25

SECTION 00250

SPECIAL REQUIREMENTS – NHDAS-DPW

PART 1 GENERAL

1.1 SECTION INCLUDES

A. COVID-19 Response

B. Security.

C. Procedures and Guidelines.

1.2 COVID-19 RESPONSE

A. The Contractor shall comply with all applicable NH Governor Emergency Orders related to the COVID-19 pandemic. The Contractor is encouraged to adhere to all current State and Federal guidelines related to the prevention of the spread of coronavirus.

1.3 SECURITY

A. Security Check:
1. After Award of Bid and prior to the start of construction the Contractor shall submit a list of all contractors' employees, all subcontractors' employees, and other related personnel who will be physically required to work at the project site. Provide the following information for person for:
   a. Name.
   b. Date of Birth.
   c. Social Security Number.
   d. Employer's Company Name
2. Anyone with a criminal history, other than traffic violations that have not been annulled will not be allowed to work at the project site. No exceptions will be allowed.
3. Provide background checks for all employees on site. The Department will not provide copies of criminal records.

B. Security Program:
1. Initiate program in coordination with Owner's existing security system at project mobilization.
2. Maintain program throughout construction period.

C. Entry Control:
1. Restrict entrance of persons and vehicles into Project site [and existing facilities].
2. Allow entrance only to authorized persons with proper identification.
3. Maintain log of workers and visitors, make available to Owner on request.
4. Control entrance of persons and vehicles related to Owner's operations.

D. Personnel Identification:

1. A drivers license or other acceptable positive identification will be required..
2. Contractor shall maintain list of accredited persons; submit copy to Owner on request.

E. Restrictions:
1. Do not allow cameras on site or photographs taken except by written approval of Owner.

END OF SECTION

DOCUMENT 00300

INFORMATION AVAILABLE TO BIDDERS

1.1 SUMMARY

A. Documents:

1. OPS Electrical Survey Report. NOTE Report and cost estimating are included to support project understanding. Bidding Scope is limited to the Contract Drawings and Specifications which does NOT include this report.
2. Hazardous Material Drawing sheets for Anticipated wall & ceiling/floor penetrations for Asbestos abatement are included in the drawing set as an Appendix. **NOTE:** Abatement will be done and paid through the State's Abetment Contractor during the Contract period. Close coordination with the Contractor will be required.

END OF DOCUMENT

Electrical Power Distribution System
Review and Report
With Preliminary Recommended Upgrades for the
Main Building
at the
Office Park South
106 Pleasant Street
Concord, NH



Lee F. Carroll, PE; Electrical Consultants 1
Madison Avenue
PO Box 357
Gorham, NH 03581-0357
(603) 466-5065

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Purpose:

This report is provided at the request of Mr. James Porter-Brown of the NH Division of Public Works Design and Construction to document existing electric power service distribution installations at the State Office Park South, 106 Pleasant Street, Concord, NH, for the Main Building. This is provided to assist in the documentation of the apparent scope of electrical upgrades/ modifications needed to correct identified electrical code deficiencies presently in place and to identify electrical equipment that has reached or is approaching its end of reliable operational life. The report also provides, an initial recommended set of upgrades proposed for consideration with pre-design cost estimates for these items. It is the understanding of the writer that the State will utilize this report in the ongoing upgrade of the installations that will be designed and hopefully constructed over the next several years.

A Short History of Electrical Installations in the Main Building:

During the data collection and verification phases of this project, Mr. Douglas Burnham was able to provide input as to the apparent history of the electric power installations in this building. It was indicated that this was one of the first State buildings to be provided with electric power and it was in 1897 when direct current power generation and distribution was installed in the parts of the building that then existed. This installation was upgraded in the 1930s. In 1941 the generation and distribution were changed to alternating current, provided from generation on site (the Steam power facility recently retired and demolished by Concord Steam who obtained it from the State in 1983).

In approximately 1995 the facility was separated from the electrical power system in the Concord Steam power plant and new, utility services were installed. In the case of the Main Building, this design involved a new 1000 KVA pad transformer adjacent to the Bancroft Building powering a new 3000 Ampere, 480/277 Volt distribution switchgear that provides power for the Bancroft Building, Annex 1, and the Gymnasium Building and three circuits to power the Main Building. The project, however, only insured that the new Main Building distribution powered several of the older, original main distribution panels (which in turn sub-feed to the remaining panels throughout the building), and there was no significant upgrade of the sub-fed panels or their feeders or distribution by the project.

The building, therefore, contains a mixture of wiring types and electrical equipment vintages, the most recent in the process of being installed, but a significant number that was installed before the facility was transferred from power fed through the steam plant to power supplied directly from the local electric power company, Concord Electric. That change was made in 1995 and 1996 but did not update most of the main sub-panels that distribute power to the many individual panels in the building, some of which may date to when the building was converted from DC power to AC power in1941 and in the period between 1941 and the 1995 project.

Existing Electrical Installations - Probable Equipment Ages

The existing main distribution panels in the Main Building date from the 1995/1996 project and are presently approximately 25 years old. A review of the nameplate data and discussions with the equipment manufacturer has resulted in the indication that this equipment is still of current design and that parts should be available for the equipment should they be needed.

Older panels that are still in service have reached their normal life for equipment to be reliable, as much of the branch circuit wiring is still currently in service.

Approach Taken in the Preparation of this Report:

The building electrical documentation in existing records form was found to be deficient so the initial review undertaken was to obtain copies of the available building electrical drawings and then to arrange on-site assistance by the facilities maintenance staff in undertaking on-site review visits to document the actual locations of all existing electrical service and distribution panels and switchboards. This information was then compared to the existing drawing information provided and drawings were prepared to locate all this equipment on building plans and a separate plan was prepared to locate them in a vertical orientation on a building section-by-section basis. From this initial data, it could be determined which existing panels were not identified as to their interconnection to the distribution system so circuit testing could be undertaken to determine the proper sources for connection of these panels on the drawings. The firm of Richardson Electric, Seabrook, NH was retained by this firm, after discussions with the State's Project Manager, to provide field circuit tracing to the extent permitted based on project funding. The information that was collected by Richardson Electric was then added to the previously started drawings to provide the existing building interconnection and location plans included with any part of this report. See " **Comparisons Between Initial Field Circuit Tracing and Contractor's Signal Tracing Results",** below in this report.

During the collection of the information to provide the above-noted building electrical power distribution drawings the various panels were documented and general notes on them were made, which have been also included herein. This information provides some indication of the number of circuits in the various panels, and in some cases the ratings of these branch circuits and power feeder circuits.

In conjunction with the above data collection, the types of existing wiring utilized were noted and, where possible its vintage noted to provide an indication of which wiring needs to be replaced during the implementation of construction projects to construct upgrades recommended in the report.

I wish to thank Mr. Douglas Burnham, facility manager, and Mr. Lee Makris, facility maintenance electrician, for their assistance in the data collection and verification phases of this project. Their knowledge of the facility was a great help in determining how the power distribution for the facility is interconnected.

Comparisons Between Initial Field Circuit Tracing and Contractor's Signal Tracing Results:

Drawing E-9 indicates the apparent power distribution that was determined with the assistance of facility staff. It leaves several panels with unknown power service connections.

Drawing E-9A indicates the apparent panel power feeders as provided by the work of Richardson Electric's employees using signal tracing equipment. It modifies some of the initial panel feeders and also indicates 2 panels on Fisk Building's first floor and indicates panel P5A in Administrative and Chapel as being on the 4th floor. I can state with great certainty that the panel P5A is, in fact on the fifth level and not on the fourth level as noted. Whether the 2 panels indicated on Fisk, first floor do exist or not I cannot be as certain, so will assume they could be somewhere in the Fisk Building area in the process going forward.

Also, in regard to Drawing E-9A, I will note that the field notes provided by the signal tracing repeatedly indicate that it is possible some of the circuits may not be indicated correctly due to

the complexity of the system. In this report, the recommendations and drawings will, however, generally be based on the E-9A representations.

Drawings E-1 through E-7 indicate the locations of the panels as they were located with assistance from the facility staff prior to the signal tracing. The panel designations are based on an agreement that was reached with the facility staff, so there may be some differences in designations from those indicated in drawing E-9A. The signal tracing subcontractor's personnel did not note modified panel locations on these drawings when they noted changes on their drawing E-9A.

Drawing E-8 indicates the master building layout for the Main Building and is provided solely as a reference plan.

Drawing E-10 is the one-line diagram for the South Side distribution in the Main Building and it indicates the panels as presently installed and utilizes drawing E-9A as its reference, with notations where exceptions to E-9A are taken. This part of the distribution system includes South Pavilion, Rumford, Fisk, the new Boiler Room, and apparently the fifth-floor panel P-5A in the Administrative and Chapel Building.

Drawing E-11 is the one-line diagram for the Center section distribution in the Main Building and it indicates panels as presently installed and utilizes drawing E-9A as its reference. This part of the distribution system serves the Administrative and Chapel Building areas, apparently except for Panel P-5A.

Drawing E-12 is the one-line diagram for the North section distribution in the Main Building and it indicates panels as presently installed and utilizes drawing E-9A as its reference. This part of the distribution system serves the Kimball, Chandler, Peaslee, North Pavilion, and North Pavilion Wing Buildings.

The existing main distribution panels in the Main Building date from the 1995/1996 project and are presently approximately 25 years old. A review of the nameplate data and discussions with the equipment manufacturer has resulted in the indication that this equipment is still of current design and that parts should be available for the equipment should they be needed.

Older panels that are still in service have reached their normal life as equipment that is reliable, as has much of the wiring still currently in service.

While the signal tracing subcontractor's data indicates some wire types/conditions, it does not document lengths of circuits or numbers of devices/equipment items on the circuits, and that was NOT the purpose of their signal tracing services. This report has, therefore, arbitrarily utilized a circuit length of 25 feet per circuit. Much more detailed field tracing would be needed to document all details, if that amount of detail were to be needed in conjunction with further contracts to carry out the actual updates suggested.

Code Issues Noted:

The following code issues were noted during the investigations leading to this report. They are all based on reviews involving the National Electric Code (NFPA 70), 2020 Edition. This is the edition that the State of New Hampshire has recently adopted. The writer also notes that this Code is considered the minimum standard for safe electrical installations. There are also references to the Life Safety Code (NFPA 101), 2018 edition, which involves electrical installation restrictions that are not included in the National Electrical Code.

1. "National Electrical Code (NEC) Article 695 Fire Pump: The present exterior main disconnect for the fire pump in the Main Building is rated 100 Amperes. NEC Article 695 and NEC Handbook example for sizing this breaker indicates the breaker rating should be not less than 290 Amperes, which would require the breaker to be 300 A trip rated. Conductor size is unknown, so whether it is adequate to limit the voltage drop to no greater than permitted by Code under locked rotor conditions cannot be confirmed, but it does appear to likely be adequate as the equipment has been in operation for some years now. Breaker, however, is undersized based on the writer's review.

2. Article 300.5(A) and table 300.5 provide minimum cover requirements for underground wiring installations. No attempt is included to determine whether existing installations conform to these within this project. As this involves the main feeder installations between Bancroft Building and the 3 Main Building power distribution rooms, and also the fire pump service conductors from the transformer that powers Bancroft Building, and there have not been changes in the depths required since that construction took place, it is *assumed* the installations are in conformity with Code requirements.

3. Article 110.26(A) Working Space, Table 110.26(A)(1) indicates working space requirements in front of electrical equipment. Some of the many panelboards definitely do not presently have the required working space in front of them. This is a condition that must be corrected during the various upgrade projects that will be part of the later phases of this project.

4. Article 250: Grounding: The power feeders from the Bancroft Building switchgear to the three (3) Main Building electrical power rooms are feeders, not service conductors by Code definition. The conductors from the Bancroft Building transformer that route directly to the Main Building would be considered service conductors.

   It was indicated that many of the older circuits in the Main Building power distribution, both feeders to larger subpanels and branch circuits, utilized the conduit as the ground bond conductor in lieu of installing a separate bonding conductor. Facility personnel has indicated that in some cases the integrity of the conduit bond has been found to have failed due to rust and other deterioration, which has on occasion resulted in a loss of grounding.

   Grounding of separately derived systems (the low voltage side of transformers which provide 208/120 Volt power for utilization) was noted to not connect these to a common grounding point. Instead, the connections have been made to a sprinkler pipe nearby or to a water line other than the building water service location. This can result in the loss of the Code-required ground bonding if piping modifications have been undertaken that disconnect the grounded pipe from the building distribution piping.

5. Article 394: Knob and Tube Wiring: It has been indicated by facility personnel that there is more likely than not some original knob and tube wiring still in service where the wires are concealed within walls or above ceilings and below upper-level floors. While the writer did not personally observe this wiring, it should be replaced during any upgrade of the electrical distribution system in the building under any phase of this project where installations are modernized. Some insurance firms now require this type of wiring to be replaced to maintain insurability. As any such installations that may still exist will be concealed, it will more likely than not result in contract change orders to correct and replace this wiring as upgrades are physically undertaken in other contracts.

6. Voltage Drop: Good practice requires the voltage drop on systems not to exceed approximately 5% in the main distribution/ feeders.

7. Article 250, Grounding and Bonding, 250.122 Size of Grounding Conductors; (F)(1)(b) Multiple Raceways. If conductors are installed in multiple raceways and are connected in parallel a wire-type equipment grounding conductor, if used, shall be installed in each raceway and shall be connected in parallel. The equipment grounding conductor installed in each raceway shall be sized in accordance with 250.122 based on the rating of the over-current protective device for the feeder or branch circuit.

8. Article 250, Grounding and Bonding, 250.122 (B) Increased in size. If ungrounded conductors are increased in size for any reason other than as required in 310.25(B) or 310.15(C), wire-type equipment grounding conductors, if installed, shall be increased in size proportionately to the increase in circular mill area of the ungrounded conductors.

9. Article 250 Grounding and Bonding, 250.122(G) Feeder Taps. Equipment grounding conductors installed with feeder taps shall not be smaller than shown in Table 250.122 based on the rating of the over-current device ahead of the feeder on the supply side ahead of tap but shall not be required to be larger than the tap conductors.

10. Life Safety Code, NFPA 101, Chapter 7 Means of Egress; 7.1.3.2.3* An exit enclosure shall not be used for any purpose that has the potential to interfere with its use as an exit, and, if so, designated as an area of refuge.

    A7.1.3.2.3: This provision prohibits the use of exit enclosures for storage or for installation of equipment not necessary for safety. Occupancy is prohibited other than for egress, refuge, and access. The intent is that the exit enclosure essentially is "sterile" with respect to fire safety hazards.

    Explanation notes in the Life Safety Handbook: Paragraph 7.1.3.2.3 prohibits the use of an exit enclosure for any purpose that could potentially interfere with its use as an exit or an area of refuge. For example, the use of an enclosed exit stair to house vending machines, copying machines, or storage or to run electrical distribution wires and cables to areas of the building is prohibited. Standpipes and emergency lighting that are part of the life safety features are permitted only if their arrangement does not interfere with the passage of people. This limitation covers more than mechanical obstruction of the egress path; it includes any use that could interfere with the use of the exit. See also 7.1.10.1 and 7.2.2.5.3.

    The State Fire Marshal's office has enforced the requirement that no equipment that is not specifically permitted in these areas may be installed in them. In stairways that would mean that the transformer enclosure that has been constructed on the 4th level of the Fisk stair and all the panelboards in the Fisk, Rumford, and Peaslee stair towers are in violation of code restrictions. It also means that any power or other conduits routed to utilize these stair towers for vertical wireway shafts are also in violation of present code rules. These issues need to be addressed in the modifications that will be proposed in this report.

Existing Installations Data Provided by Richardson Electric:

The information provided by Richardson Electric in conjunction with their signal tracing of the distribution circuits is included in Appendix A, B, C, and D and on Drawing E-9A.

Appendix data in A through C documents the circuit tracing performed with photographs of

various equipment and commentary on its condition and wiring presently in use. The reader should note that some photograph descriptive write-ups may be on the page preceding or following the actual photograph being referenced.

Appendix D is the panel and switchboard data that was prepared in conjunction with the work under Appendix A through C.

Drawing E-9A, their apparent panel one-line drawing, is included under Appendix E, which also includes all other drawings that were prepared as part of this project.

Proposed Sequence to Correct Existing Electrical Deficiencies and Improve Electrical Distribution Reliability:

It is the writer's recommendation that the project to upgrade the present electrical power distribution in the Main Building at Office Park South be implemented in three (3) steps. While these can be implemented in any order finally selected, this report recommends starting at the South Side with corrective actions for South Pavilion, Rumford, and Fisk and the new Boiler Facility areas of the building, and one panel in the center section, 5th floor (based on signal traced circuit connection). The second segment of the project would involve the Administrative and Chapel Building power distribution. The third segment would address the Northern Side of the Building with corrective actions for Kimball, Chandler, Peaslee, North Pavilion, and North Pavilion Annex areas of the building.

As the writer is not sure what the upgrade work will require regarding possible relocations of existing operations in each area as upgrades are implemented, it may be decided to modify the number of phases under which the program is ultimately scheduled.

The cost estimates provided later in this report do NOT include any temporary or permanent relocations of existing working areas, so those costs need to be added by someone more familiar with that aspect of the overall project. The estimates also do not include escalation that needs to be considered over the final time frame under which the corrective actions will be undertaken. The estimates also do NOT include the costs for the design of the final construction phases or the oversight of the projects that will be involved by an assigned representative of the Department of Administrative Services, Division of Public Works Design and Construction.

Additionally, this report has a limited scope and reviews solely the electric power distribution aspects of the building wiring systems, so there is no inclusion here-in for any potentially needed telephone, ether- net/data wiring, or potential cable television systems wiring as it regards the facility.

Apparent Existing Main Building Electrical System Grounding:

The present power feeders to the Main Building power distribution centers appear to consist of three (3) 800 Ampere feeders from the Bancroft Building Main Switchgear, one each to a Man Building 480/277 Volt, 3 phase, 4 wire, 60 Hertz distribution panel in the " South", "Administrative", and "North" sections of the building. Each of the three feeders consists of two parallel conduits with conductors and one (1) each of these conduits to each of the three building sections contains a ground bond conductor.

The various step-down transformers to provide 208/120 Volt, 3 phase, 4 wire, 60 Hertz power have grounding conductors, some of which are connected to the Main Building water

service pipe, some of which connect to sprinkler pipes, and others which appear to connect to possibly water distribution piping. It was indicated that previous work that had been undertaken was supposed to have corrected this with all these ground connections having been rerouted to the main water service to the building. This work was apparently never completed.

There are also indications that some panelboards do not have ground bonding conductors and/or if the metallic conduit was to be used for that purpose, that the required grounding bushings required were not installed. Due to the age of some of the building metallic conduits, it is likely that some or possibly even all do not provide an appropriate low resistance path to conduct ground currents, should they be called upon to do so.

The proposed general modifications to the Main Building electrical power system grounding will involve the correction of the apparent issues noted to the extent they have been identified during the building reviews.

Method of Calculating Estimated Costs to Correct Apparent Electrical Deficiencies:

The basis of cost estimating for the various aspects identified that should be considered for corrective action will utilize estimating data in the 2022 Edition of " Electrical Costs with RS Means data" as published by The Gordian Group where such item costs are noted in that publication, and by use of this firm's historical project information where it is not included in the publication.

As noted previously in this report the estimated costs indicated herein do not include escalation, engineering design, and direction, costs of relocations for operations presently within areas to be worked in, or issues that may be uncovered during construction that are not readily visible and obvious (walls and ceilings were not opened, and power shutdowns were not involved to obtain the information noted). It is more likely than not that there are issues that will be discovered during the implementation of corrective work under the various contacts that may be undertaken to correct deficiencies noted.

Where the report indicates the replacement and relocation of an existing panelboard, the estimates in this report are based on the new panel being within 50 feet of the proposed new feeder source when on the same building floor level as the panel being replaced,100 feet when one floor above or below the source panel, and 150 feet were 2 floors above or below the source panel. Panelboards are based on the same rated amperes as the panels being replaced/relocated, generally 100 A, 225 A, or 400 A., with the new panels estimated not to be rated less than 100 A. each. Each branch circuit from each relocated/ replaced panel is estimated to require 25 feet of new conduit plus conductors. All conduits in this report are based on electrical metallic tubing (EMT) and not on rigid galvanized steel (existing conduits are generally rigid galvanized steel, with some EMT in newer installations). The estimates include an amount for the removal of discontinued conduits and wire as part of the project. While the reuse of existing conduits may be feasible in parts of the project, these areas are definitely not adequately defined herein to indicate which specific conduits will be suitable for reuse. Quantities of items to be removed as noted are strictly the writer's best estimate and are not based on any field measurements. On that basis, they may be understated in terms of work details that will be developed the future construction projects.

Proposed specific new/relocated panelboard locations are not indicated in this report, and that

detail would become part of the actual design phase for the actual future construction projects. It is recommended, however, that each floor in each building have a room or space assigned for the new/relocated panel installations, preferably stacked vertically when selected.

Apparent Scope of Corrective Action for the " South Side" Buildings Portion of the Main Building Complex:

The following items and following estimates generally do not include the costs to increase the available numbers of distribution branch circuit breaker positions in panels but would only maintain the present numbers of such branch circuits. A separate cost item is noted to add supplemental panelboards adjacent to existing or replacement panelboards and sub-feed them from the existing or replacement panelboards. This would NOT increase the capacity of feeders to the panel but would provide for the capability of adding future branch circuits. Panelboard feeder capacity for future load additions would need to be determined as well as the adequacy of the distribution system prior to such future load additions, and possibly other, more significant electrical system upgrades might be needed at that time. As there are no power or ampere meters installed or apparent historical records of loadings of the existing feeder circuits for the existing distribution system sub-panelboards, there will be future field research needed to determine whether any of the present sub-feed circuits need to be upgraded in conjunction with the future construction projects to address this possible issue.

The apparent scope of electrical upgrades for this portion of the Main Building includes the following initially identified issues:

1. Upgrade the fire pump feeder and, disconnect.
2. Provide missing ground bond conductor in one power feeder conduit.
3. Provide supplemental ground conductor from the switchboard to water service pipe.
4) Replace and relocate Panelboards P1B, P2A, P3A in the Rumford Building stair tower, and modify all branch circuits and conduits as required.
5) Replace and relocate Panelboards P1C, P2B, P3B in Fisk Building stair tower, and modify all branch circuits and conduits as required.
6) Remove and relocate transformer and disconnect and enclosure in Fisk Building stair tower, top level, including new feeder and conduit from Switchboard HDP1.
7) Provide ground bond to main water system from transformer T1 adjacent to HDP-1A.
8) Remove and replace/relocate Panelboards/breakers SD-4, SD-4B, SD-4C. Provide new feeder to new replacement panel for SD-4 and new feeder circuits and conduits for all other associated circuits presently powered from SD-4. Correct ground bond issues in all South Pavilion Panels.
9) Provide ground bond to main water system from new Boiler 112.5 KVA transformer.
10) Replace Panelboard P5A and feeder. Correct any deficiencies in branch circuit conduits and wiring.
11) Replace panel P3C in the hall on Fisk Building, third floor.
12) Provide ground bond conductors for feeder from HDP-1 to HDP-A

13) Separate ground bond/ neutral busses in panels not being replaced.

14) Demolition/Removals

Cost Estimate to Correct Deficiencies in South Buildings:

The following are the estimated costs for the corrective work in the South Buildings based on the above listings:

1) Estimate basis approximately 100 feet from the transformer to Main Building Disconnect:

100 feet, 3" Schedule 40 PVC conduit @ $9.95

1- 300 A, NEMA 3R, 480 V, 3 pole Disconnect

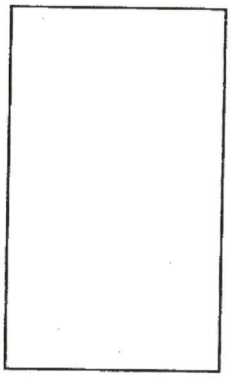
300 feet, 350 Kcmil Cu conductor @ $12

100 feet, trench, backfill, loam @ allowance @ $25

100 feet, 1/0 ground conductor @ $4.00

Miscellaneous connections, etc. allowance

Total, this item

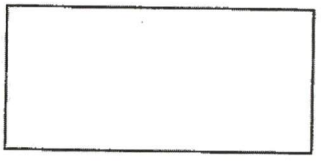


2) Estimate basis, approximately 250 feet from Bancroft switchgear to HDP-1. Also assumes ground wire can be installed without removal and replacement of power conductors in the one conduit involved. Utilizes the same conductor size as in the one conduit with the ground bond conductor.

250 feet, 2/0 ground conductor @ $4.90

Miscellaneous allowance

Total, this item

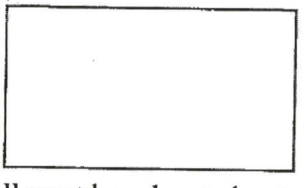


3) Estimate basis, approximately 300 feet from HDP-1 to water service connection to provide supplemental ground connection.

300 feet, 2/0 ground conductor @ 4.90

Miscellaneous allowance

Total, this item



4) Estimate basis, each panel is a 100 A, 30 pole unit. All must be relocated out of the stair tower per Life Safety Code.

3 - panelboards, 100 A bus, 30 pole, MLO @ $2,775

Sub-Total, this item

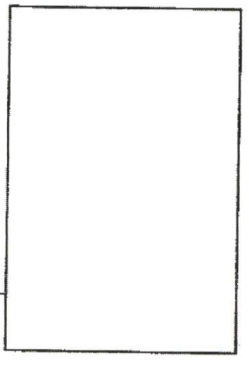
Feeder P1B 50 feet 2" EMT @ $15.15

200 feet #1 copper conductor @3.95

50 feet #6 copper ground bond @ $1.39

Miscellaneous allowance

Sub-Total, this item



Feeder P2A (Same as P1B except quantities double)

Sub-Total this item

Feeder P3A (Same as P1B except quantities triple)

Sub-Total, this item

Branch circuit wiring for P1B, P2A, and P3A, 30 ckts each.

90 circuits @ 25 feet 3/4 " EMT= 2,250 @ $7.40

6750 feet #12 copper wire @$0.745

Miscellaneous allowance

Sub-Total, this item

Total, This Item

5) Estimate basis, each panel is the same as in Item #4 above, but feeders for P1C and P2B increase in length to 150 feet and 200 feet respectively. and panel P3B will be 50 feet, powered from above.

Item #4 estimate

Less conduit and feeder 100 feet long

Plus, the feeder is 200 feet long 2 x 3,500

Total, this item

6) Estimate basis, new transformer feeder allowance 300 feet, plus new disconnect. Panels accommodated in item #5 above. Assumes planning will permit relocation of existing transformer during relocation.

300 feet 2" EMT @ $ 15.15

900 feet #1 copper conductor @3.95

300 feet #6 copper ground @1.39

New transformer enclosure and miscellaneous

Total, this item

7) Estimate basis. The transformer to water service ground bond is 400 feet.

400 feet 1/0 copper ground wire @ $4.00

Miscellaneous

Total, this item

8) Estimate basis, new panel to replace SD-4, SD-4B, and SD-4C, assumed possibly to locate in or near panel LDP-1A. The existing panel SD-4 feeder breaker in LDP-1A is 200 A, and this estimate is based on the replacement panel being of the same rating. existing SD-4B is an unused/discontinued 200 A breaker that will be eliminated

completely. Panel SD-4C is a single 2 pole, 20 A breaker that will be integrated into the new replacement panel. A new panel will be 200 A, MLO, 208/120 V, 3 phase, 4 wire, 60 Hertz. This item will also correct indicated missing ground bonding of all South Pavilion panels and others associated with SD-4 and LDP-1A, with the assumption that the added wires can be installed without having to remove existing circuit feeder conductors.

New replacement panel for SD-4

New feeder from SD-4 assumed as 25 feet:

25 feet, 3" EMT @ $25.00

100 feet, 250 Kcmil copper @ $9.40

25 feet #6 copper ground bond wire @ 1.39

New feeder and ground to South Pavilion, Level 3 panel

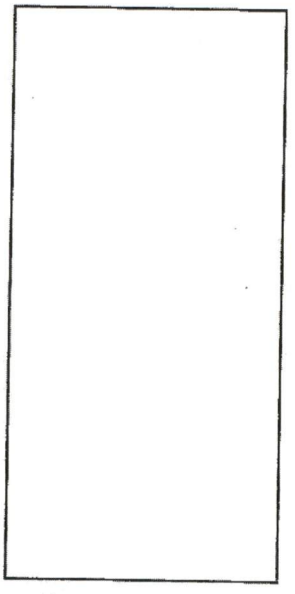
150 feet 2" EMT @ $15.15

600 feet, 250 Kcmil copper @ 9.40

150 feet #6 copper ground bond wire @ $1.39

Add ground bonds to 5 panels,

250 feet #6 copper ground wire @ $1.39



New feeder to panel PBC, assumed 1/2 of cost of new feeder to P1B

Estimate $1,750 x 0.5



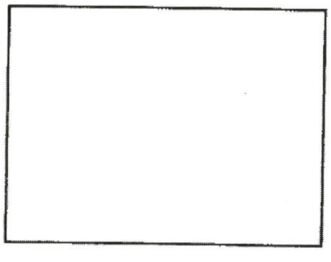
Branch circuit modifications not included above, estimate 2 -200 A feeders 25 feet long with conduit:

50 feet 3" EMT @ 25.00

200 feet 250 Kcmil copper conductor @ 9.40

Miscellaneous allowance

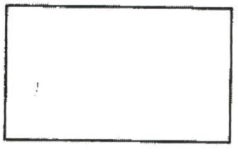
Total this item



9) Estimate basis, allow same as item 7 above

Estimate

Total, this item

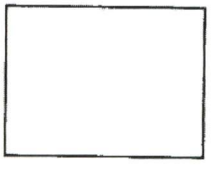


10) Estimate basis, allow 400-foot feeder, 100 A panel, and 10 circuits to be rewired.

1 panelboard

400 feet 2" EMT @ $15.15

1,600 feet # 1 copper conductor @ $3.95



400 feet #6 copper ground bond conductor @ $1.39

10 branch circuits to rewire @$244.45

Miscellaneous allowance

Total, this item

11) Estimate basis, panel P3C will be a 100 Ampere, 30 pole panel and will be within 25 feet of relocated panel P3B. 22 circuits will require rewiring.

1 panelboard

25 feet 2" EMT @ 15.15

100 feet #1 copper conductor @ 3.95

25 feet #6 copper ground bond wire # 1.39

22 circuits to rewire @ 244.45

Miscellaneous allowance

Total, this item

12) Estimate basis, HDP-1A 400 feet and HDP-1 300 feet.

700 feet 2/0 copper grounding conductor @ $4.90

Miscellaneous allowance

Total, this item

13) Separate ground bonds and neutrals in panels not being replaced (5). Estimate basis of cost as 200 circuits @ $10

Total, this item

14) Estimate basis for demolition and removals for the South buildings areas includes the below-indicated items:

a) Removal of transformer enclosure, Fisk stairway: allowance

b) Removals of 11 panels @ $655

c) Removal of 3" rigid steel conduit 200 feet @ $5.20

d) Removal of 2" Rigid Steel Conduit 500 feet @ $3.94

e) Removal of 1000 feet 1/2" rigid steel conduit @ $3.25

f) Removal of replaced wires allowance 5000 feet @ $0.50

g) Miscellaneous removals - allowance

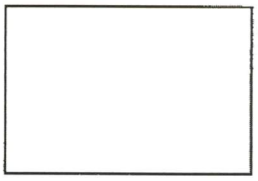
Total, this item

The summary total suggested for the "South" Building's electrical scope indicated:

Total, this Building Section

Suggested Contingency 20%

Total - South Buildings



Additional cost estimated if a supplemental 24 pole, 100 Ampere, 3 phase, 208/120 Volt panel was to be included adjacent to existing panel to provide future branch circuit availability.

The cost estimate basis for this estimate is 12 added panels:

12 panels @ $2,600.00

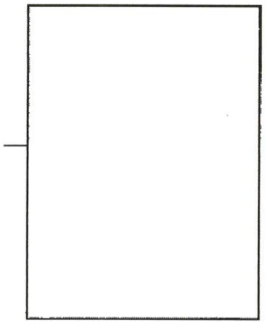
12 100 A breakers for feeders @ 675.00

Conduit @ wire allowance 12 @ 250.00

Total this option

Suggested Contingency 30%

Suggested Total



Apparent Scope of Corrective Action for the "Administrative" Building's Portion of the Main Building Complex:

The apparent scope of electrical upgrades for this portion of the Main Building includes the following initially identified issues:

1. Provide a missing ground bond conductor in one power feeder conduit.
2. Provide a supplemental ground conductor from the switchboard to water service pipe.
3. Provide ground conductor from transformer T2 to water service pipe.
4. Replace and relocate panel SD-11. and provide a new feeder from LDP-2
5. Replace and relocate panel SD-36. old obsolete Trumbull panel. Provide new feeders LDP-2 to SD-36 (estimate 150 feet) replacement and SD-36 and replacement of P4-B.
6. Replace and relocate panel SD-36A and provide a new feeder (assumed from LDP-2 with added feeder breaker - estimate 400 feet).
7. Replace and relocate panel PSB-1.
8. Replace panel P3-D, existing obsolete Westinghouse panel.
9. Provide new feeders from new panel replacing SD-11 to each of the following panels: P2-C, P2-D, P1-D, P1-F, PB-F, PB-G, PB-H, PB-I, PB-J.
10. Provide new feeder to panel P1J to panel replacing SD-11 (signal trace indicated P1J powered from SD-11, not SD-12A as appeared during writer's site reviews. Estimated 150 feet). (P1J is not physically in the Administrative/Boiler Building portion of the Main Building).

11) Separate ground bond/ neutral busses in panels not being replaced.

12) Demolition/Removals

Cost Estimate to Correct Deficiencies in Administrative and Boiler Buildings:

The following are the estimated costs for the corrective work in the Administrative and Boiler Buildings based on the above listings:

1. Estimate basis, approximately 350 feet from Bancroft switchgear to HDP-2. Also assumes ground wire can be installed without removal and replacement of power conductors in the one conduit involved. Utilizes same conductor size as in the one conduit with ground bond conductor.

350 feet, 2/0 ground conductor @ $4.90

Miscellaneous allowance

Total, this item

2. Estimate basis, approximately 100 feet from HDP-2 to water service connection to provide supplemental ground connection.

100 feet, 2/0 ground conductor @ 4.90

Miscellaneous allowance

Total, this item

3. Estimate basis. The transformer to water service ground bond is 100 feet.

100 feet 1/0 copper ground wire @ $4.00

Miscellaneous

Total, this item

4. Estimate Basis, allow 150 feet from LDP-2 to new SD-11.

150 feet 3" EMT @ $25.00

600 feet 250 Kcmil copper conductor @ 9.40

150 feet #4 copper ground @ 1.86

200 A, MLO, 42 pole panelboard @ 4,075.00

Miscellaneous Allowance

Total, This Item

5. Estimate Basis SD 36 and associated panels P3D and P4B. SD-36 is noted as fed by a 100 A circuit from LDP-2. Panel P4B presently has more mini breakers than the panel is listed for, and it is powered from a 150 A breaker in SD-26. Estimate basis will be a new 200 A breaker for LDP-2 for SD-36 replacement with a new double tub 200 A panel to replace both SD-36 and P3D. Also, will include a new feeder from the new panel to replacement for P4B with a new feeder from the replacement panel for SD-36 and P3D. Estimate basis 250 feet LDP-2 to replacement SD-36. 125 feet from the new SD-36 to P4B.

2 - 200 A, MLO, 42 pole panelboards @ $ 4,075.00

1 - 200 A panelboard for P4B

500 feet # 1/0 copper conductor @ 4.00

125 feet #4 copper ground @ 1.86

125 feet 2" EMT @ 15.15

1000 feet 250 Kcmil copper conductor @ 9.40

250 feet #4 copper ground @ 1.86

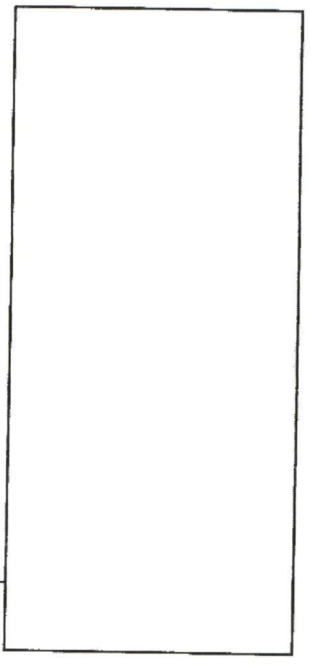
250 feet 3 " EMT @ 25.00

New 200 A feeder breaker

80 branch circuits to rewire @$244.45

Miscellaneous allowance

Total, This Item



6. Estimate Basis: New 400-foot-long feeder to SD-36A from LDP-2, Plan on 100 A and use breaker presently powering SD-36.

1 - 200 A panelboard @ 4,075.00

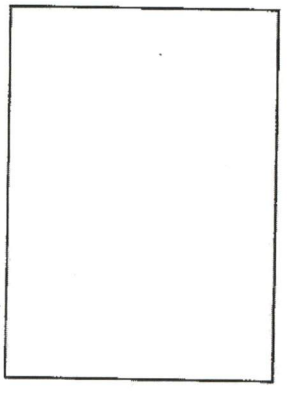
400 feet 3" EMT @25.00

1,600 feet 300 Kcmil copper conductor @ @ 10.75

400 feet # 4/0 copper ground @ 7.00

Miscellaneous allowance

Total, This Item



7, Estimate Basis: Provide new 100 A MLO panel with 50 A feeder from an existing source, estimated 100 feet

1 - 100 A, panelboard @ 2,775.00

100 feet 2" EMT @ 15.15

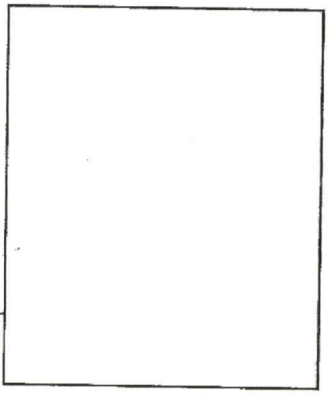
400 feet 1 copper conductor @ 3.95

100 feet #6 Copper ground wire @ 1.39

12 branch circuits to rewire @$244.45

Miscellaneous allowance

Total, This Item



8. Estimate Basis: replace the panel with 42 pole, 200 A, 208/120v, 3 phase panel

with new 100 A feeder estimated 10 feet long (adjacent to SD-36 panel replacement.)

1 200 A panelboard

10 feet 2" EMT @ 15.15

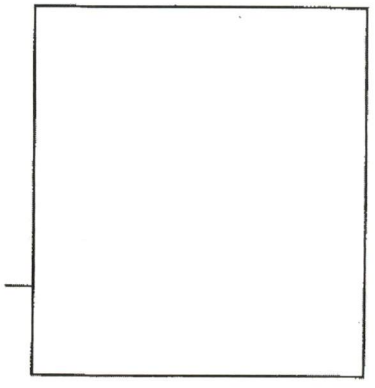
40 feet #1 copper conductor @ 3.95

10 feet #6 Copper ground wire @ 1.39

36 branch circuits to rewire @$244.45

Miscellaneous Allowance

Total, This Item



9. Estimate Basis: Replace and relocate 9 existing panelboards with new 42 pole, 3 phase panel, and with 100 A feeders. estimated total length of 1250 feet. Assumes reuse of existing conduits.

9 panel 200 A panels @ 4,075.00

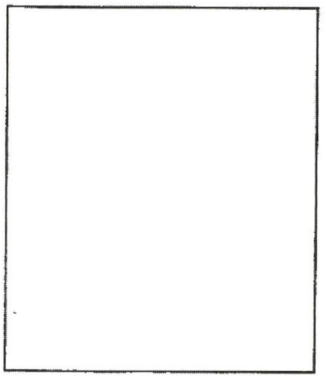
5000 feet #1 copper conductor @ 3.95

1250 feet #6 copper ground wire @ 1.39

360 branch circuits to rewire @$244.45

Miscellaneous Allowance

Total, This Item



10. Estimate Basis: New panel and feeder same as item 9 above, with 150-foot feeder.

1 200 A panel

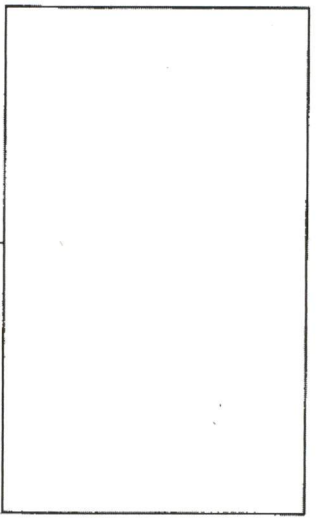
600 feet #1 copper conductor @ $3.95

150 feet #6 copper ground wire @1.39

36 branch circuits to rewire @$244.45

Miscellaneous allowance

Total, This Item



11. Estimate Basis: Estimate 2 panels involved.

Estimate not over 100 circuits @ $10.00

Total, This Item

12.) Estimate basis for demolition and removals for the Administration building areas includes the below indicated items:

a) Removals of 16 panels @ $655

b) Removal of 3" rigid steel conduit 800 feet @ $5.20

c) Removal of 2" Rigid Steel Conduit 1000 feet @ $3.94

d) Removal of 1500 feet 1/2" rigid steel conduit @ $3.25

e) Removal of replaced wires allowance 10,000 feet @ $0.50

f) Miscellaneous removals - allowance

Total, this item

Summary total suggested for "Administration" Buildings electrical scope indicated:

Total, this Building Section

Suggested Contingency 20%

Total - South Buildings

Additional cost estimated if a supplemental 24 pole, 100 Ampere, 3 phase, 208/120 Volt panel was to be included adjacent to existing and/or panels to provide future branch circuit availability.

The cost estimate basis for this estimate is 12 added panels:

17 panels @ $2,600.00

17 100 A breakers for feeders @ 675.00

Conduit @ wire allowance 17 @ 250.00

Total this option

Suggested Contingency 30%

Suggested Total

Apparent Scope of Corrective Action for the "North Side" Buildings Portion of the Main Building Complex:

The apparent scope of electrical upgrades for the North portion of the Main Building, which includes the following Building Names, Kimball, Chandler, Peaslee, North Pavilion, North Pavilion Annex, includes the following initially identified issues:

1) Provide missing ground conductor in one power feeder conduit.

2) Provide supplemental ground conductor from switchboards HDP-3 to water service pipe. Data provided indicates HDP-3A has a ground wire connected to the water service line, presently with the HDP-3 ground tapped to it outside the water service room.

3) Provide ground conductor from Transformers T3, T3A, and T3B to water service pipe.

4) Correct conductor size from 30 KVA transformer on 3rd floor electrical room in Peaslee

to distribution panel from #4 to #2.

5) Provide new double tub panel, each tub 42 pole, 200 A, to replace existing SD-12A and PBJ. provide new 100 A, 24 pole MLO panels and new feeder and conduit from new panel replacing SD12A and PBJ. to replace existing panels P1K and P3F. Provide new LDP-3 150 A panel breaker to feed new panel replacing SD-12A and PBJ.

6) Provide new twin panels, each 42 pole, 400 A MLO panel to replace existing SD-12, with new feeder and conduit. Provide new panel to replace PP-B2 (so called Dungeon) panel with new 100 A, 24 pole, MLO panel. Panel SD-12SP appears not to require any modifications.

7) Provide new feeder conduit and wire to new,24 pole, 100 A relocated panels P1M, P2H, and P3H presently in Peaslee Stair tower. Existing panels a single-phased panels being replaced with 3 phase.

8) Provide new feeder conductors and ground bond conductor from new panel replacing SD-11 (per circuit tracing) or SD-12A (field visual tracing)- whichever is correct to existing panels P1J, P2E, P3E in Kimball Building.

9) According to field signal tracing report, there is no change required in conjunction with existing panels LP-101 and LP-102. Information is inconclusive whether neutrals and ground bonds on branch circuits are separated, so include potential costs to so separate these.

10) PPB-1 (new elevator panel in Peaslee, Basement level) needs to have feeder breakers in P1 confirmed. Indication in signal tracing report indicates 3 circuits feeding it. No corrective action is expected other than correction of circuit number(s) involved at P1. No other corrective work is apparently needed for feeders to P2 and P1, except is inconclusive whether neutral and ground bonds for branch circuits are separated, so include potential costs to so separate these.

11) Provide new panel to replace panels SPX and SPXA with new conduit and feeder from panel replacing panel SD-12. Provide 100 A circuit to new 42 pole panel. combine all SDX and SDXA circuits into new panel.

12) Provide new feeder and conduit from new panel replacing SD-12 to panels P1L, P2G, P3. Replace and relocate existing panels. New panels to be 42 pole, MLO with single 100 A feeder, with P2G sub-fed from P1L and P3 sub-fed from P2G.

13) Provide new panel to replace SD-13 with new conduit and feeder from new panel replacing SD-12. Provide new sub-feed to Panel BA, replacing panel BA with new 42 pole panel and 100 A feeder. Replace feeder and conduit from Panel BA to Panel PBL, replacing PBL with new 24 pole, 100 A panel.

14) Panels NPW-1 and NPWi2 appear to have adequate feeders and grounding. It is inconclusive whether the neutrals and grounds are separated for branch circuits in these panels, so include potential costs to so separate these.

15) Provide new feeder and conduit from new panel replacing SD-13 to P1O and from P1O to P2N. Provide new 42 pole panels with 100 A feeder to these.

16) Demolition/Removals

Cost Estimate to Correct Deficiencies in North Buildings:

The following are the estimated costs for the corrective work in the North Buildings based on the above listings:

1. Estimate basis, approximately 500 feet from Bancroft switchgear to HDP-3 (North Buildings). Also assumes ground wire can be installed without removal and replacement of power conductors in the one conduit involved. Utilizes same conductor size as in the one conduit with ground bond conductor.

500 feet, 2/0 ground conductor @ $4.90

Miscellaneous allowance

Total, this item



2. Estimate basis: Based on the data provided by the signal tracing contractor, this item would have no cost for this portion of the building.

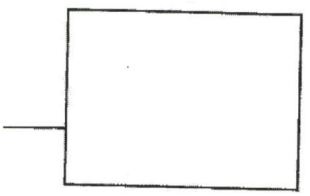
3. Estimate Basis: Based on the data provided by the signal tracing contractor, this item would have no cost for this portion of the building.

4. Estimate Basis: Allow 350 feet #2 Ground wire to make this upgrade recommended by the signal tracing contractor:

500 feet #2 copper ground conductor @ 3.10

Miscellaneous allowance

Total, This Item



5. Estimate Basis: SD 12A and associated panels P1K and P3F. Estimate basis will be new 200 A breaker for LDP-3 for SD-12A replacement with new 200 A panel to replace both SD-12A and PBJ. Also, will include new feeders from new panel to replacement for PSD-12A to panels P1K and P3F. Estimate basis 100 feet LDP-3 to replacement SD-12A. 75 feet from new SD-12A to P1K and 100 feet from P1K to P3F.

1 - 200 A, MLO, 42 pole panelboards @ $

2 - 100 A panelboard for P1K and P3F

400 feet # 1/0 copper conductor @ 4.00

100 feet #4 copper ground @ 1.86

700 feet #1 copper conductor @ 3.95

175 feet #6 copper ground @ 1.39

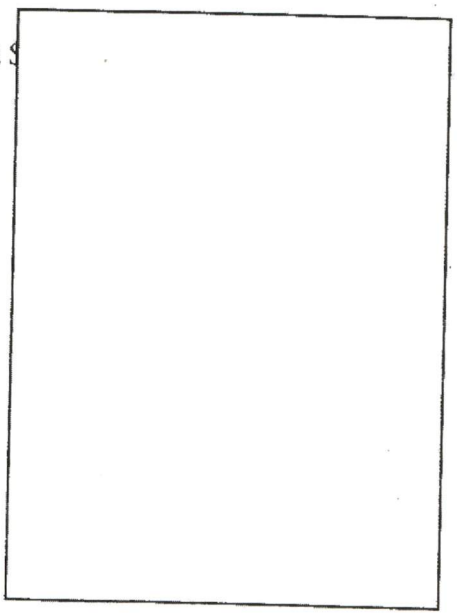
275 feet 2" EMT @ 15.15

New 200 A feeder breaker

40 branch circuits to rewire @$244.45

Miscellaneous allowance

Total, This Item



6. Estimate Basis: SD-12 replace with new double tub, 200 A, 42 pole per tub panel with new feeder from LDP-3A, approximately 50 feet. Provide new 100 A panel to replace panel PP-B2 (so called dungeon) with new feeder.

200 feet 600 Kcmil copper conductor @ 20.25

50 feet #2 copper ground wire @3.10

50 feet 4" EMT @32.50

600 feet #1 copper conductor @ 3.95

150 feet #6 copper ground @1.39

150 feet 2" EMT @ 15.15

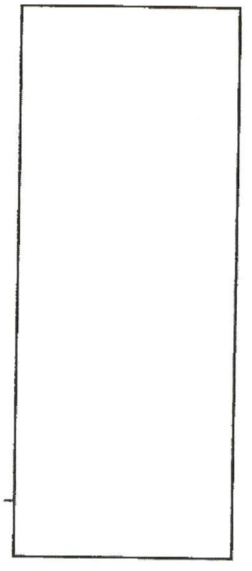
2-200 A MLO, 42 pole panelboards @ 4,075.00

1- 100 A panelboard @ 2,775.00

10 branch circuits to rewire @244.45

Miscellaneous allowance

Total, This Item



7. Estimate Basis: Replace and relocate panels P1M, P2H, P3H in Peaslee stair tower with new 24 pole, 100 A panels and new feeders from new panel replacing SD-12. Panels on single feeder and sub-feed one to another, 100 feet SD-12 to P1M, allow 50 feet floor to floor with relocations.

800 feet #1 copper conductor @ 3.95

200 feet #6 copper ground @ 1.39

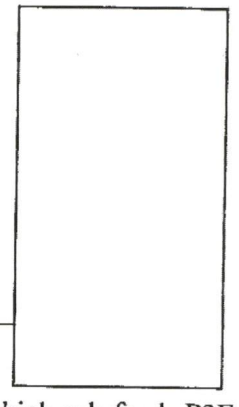
3 -100 A panels @ 2,775.00

200 feet 2" EMT @ 15.15

40 branch circuits to rewire @ 244.45

Miscellaneous allowance

Total, This Item



8. Estimate Basis: New feeders to P1J with sub-feed to P2E which sub-feeds P3E. Existing panels to be retained. Existing conduits assumed acceptable for reuse on sub-feed circuits with new conduit to P1J. Allows for 100 Ampere, 100-foot feeder to P1J and 50 feet for each sub-feed.

800 feet #1 copper conductor @ 3.95

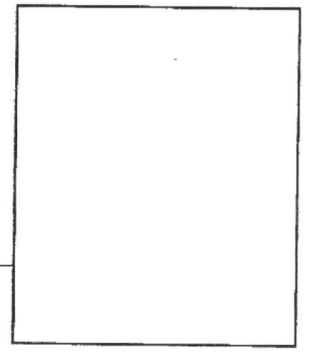
200 feet #6 copper ground @ 1.39

100 feet 2" EMT @15.15

72 circuits to isolate neutrals from grounds @ 10.00

Miscellaneous allowance.

Total, This Item

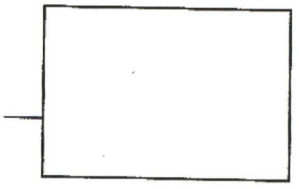


9. Estimate Basis: Allows for separation of neutrals and grounds only for LP-101 and LP-102

84 circuits @ 10.00

Miscellaneous allowance

Total, This Item

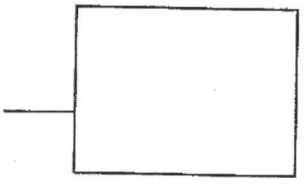


10. Estimate Basis: Allows for separation of neutrals and grounds in panels P1 and P2 and PPB-1.

100 circuits @ 10.00

Miscellaneous allowance

Total This Item



11) Estimate Basis; Provide single new panel to replace existing panels SPX and SPXA with new 42 pole with new 100 A feeder allowed as 100 feet long.

1 panel, 42 pole @ 4,075.00

400 feet #1 copper conductor @ 3.95

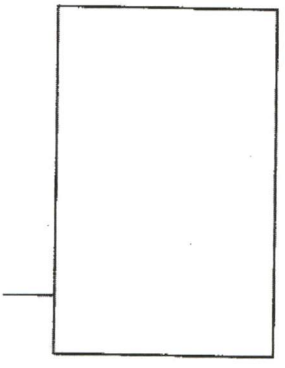
100 feet copper ground @1.39

100 feet 2" EMT @ 15.15

50 branch circuits rewire @ 244.45

Miscellaneous allowance

Total, This Item



12. Estimate Basis: Provide 3 new 200 A, 42 pole panels with a new 100 A feeder from new SD-12 to P1L which will sub-feed P2G, which in turn will sub-feed P3. Allow 100 feet to P1L and 50 feet each for sub-feeds.

3 panelboards @ 4,075

800 feet #1 copper conductor @3.95

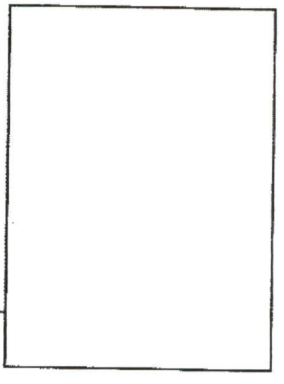
200 feet #6 copper ground @ 1.39

200 feet 2" EMT @ 15.15

80 branch circuits rewire @244.45

Miscellaneous allowance

Total, This Item



13. Estimate Basis: Replace panel SD-13 and provide new feeder from new SD-12 at 200 A. Replace panel BA with 42 pole panel with 100 A feed from new panel SD-13 and provide new panel PBL, 100 A, 24 pole fed from new panel BA. Each sub-feed based on 50 feet.

2 new panelboards @ 4,075.00

1 new panelboard @ 2,775.00



100 feet 3' EMT @ 25.00

400 feet 250 Kcmil copper conductor @ 9.40

100 feet #6 copper ground 1.39

400 feet #1 copper conductor @ 3.95

100 feet #6 copper ground @ 1.39

40 branch circuits rewire @ 244.45

Miscellaneous allowance

Total, This Item

14. Estimate Basis: Costs to separate neutrals and grounds in panels NPW-1 and NPW-2.

84 circuits @ 10.00

Miscellaneous allowance

Total, This Item

15. Estimate Basis: Replace panel P1O with new feed from new SD-13, estimated 100 feet, 100 A feeder. Sub-feed P1O to P2N, estimated 50 feet. Circuits to be 100 A. Panels to be 42 pole.

2 panelboards 42 pole @ 4,075.00

150 feet 2" EMT @ 15.15

600 feet #1 copper conductor @ 3.95

150 feet #6 copper ground @ 1.39

60 branch circuits rewire @ 244.45

Miscellaneous allowance

Total, This Item

16 Demolition/Removals: Estimate basis for demolition and removals for the North buildings areas includes the below indicated items:

a) Removals of 21 panels @ $655

b) Removal of 4" rigid steel conduit 400 feet @est 10.00

c) Removal of 3" rigid steel conduit 200 feet @ $5.20

d) Removal of 2" Rigid Steel Conduit 800 feet @ $3.94

e) Removal of 1500 feet 1/2" rigid steel conduit @ $3.25

f) Removal of replaced wires allowance 10,000 feet @ $0.50

g) Miscellaneous removals - allowance

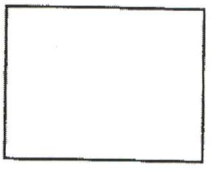
Total, this item

Summary total suggested for "North" Buildings electrical scope indicated:

Total, this Building Section

Suggested Contingency 20%

Total - South Buildings



Additional cost estimated if a supplemental 24 pole, 100 Ampere, 3 phase, 208/120 Volt panel was to be included adjacent to existing panels not being replaced to provide future branch circuit availability.

The cost estimate basis for this estimate is 12 added panels:

16 panels @ $2,600.00

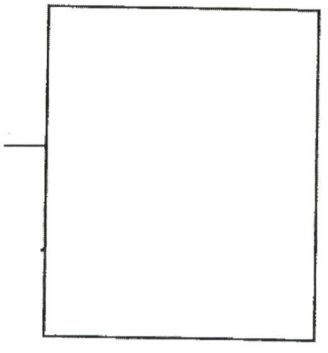
16 100 A breakers for feeders @ 675.00

Conduit @ wire allowance 16 @ 250.00

Total this option

Suggested Contingency 30%

Suggested Total



Summary of Report:

The preceding pages of this report have indicated the approach taken in its preparation, the specific Code and Standards references involved, and a listing of identified corrective actions in the various parts of the Main Building complex. In addition to an indication of issues noted by the writer during site reviews with the facility maintenance electrical and building management staff, it also notes the information added by the sub-contractor, Richardson Electric during their several site visits to perform signal tracing to attempt to confirm the various panelboard interconnections. It also notes the subcontractor's personnel's indication that in some instances it would require actual power feeder interruptions to positively confirm the tracing indicated is correct.

As there is no known electrical historical operational loading data on the various subpanels and distribution panelboards, it is not possible to state whether any of the circuits to the subpanels and/or panelboards need to be upgraded for greater electrical loading capability based on this report. It is recommended that some of that information be obtained during the design phases for corrective action in the future. Any such determination would most likely increase the costs to implement future corrective projects.

It is also noted within the report that more likely than not, the future corrective action projects will uncover concealed conditions that will require added corrective work, for example: If knob and tube wiring is found within walls or otherwise concealed, its replacement would need to be implemented at that time.

The report indicates the estimated costs presented do not provide added distribution circuits. However as the report basis is that 100 A new/replacement panels would be 24 pole (24 circuits at 120 volts), and that new 200 or 400 A panels will be 42 pole (42 circuits at 120

volts) and some have been indicated as "double tub", or double the circuit capacity based on present apparent requirements (or to combine 2 present panels into a single panel) there will be some small number of added circuits available is some instances, but not in all.

The reports above indicated estimated costs to implement total as below:

Building Area	
South Buildings	
Administrative	
North Buildings	

This results in a total report estimated cost of [redacted] if added circuit capacity is included, in which case the total would become [redacted]

The foregoing does not include the present materials cost escalation which could be as high as 25 to 30 percent as a minimum nor does it include the present labor rates which have resulted due to the increase in the minimum hourly wage and present shortage of qualified electricians, not just in New Hampshire. These factors were not fully present when the estimating manual utilized was published.

It is my sincere hope that the materials provided within this report and its appendices will be of assistance as the design of corrective actions and their implementation are undertaken in this impressive State building.

End of Report

Appendix “A"

Office Park South, Pleasant Street, Coucord, NH - Main Building Reduced scope

Initial Contractor field confirmation items - Existing Electrical Distribution System

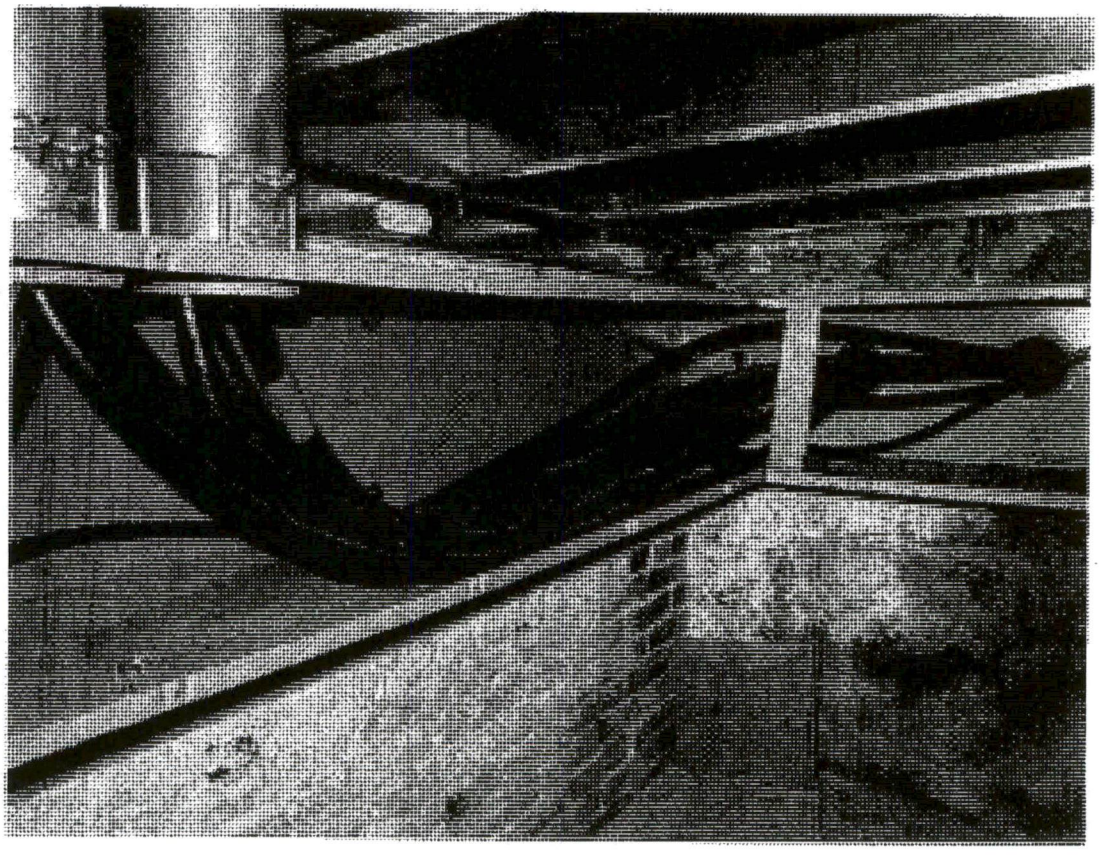
The following is based on drawings E-1 through E-7 Floor plans with panel located; E-8 Locus Plan; E-9 Panels located vertically on floors by Building; E-10 - E-12 Partial One Line Diagrams of the 3 feeders and distribution as developed to date. Based on this data, the following field tracing is needed to confirm the accuracy of the data indicated on the referenced drawings and to permit the completion of one-line diagrams.

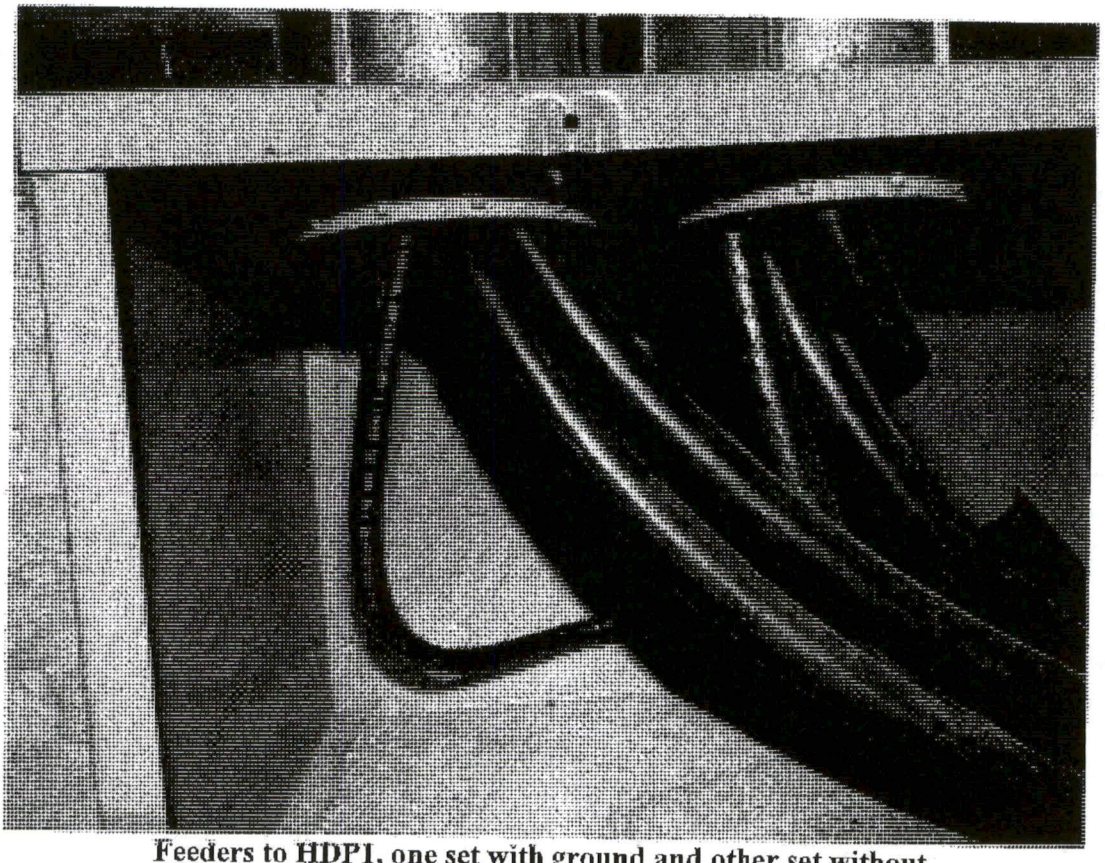
A) Feeders on circuits from Bancroft switchgear to Main Building Panels:

1) Confirm conductors to HDP-1 are 2 sets 4-500KcMil CU, 1 with 2/0 gr and 1 with 3//0 in 1"C. Determine how this is connected at Bancroft switchgear.

HDP-1 has 2 sets 4- 500MCM in 4" PVC raceway from Bancroft switchgear to the panel via a wireway under the floor. One raceway has 2/0 ground with the feeders grounding the panel' the other does not.

There is a 1" PVC conduit with a 3/0 conductor from Bancroft ground bus to the water main in next room and bonded to the water pipe.





Feeders to HDP1, one set with ground and other set without.

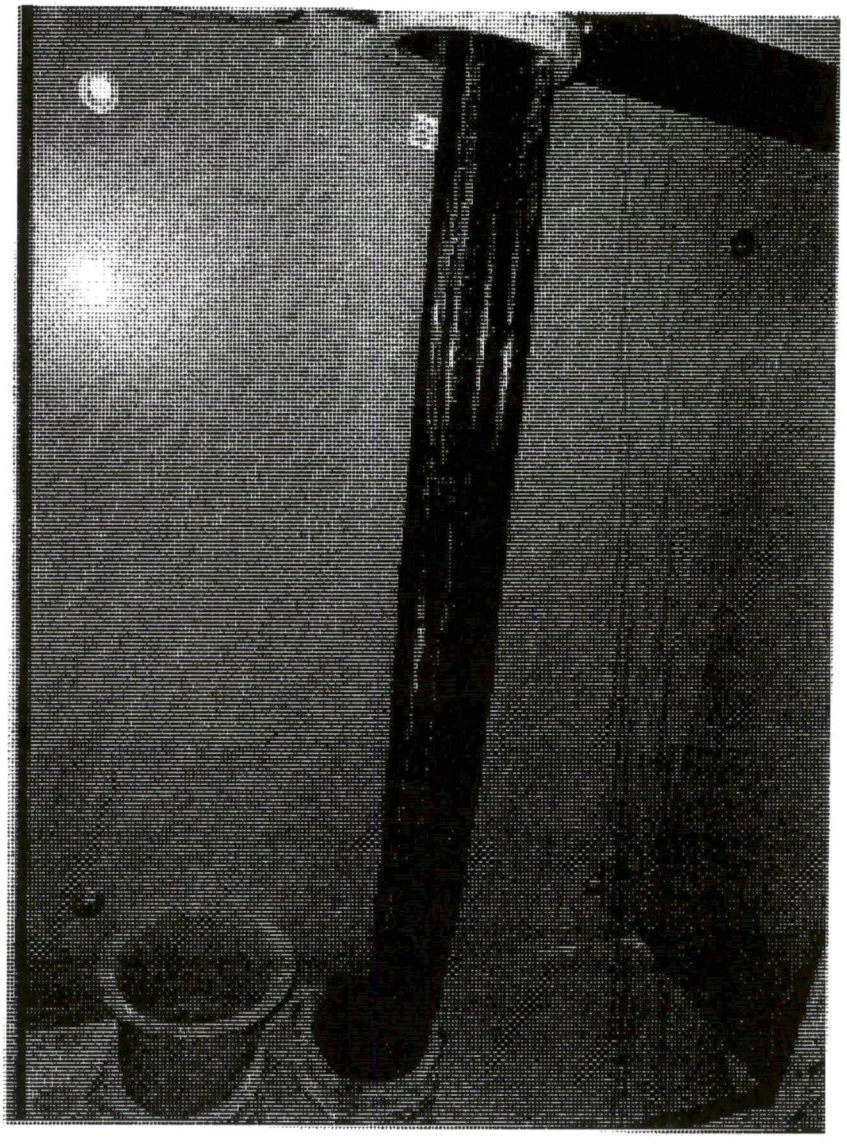


2) Feeders to HDP-3. Confirm same as for #1 above.
3) Feeders to HDP-2 confirm they are 2 sets of 500 KcMil with a 2/0 gr with one set.

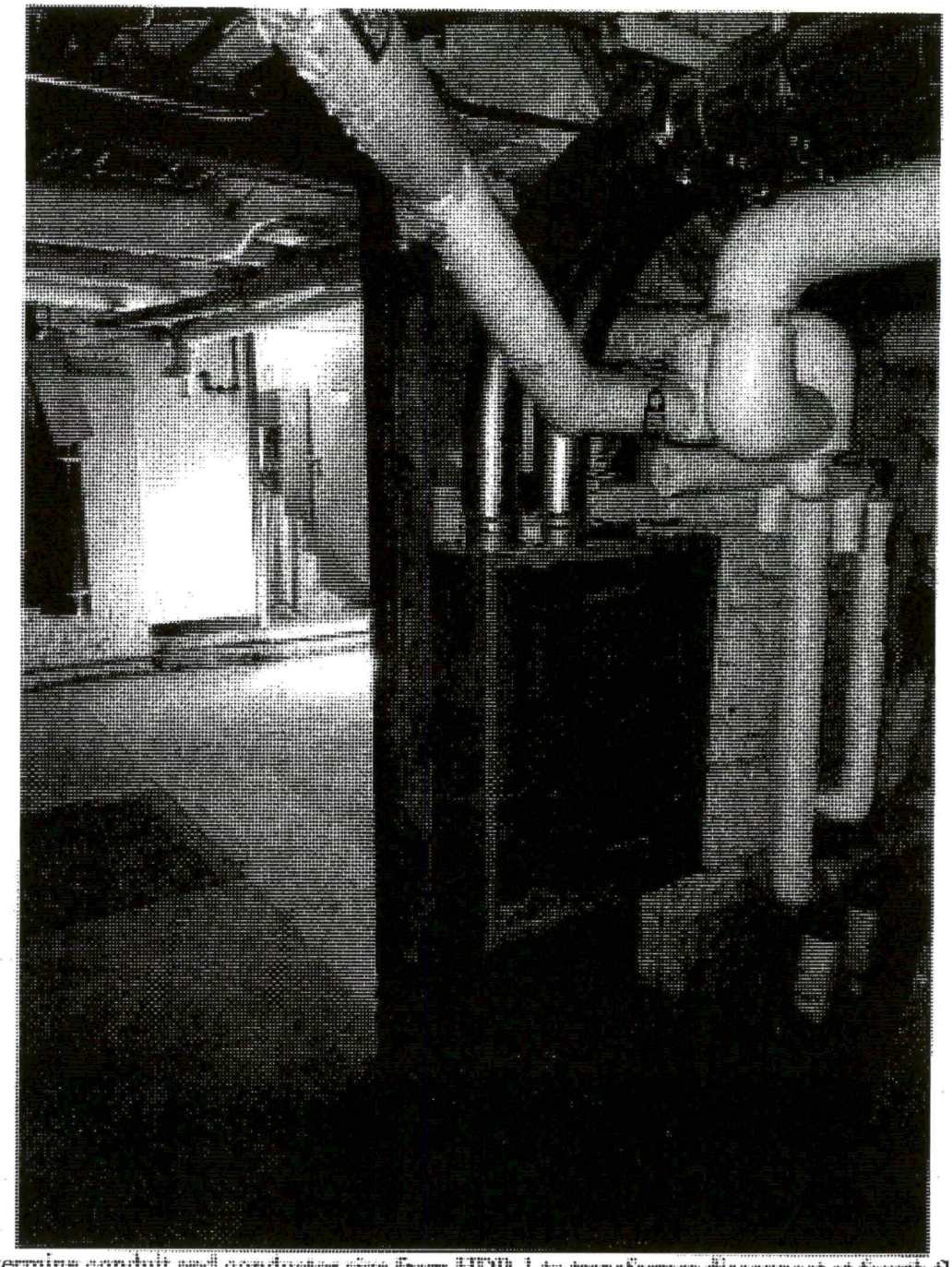
B) Feeders in Main Building:

1) Confirm feeder from HDP-1 to HDP-1A is 4 - 500 KcMil Cu in 3 1/2 " C. Confirm proper ground bonding if conduit is used as ground bond.

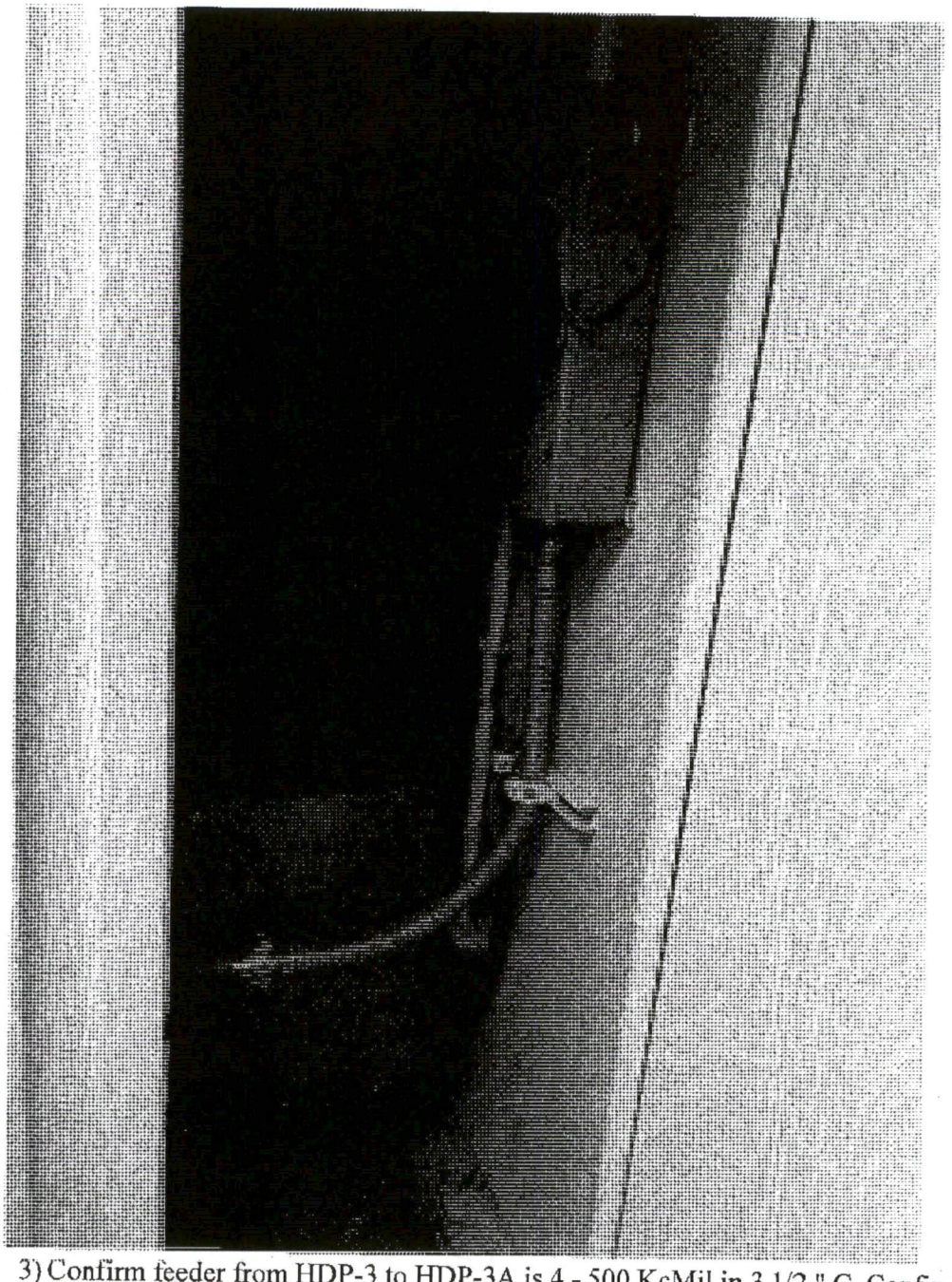
Feeder HDP1 to HDP1 A is 4- 500MCM conductors without equipment ground in 4" conduit Plastic bushings are used; no Bonding Bushing with Bonding jumper is used at the wireway to panel or panel.



Junction box between HDP1 and HDP1 A in hallway, no ground conductor



2) Determine conduit and conductor size from HDP-1 to transformer disconnect at fourth floor stairwell Fiske Building. **Confirm proper grounding if no bonding conductor installed. HDP-1 to Transformer disconnect is 100-amp breaker with 3-#2 and #6 ground. Transformer and disconnect is installed inside a closet in 4th floor, the clearance requirements are not maintained. The Conduit size feeding disconnect is 2"EMT. The Disconnect door will not open in the ON position, I could not find the override mechanism to open the door at time of inspection.**

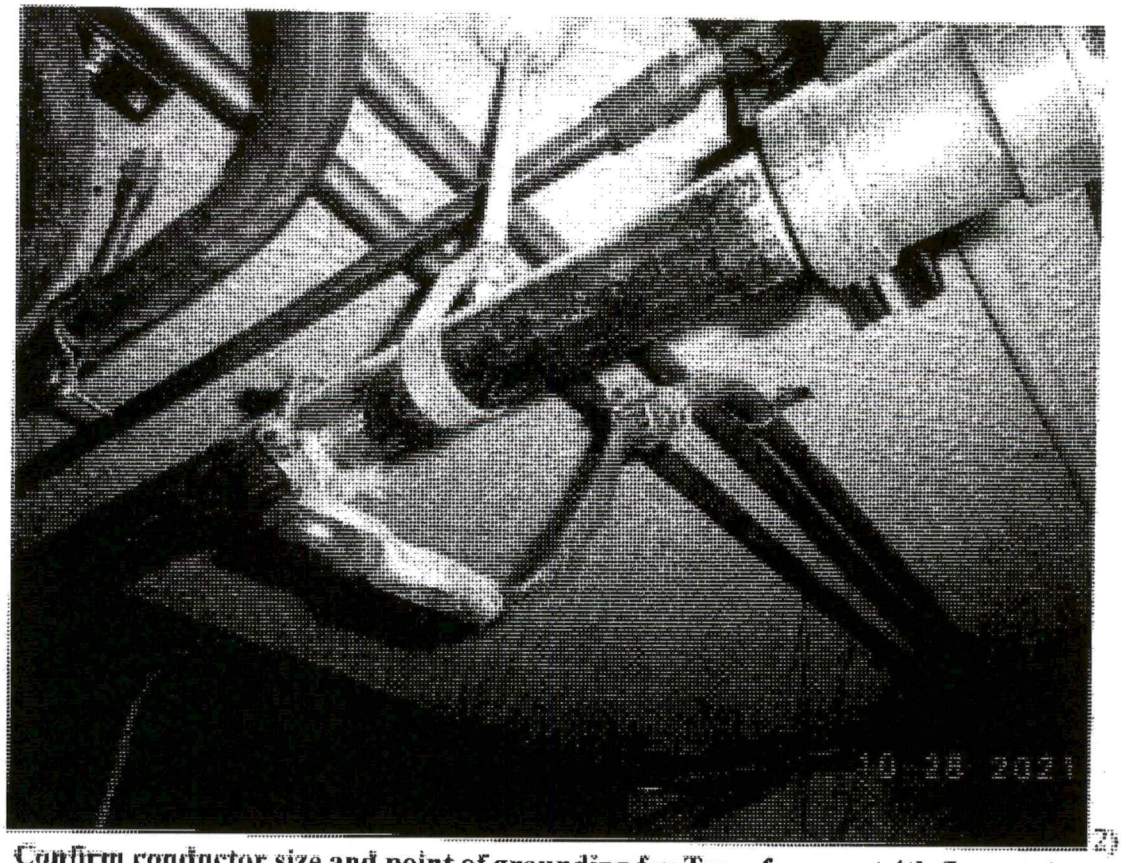


3) Confirm feeder from HDP-3 to HDP-3A is 4 - 500 KcMil in 3 1/2 " C. Confirm if 111111ground bonding is correct if no bonding conductor is installed.

3) Confirm conduit, conductor size and proper bonding for feeder from HDP-3A to HDP-P3 on 3rd floor of Peaslee Building

C Grounding in Main Building

1) confirm conductor size and point of grounding for transformer T1A adjacent to HDP-1A Appears to be bare 3/0 and is bonded to sprinkler pipe



Confirm conductor size and point of grounding for Transformer at 4th floor stair-tower in Fisk Building

Conductor size appears to be #2 and is bonded to sprinkler pipe in front of transformer



3) Confirm conductor size and point of grounding for transformer T-2 adjacent to panel HDP-2

4) Confirm conductor size and point of grounding for transformer T3 adjacent to HDP-3

5) Confirm conductor size and point of grounding for transformer T3A adjacent to panel HDP-3A

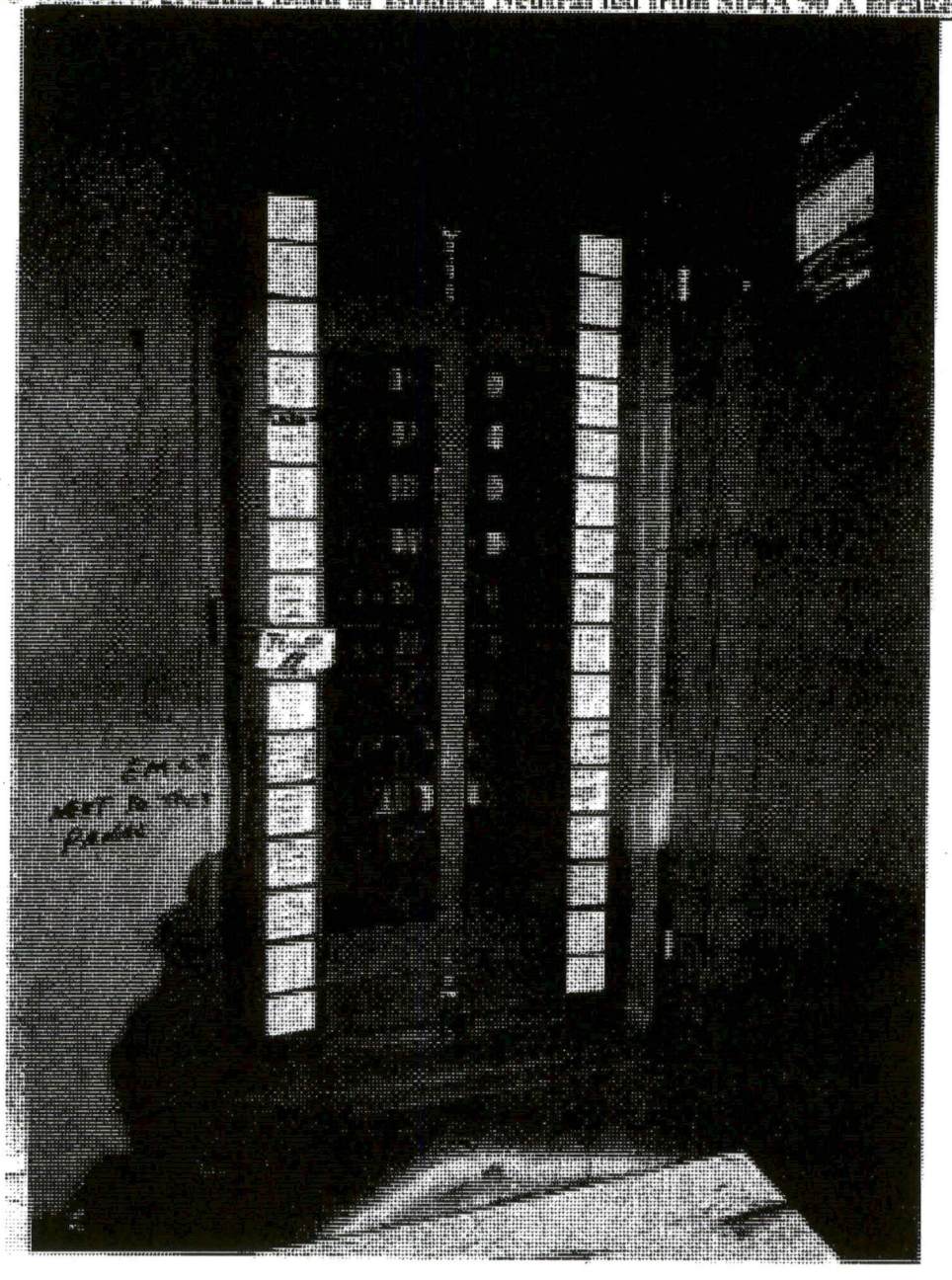
6) Confirm conductor size and point of grounding for transformer T3B adjacent to transformer T3A.

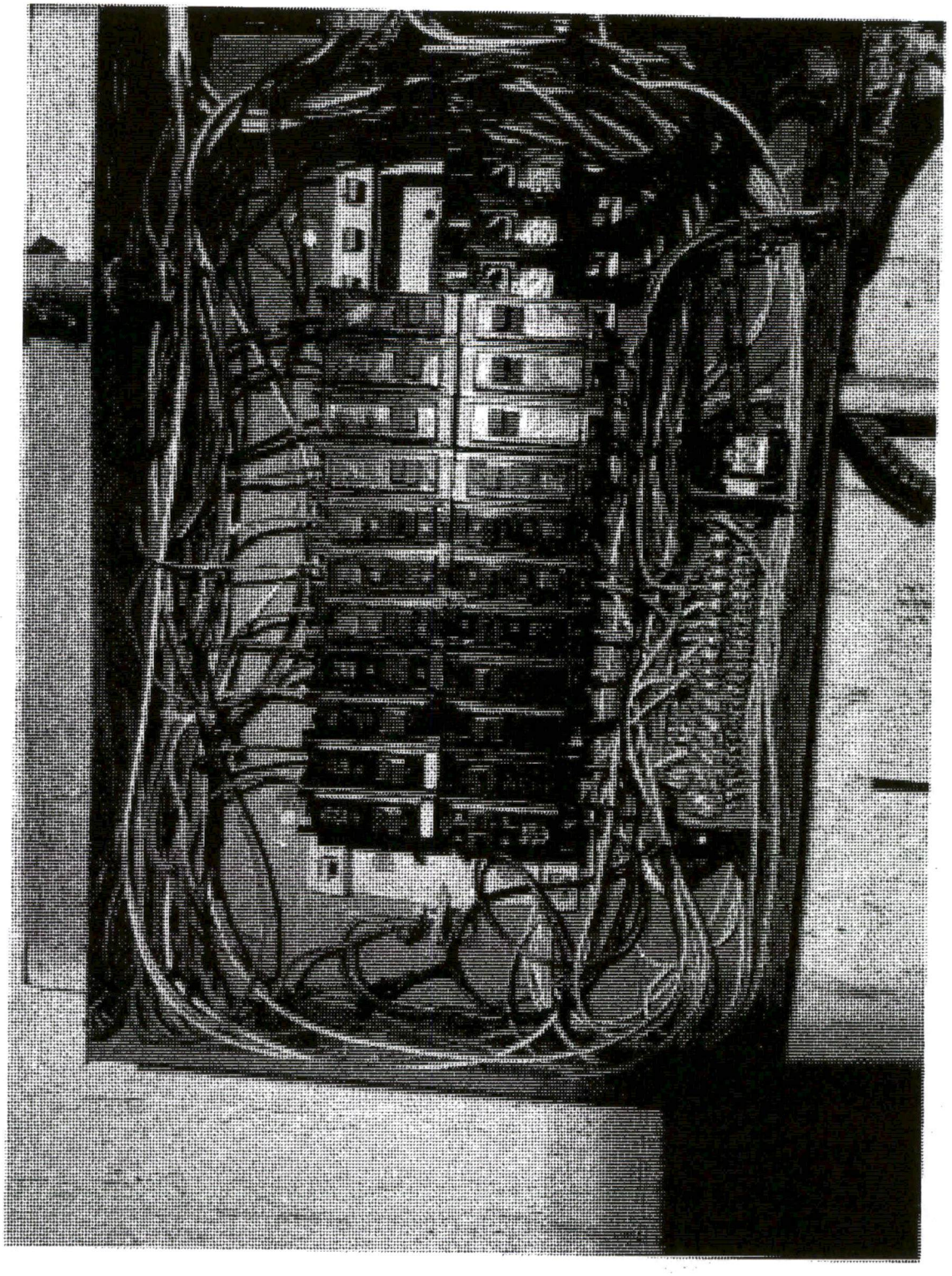
7) determine conductor size and point of grounding for transformer (30 KVA) adjacent to panel HDP-P3, third floor Peaslee.

D. Circuit Tracing - HDP-1 (South Feeder) Note circuits with Old wiring. Note if panels have neutrals isolated from ground bus. If no ground bonds installed note if conduits used as ground bonds are properly bonded per Code.

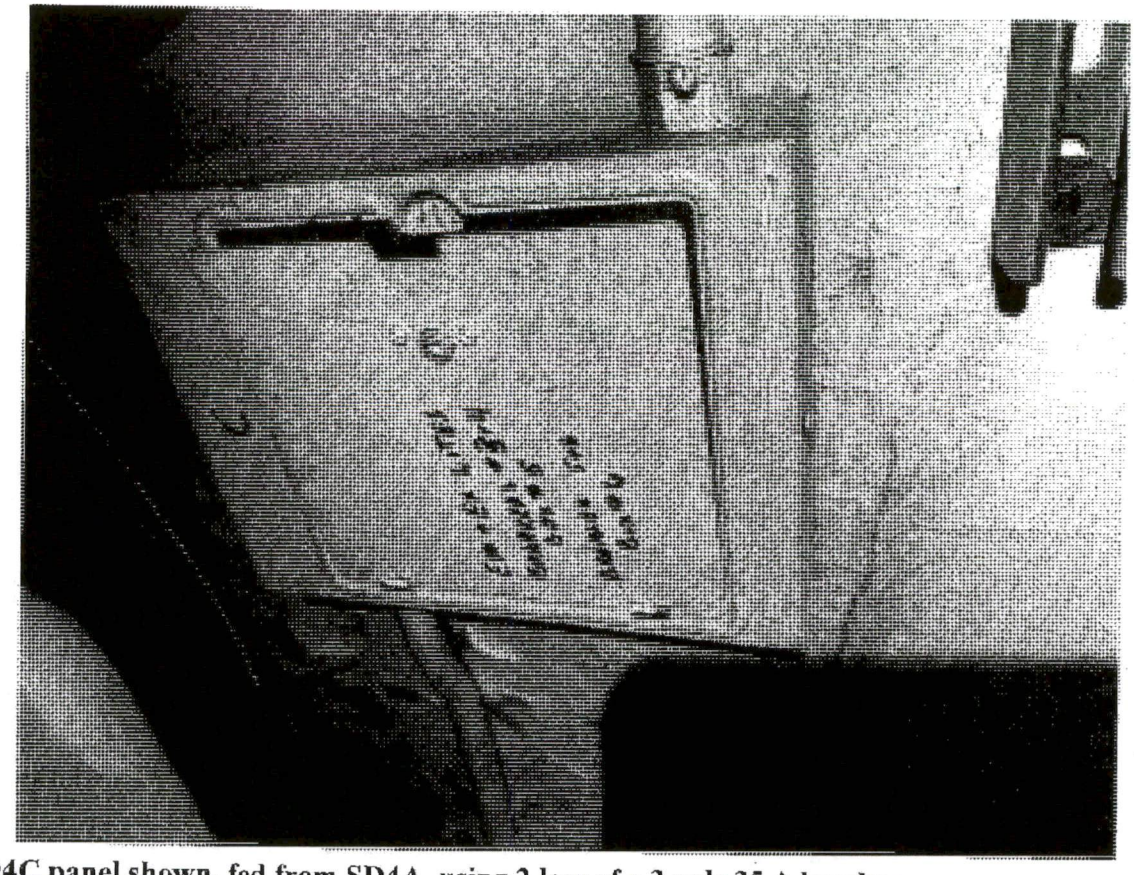
1) Confirm breaker ratings and positions from SD-4 to:

a) PBC MLO.No ground; Bond or Isolated Neutral fed from SD4A 50 A breaker

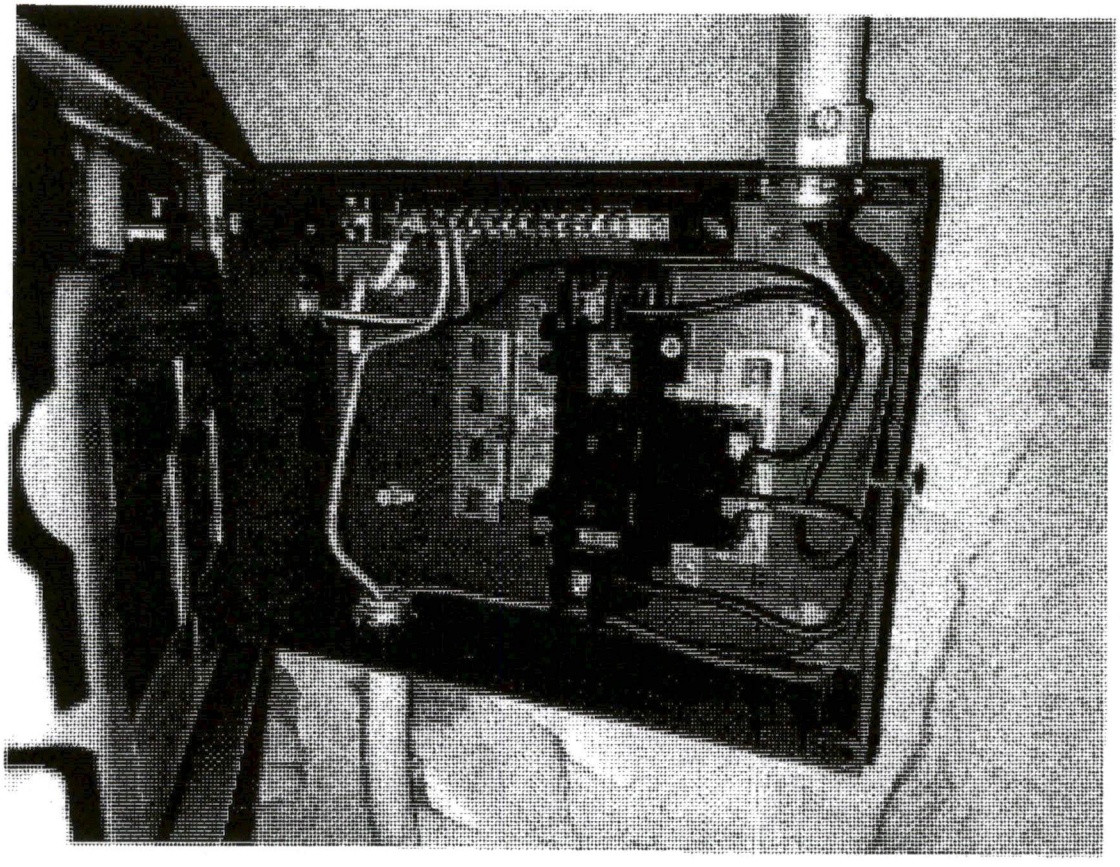


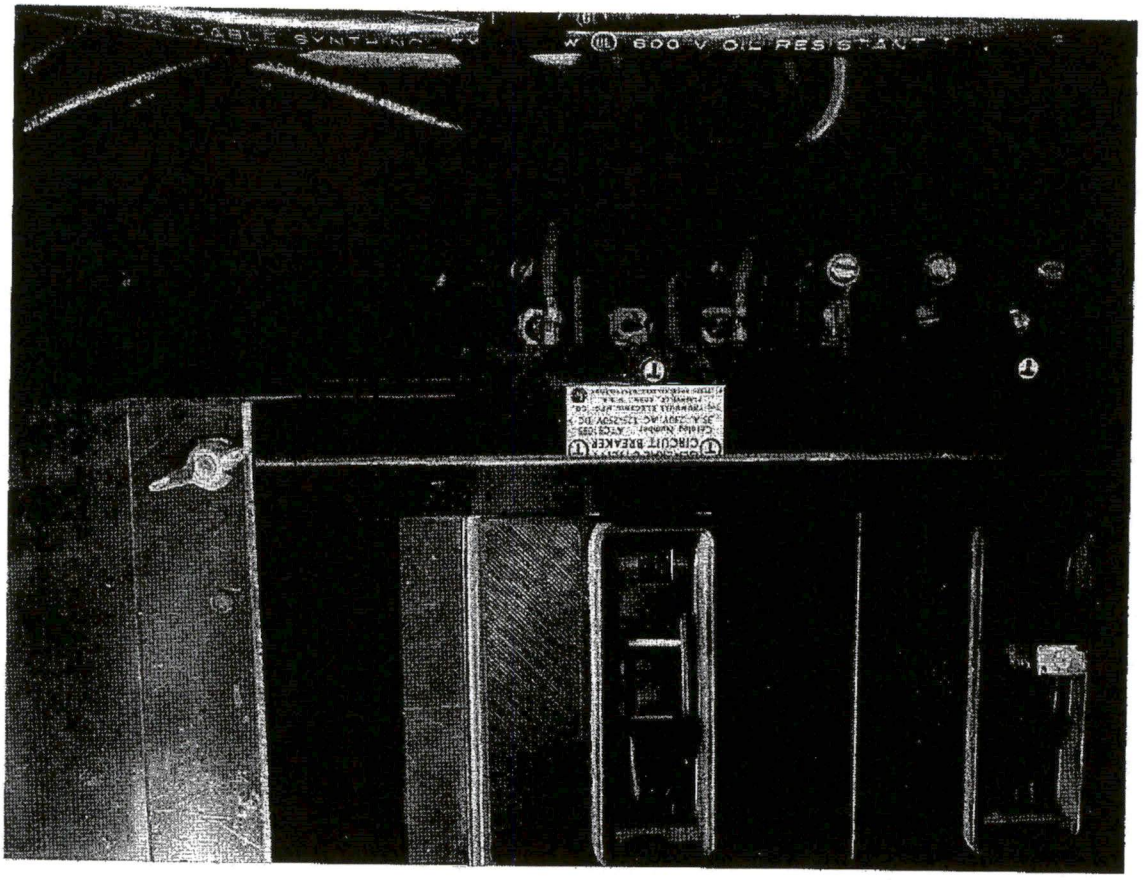


b) SD4C **MLO, no ground Bond, has isolated neutral**

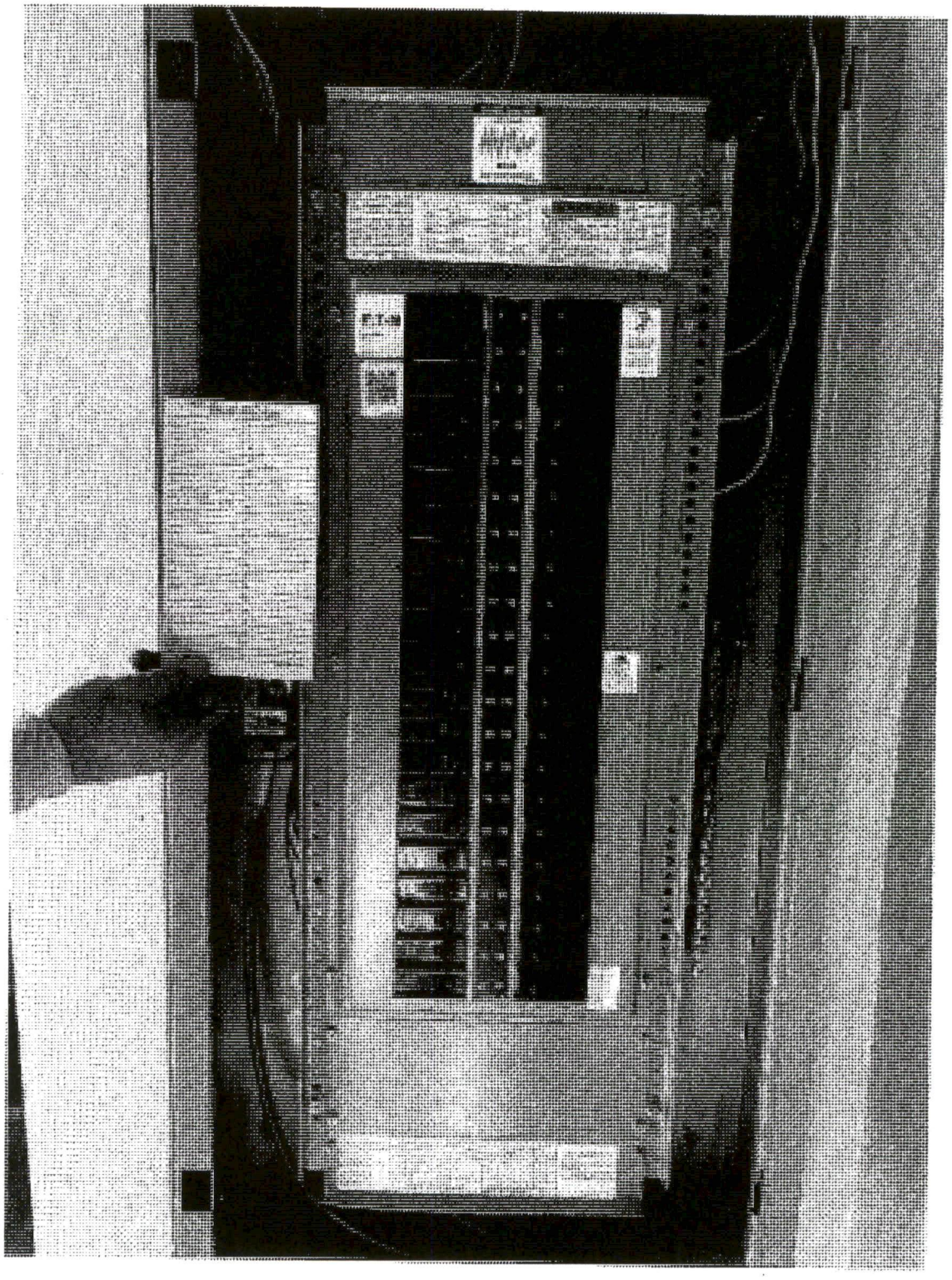


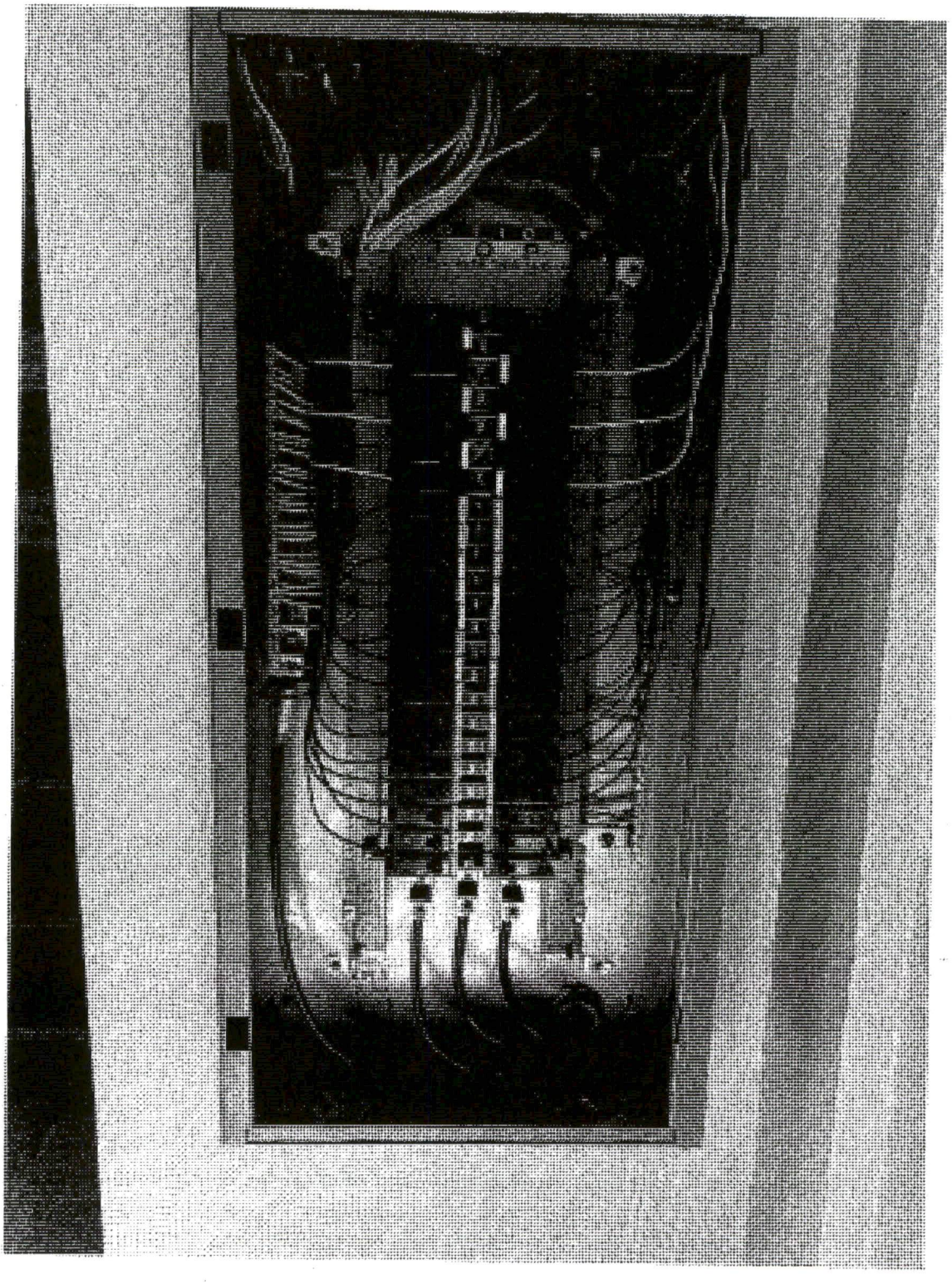
SD4C panel shown, fed from SD4A, using 2 legs of a 3 pole 35 A breaker



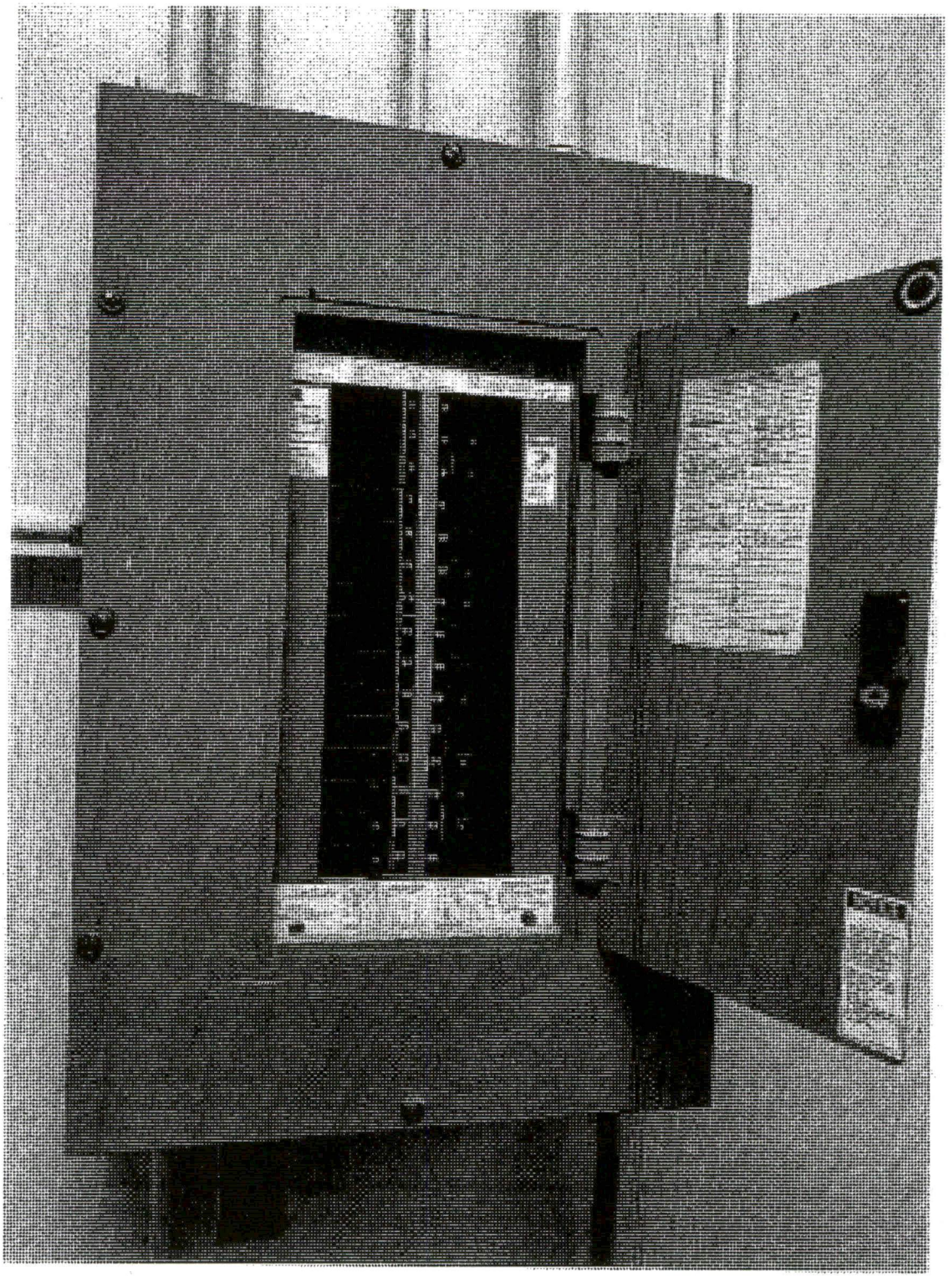


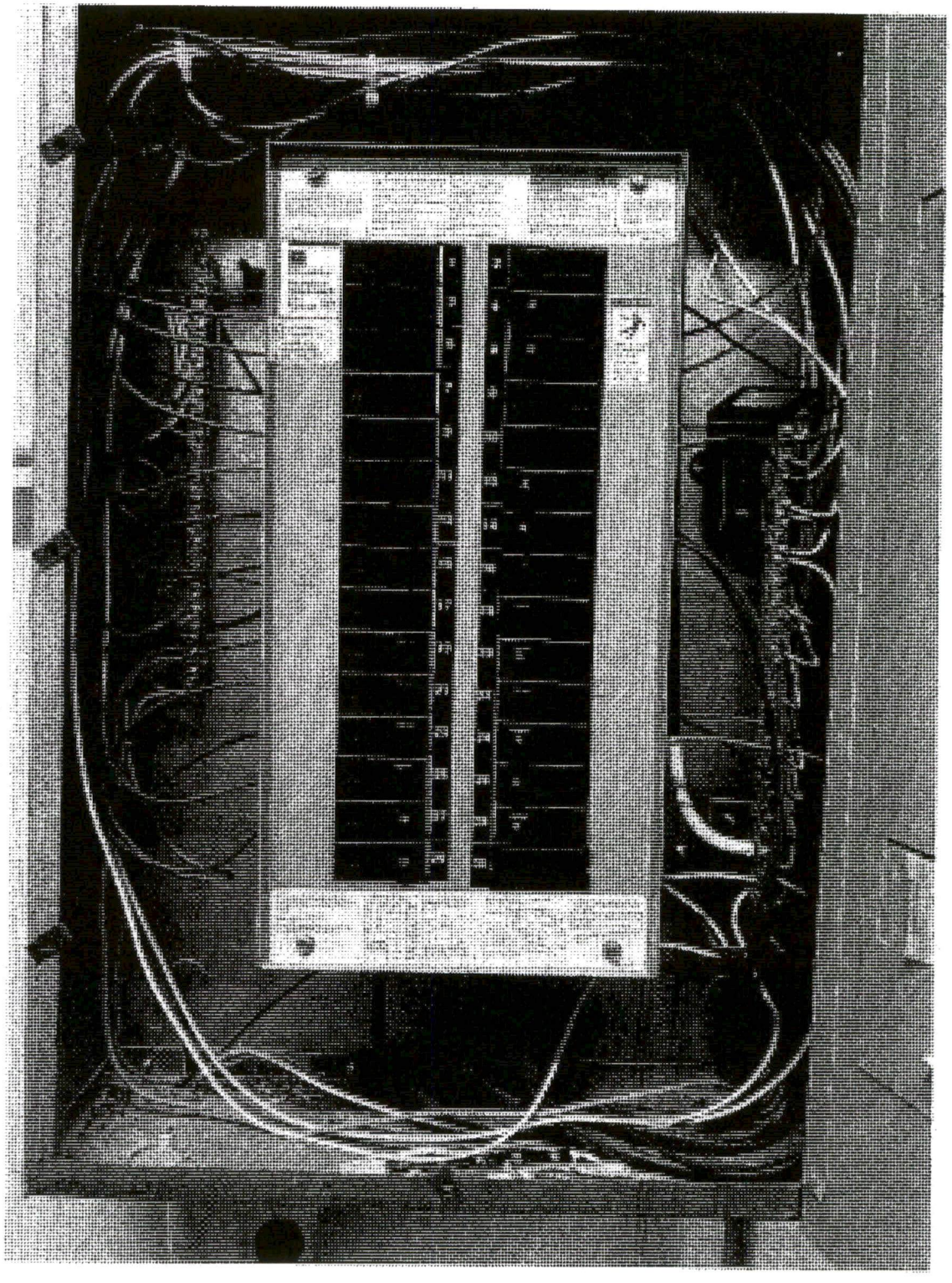
c) South Pavilion Level 3 **No ground or Bond, has Isolated neutral**



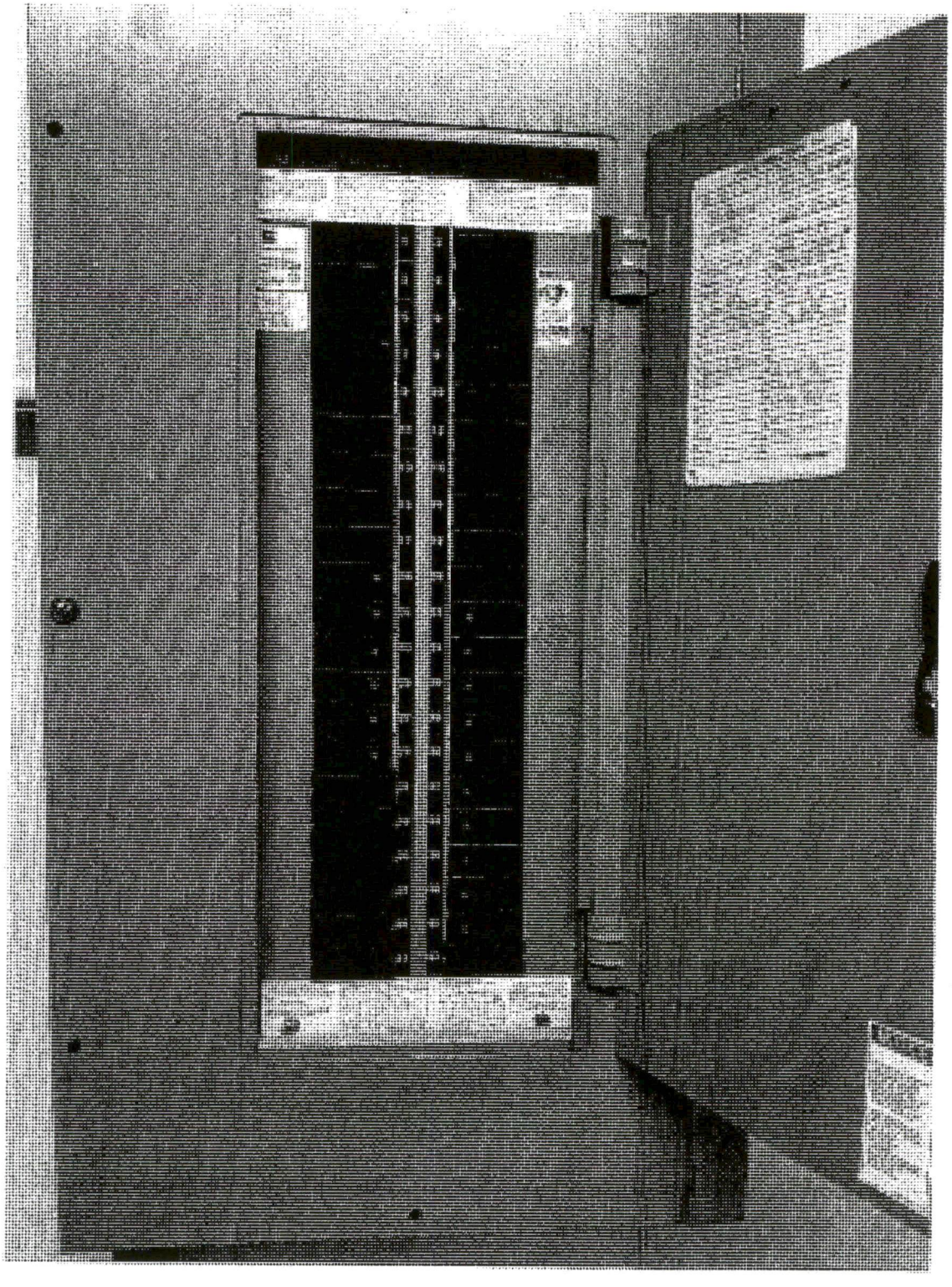


d) P-1B (Rumford) **MLO, has Isolated neutral, ground fed from SD4A 100A breaker**

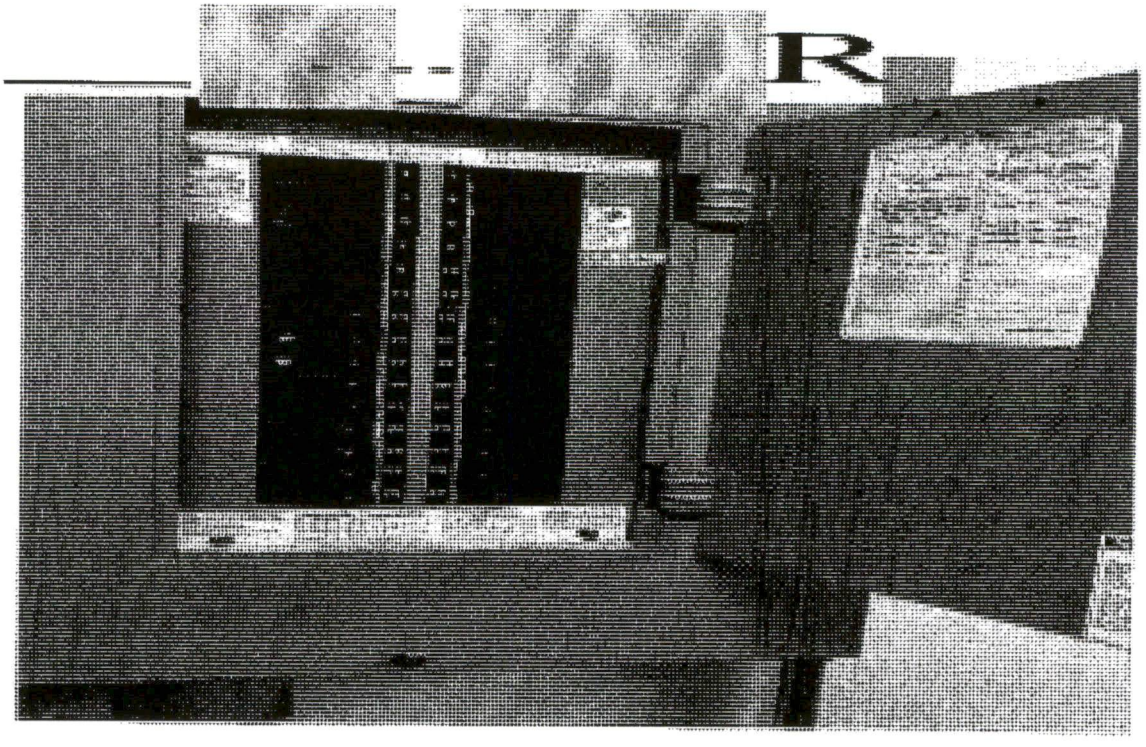


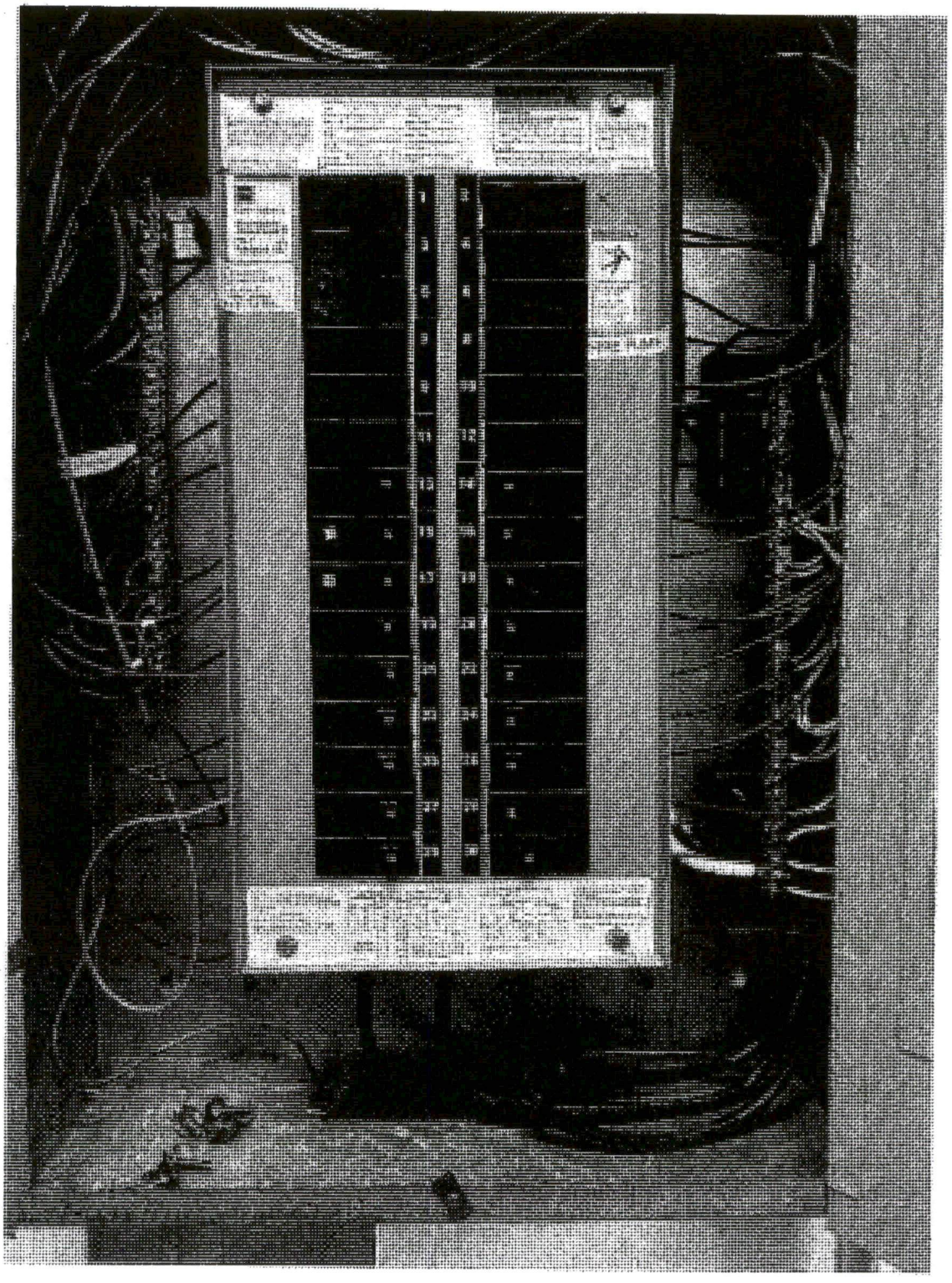


e) P-2A (Rumford)**MLO,has Isolated neutral, ground fed from SD4A 100A breaker**

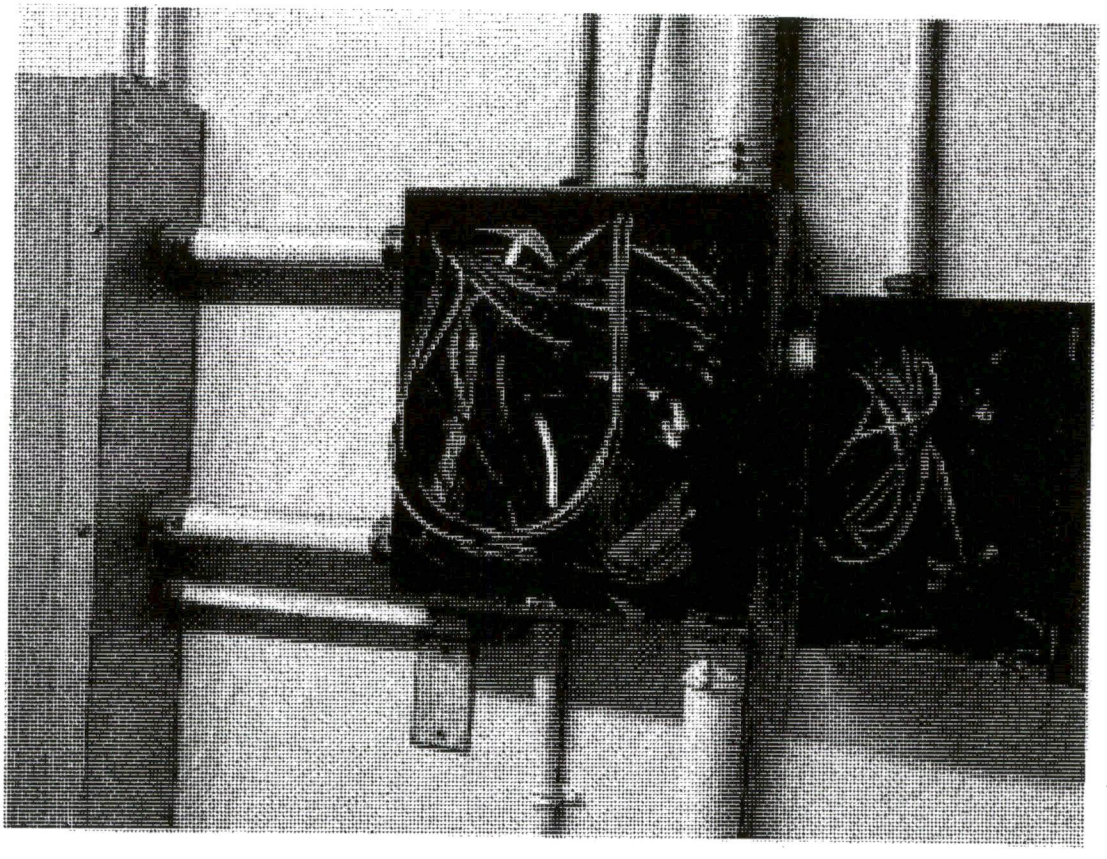


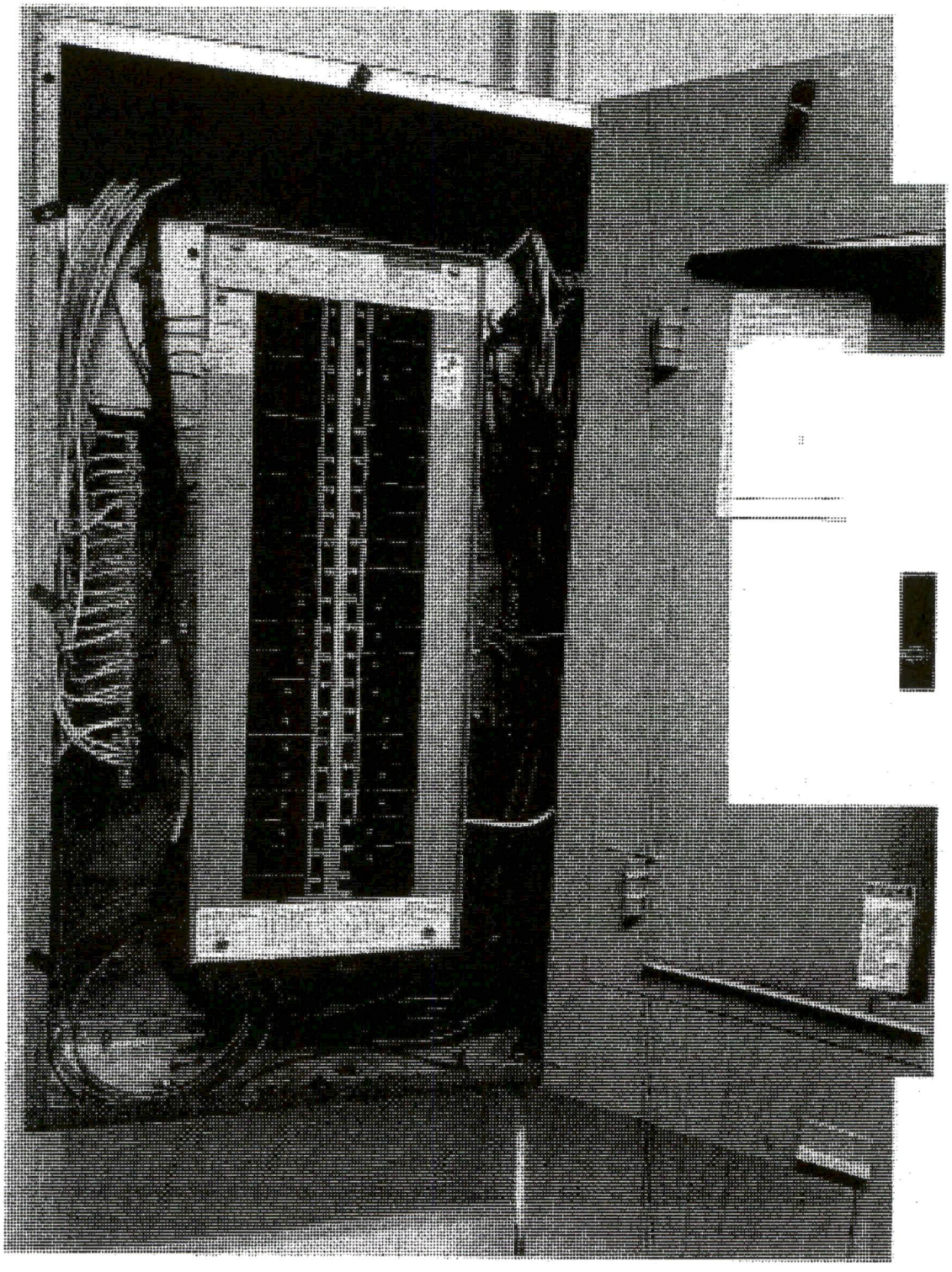
f) P-3A (Rumford) **MLO, has Isolated neutral, ground fed from SD4A 100A breaker**

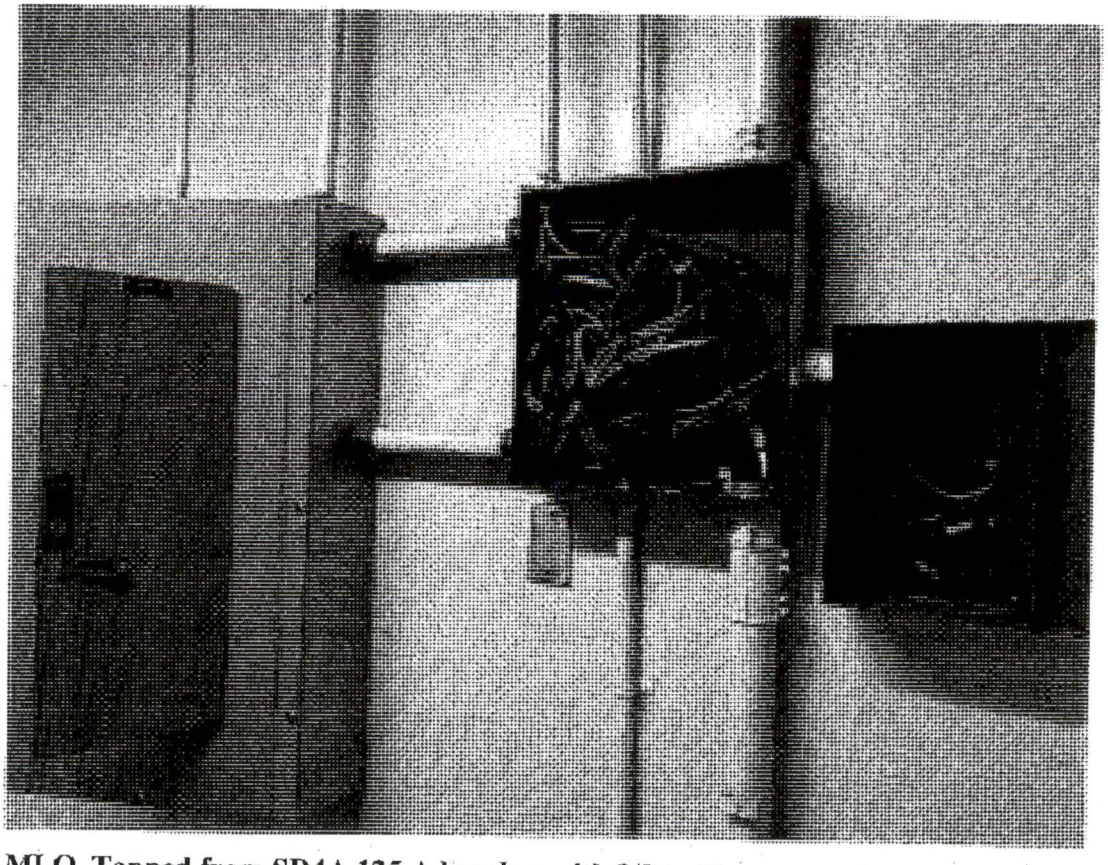




g) P-1C (Fisk) **MLO, Tapped from SD4A 125 A breaker with 3/0 to #2 no ground, no bonding bushing or bonding jumper, same feed is also tapped for P-2B**

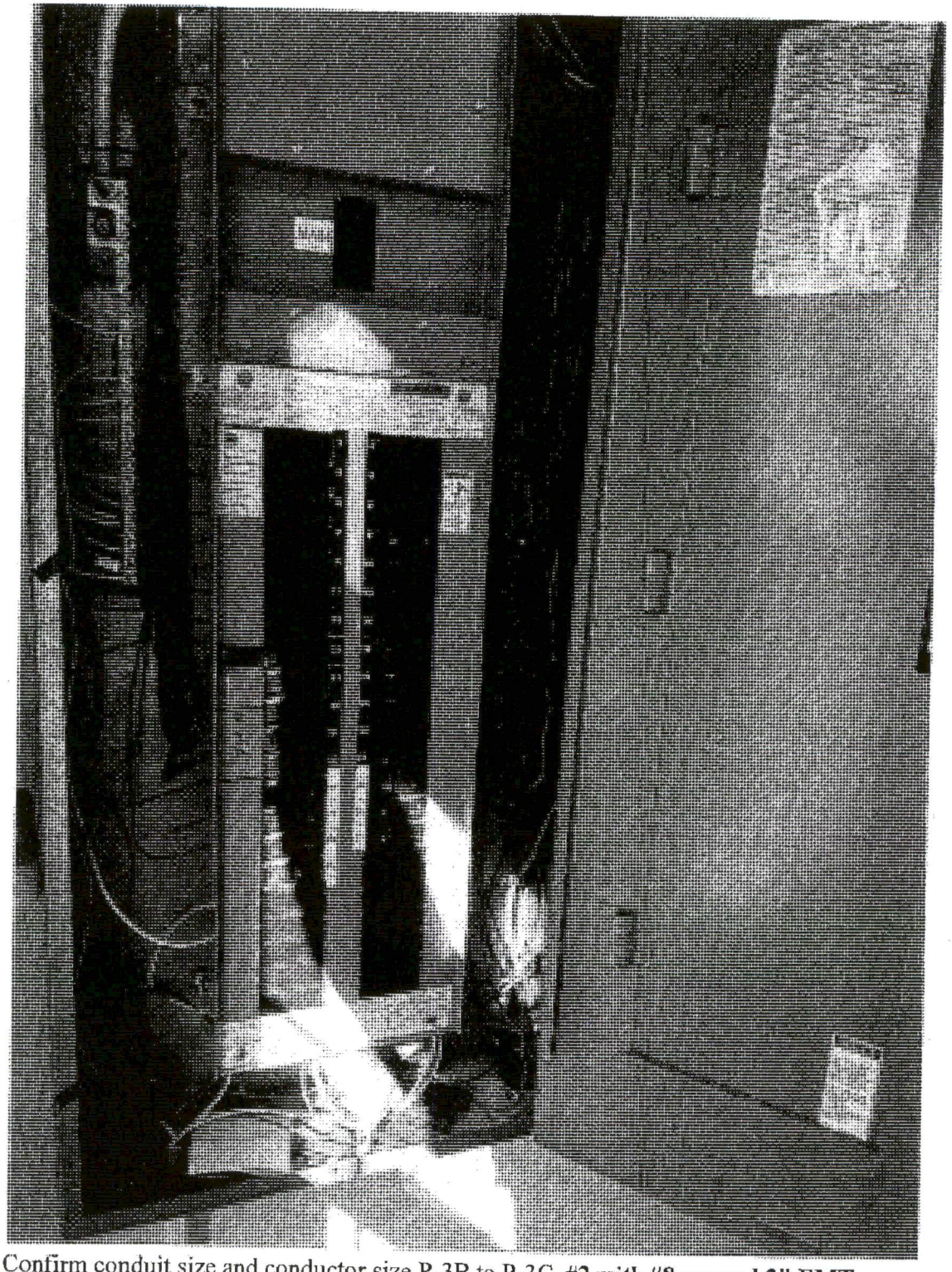






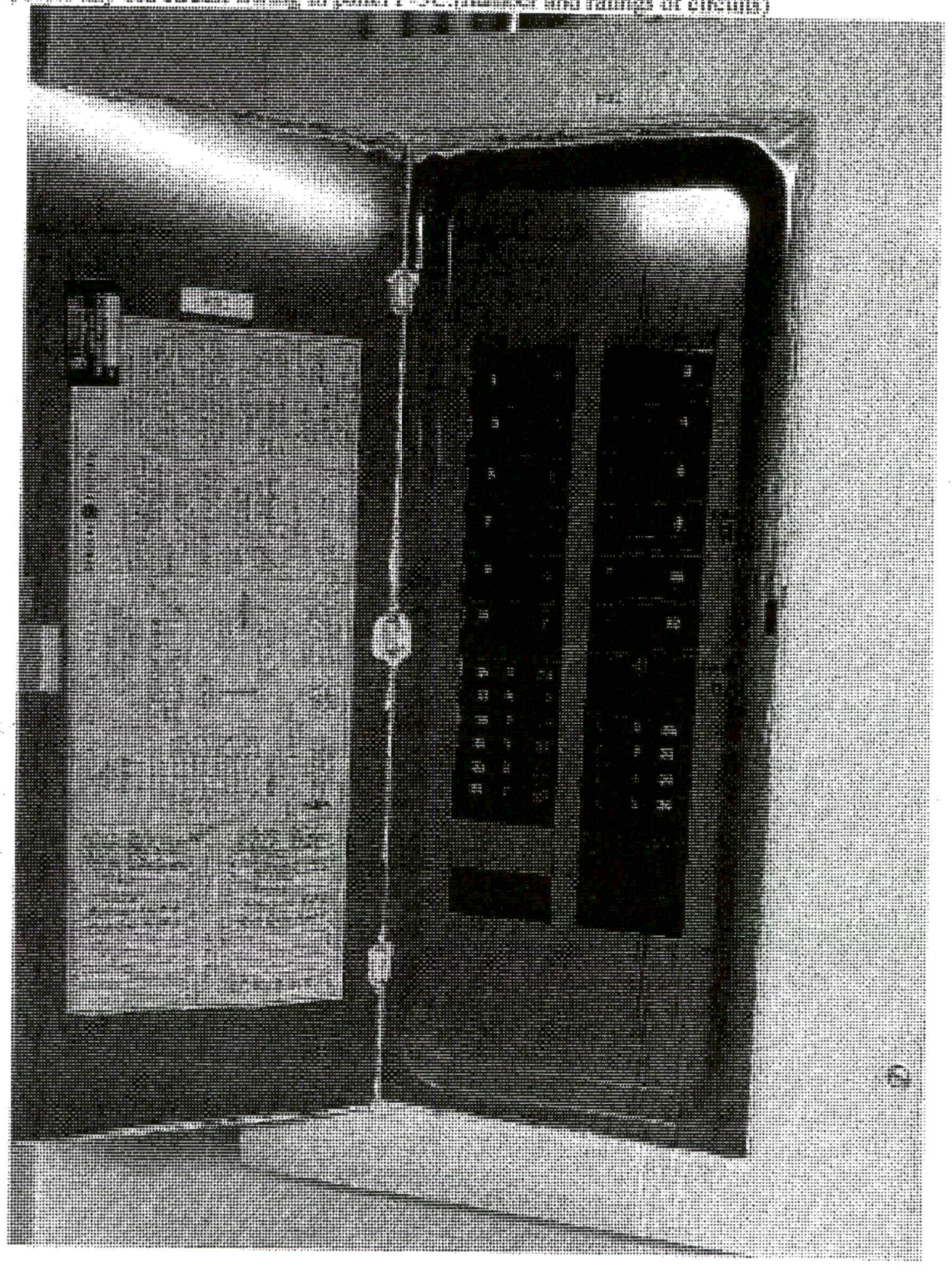
MLO, Tapped from SD4A 125 A breaker with 3/0 to #2 no ground, no bonding bushing or bonding jumper, same feed is also tapped for P-1C

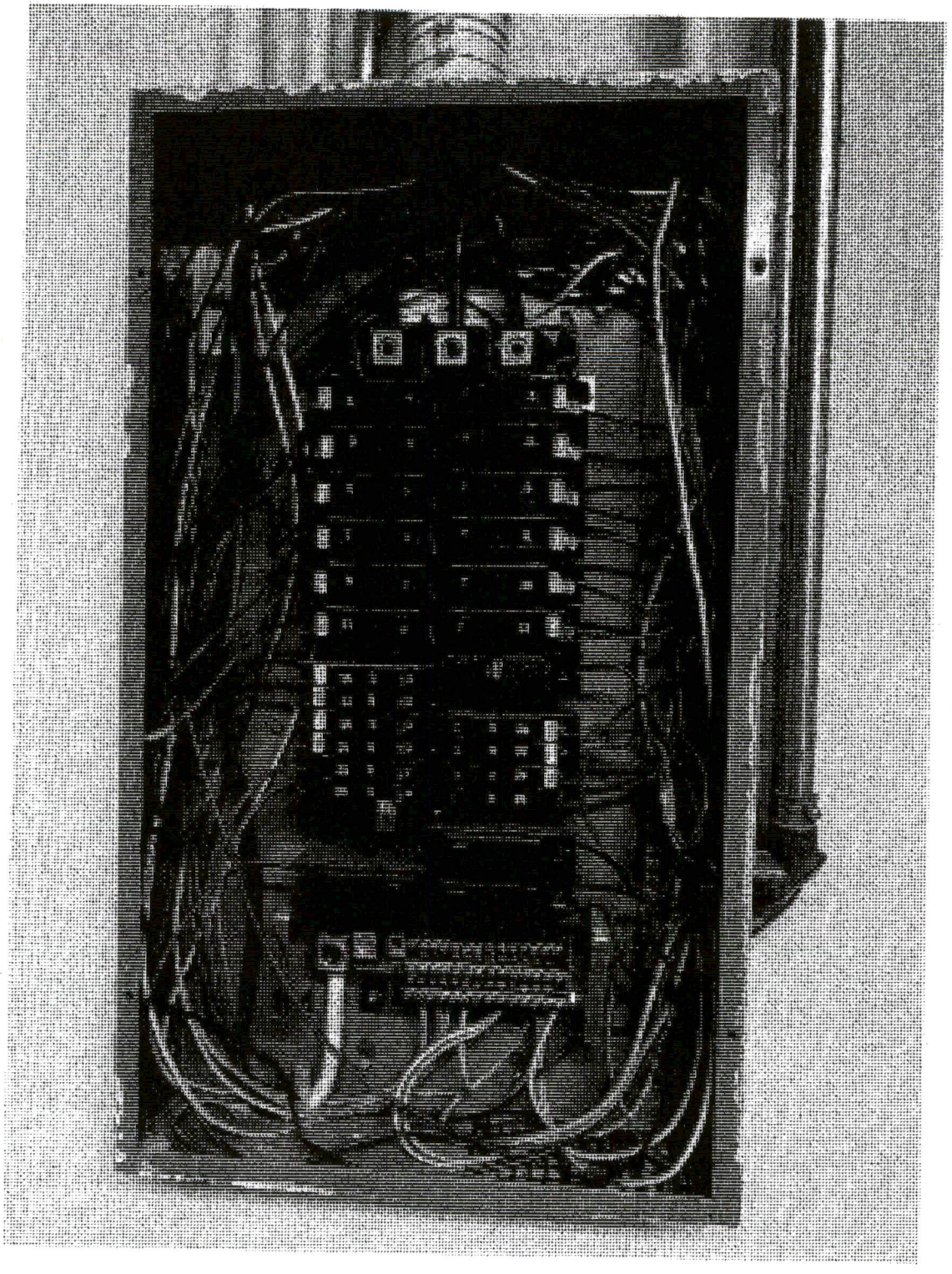
2) Confirm conduit size and conductors from transformer, Fisk 4th floor to Panel P-3B **3/0 with #6 ground, 2" EMT**



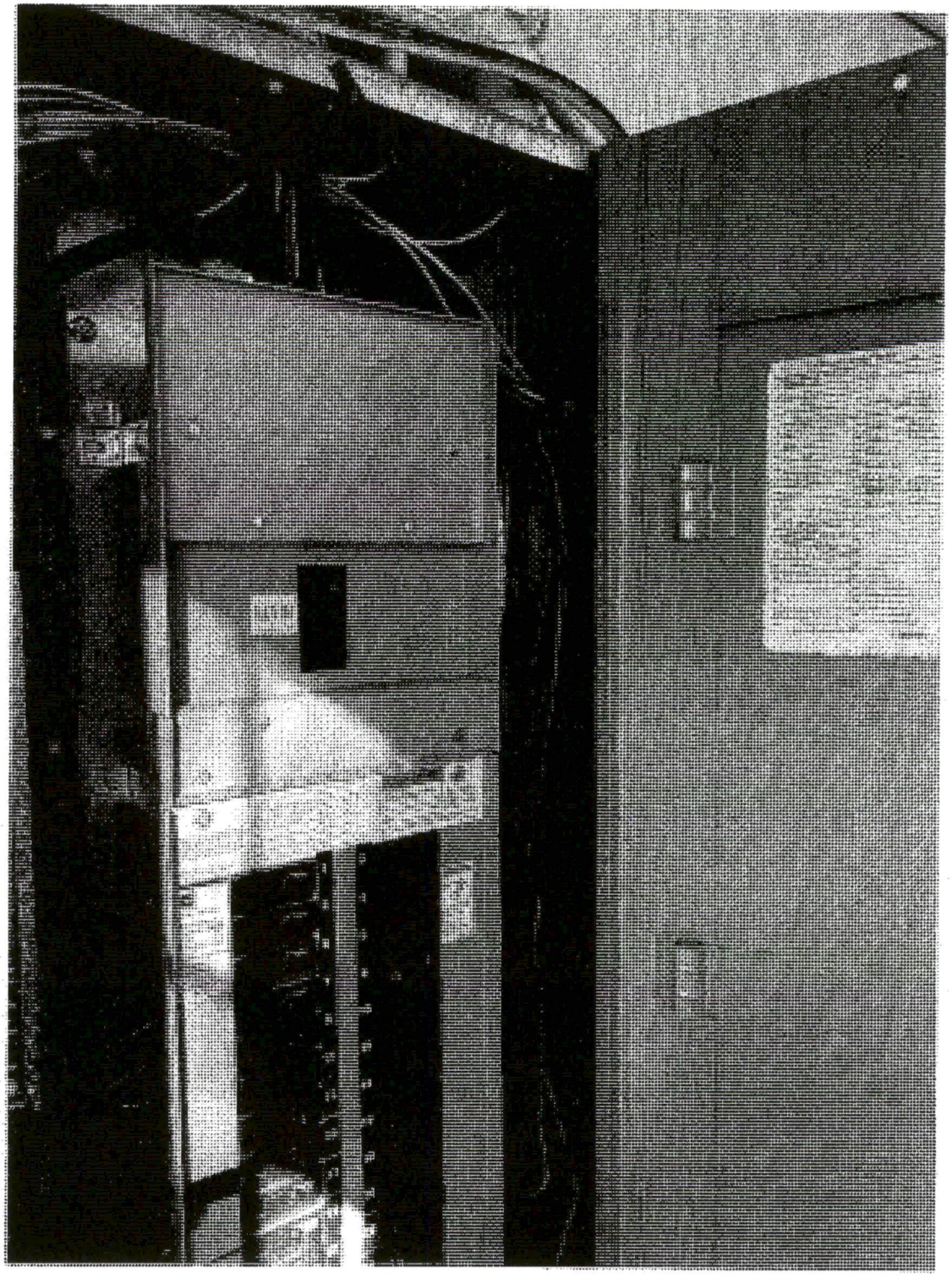
3) Confirm conduit size and conductor size P-3B to P-3C. **#2 with #8 ground 2" EMT**

4) Note any old circuit wiring in panel P-3C.(number and ratings of circuits)



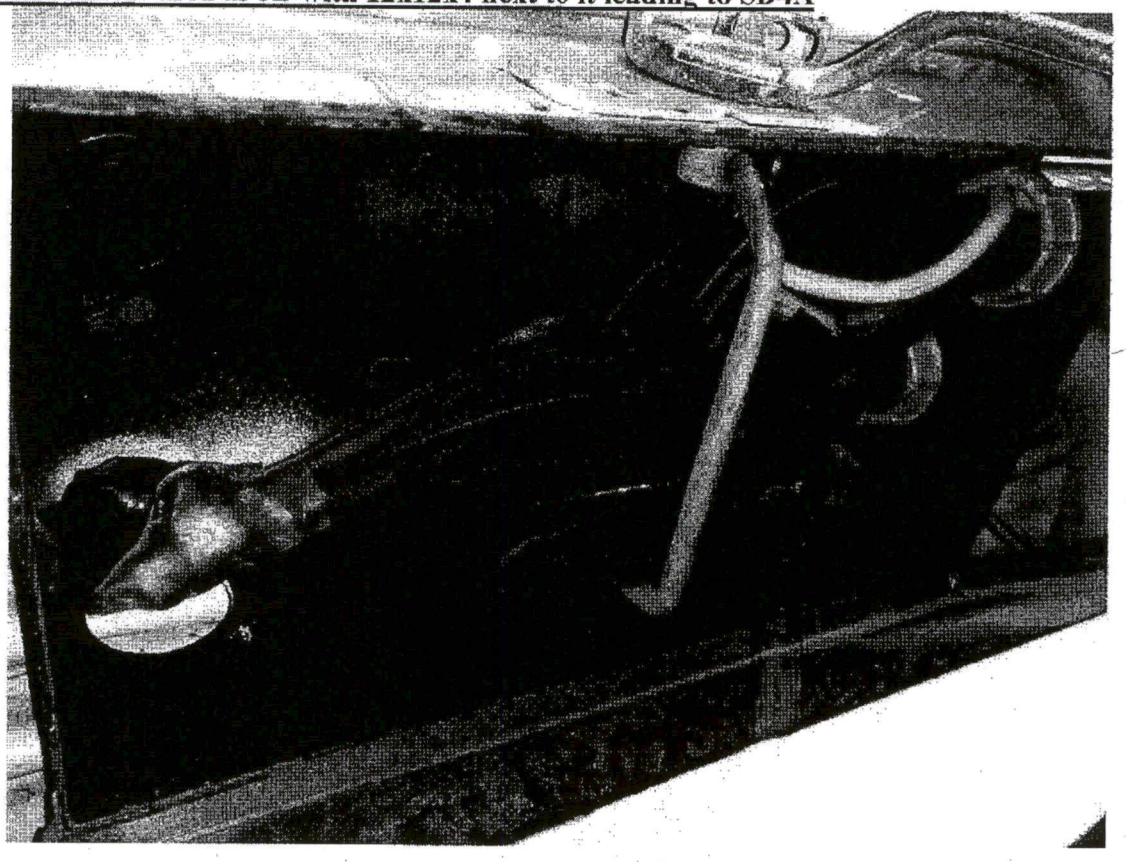


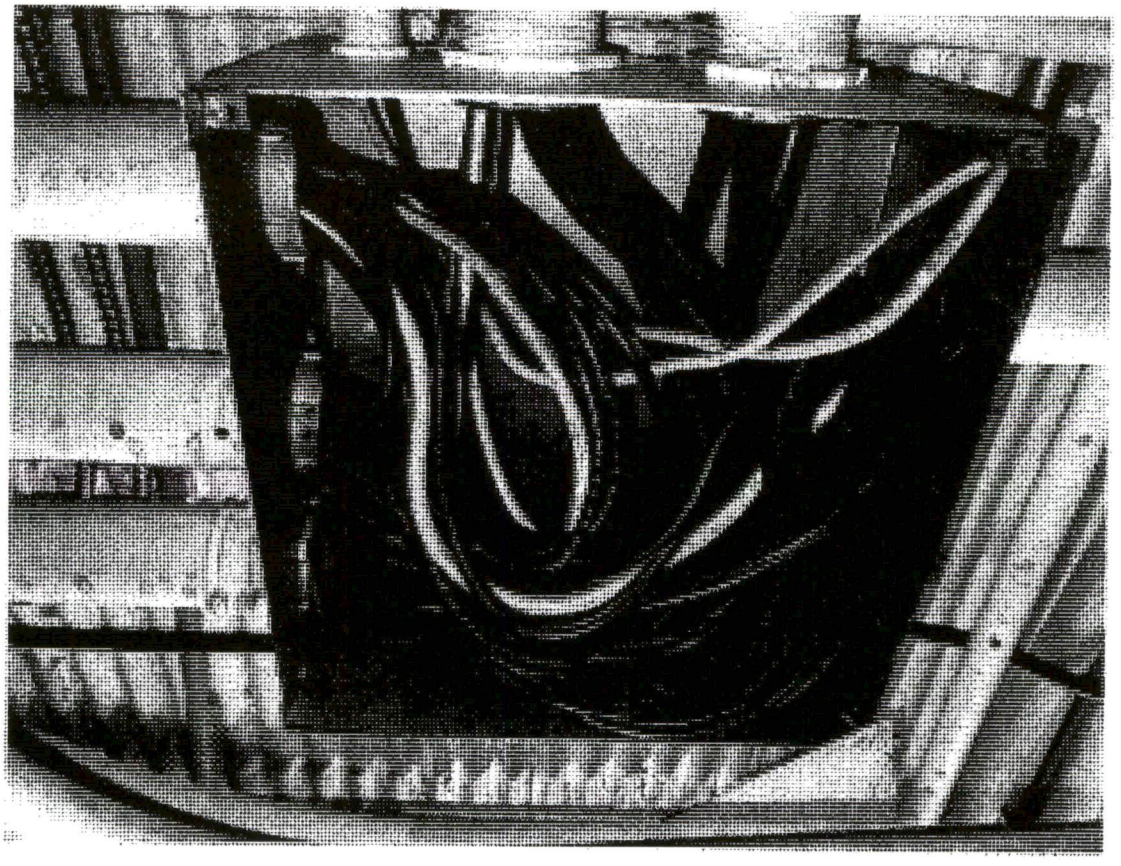
5) Note any old wiring in panel P-3B and adjacent junction box (number and ratings of circuits.



6) number and circuit ratings with old wiring in panels below, and in any adjacent junction boxes fed from the panels:

22 circuit MLO panel with 23 circuits used (1 breaker space is tandem. Fed from SD4A with 50A breaker, leaves SD4A with #8 THHN and spliced at a JB with #2 cloth covered old disconnect used as JB with 12x12x4 next to it leading to SD4A



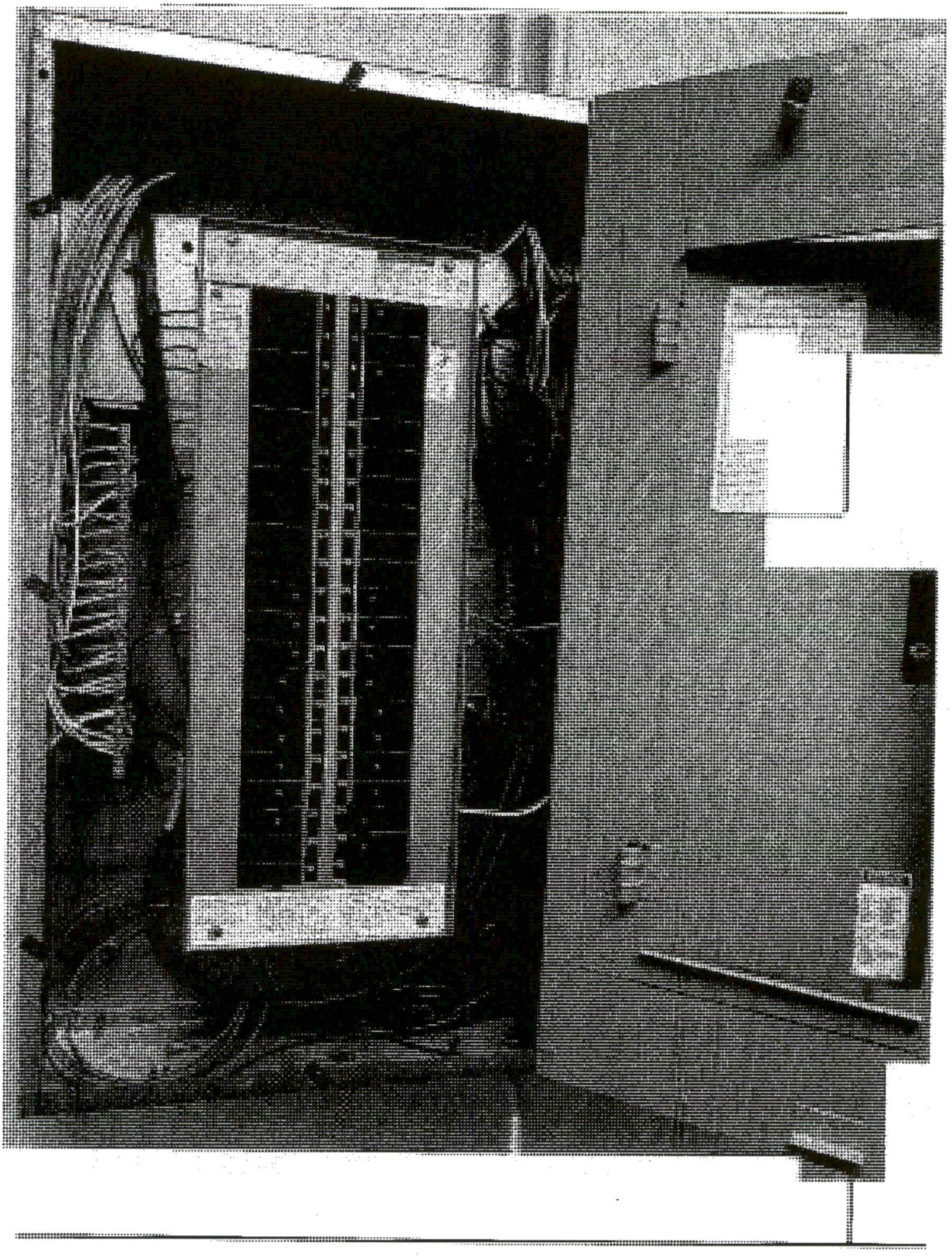


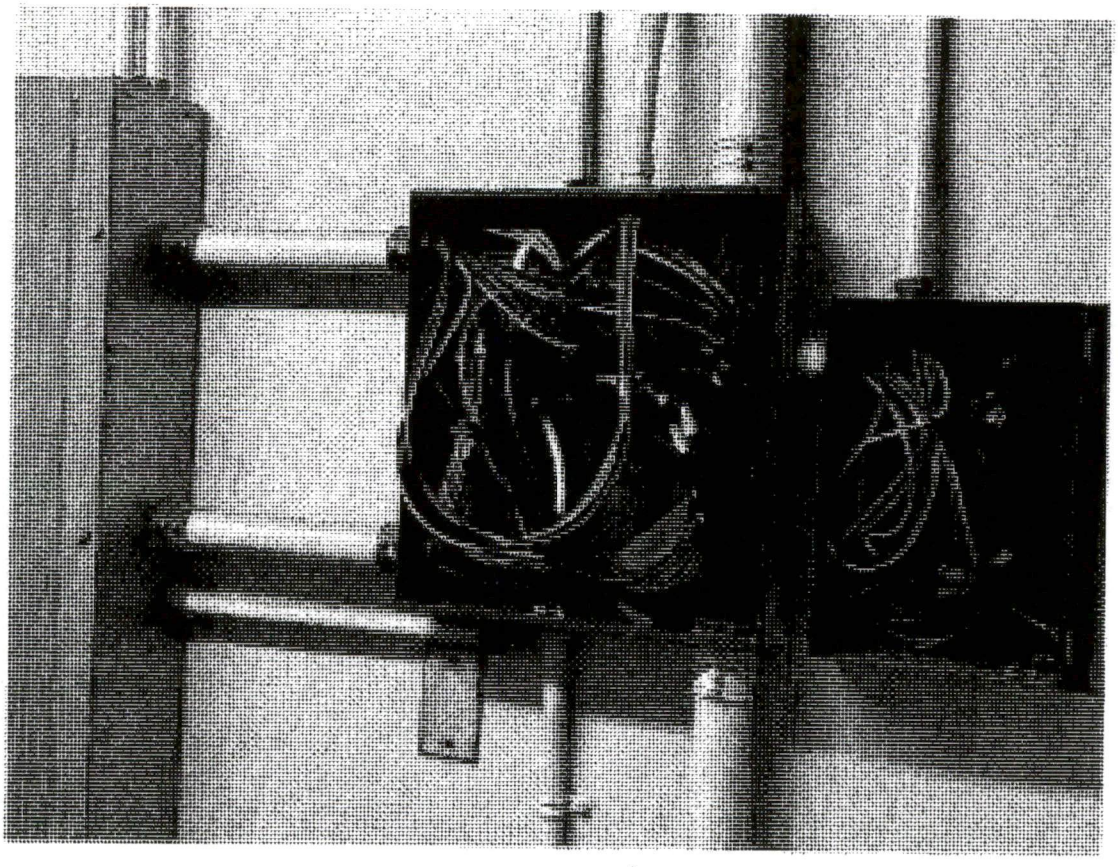
b) P-1B **30 circuit MLO Fed from SD4A 100A breaker #2 feeders with #6 ground No bonding bushing. See section D for pictures of associated junctiou boxes best to panel**

c) P-2A **30 circuit MLO Fed from SD4A 100A breaker #2 feeders with #6 ground No bonding bushing. See section D for pictures of associated junction boxes next to panel**

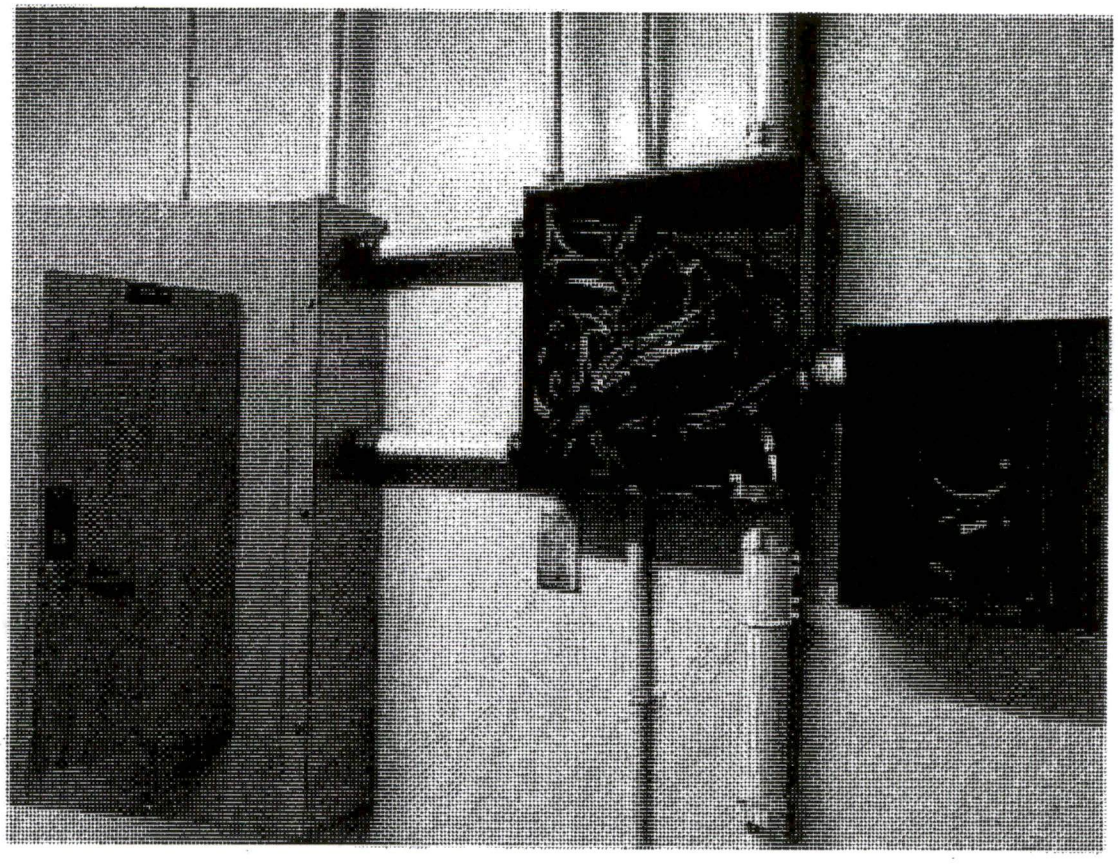
d) P-3A**30 circuit MLO Fed from SD4A 100A breaker #2 feeders with #6 ground No bonding bushing. See section D for pictures of associated junction boxes next to panel**

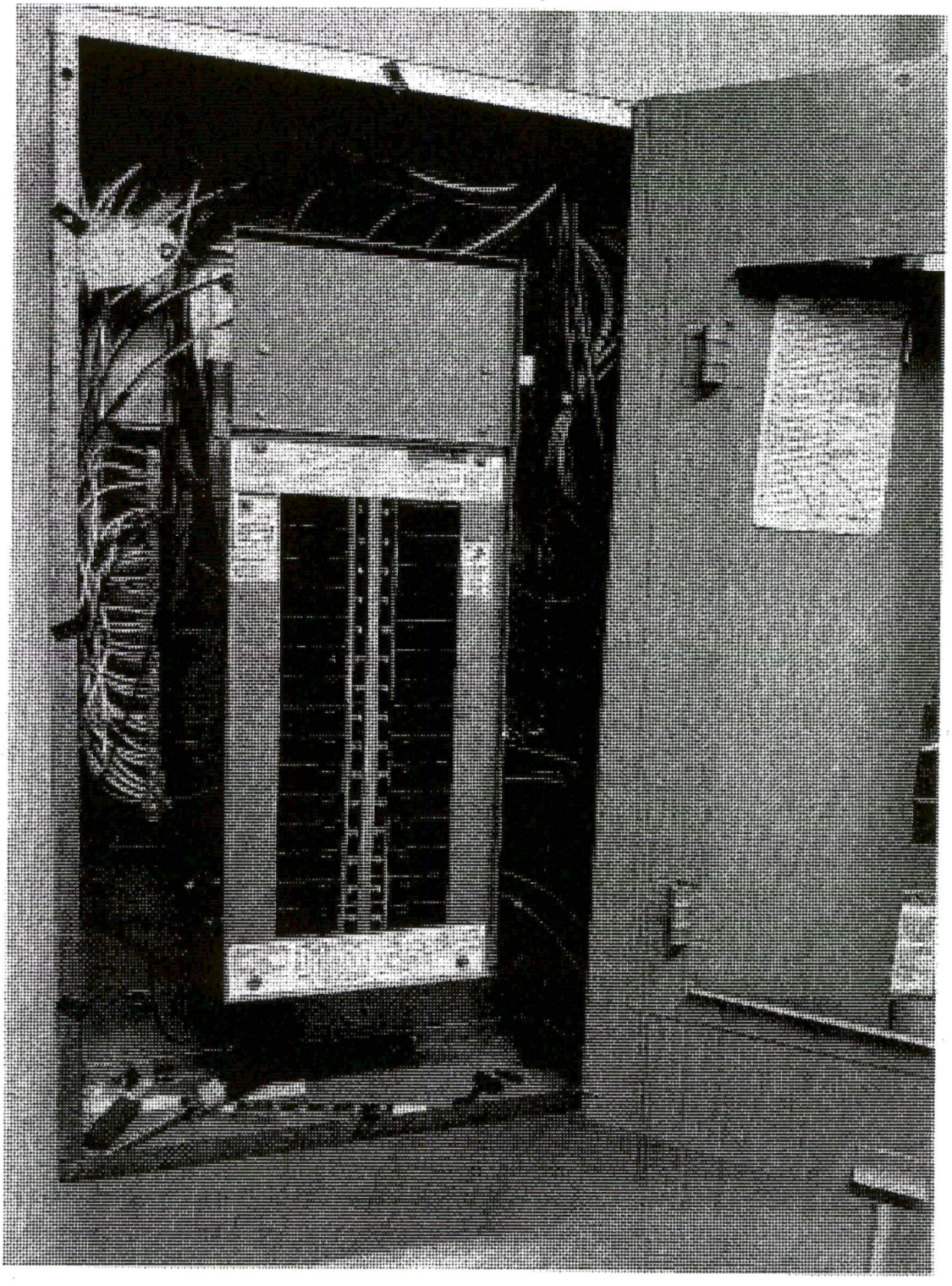
e) P-1C **42 CKT MLO tapped from 125A breaker CKT32,34,36 3/0 tap to #2 to panel, no Bond jumper**





f) P-2B **30 CKT MLO tapped from SD4A breaker CKT 32,34,36 3/0 tap to #2 to panel, no Bond jumper**





E. Circuit Tracing - HDP-2 (Administration Feeder) Note circuits with old wiring. Note if panels have neutrals isolated from ground bus. If no ground bonds installed note if conduits used as ground bonds are properly bonded per Code.

1) Confirm breaker ratings and positions from SD-11 to
   a) SD-10 and 10A
   b) LDP-2
   c) PBF
   d) PBG
   e) PBH
   f) PBI
   g) PBM
2) Confirm what panel or panels feed to the following, the panel breaker positions and ratings:
   a) P1D
   b) P1E
   c) P1F
   d) P2C
   e) P2D
   f) P4B
   g) P5A
3) Confirm that Panel SD-10 powers Panels SD36 A and SD-36, and if not where they are powered from and breaker rating and position in panel feeding them
4) Confirm that Panel SD-10 feeds Panel P1G and breaker rating and position. If not, determine source of power feed.
5) Confirm Panel New P3G is powered from Panel P1G and breaker rating.
6) Confirm source of power fed to Panel PAB-2, PSB with breaker ratings and pole positions of feeders.
7) Verify if Panel LDP-2 powers any of the above panels where present sources are not identified on one line.

F. Circuit Tracing HDP-3 (North Feeder). Note circuits with old wiring. Note if panels have neutrals isolated from Ground bus. If no ground bonds installed note if conduits used as ground bonds are properly bonded per Code.

1) Confirm grounding for panels P1H and P1I in computer room on feeders from LDP-3
2) Confirm grounding on LDP-3 feeder to panel P2F
3) Confirm grounding on LDP-3 feeder to panel SD-12A. Confirm SD-12A feeds panels PBJ, P1J, P2E, and Panels P3E and P3F. If not determine feeds to these. If so, note breaker ratings and positions in SD-12A for the circuits.
4) Confirm power feed, breaker position and rating for Panel P1K.
5) Determine grounding and age of wire involved with Panel LBP-3, 3rd floor Peeslee
6) Determine grounding on LDP-3A feeder to Panel L-101 and sub feed to panel LP-102.
7) Confirm power feeder from Panel LDP-3A to Panel P2 and sub feed from P2 to new elevator panel. Note grounding.
8) Confirm power feeder from LDP-3A to Panel SD-12, including grounding method.
9) Confirm feeders and grounding methods on feeders from LDP-3A to Panels NPW-1 and NPW-2. Note grounding method provided.
10) Confirm feeder from LDP-3A to Panel PP-1N

11) Confirm feeder from SD-12 to SD-13B, including rating and panel position.

12) Confirm feeder from SD-12 to Panel SDX with sub feed to Panel SDXA, including breaker rating and position

13) Confirm feeder from SD-12 to Panels P1m, Pm, and P3H. Confirm whether panels sub feed or have individual circuits. Note breaker position or positions and ratings.

14) Determine source of feeder panel P3 in Chandler. Note feeder breaker rating and position. Note grounding provided.

15) Confirm Panel SD-12 feeds Panel SD-13 and breaker rating and position in SD-12.

16) Determine source of feeder for panel PO, first floor North Pavilion, and breaker rating and position in feeding panel.

17) Confirm Panel SD-13 feeds Panel BA which sub feeds Panel PBL. Note breaker positions and ratings for feeders.

18) Confirm the Old Panels to be removed in North Pavilion Wing and fed from SD-13 can be demolished without having to transfer any wiring splices that may exist within them.

19) Confirm the Panel SD-12 has a feeder to the vicinity of SD-10 and 10A that then powers the old kitchen panel. Note breaker rating and position. Is there any load or loads still active in the Old Kitchen area for lights, etc. or can this be removed with no other work required.

Appendix “B"

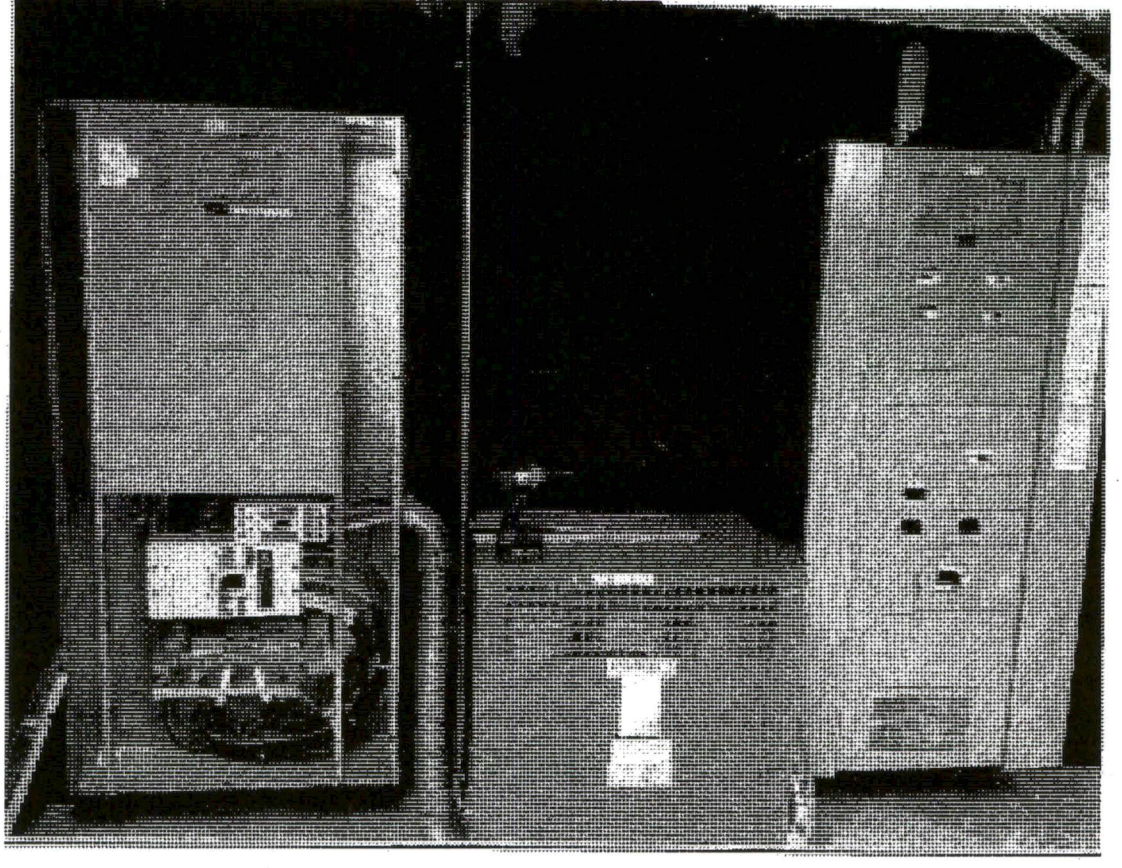
Office Park South, Pleasant Street, Concord, NH - Main Building
Reduced scope

Initial Contractor field confirmation items - Existing Electrical Distribution System

The following is based on drawings E-1 through E-7 Floor plans with panel located; E-8 Locus Plan; E-9 Panels located vertically on floors by Building; E-10 - E-12 Partial One Line Diagrams of the 3 feeders and distribution as developed to date. Based on this data, the following field tracing is needed to confirm the accuracy of the data indicated on the referenced drawings and to permit the completion of the one-line diagrams.

A) Feeders on circuits from Bancroft switchgear to Main Building Panels:

1) Confirm conductors to HDP-1 are 2 sets 4-500KcMil CU, 1 with 2/0 gr and 1 with 3//0 in 1"C. Determine how this is connected at Bancroft switchgear.
2) Feeders to HDP-3. Confirm same as for #1 above.
3) Feeders to HDP-2 confirm they are 2 sets of 500 KcMil with a 2/0 gr with one set.
This is correct, Feeders enter panel via JB on other side of wall and from there it [illegible]





B) Feeders in Main Building:

1) Confirm feeder from HDP-1 to HDP-1A is 4 - 500 KcMil Cu in 3 1/2 " C. Confirm proper ground bonding if conduit is used as ground bond.

2) Determine conduit and conductor size from HDP-1 to transformer disconnect at fourth floor stairwell Fiske Building. Confirm proper grounding if no bonding conductor installed.

3) Confirm feeder from HDP-3 to HDP-3A is 4 - 500 KcMil in 3 1/2 " C. Confirm if ground bonding is correct if no bonding conductor is installed.

3) Confirm conduit, conductor size and proper bonding for feeder from HDP-3A to HDP-P3 on 3rd floor of Peaslee Building

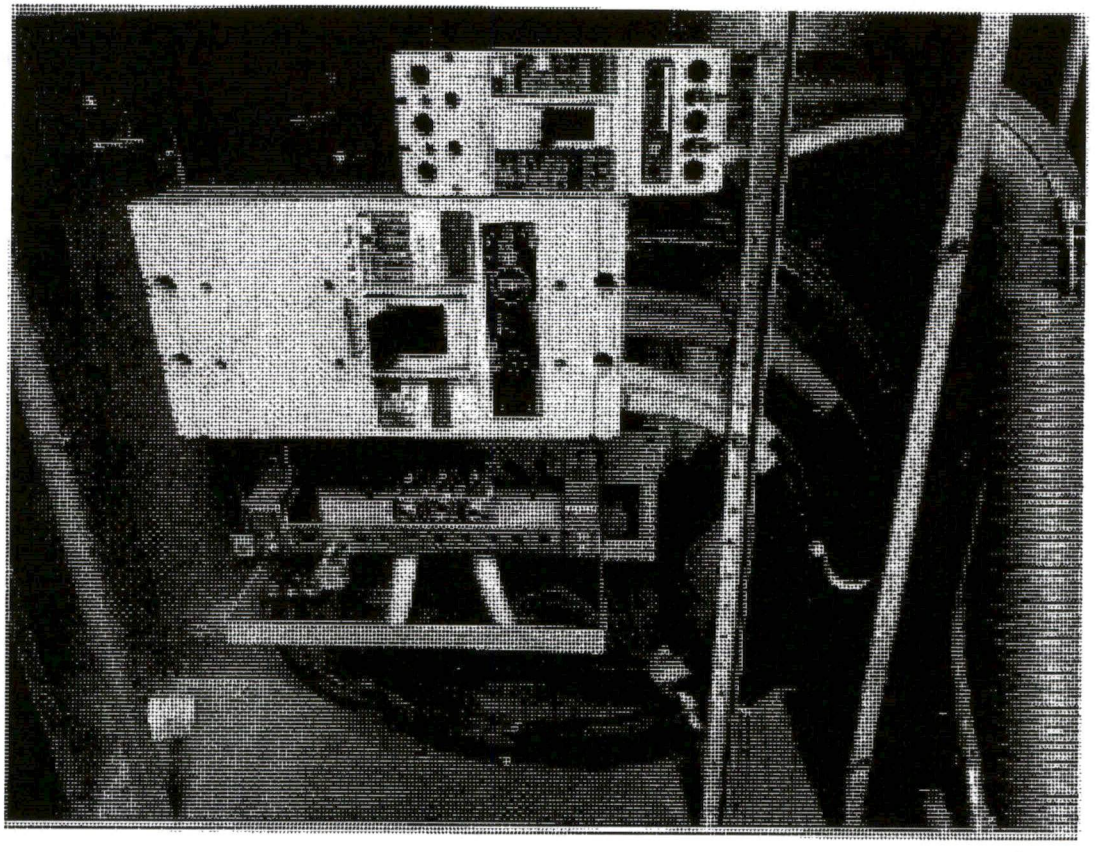
C Grounding in Main Building

1) confirm conductor size and point of grounding for transformer T1A adjacent to HDP-1A

2) Confirm conductor size and point of grounding for Transformer at 4th floor stair-tower in Fisk Building

3) Confirm conductor size and point of grounding for transformer T-2 adjacent to panel HDP-2

Feeders are 250mcm from 250 Amp breaker and #4 equipment ground. Point of Ground appears to be 2/0 bare copper attached to sprinkler pipe above Transformer





4) Confirm conductor size and point of grounding for transformer T3 adjacent to HDP-3

5) Confirm conductor size and point of grounding for transformer T3A adjacent to panel HDP-3A

6) Confirm conductor size and point of grounding for transformer T3B adjacent to transformer T3A.

7) determine conductor size and point of grounding for transformer (30 KVA) adjacent to panel HDP-P3, third floor Peaslee.

D. Circuit Tracing - HDP-1 (South Feeder) Note circuits with Old wiring. Note if panels have neutrals isolated from ground bus. If no ground bonds installed note if conduits used as ground bonds are properly bonded per Code.

1) Confirm breaker ratings and positions from SD-4 to:
   a) PBC
   b) SD4C
   c) South Pavilion Level 3
   d) P-1B (Rumford)
   e) P-2A (Rumford)
   f) P-3A (Rumford)
   g) P-1C (Fisk)
   h) P-2B (Fisk)
2) Confirm conduit size and conductors from transformer, Fisk 4th floor to Panel P-3B
3) Confirm conduit size and conductor size P-3B to P-3C.
4) Note any old circuit wiring in panel P-3C. (number and ratings of circuits)
5) Note any old wiring in panel P-3B and adjacent junction box. number and ratings of circuits.
6) Note number and circuit ratings with old wiring in panels below, and in any adjacent junction boxes fed from the panels:
   a) P-1A
   b) P-1B
   c) P-2A
   d) P-3A
   e) P-1C
   f) P-2B

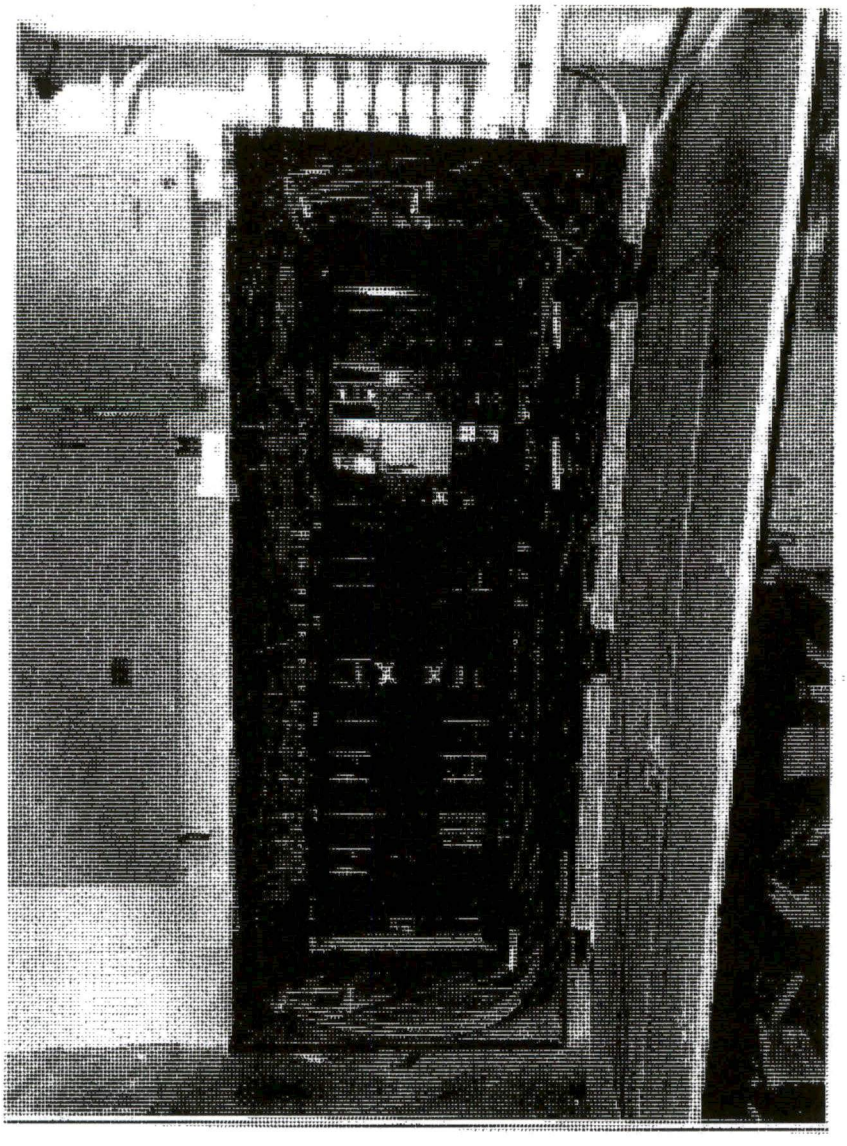
E. Circuit Tracing - HDP-2 (Administration Feeder) Note circuits with Old wiring. Note if panels have neutrals isolated from ground bus. If no ground bonds installed note if conduits used as ground bonds are properly bonded per Code.

1) Confirm breaker ratings and positions from SD-11 to

a) SD-10 Fed from LDP-2 circuit 38,40,42 200 Amp Breaker with 3/0 THHN from LDP-2, spliced to cloth inside if SD11 to SD10 in 3" rigid raceway through floor, Has isolated neutral, no bond or ground present,



Splice point from THHN to cloth in SD11 for SD10 shown to cloth conductors into 3' rigid conduit below panelbox

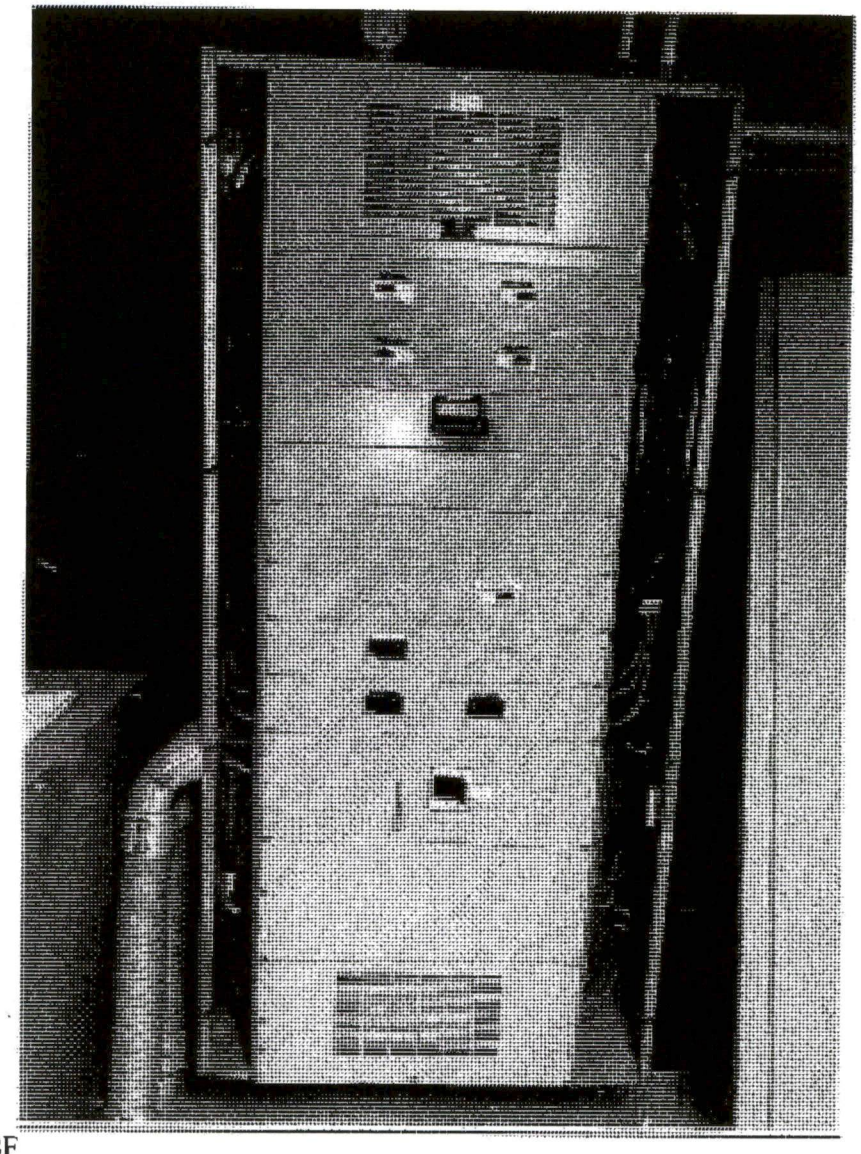


and 10A

10 A is an abandoned panel next to SD10 not energized

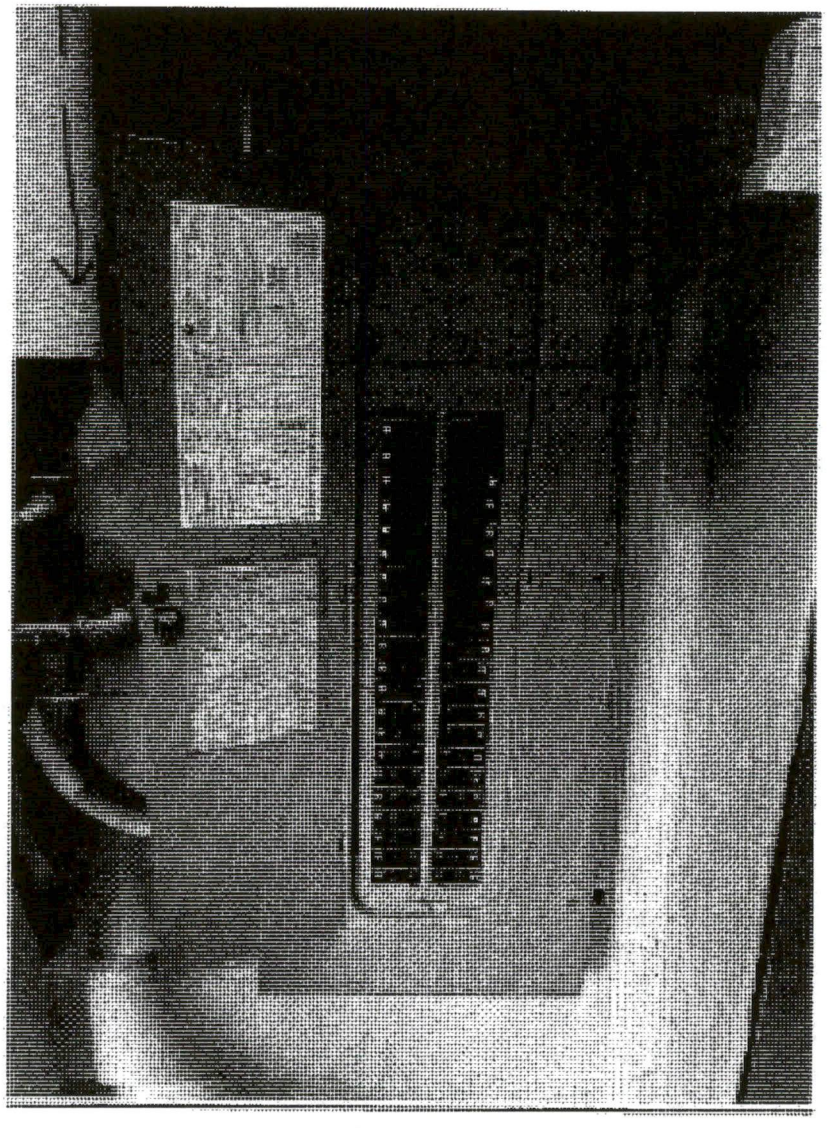
b) LDP-2

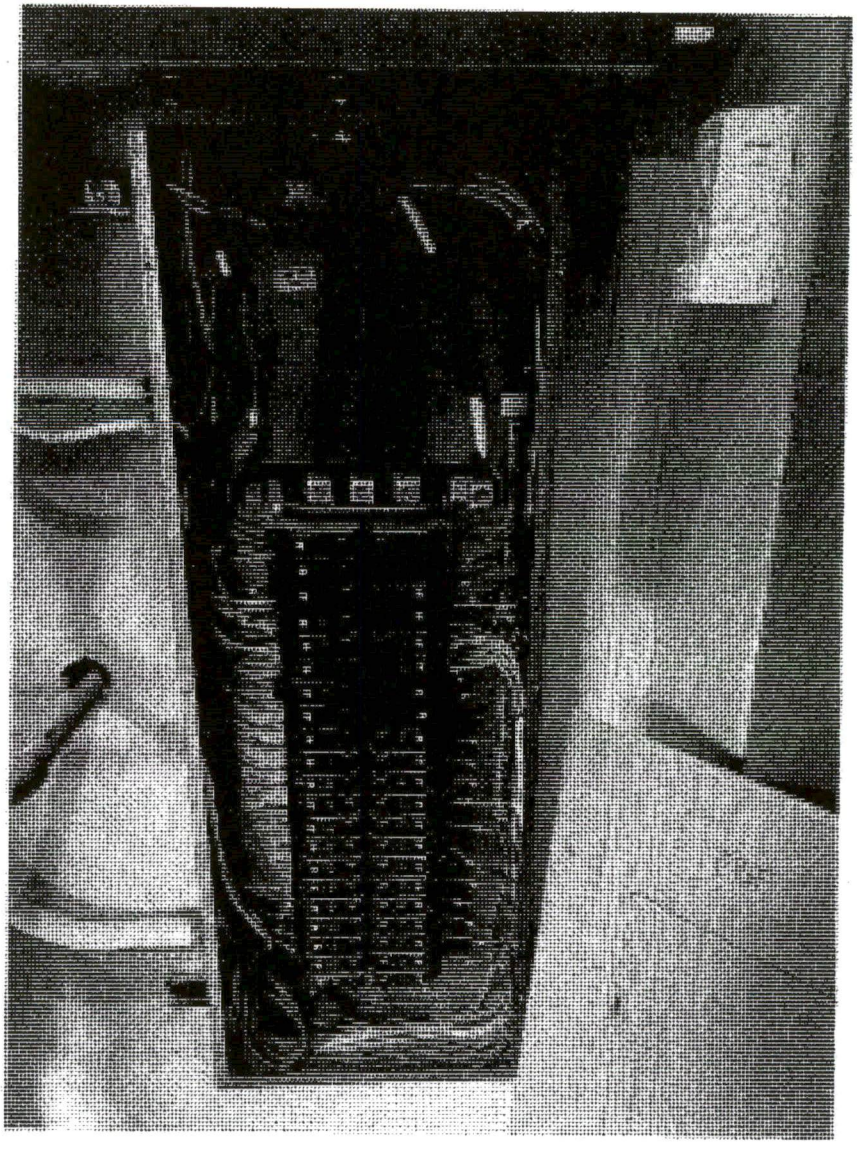
LDP-2 is fed from transformer to 500 Amp MB with parallel 250 MCM 4W with no ground, no bonding bushings



c) PBF

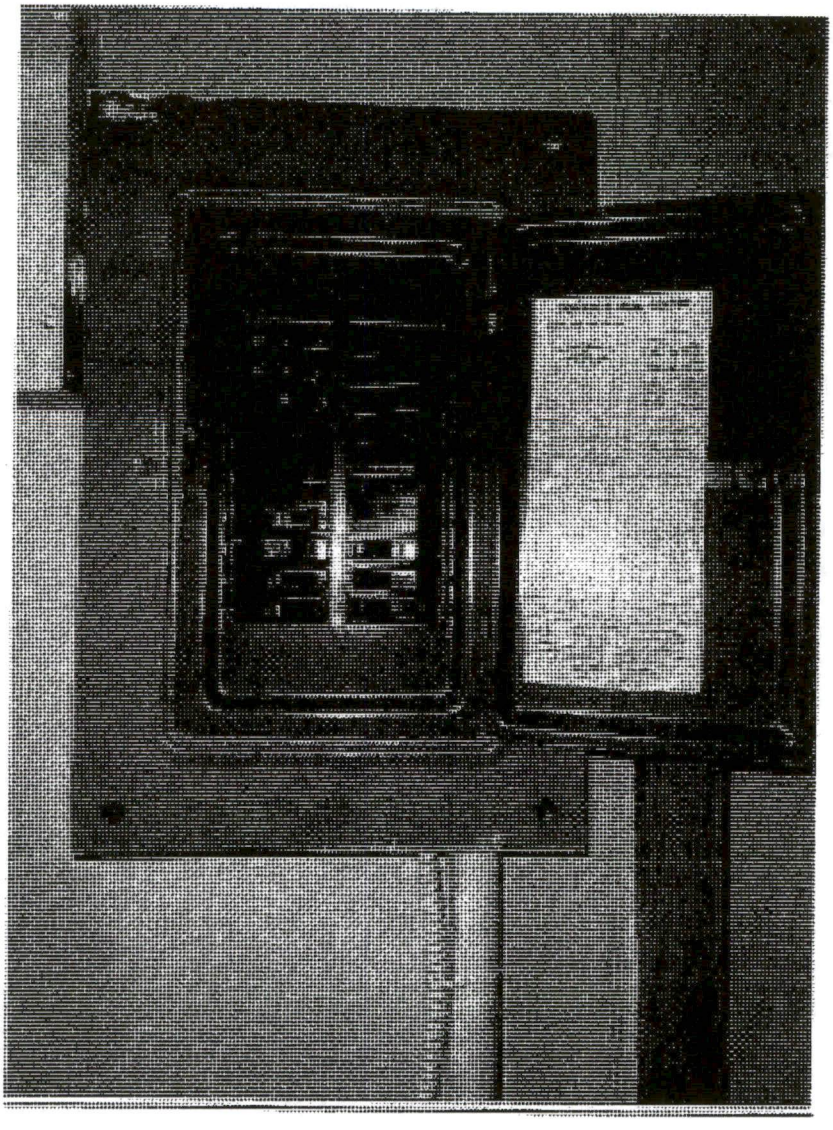
Was also Labeled SD11A, left side of SD11 100A breaker #13 with 4-#2 THHN and #6 ground

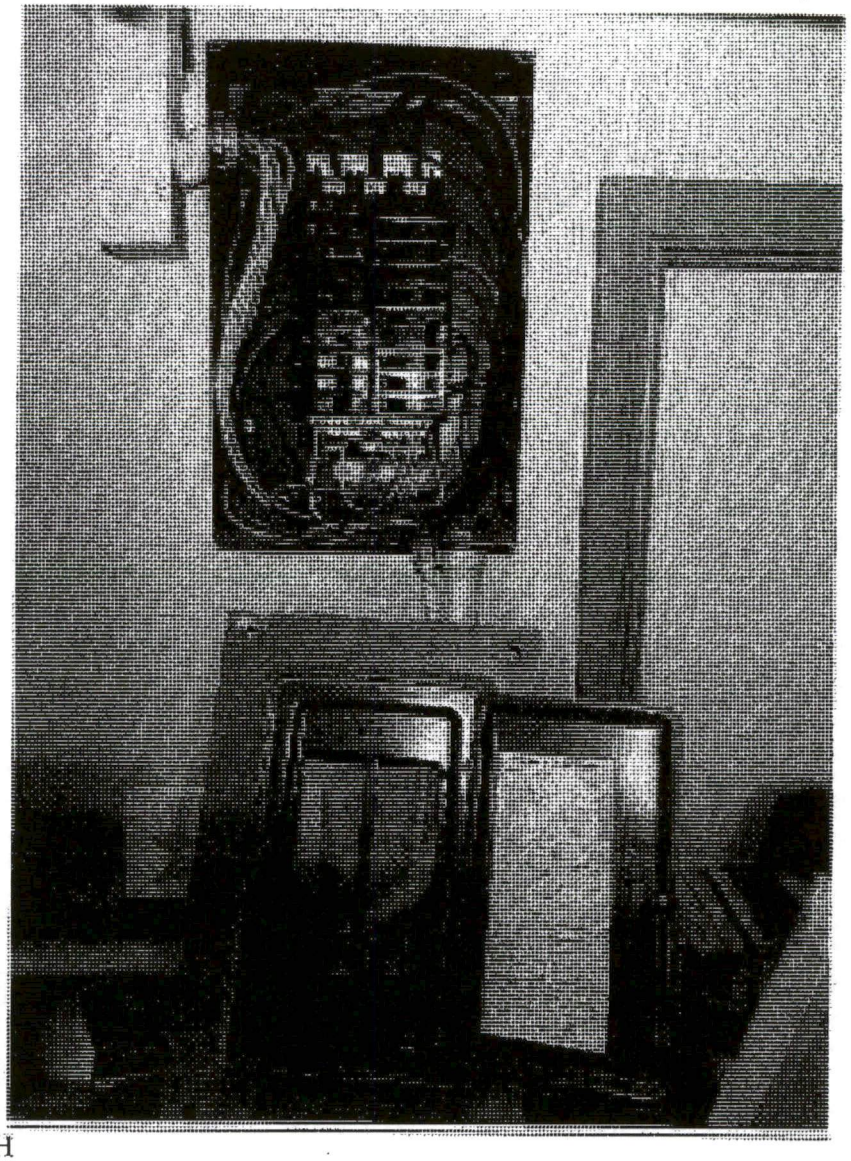




d) PBG

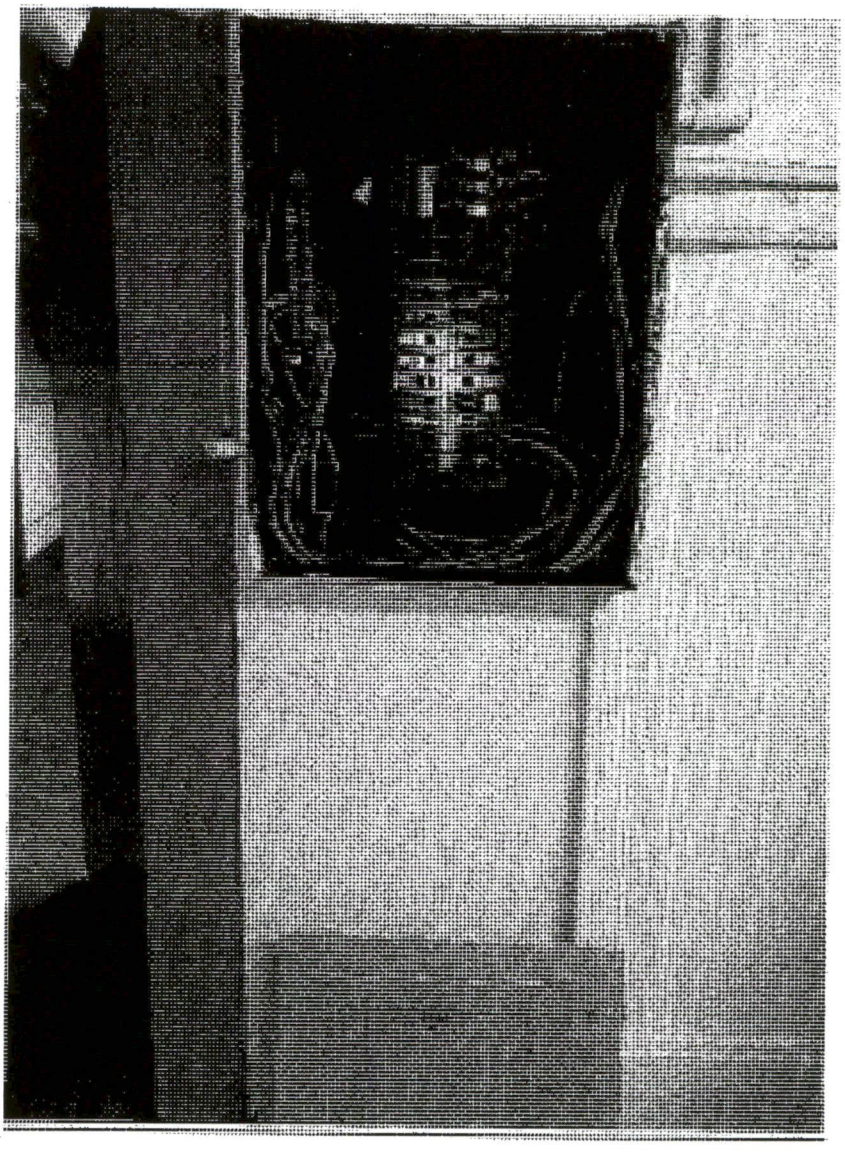
Was also Labeled SD11B, right side of SD11 Fed from SD11 50 Amp breaker 16 with 4W #4 THW





e) PBH

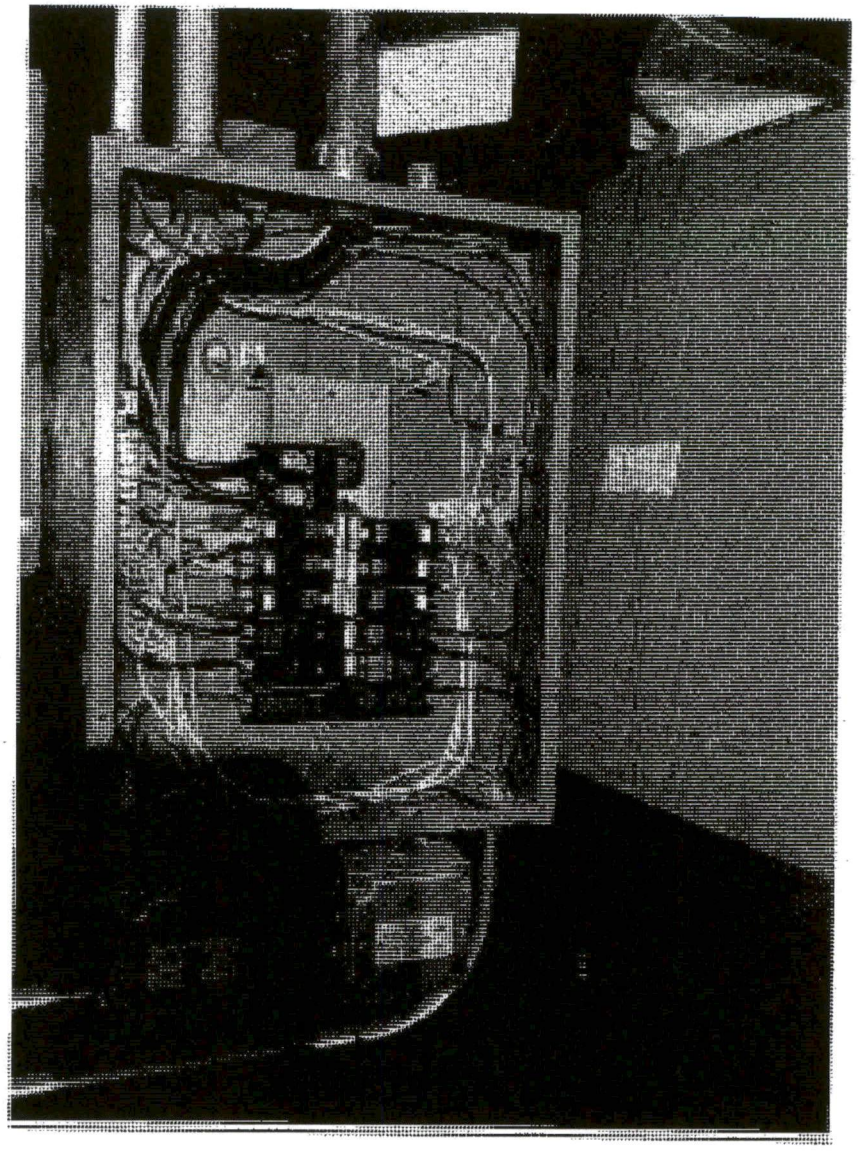
Was also Labeled SD11C , fed from SD11 70 amp breaker ckts 32, 34,36 with 4 w #2 cloth with no ground



f) PBI

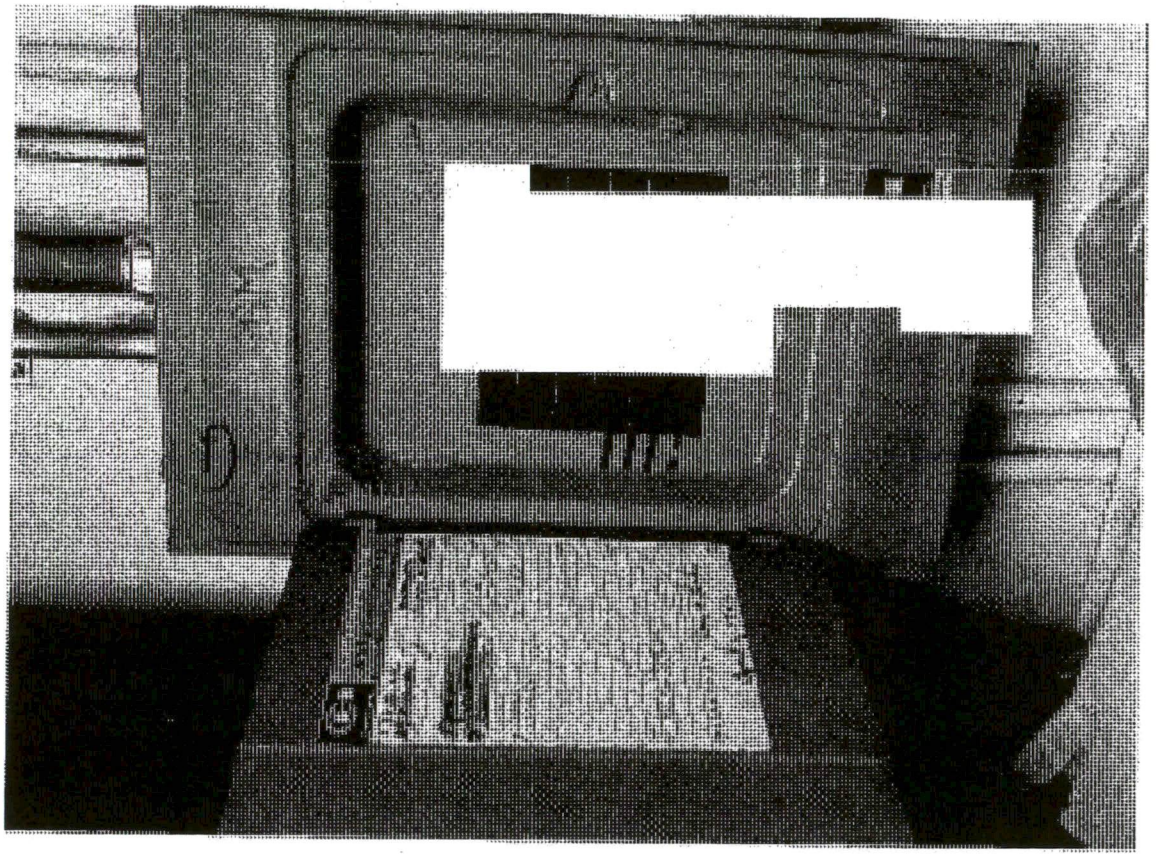
Fed From SD11 using 2 legs of 3 pole 90 Amp breaker with white THHN taped over with black tape. 1 ¼" conduit, #2 wire with no ground.

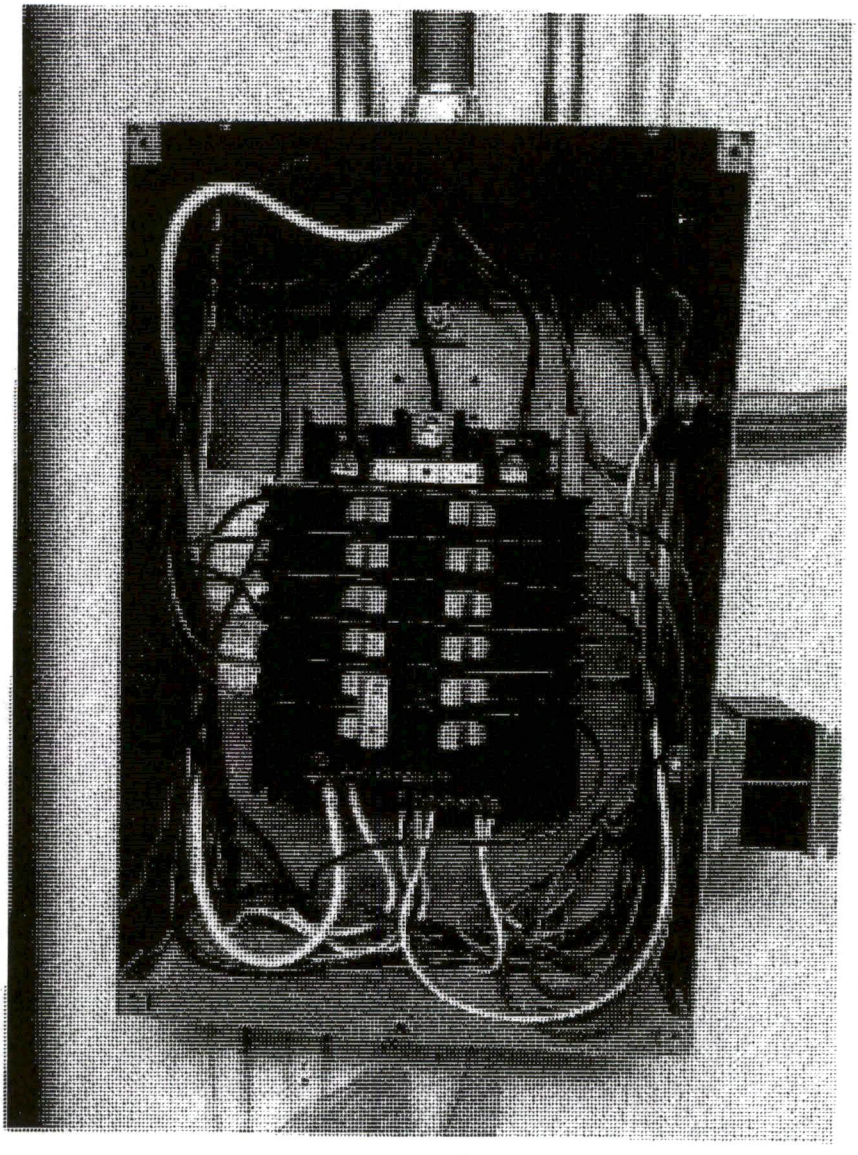
PBI is grounded by a bare #2 conductor in a separate conduit to water main located in Kimball hallway room #3



g) PBM

Located RM 73 Fed from SD11 35 Amp breaker 4 with 4W #8 THNN





2) Confirm what panel or panels feed to the following, the panel breaker positions and ratings:

a) P1D

P1D is no longer used as a panel, it is a Junction Box for P2C

b) P1E

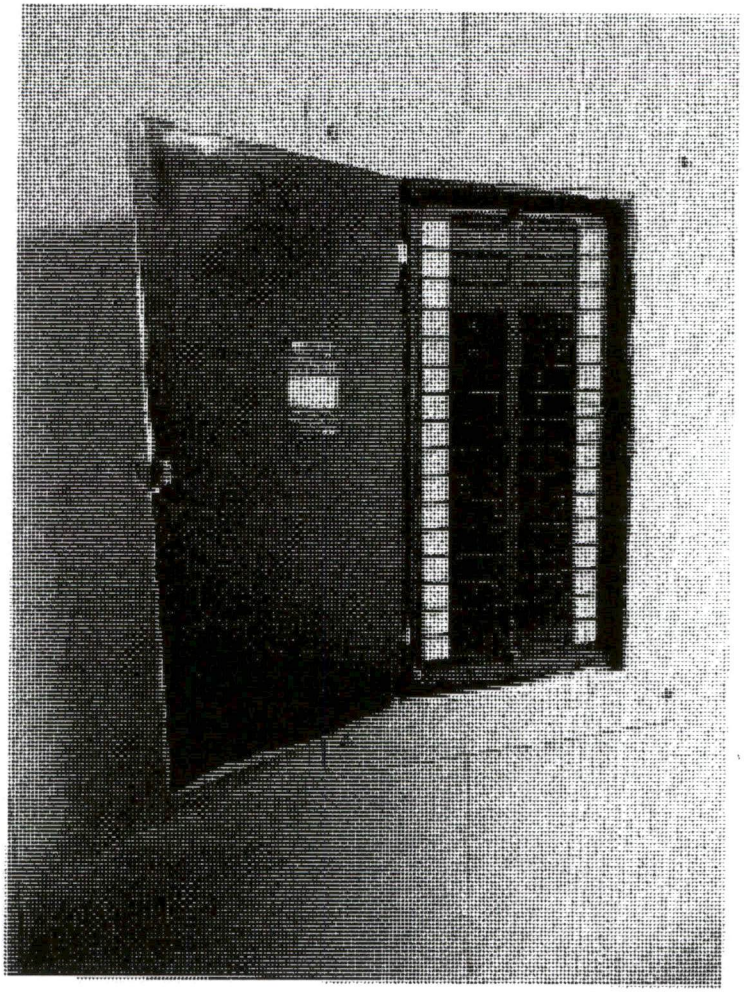
P1E has the strongest signal coming from SD11 breaker 12 at B and C phase, P1E has two legs and SD11 breaker 12 is a 3 pole 70 Amp with cloth appearing to be #4

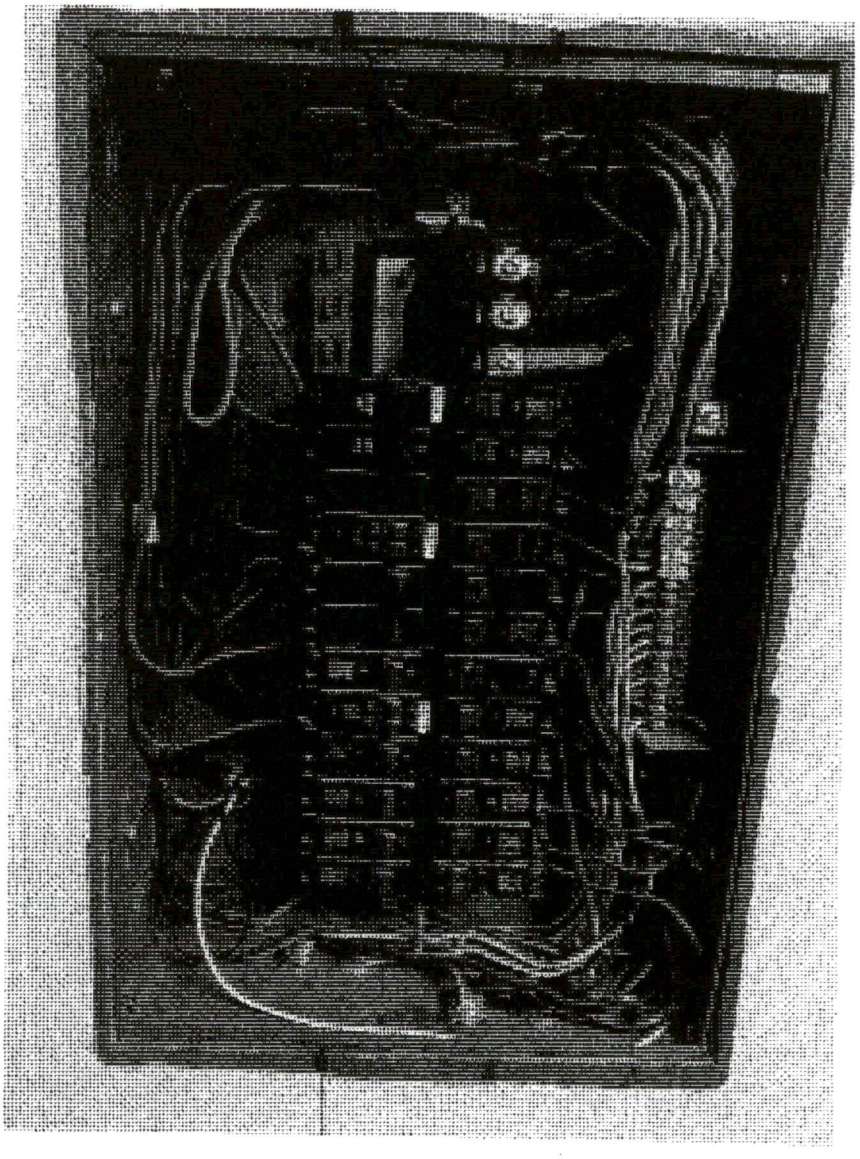
c) P1F

P1F is Fed from SD 10 50 Amp breakerckts 14, 16, 18, cloth appears to be #2 up until 2' from the panel there is a wireway where THHN is spliced in the wireway.. The neutral is Isolated but the ground is only coming from the wireway,

d) P2C

Fed from SD11 100Amp breaker 15 leaving in 2" conduit with 250mcm copper THHN no ground and spliced to Aluminum conductors at a Junction box to P2C





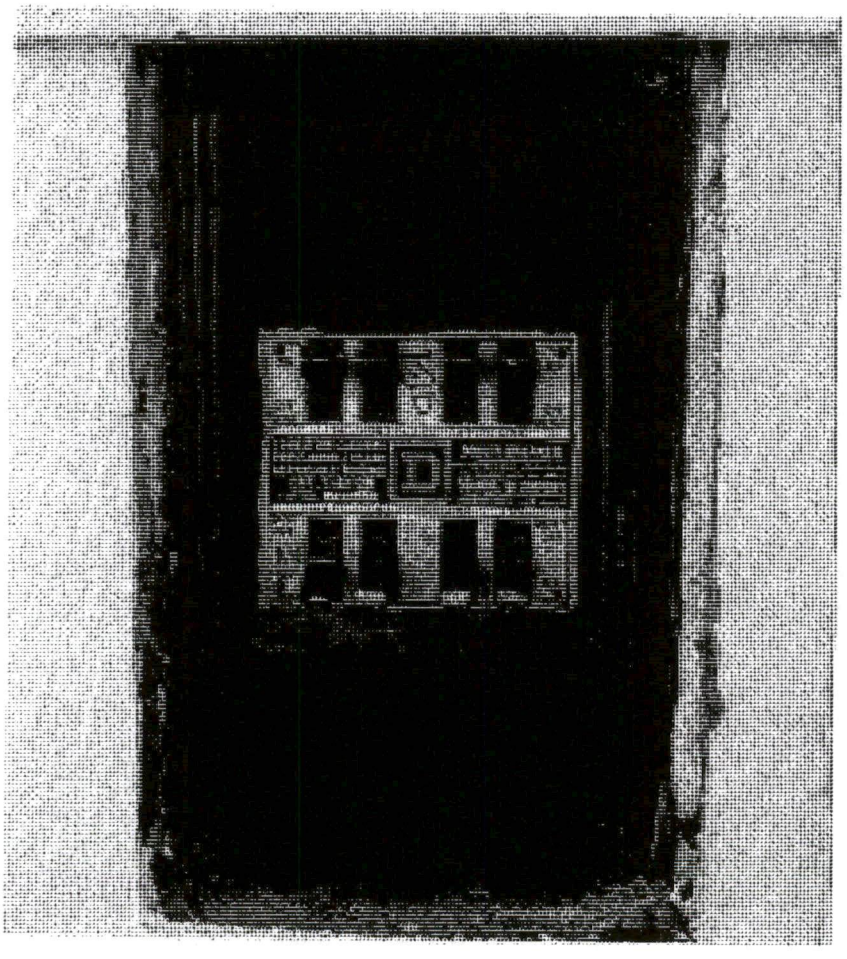
The splice point from copper to aluminum is locatated at a hinged Junction box in the back room of Room 76. The bare aluminum ground is wrapped with black tape

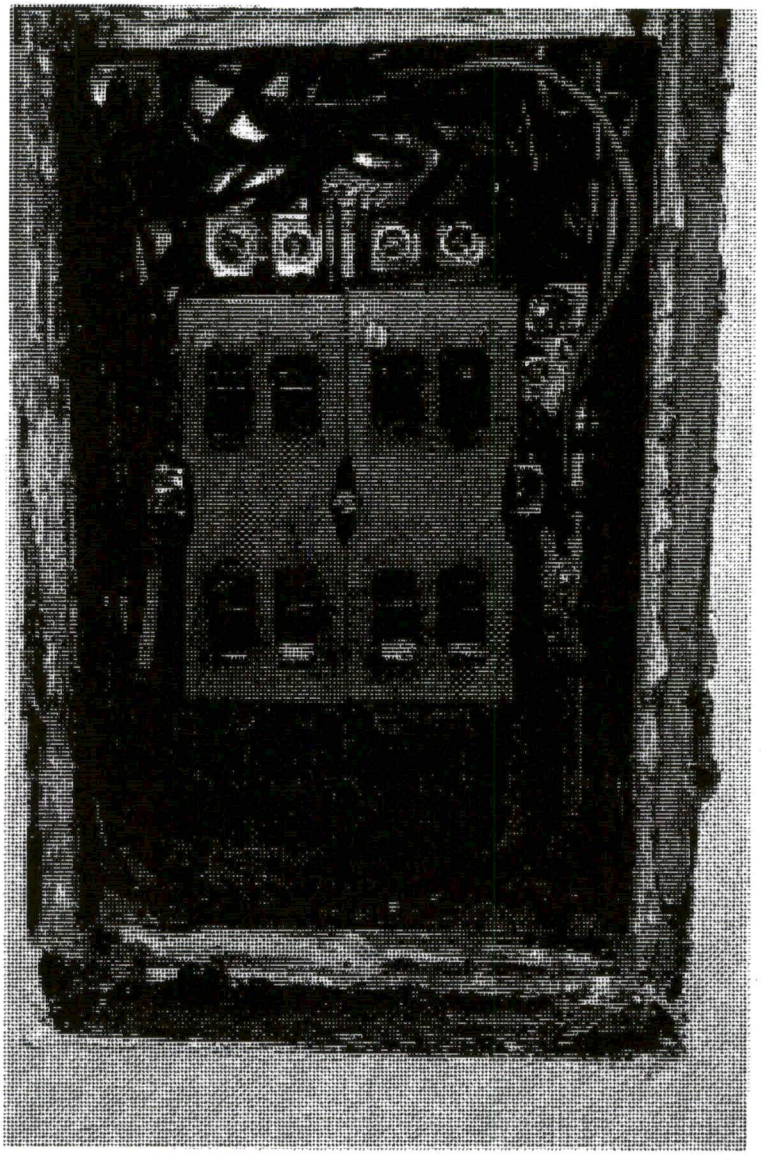


e) P2D

This is a questionable panel to trace, the sub panel has two legs cloth conductors believed to be from two legs of a 3 pole 100 amp breaker in SD11 breaker 14, an outage can only confirm verification of this circuit. The conductors are cloth covered and appears to be #2

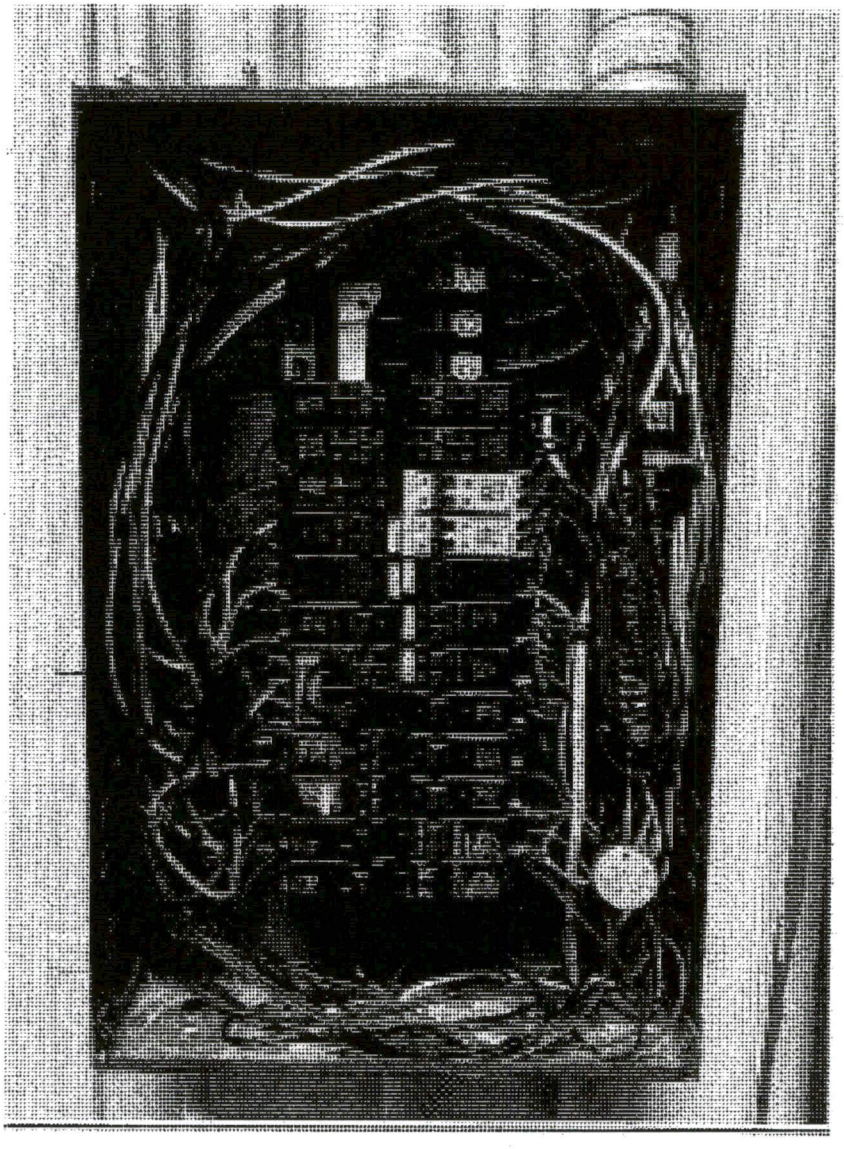
#7 3rd Fl. = =
#6 SERVER
#8 Patron office





f) P4B

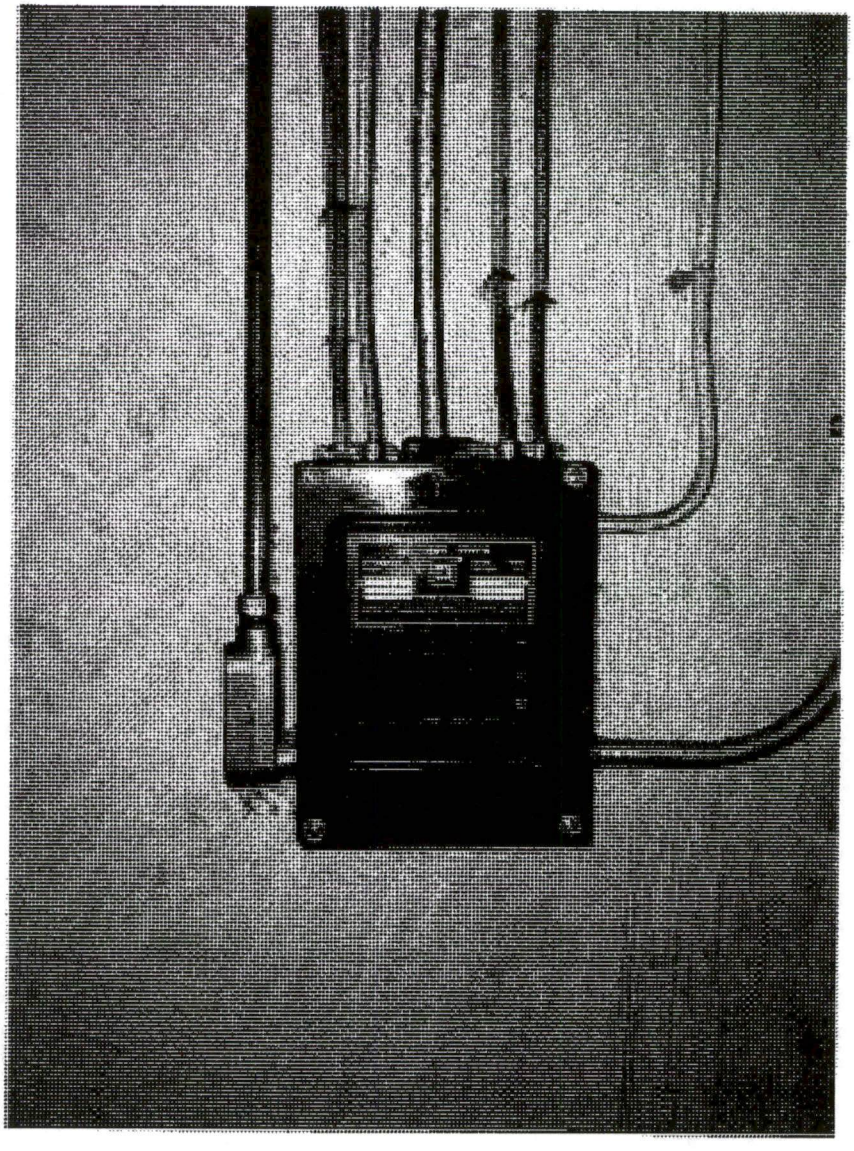
P4B is fed from SD36 150-amp breaker circuits 23, 25,27 with 1/0 THHN



This panel appears to have replaced a recessed panel in opposite wall which became a splice point junction box with modified cover

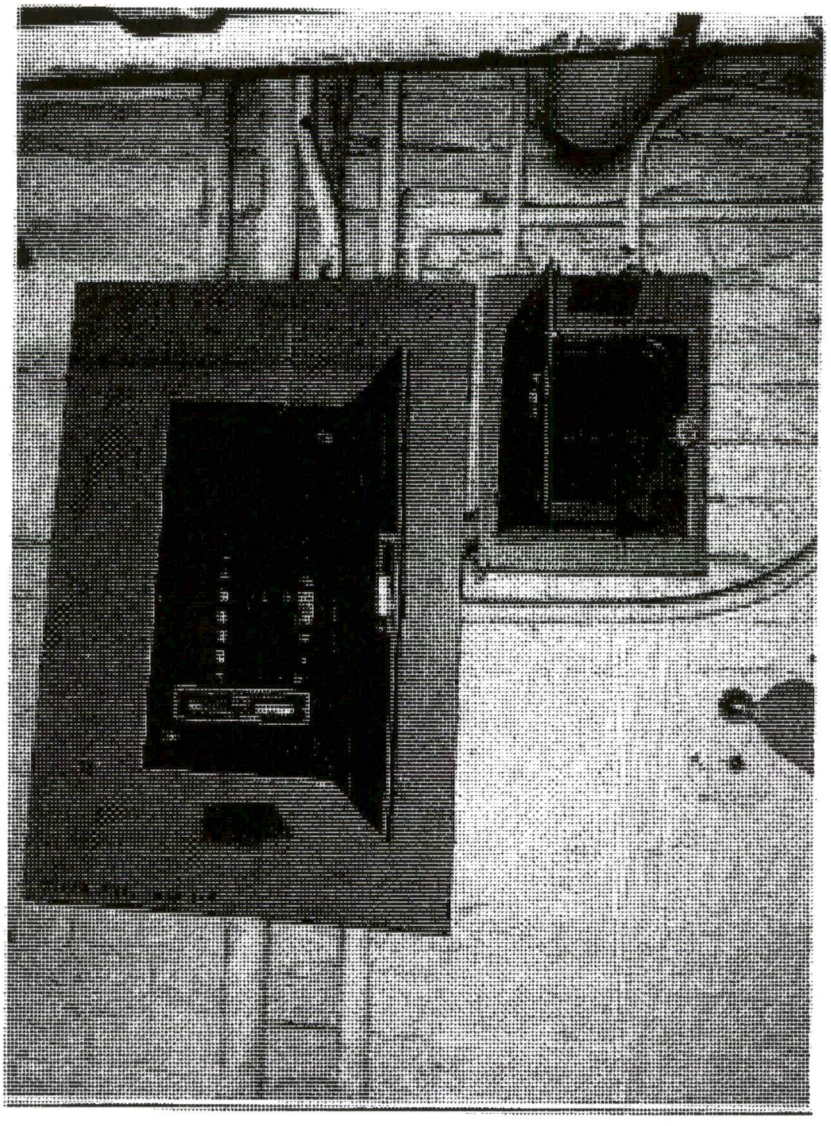


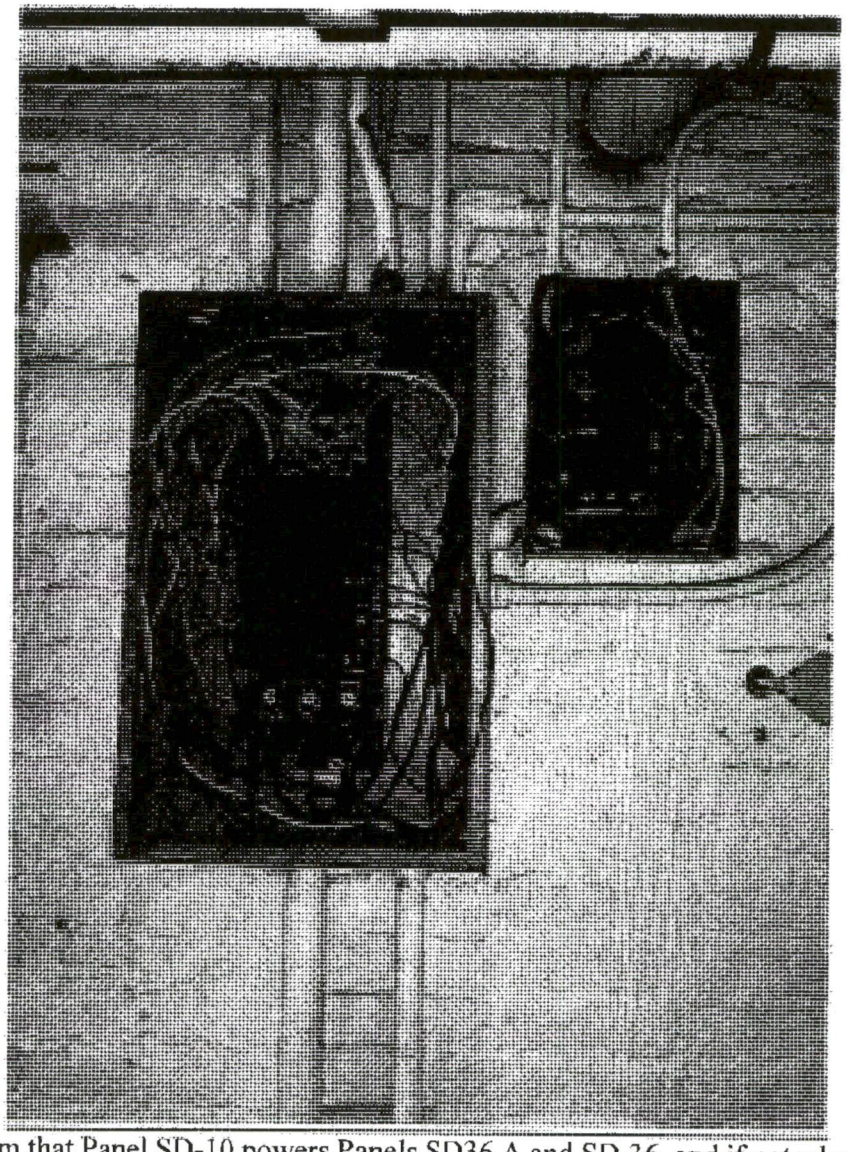
g) P5A



P5A located 4th floor attic near administrative building, it is fed from an unmarked panel in basement not on the drawings between boiler room and pump room 043. With cloth covered "romex". Tapped of 2 of the main lugs feeding this 3 phase panel fed from SD4 breaker 6 on a 50 amp breaker
This umarked panel is also tapping a small unmarked panel with 2 legs located to the right of the larger panel feeding it
Note that this circuit identication at SD4 is not 100% confirmed but as strongest signal to our test equipment, only a outage from that breaker can confirm the correct feeders.

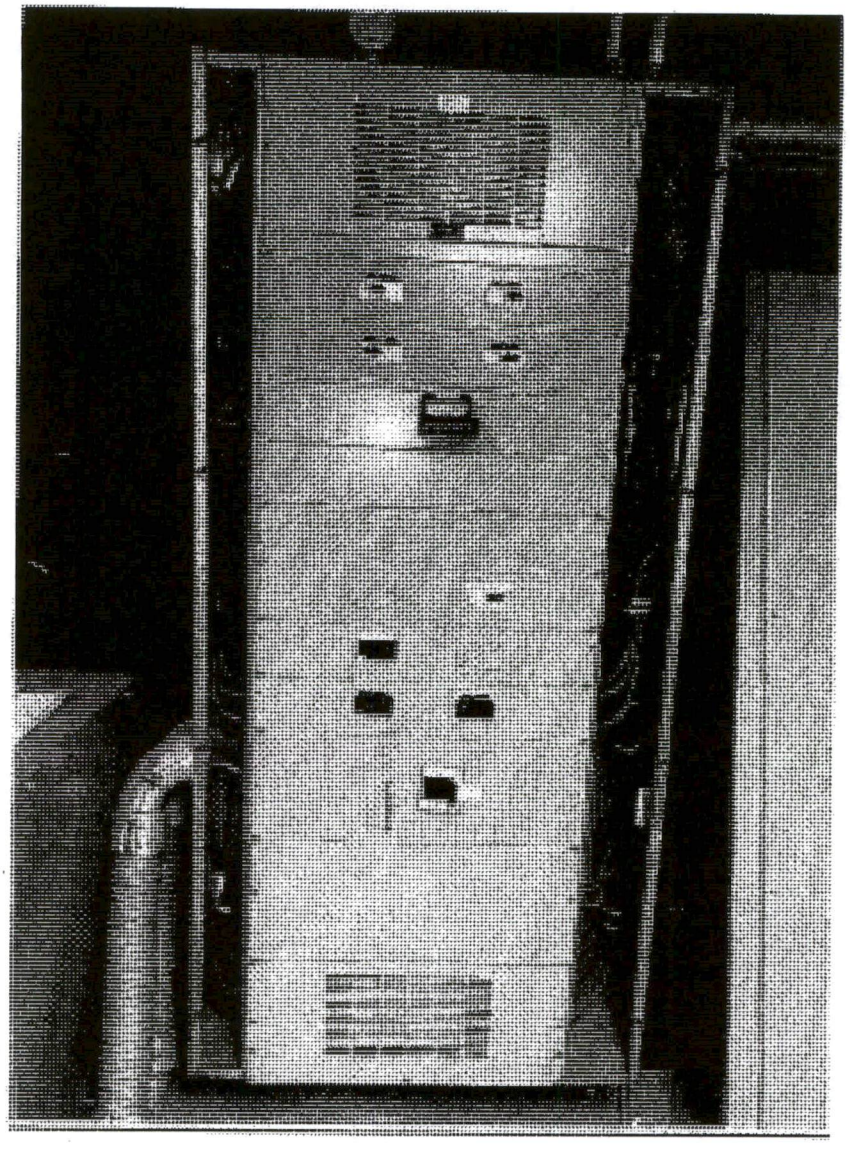
These two unmarked panels we have given a temporary identifier as UPB-A and UPB-B (Unmarked Panel Basement) pictures show below.



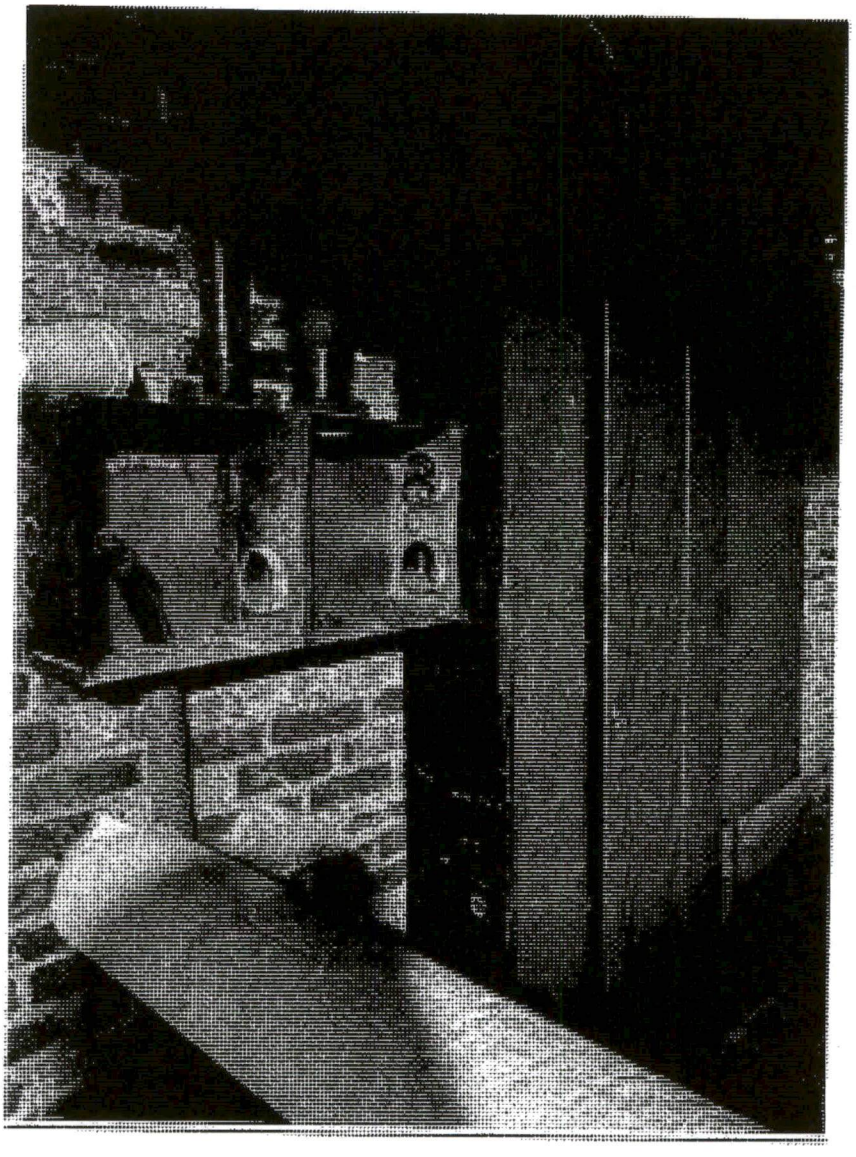


3) Confirm that Panel SD-10 powers Panels SD36 A and SD-36, and if not where they are powered from and breaker rating and position in panel feeding them

SD36 is fed fer LDP-2 100 Amp breaker CKT2,4,6 with 1/0 THHN in 1 ¼ pipe into Panel SD10 where it is spliced to cloth conductors in panel to SD36



SD36A is fed from SD10 125 Amp circuit lower right in 2/0 cloth conductors in 3" conduit to SD36A

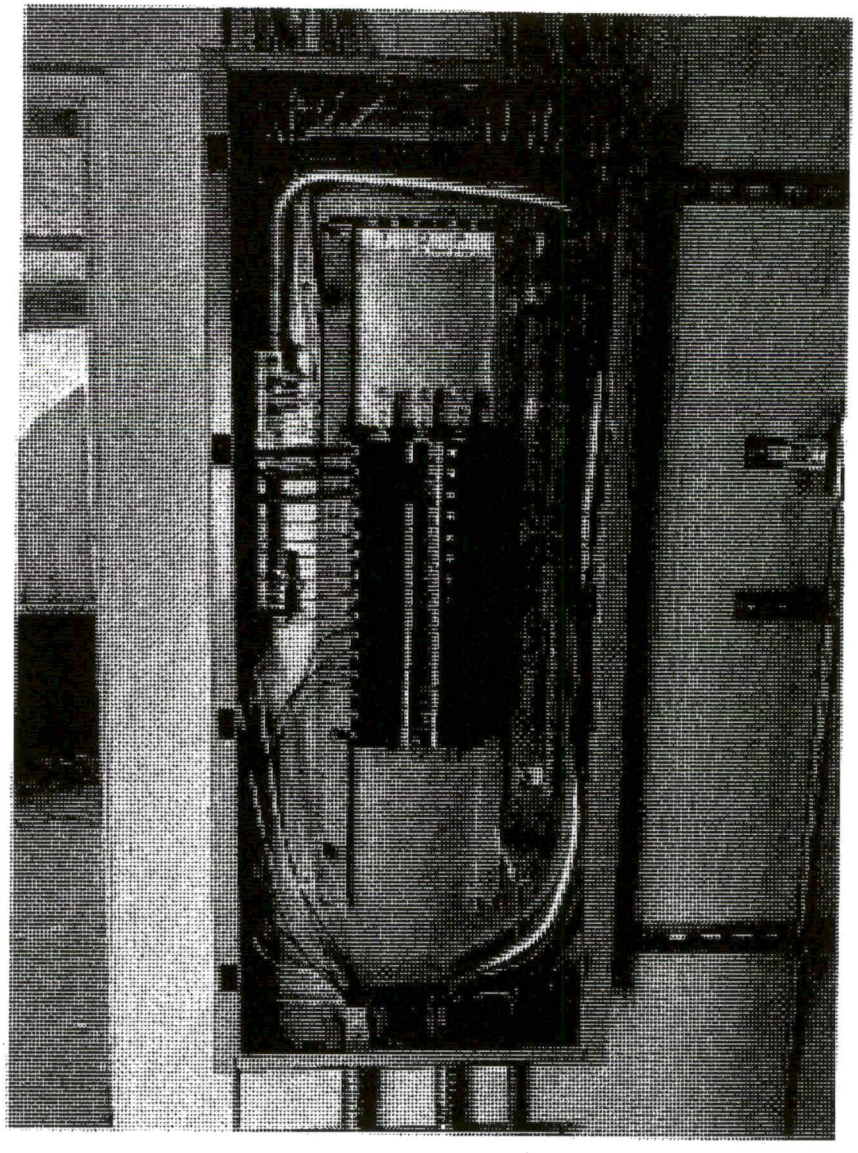


4) Confirm that Panel SD-10 feeds Panel P1G and breaker rating and position. If not, determine source of power feed.

5) Confirm Panel New P3G is powered from Panel P1G and breaker rating.

P3G is a typo the panel being questioned is P2G

P2G is fed from P1D which is now serves as Junction box.



6) Confirm source of power fed to Panel PAB-2, PSB with breaker ratings and pole positions of feeders.

PSB is now a junction box feedingPSB-1, fed from SD-10 50 Amp breaker 7 PAB-2 does not exist

7) Verify if Panel LDP-2 powers any of the above panels where present sources are not identified on one line.

I have marked up corrections in the one line used on site, these are based on strongest signal from our test equipment, only a true shut down from the suspected sources can verify this, be aware there are some panels using 2 legs of a 3 pole

breaker, so it is unknown where the third leg is feeding, could be feeding other panels with a shared leg of another phase.

F. Circuit Tracing HDP-3 (North Feeder). Note circuits with old wiring. Note if panels have neutrals isolated from Ground bus. If no ground bonds installed note if conduits used as ground bonds are properly bonded per Code.

1) Confirm grounding for panels P1H and P1I in computer room on feeders from LDP-3

2) Confirm grounding on LDP-3 feeder to panel P2F

3) Confirm grounding on LDP-3 feeder to panel SD-12A. Confirm SD-12A feeds panels PBJ, P1J, P2E, and Panels P3E and P3F.. If not determine feeds to these. If so, note breaker ratings and positions in SD-12A for the circuits.

4) Confirm power feed, breaker position and rating for Panel P1K.

5) Determine grounding and age of wire involved with Panel LBP-3, 3rd floor Peeslee

6) Determine grounding on LDP-3A feeder to Panel L-101 and subfeed to panel LP-102.

7) Confirm power feeder from Panel LDP-3A to Panel P2 and subfeed from P2 to new elevator panel. Note grounding.

8) Confirm power feeder from LDP-3A to Panel SD-12, including grounding method.

9) Confirm feeders and grounding methods on feeders from LDP-3A to Panels NPW-1 and NPW-2. Note grounding method provided.

10) Confirm feeder from LDP-3A to Panel PP-1N

11) Confirm feeder from SD-12 to SD-13B, including rating and panel position.

12) Confirm feeder from SD-12 to Panel SDX with subfeed to Panel SDXA, including breaker rating and position

13) Confirm feeder from SD-12 to Panels P1m, Pm, and P3H. Confirm whether panels subfeed or have individual circuits. Note breaker position or positions and ratings.

14) Determine source of feeder fopanel P3 in Chandler. Note feeder breaker rating and position. Note grounding provided.

15) Confirm Panel SD-12 feeds Panel SD-13 and breaker rating and position in SD-12.

16) Determine source of feeder for panel P!O, first floor North Pavilion, and breaker rating and position in feeding panel.

17) Confirm Panel SD-13 feeds Panel BA which subfeeds Panel PBL. Note breaker positions and ratings for feeders.

18) Confirm the Old Panels to be removed in North Pavilion Wing and fed from SD-13 can be demolished without having to transfer any wiring splices that may exist within them.

19) Confirm the Panel SD-12 has a feeder to the vicinity of SD-10 and 10A that then powers the old kitchen panel. Note breaker rating and position. Is there any load or loads still active in the Old Kitchen area for lights, etc. or can this be removed with no other work required.

Appendix "C"

Office Park South, Pleasant Street, Concord, NH - Main Building
Reduced scope

Initial Contractor field confirmation items - Existing Electrical Distribution System

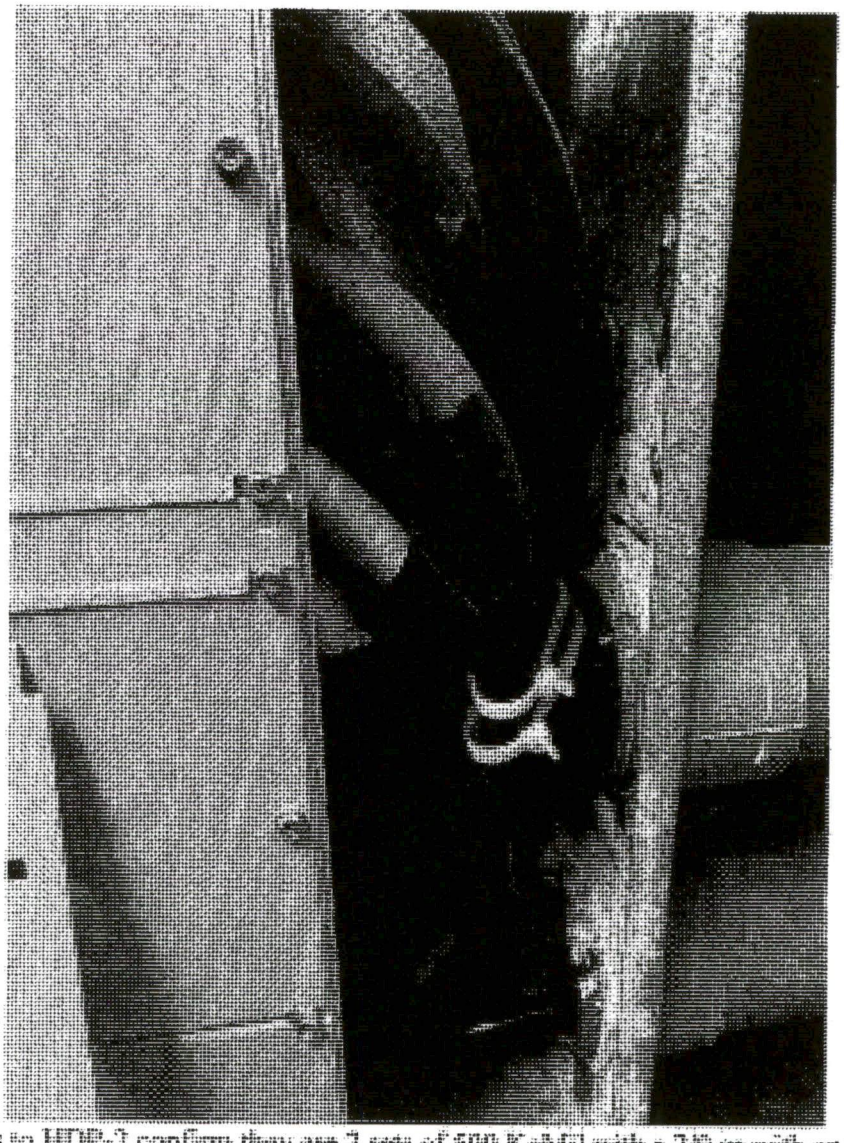
The following is based on drawings E-1 through E-7 Floor plans with panel located; E-8 Locus Plan; E-9 Panels located vertically on floors by Building; E-10 - E-12 Partial One Line Diagrams of the 3 feeders and distribution as developed to date. Based on this data, the following field tracing is needed to confirm the accuracy of the data indicated on the referenced drawings and to permit completion of the one line diagrams.

A) Feeders on circuits from Bancroft switchgear to Main Building Panels:

1) Confirm conductors to HDP-1 are 2 sets 4-500KcMil CU, 1 with 2/0 gr and 1 with 3//0 in 1"C. Determine how this is connected at Bancroft switchgear.

2) Feeders to HDP-3. Confirm same as for #1 above.

Feeders from Bancroft are 4- 500MCM in two sets PVC 4" underground, one set has 2/0 found in raceway, other does not.



3) Feeders to HDP-2 confirm they are 2 sets of 500 KcMil with a 2/0 gr with one set.

B) Feeders in Main Building:

1) Confirm feeder from HDP-1 to HDP-1A is 4 - 500 KcMil Cu in 3 1/2 " C. Confirm proper ground bonding if conduit is used as ground bond.

2) Determine conduit and conductor size from HDP-1 to transformer disconnect at fourth floor stairwell Fiske Building. Confirm proper grounding if no bonding conductor installed.

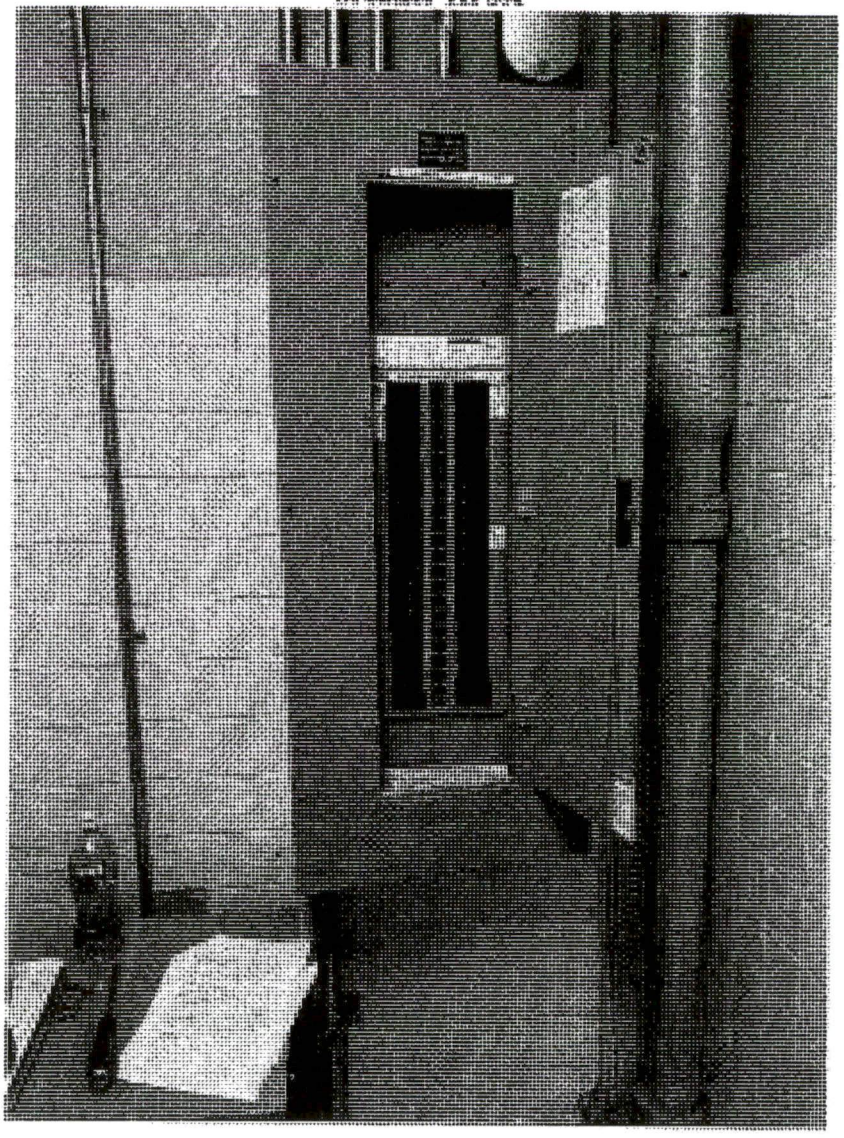
3) Confirm feeder from HDP-3 to HDP-3A is 4 - 500 KcMil in 3 1/2 " C. Confirm if ground bonding is correct if no bonding conductor is installed.

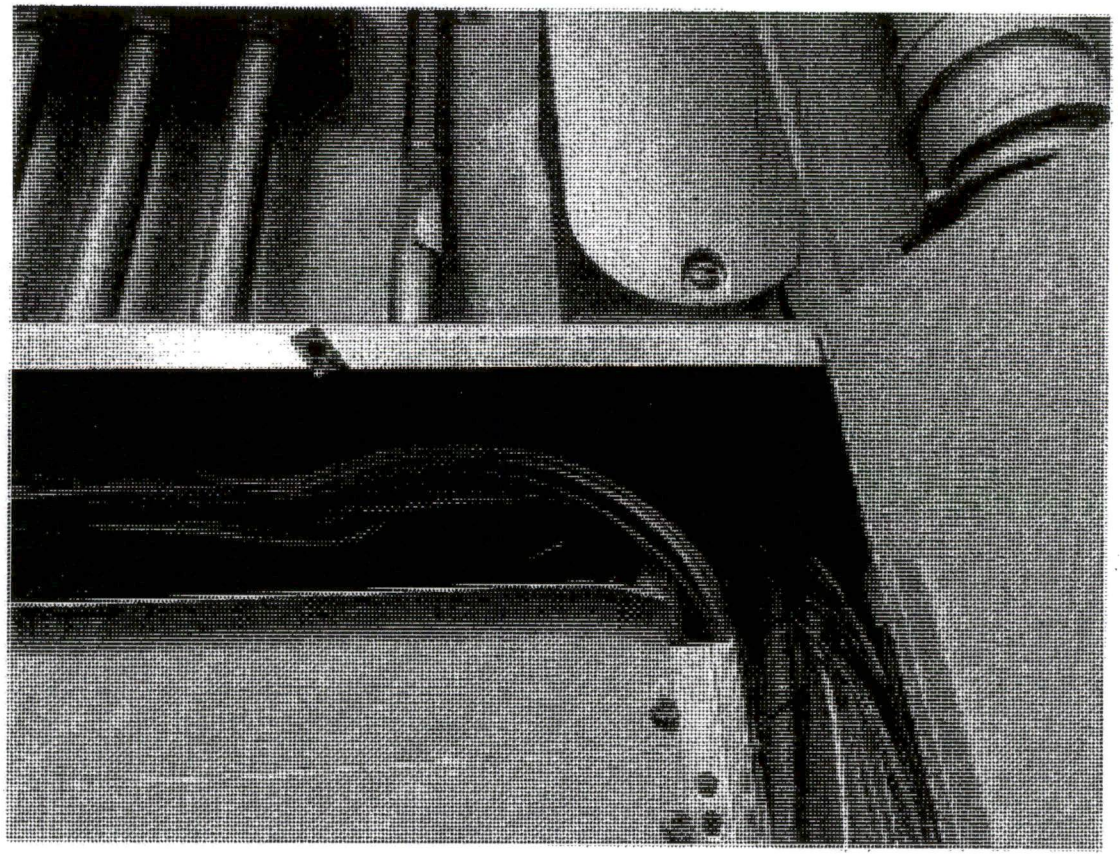
They are 4- 500MCM, but in 4' EMT conduit, no ground was installed in raceway, the ground is coming from a separate 2/0 THHN free aired and attached with one hole straps to ceiling and attached to water main.

(see section C, subheading 4, 5,and 6 for reference)

3) Confirm conduit, conductor size and proper bonding for feeder from HDP-3A to HDP-P3 on 3rd floor of Peaslee Building

Conduit size is 3" with 2/0 THHN and 4/0 equipment ground fed from 225 Amp breaker HP3A





C Grounding in Main Building

1) confirm conductor size and point of grounding for transformer T1A adjacent to HDP-1A

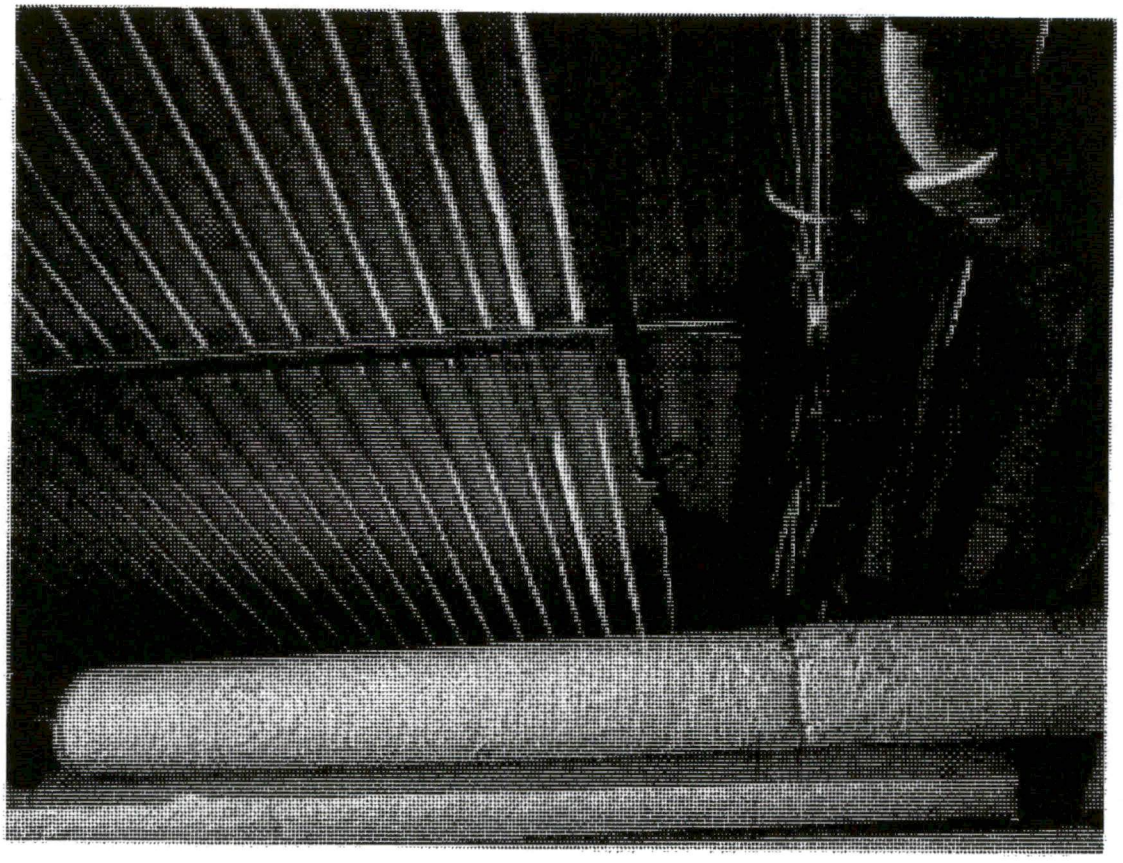
2) Confirm conductor size and point of grounding for Transformer at 4th floor stair-tower in Fisk Building

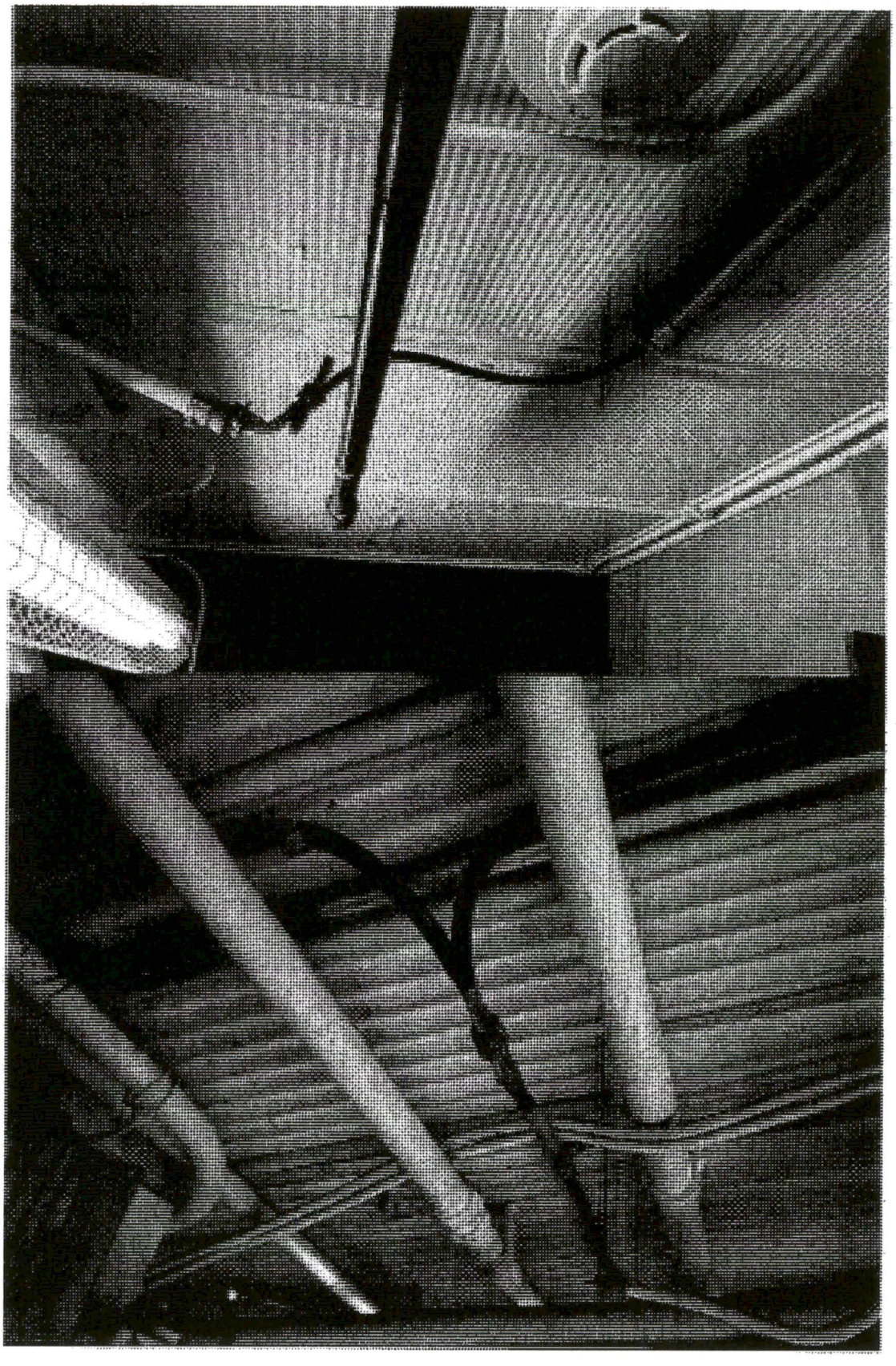
3) Confirm conductor size and point of grounding for transformer T-2 adjacent to panel HDP-2

4) Confirm conductor size and point of grounding for transformer T3 adjacent to HDP-3 **Conductor size is 2/0 from T3 in 1' PVC in electrical room out to hallway, from there it is spliced 2/0 THHN free aired and attached to ceiling supported by one hole straps attached to ceiling. There is another splice point between the hallways leading to HDP3A that connects grounds for HDP3 and HDP3A to the water main in room #3**

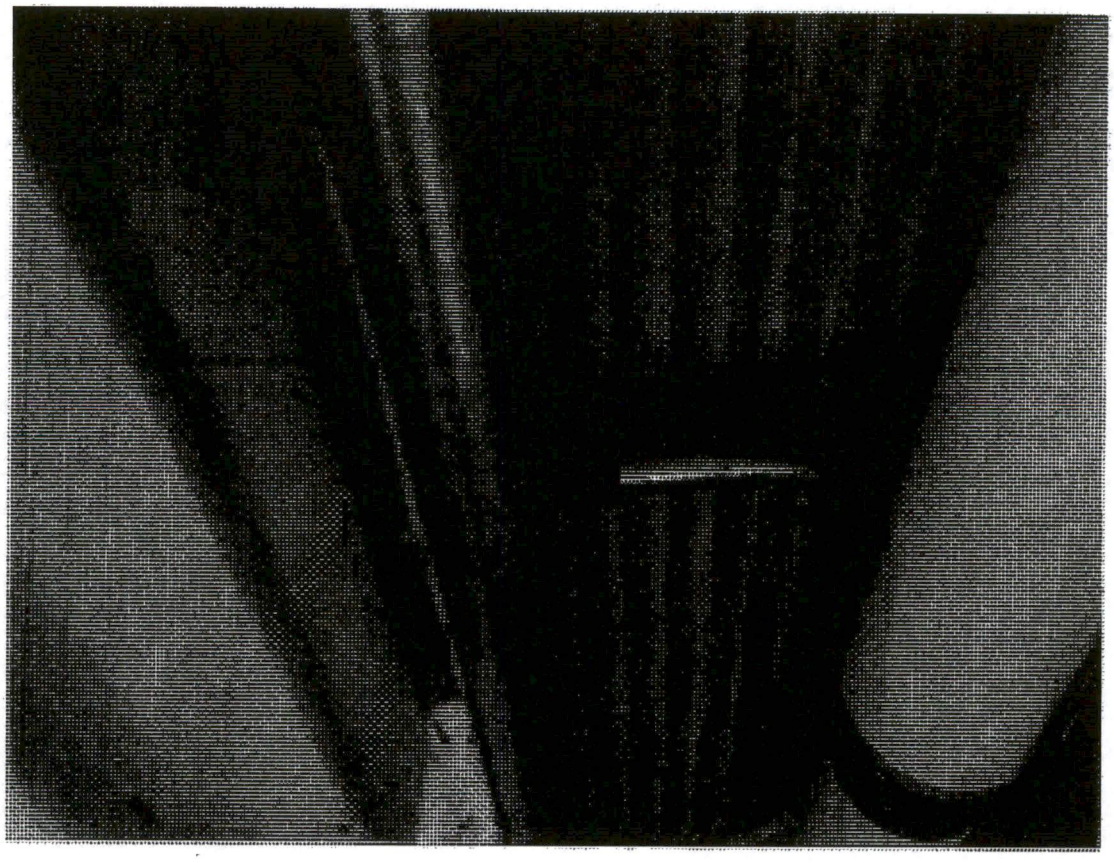
5) Confirm conductor size and point of grounding for transformer T3A adjacent to panel HDP-3A

For Grounding, see above statement and refer to pictures below that depicts both statements.











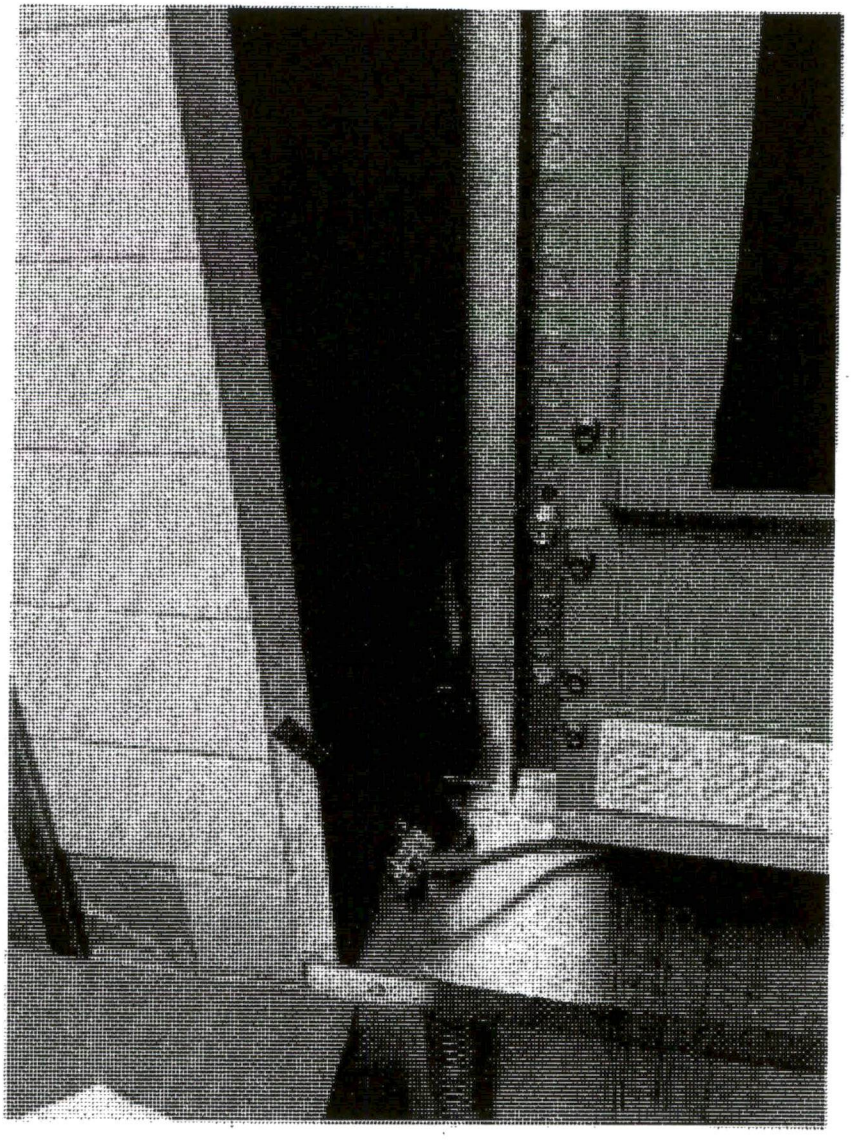
6) Confirm conductor size and point of grounding for transformer T3B adjacent to transformer T3A.

2/0. See above statements and pictures for reference.

7) determine conductor size and point of grounding for transformer (30 KVA) adjacent to panel HDP-P3, third floor Peaslee.

At the primary side, the transformer is fed from a 90 Amp breaker with 3 wire #4 THHN and #4 THHN ground.

At the secondary side, the conductors are #2 4 wire with #4 THHN copper feeding a 100 Amp Breaker. The point of ground for the transformer is located at Water Main tied with same branch for Bonding as described in Section C, subheading 4,5, and 6. Refer to that section for description and pictures of the bonding system.



D. Circuit Tracing - HDP-1 (South Feeder) Note circuits with old wiring. Note if panels have neutrals isolated from the ground bus. If no ground bonds are installed note if conduits used as ground bonds are properly bonded per Code.

1) Confirm breaker ratings and positions from SD-4 to:
   a) PBC
   b) SD4C
   c) South Pavilion Level 3

d) P-1B (Rumford)
e) P-2A (Rumford)
f) P-3A (Rumford)
g) P-1C (Fisk)
h) P-2B (Fisk)

2) Confirm conduit size and conductors from transformer, Fisk 4th floor to Panel P-3B
3) Confirm conduit size and conductor size P-3B to P-3C.
4) Note any old circuit wiring in panel P-3C. (number and ratings of circuits)
5) Note any old wiring in panel P-3B and adjacent junction box. (number and ratings of circuits.
6) Note number and circuit ratings with old wiring in panels below, and in any adjacent junction boxes fed from the panels:

a0 PBC
b) P-1B
c) P-2A
d) P-3A
e) P-1C
f) P-2B

E. Circuit Tracing - HDP-2 (Administration Feeder) Note circuits with old wiring. Note if panels have neutrals isolated from ground bus. If no ground bonds installed note if conduits used as ground bonds are properly bonded per Code.

1) Confirm breaker ratings and positions from SD-11 to
a) SD-10 and 10A
b) LDP-2
c) PBF
d) PBG
e) PBH
f) PBI
g) PBM

2) Confirm what panel or panels feed to the following, panel breaker positions and ratings:
a) P1D
b) P1E
c) P1F
d) P2C
e) P2D
f) P4B

g) P5A

3) Confirm that Panel SD-10 powers Panels SD36 A and SD-36, and if not where they are powered from and breaker rating and position in panel feeding them

4) Confirm that Panel SD-10 feeds Panel P1G and breaker rating and position. If not, determine source of power feed.

5) Confirm Panel New P3G is powered from Panel P1G and breaker rating.

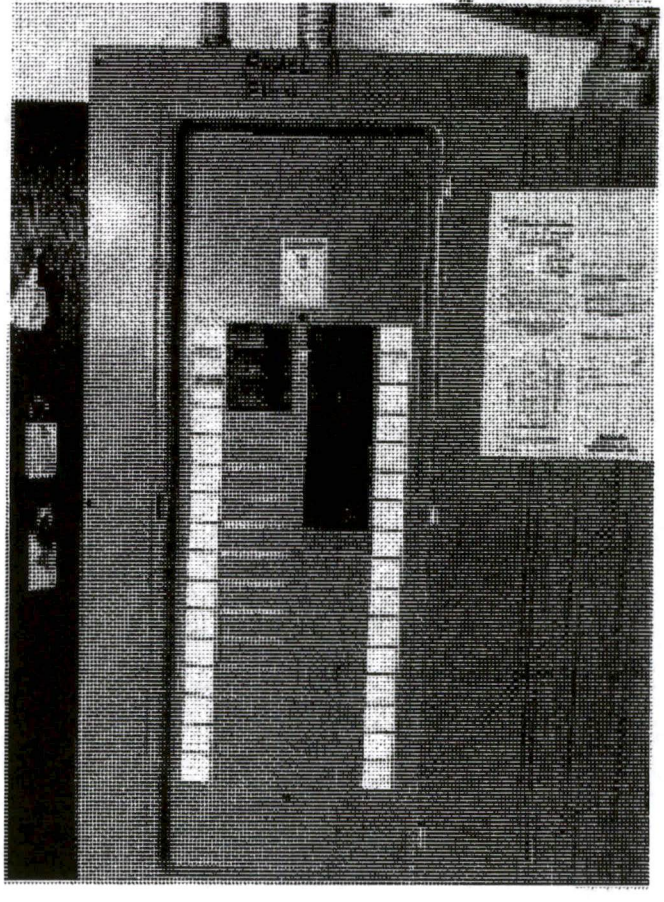
6) Confirm source of power fed to Panel PAB-2, PSB with breaker ratings and pole positions of feeders.

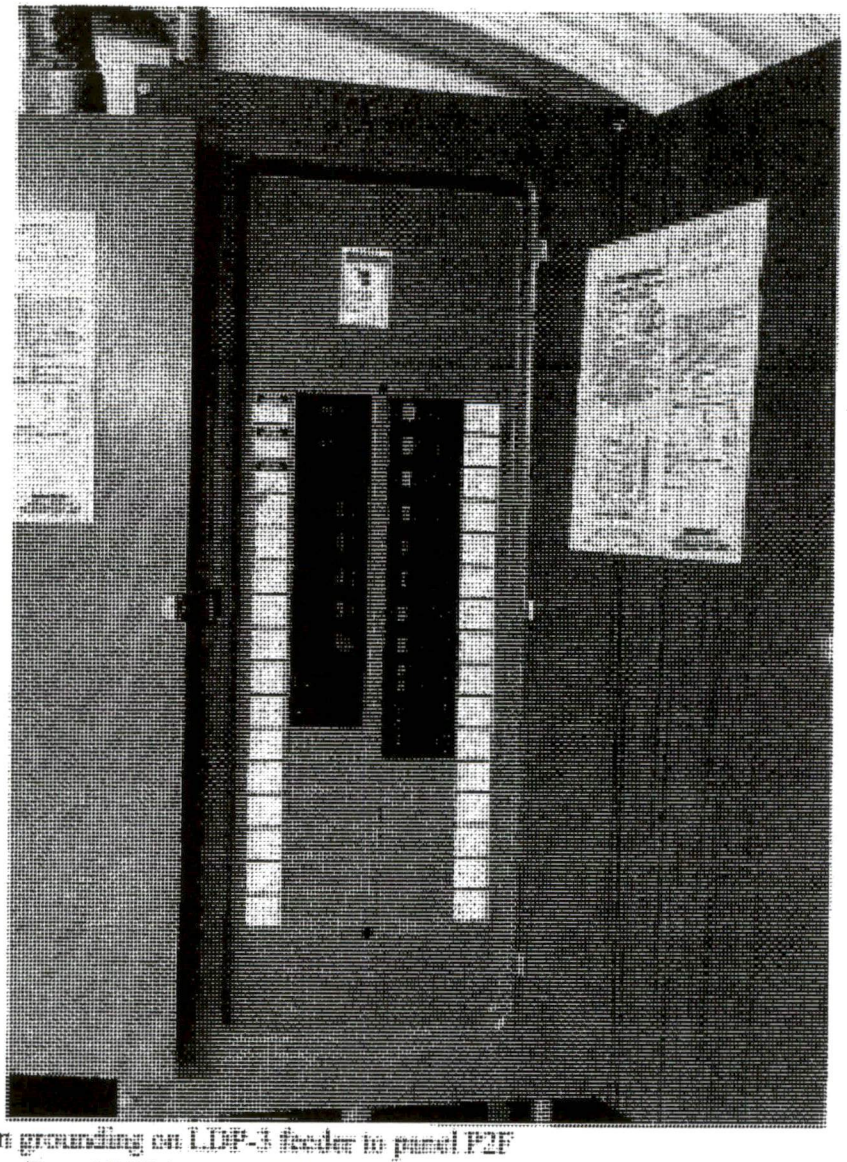
7) Verify if Panel LDP-2 powers any of the above panels where present sources are not identified on one line.

F. Circuit Tracing HDP-3 (North Feeder). Note circuits with old wiring. Note if panels have neutrals isolated from Ground bus. If no ground bonds installed note if conduits used as ground bonds are properly bonded per Code.

1) Confirm grounding for panels P1H and P1I in computer room on feeders from LDP-3

P1H and P1I Have #2 THHN conductors to ground bus bar in LDP-3



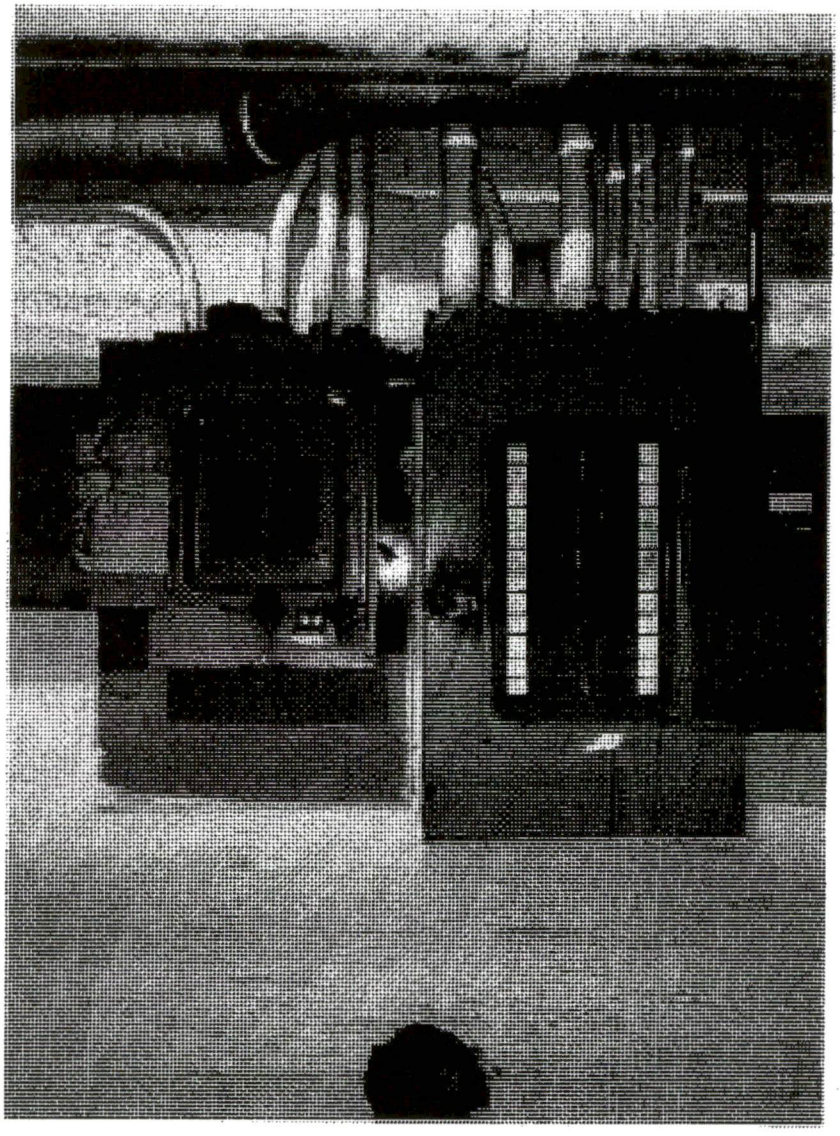


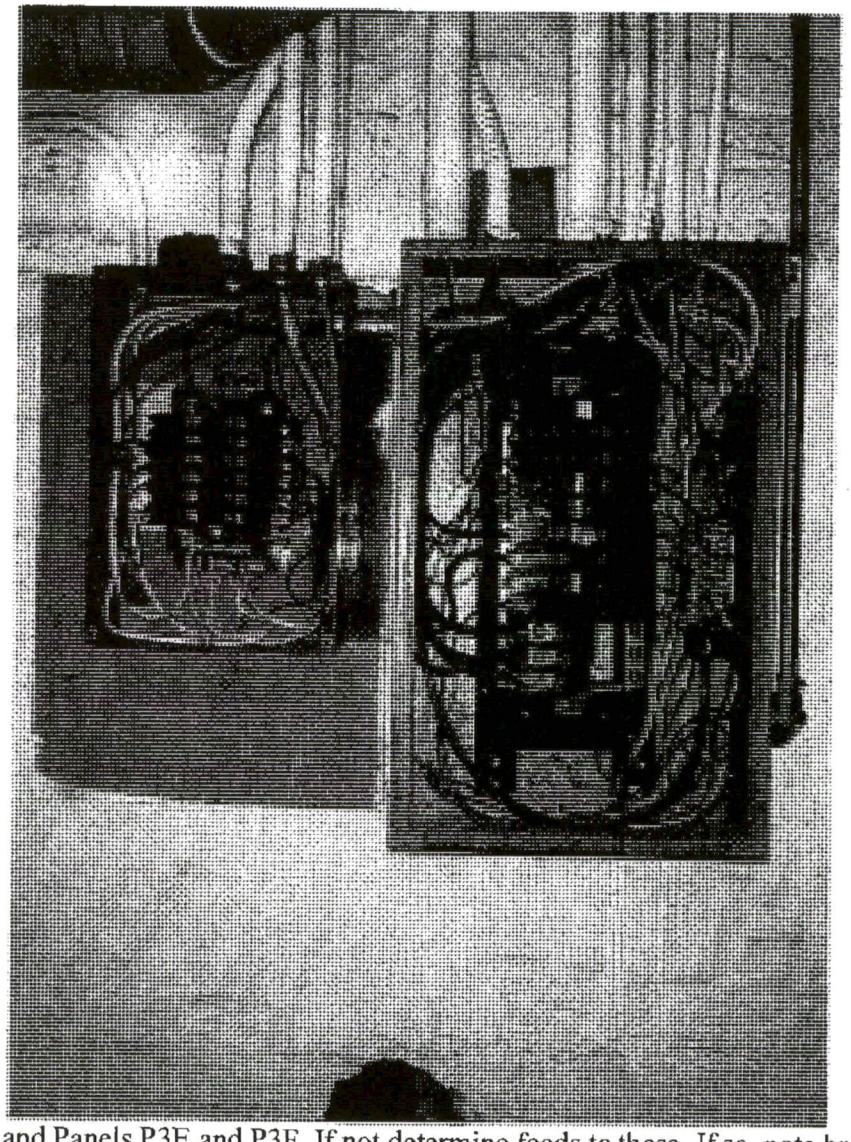
2) Confirm grounding on LDP-3 feeder to panel P2F

Panel P2F has #2 THNN conductors to ground bar in LDP-3

3) Confirm grounding on LDP-3 feeder to panel SD-12A. Confirm SD-12A feeds panels PBJ

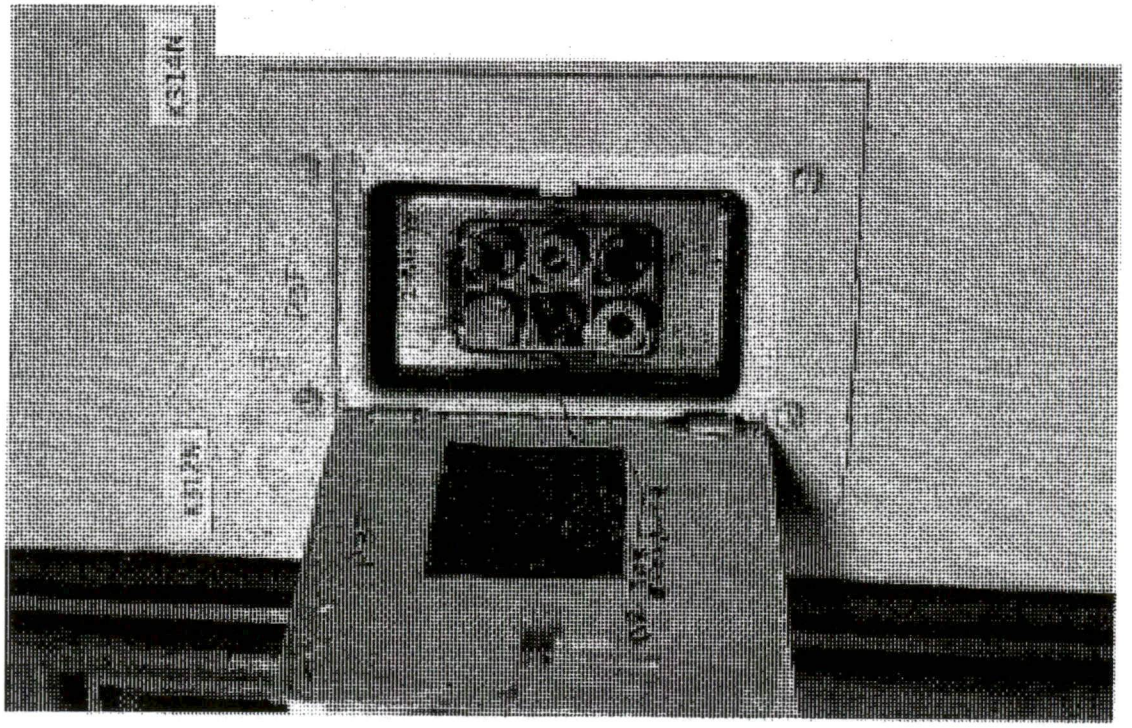
PBJ is fed from SD12Atapped of the feed 12A main lugs

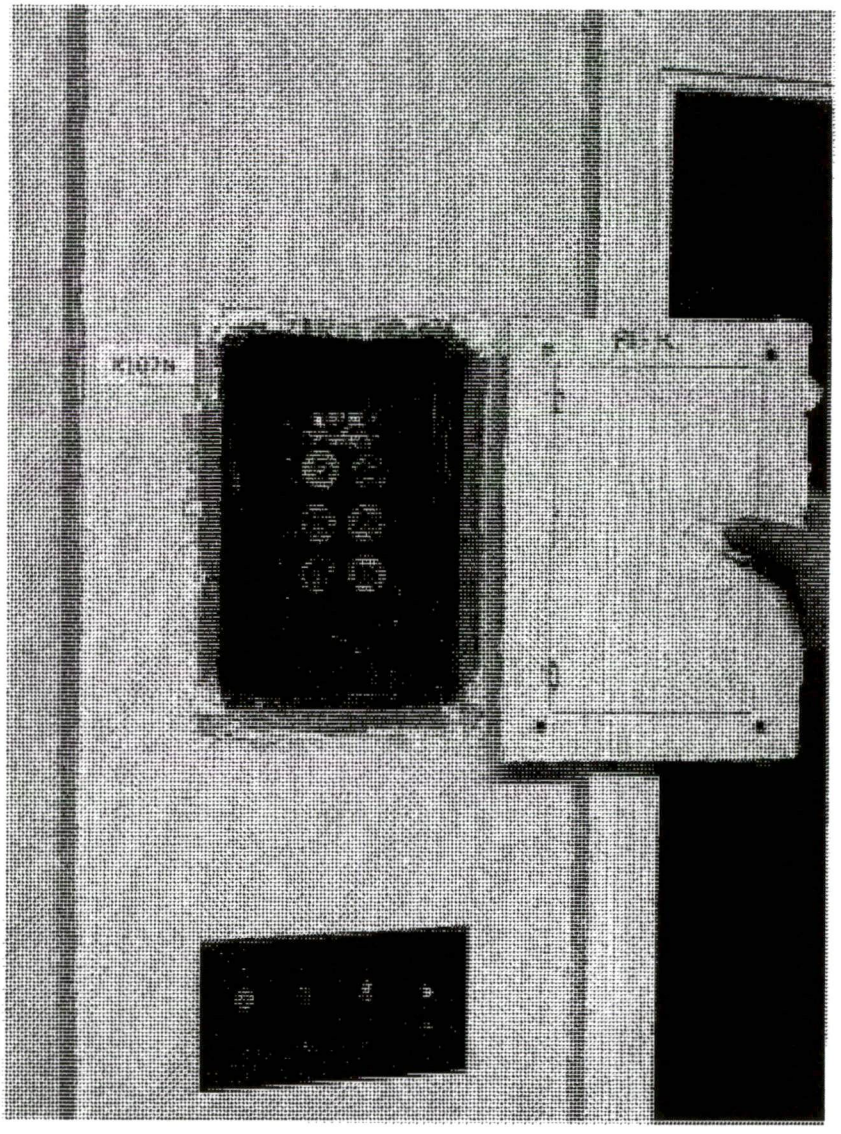




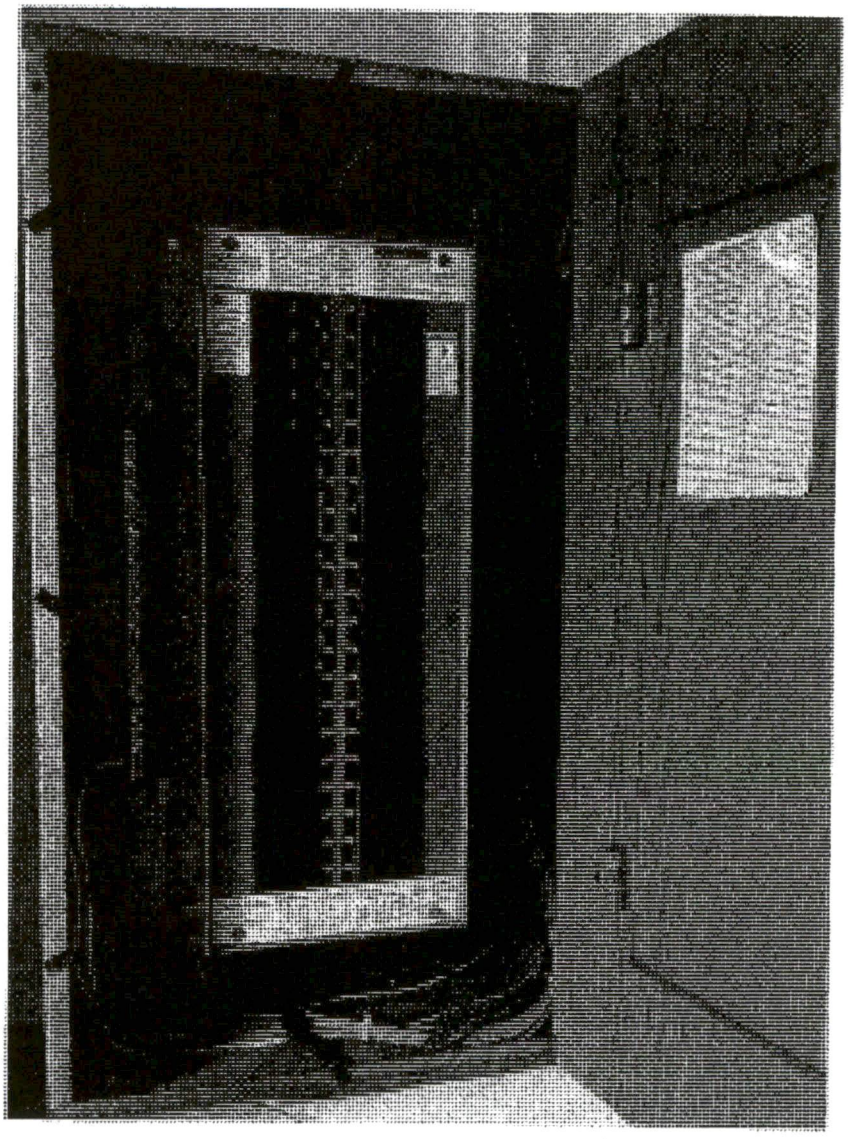
, P1J, P2E, and Panels P3E and P3F. If not determine feeds to these. If so, note breaker ratings and positions in SD-12A for the circuits

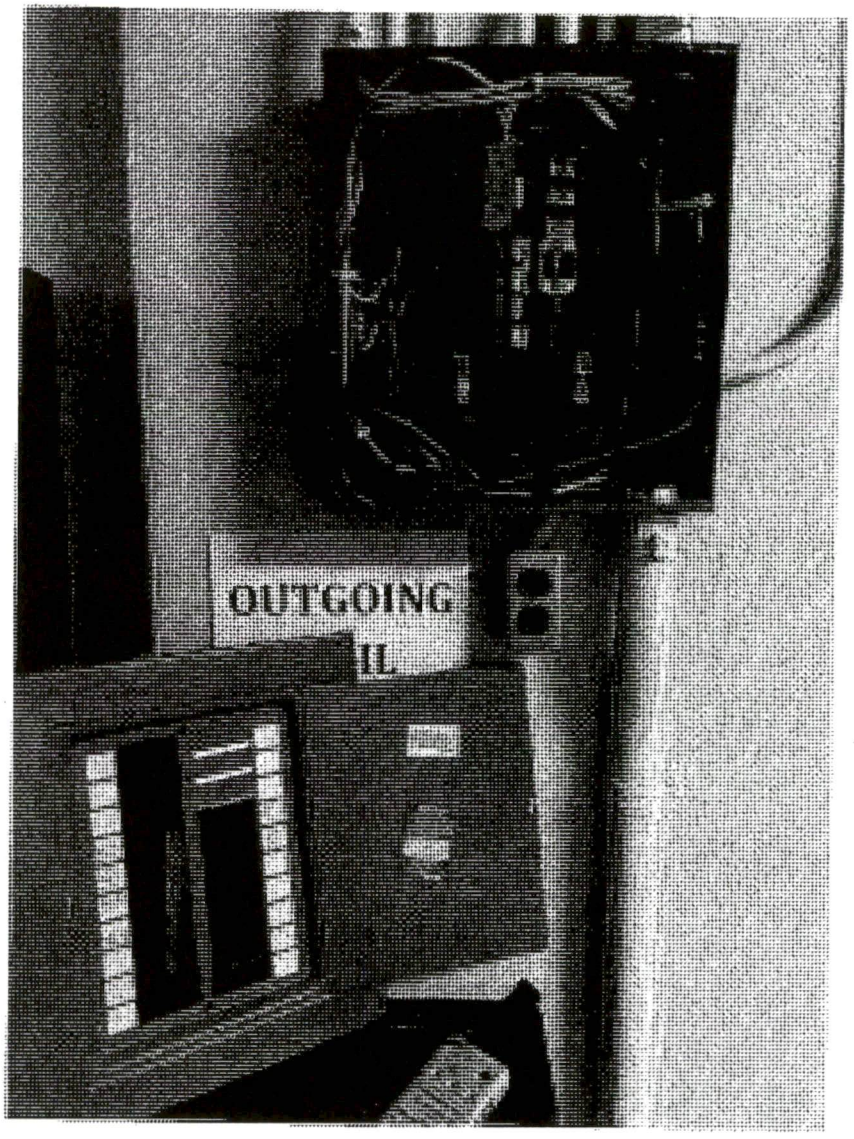
P3F and P1K daisy chained and are fed from a 2 pole 40-amp breaker in SD12A with cloth wiring appearing to be #8

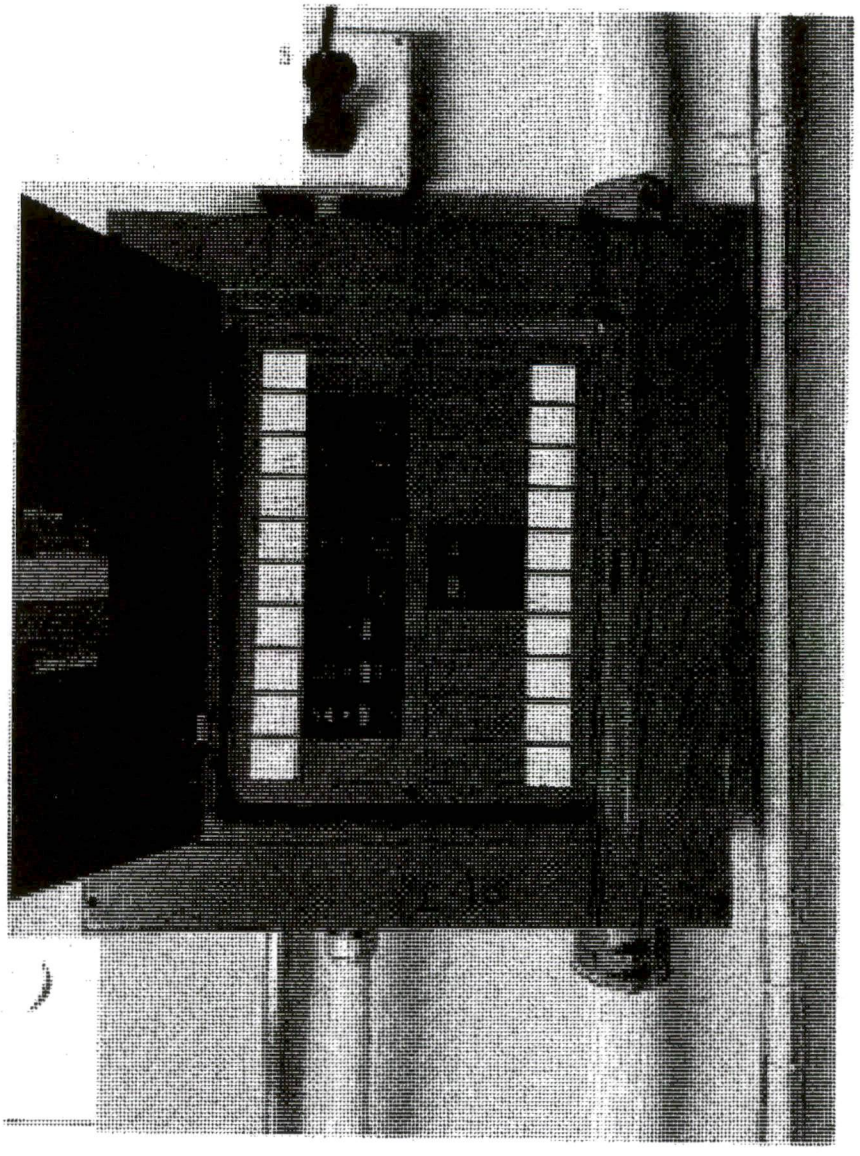


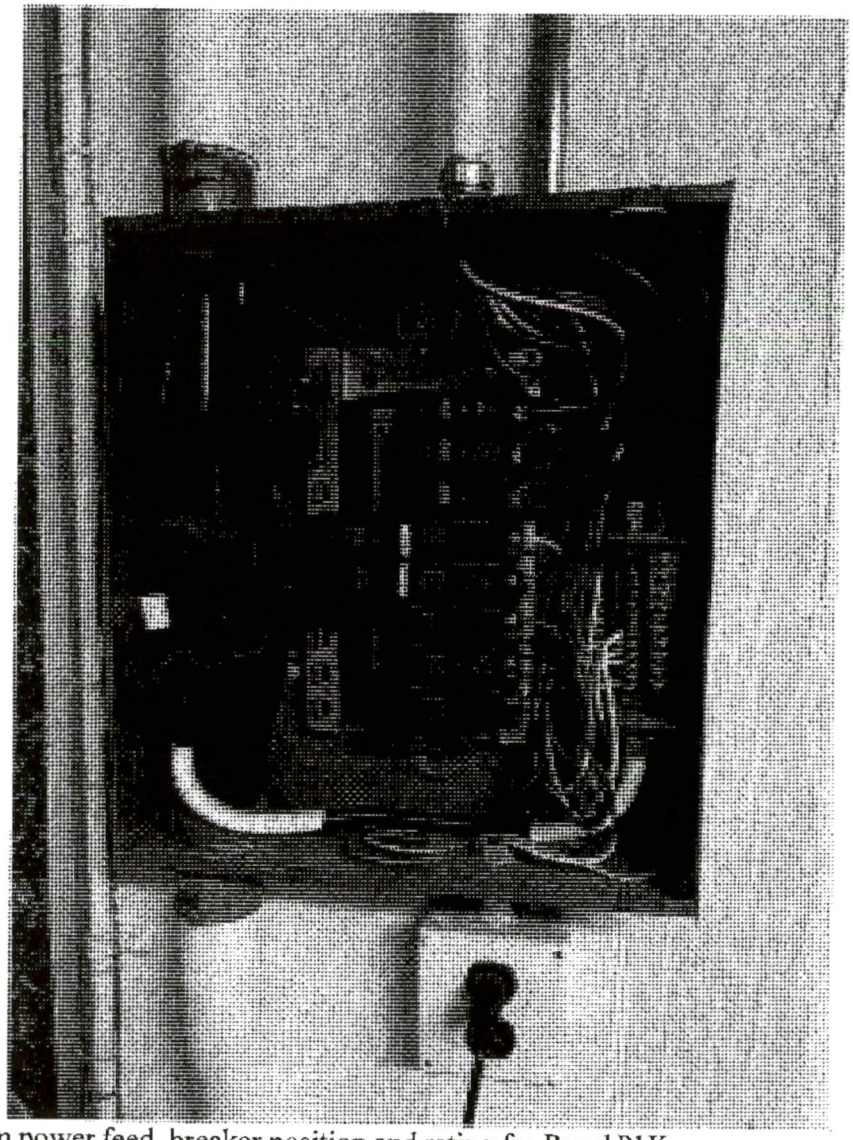


P3E, P2E, P1J are daisy chained together with 3/0 THHN with no ground from Panel SD11 100 amp breaker #15 (lower left), in each panel passing through, the feeders are tapped in the panel with 2/0 THHN feeding the panel itself, they have Isolated neutrals with no bonds or grounds




OUTGOING
IL

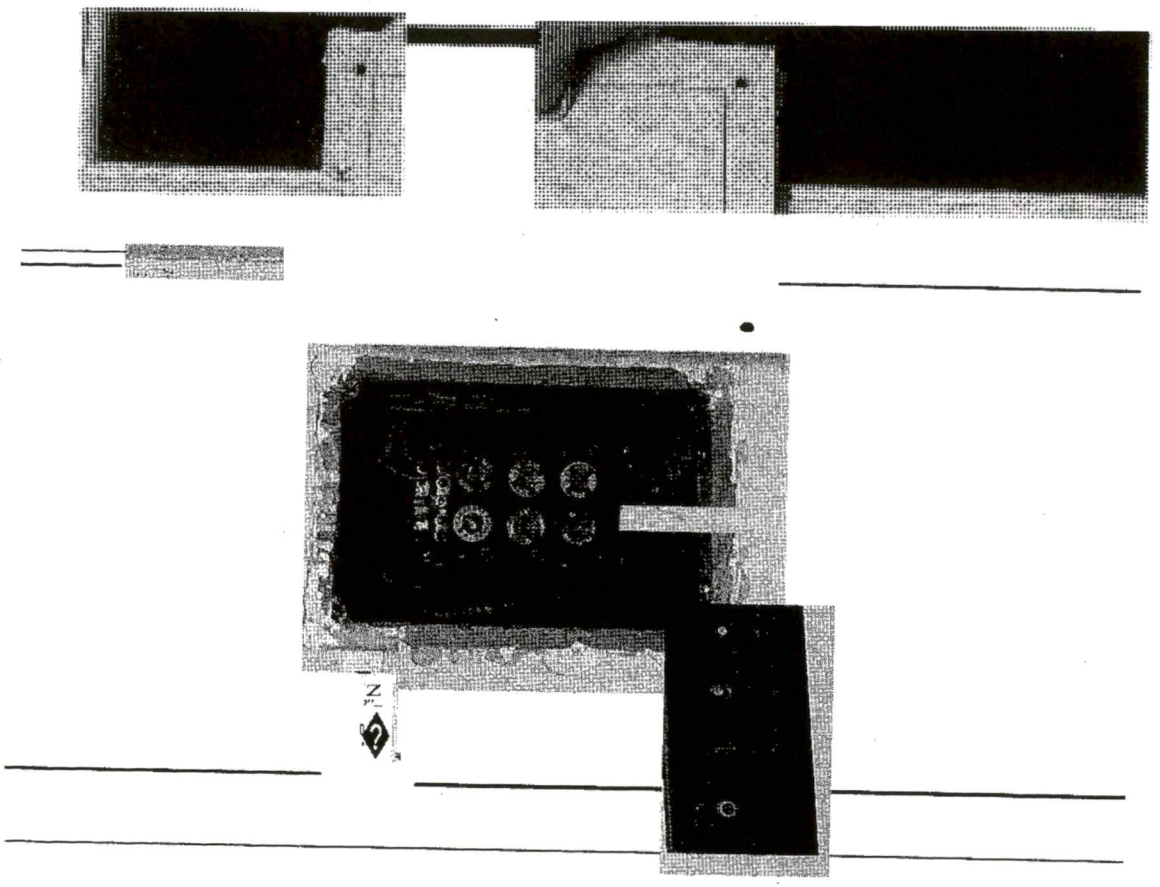


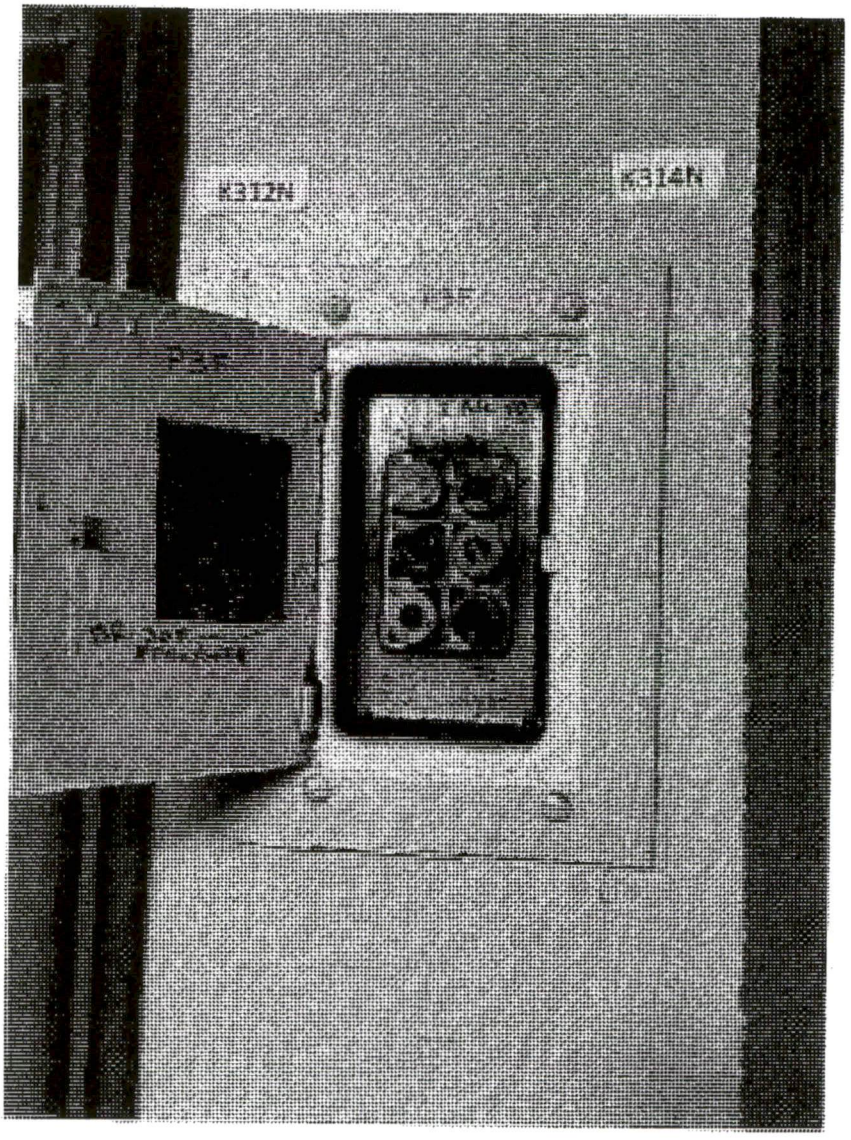


4) Confirm power feed, breaker position and rating for Panel P1K.

Panel SD12A 40A 2 pole breaker #11 and #13 feeds fuse panels P3F, and P1K, there was a panel between the floor of P3Fand P1K that is now a junction box. some of the branch circuits from P1 J is feeding this junction box as well

The feed from 12A circuits 11 and 13 and panels P3F and P1k are all cloth wiring appearing to be #8





5) Determine grounding and age of wire involved with Panel LBP-3, 3rd floor Peeslee

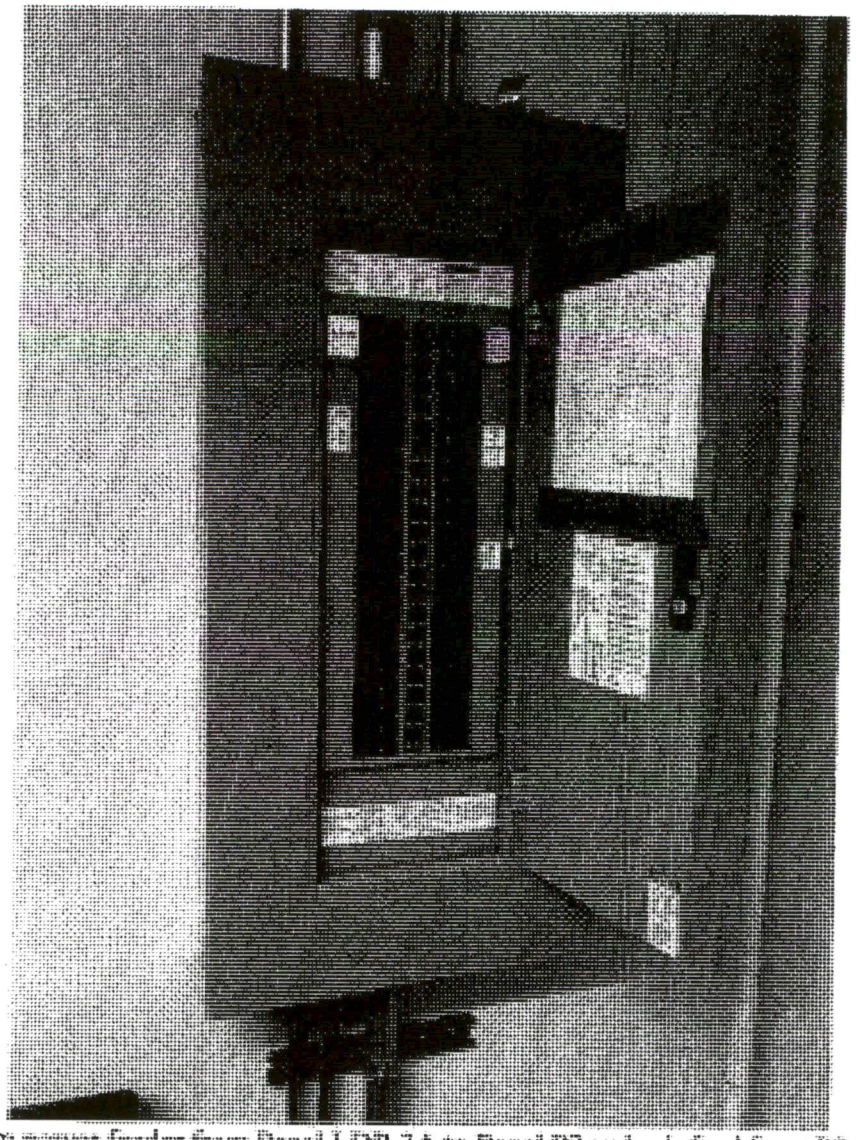
We assume you mean LP-3; this is a new Panel fed from the transformer on 3rd floor. The wiring is new, and the ground is from transformer that is bonded to water main in basement as described in section C (4) (5) (6) with 2/0 and all tied together.

6) Determine grounding on LDP-3A feeder to Panel L-101 and sub feed to panel LP- 102.

LP-101 is fed from LDP-3A with4/0 bare copper conductor in raceway to ground bus with bonding bushing at the panel.

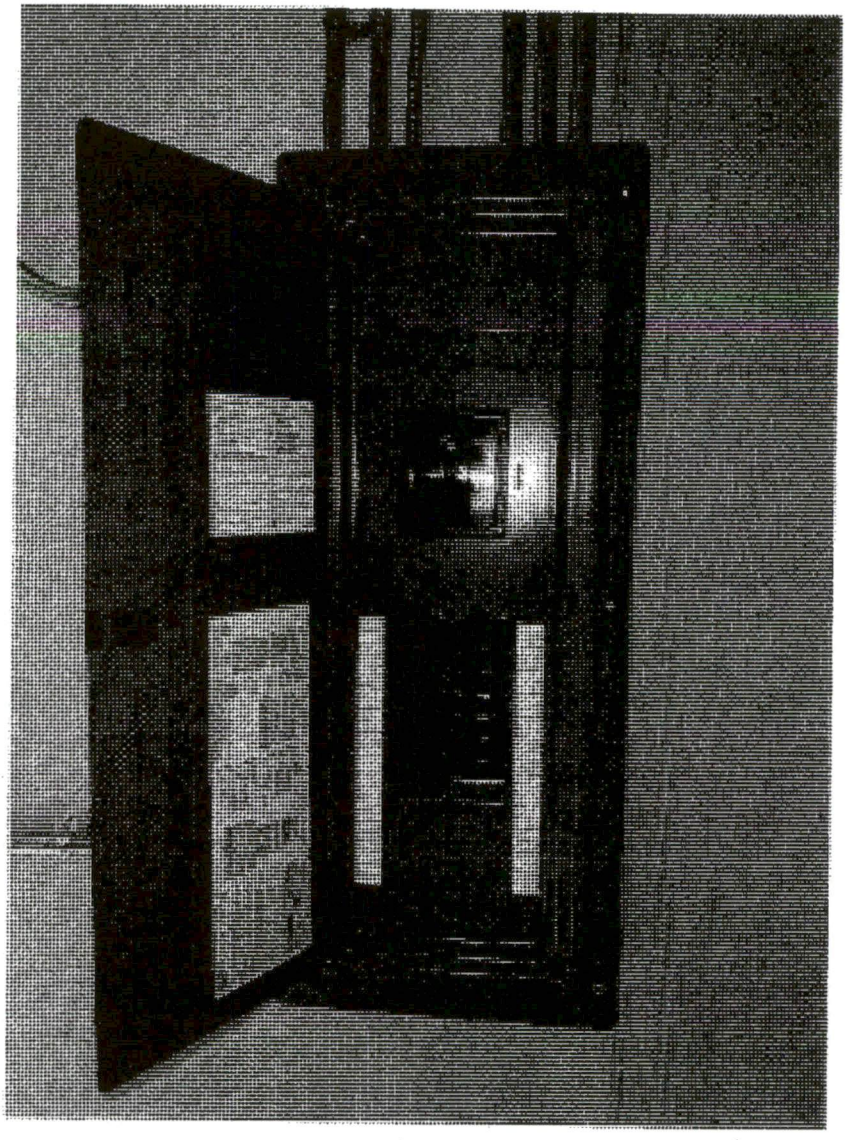


LP-102 is a sub panel from LP-101, the ground is #6 THHN with plastic bushing at the panels.



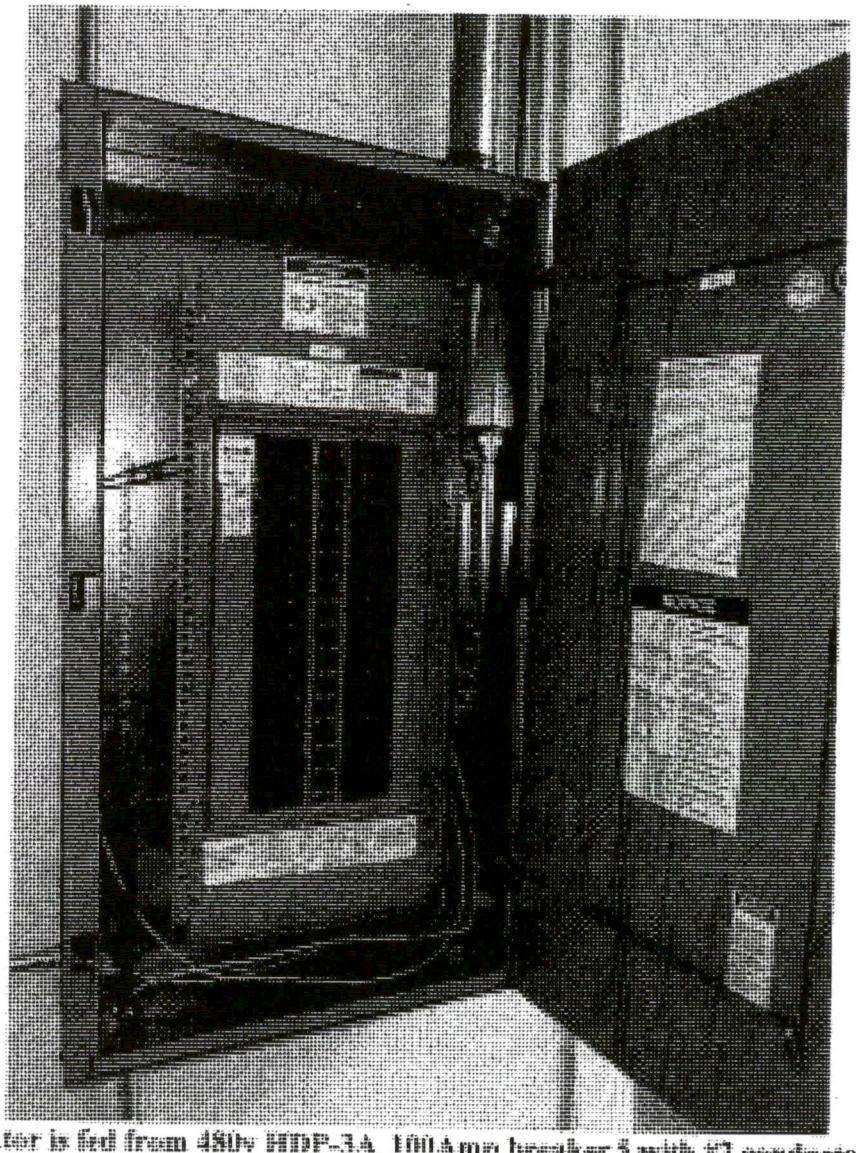
7) Confirm power feeder from Panel LDP-3A to Panel P2 and sub feed from P2 to new elevator panel. Note grounding.

P2 is fed from LDP-3A 200 Amp breaker #6 with 3/0 THHN conductors and #6 bare ground, the ground conductor size is undersized for 200 amps
P1 is sub feed from P2 (100 Amp)
P2 sub feeds the (New panel PPB-1) outside the elevator room 40-amp 2 phase with #8 conductors
Elevator panel is PPB-1 fed from P1 circuit 25'27, 29 40



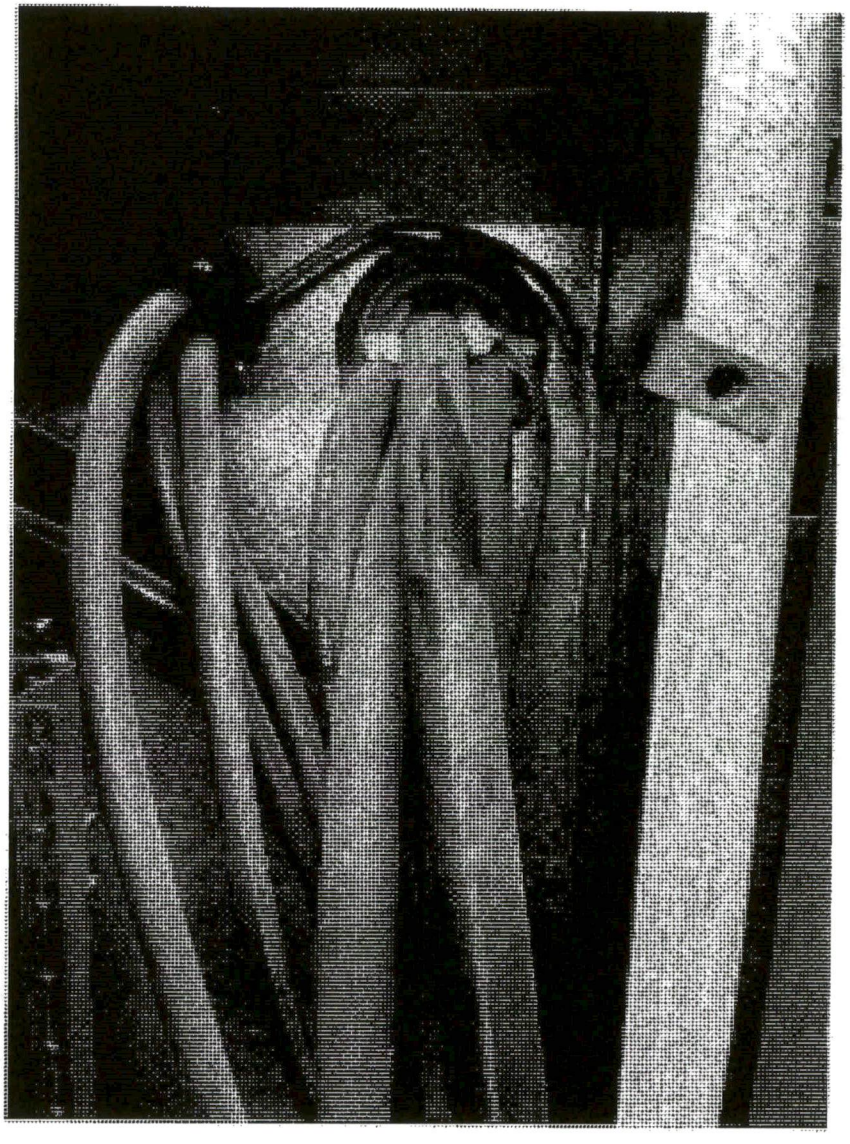
Also, to note, there is another pane las PPB-2 that is fed fromSD12 70 Amp breaker #7 with #2 cloth spliced in a JB next to panel, there is a separate #6 ground to water main.



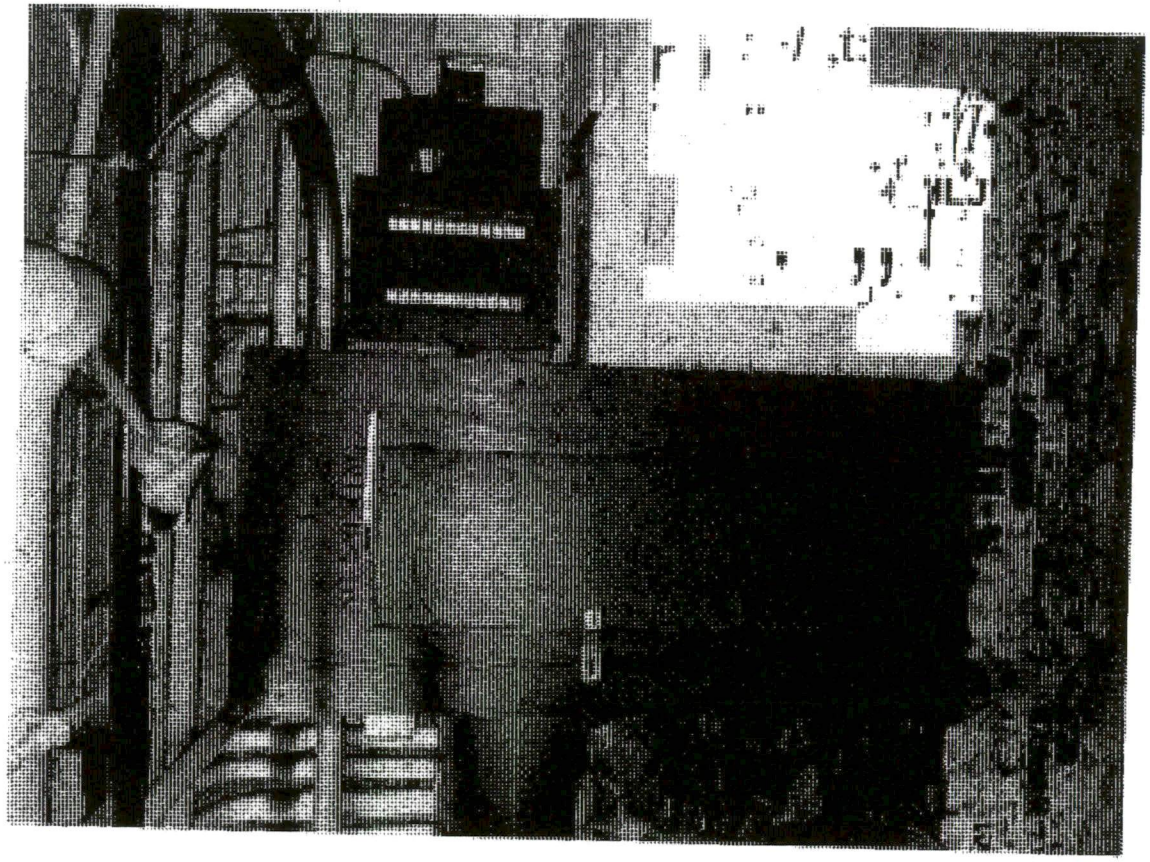


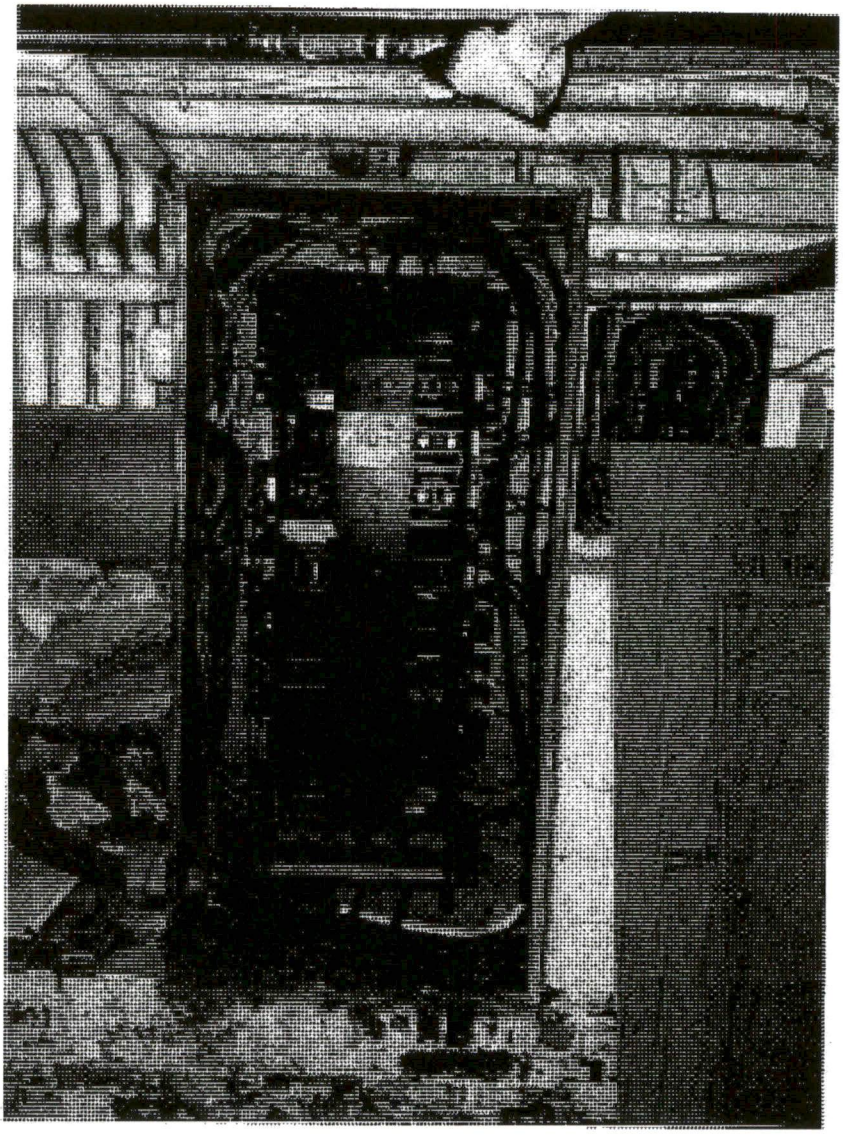
The elevator is fed from 480v HDP-3A 100Amp breaker 5 with #2 conductors in 1" flexible conduit from HDP-3A to disconnect

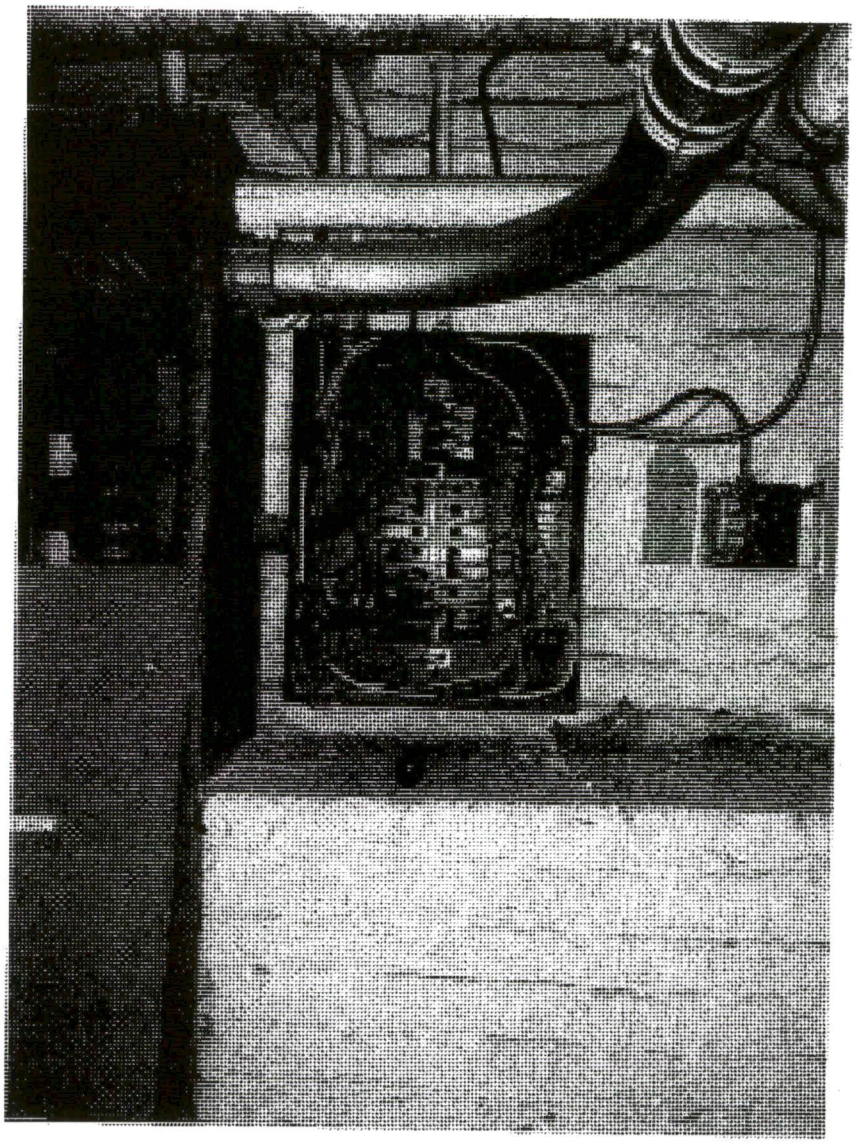
8) Confirm power feeder from LDP-3A to Panel SD-12, including grounding method. **SD12 is fed from LDP-3A 400 Amp breaker#7 with 500 MCM conductors and #6 bare copper ground in 3" liquid tight conduit. The ground conductor size is undersized for 400 amps.**



There is also a sub panel next to SD12 that is not on the one line or scope. For purpose of this report, we have named this panel SD12-SP (for sub panel)
It is fed from SD12 50-amp breaker circuit 2,4,6 with #3 THHN. During the survey while the panels were open the facilities electrician added a #6 THHN ground from SD12 to SD12-SP.





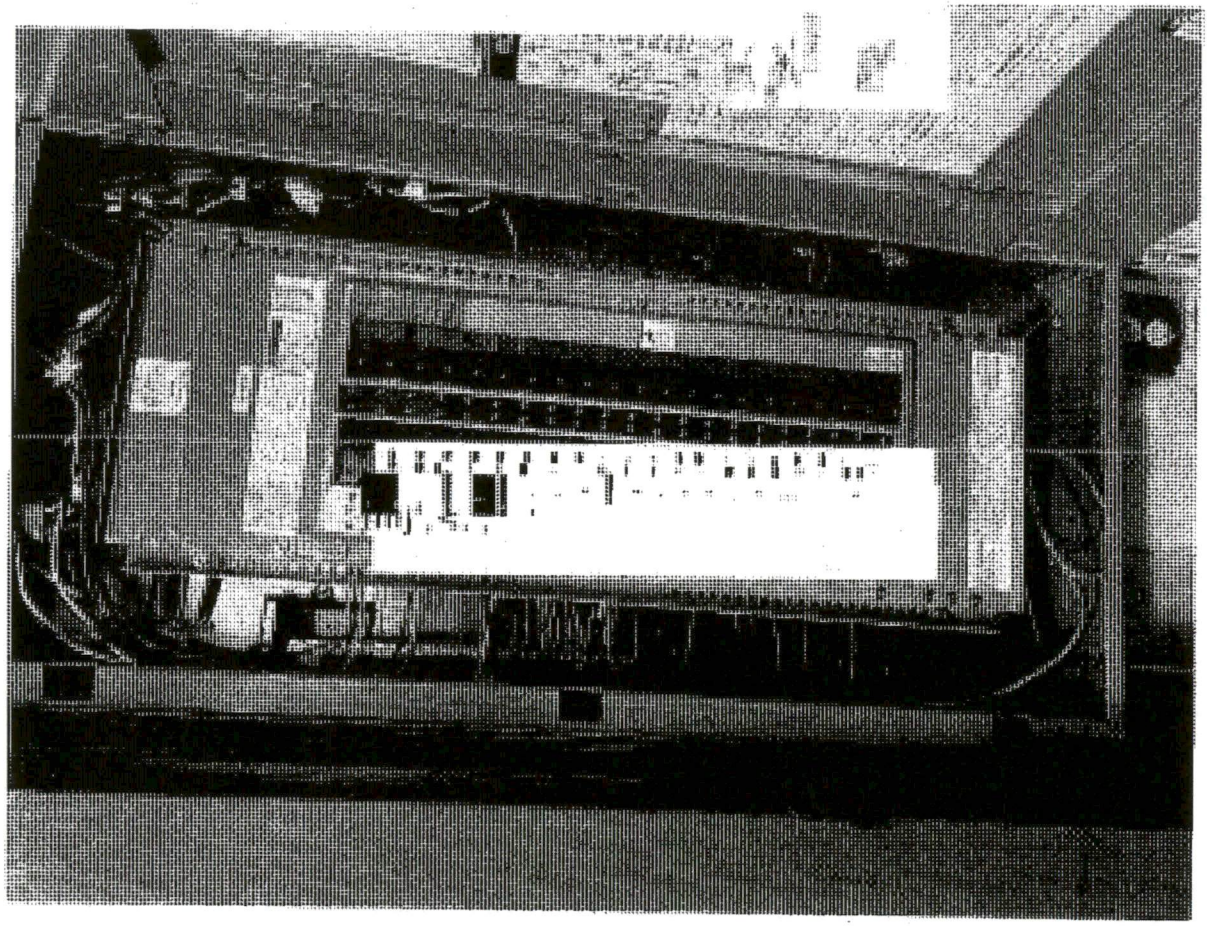


9) Confirm feeders and grounding methods on feeders from LDP-3A to Panels NPW-1 and NPW-2. Note grounding method provided.

NPW-1 is fed from 225 Amp breaker #2 LDP3=A with 4 wire 250MCM THHN and #6 ground (undersized)

NPW-2 is fed from NPW-1 100-amp breaker circuits 1,3,5 with #1 THHN and #8 ground.





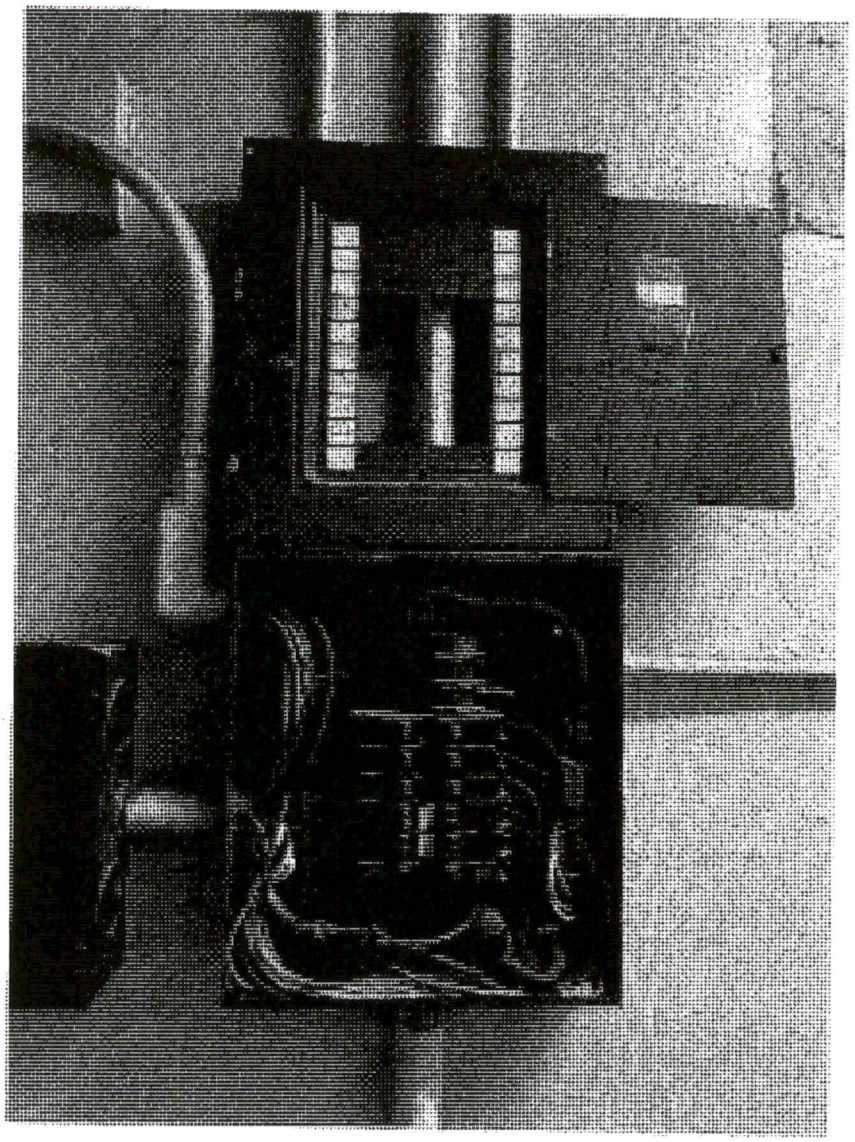




10) Confirm feeder from LDP-3A to Panel PP-1N

There is no panel PP-1N this is A mislabeled panel that has been relabeled to appropriate label P1-M

See subheading 13



11) Confirm feeder from SD-12 to SD-13B, including rating and panel position.
12) Confirm feeder from SD-12 to Panel SDX with sub feed to Panel SDXA, including breaker rating and position

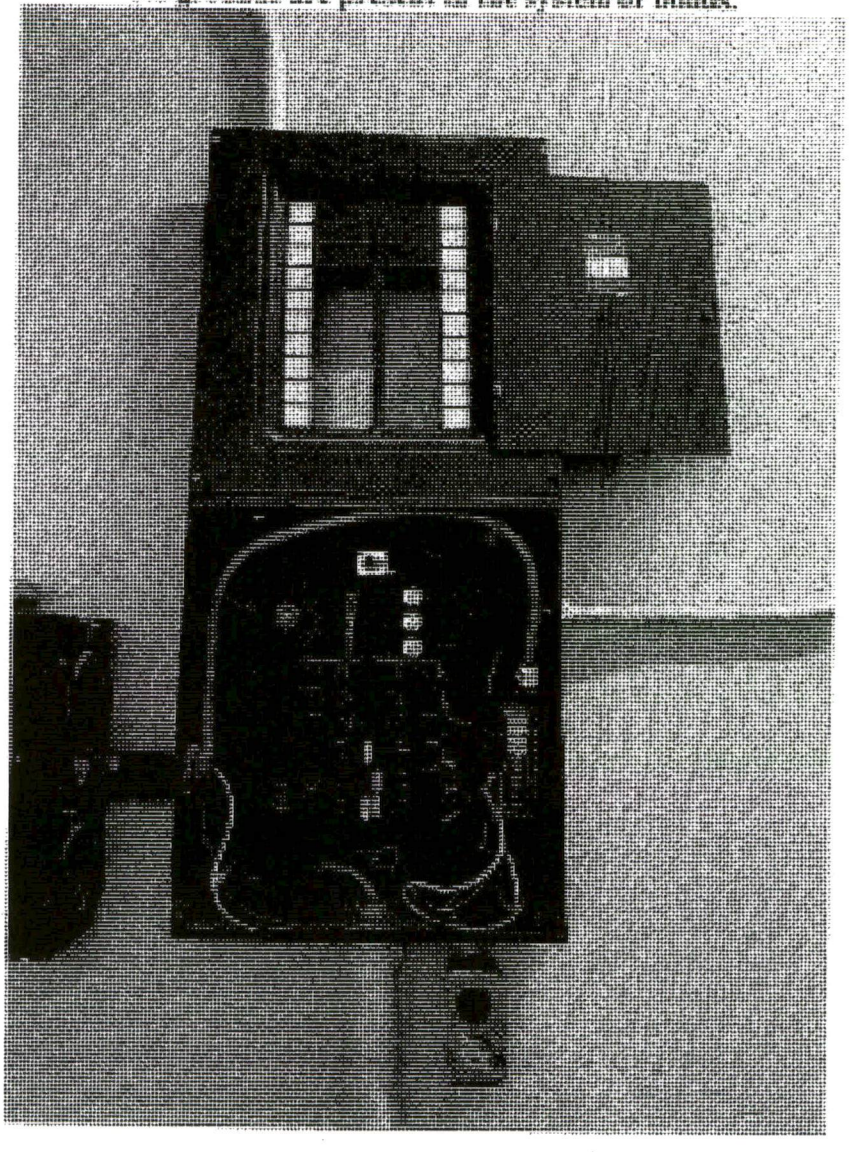
Panel SDX is fed from SD12 breaker#8 70 Amp breaker with #2 cloth conductors, no ground or bond

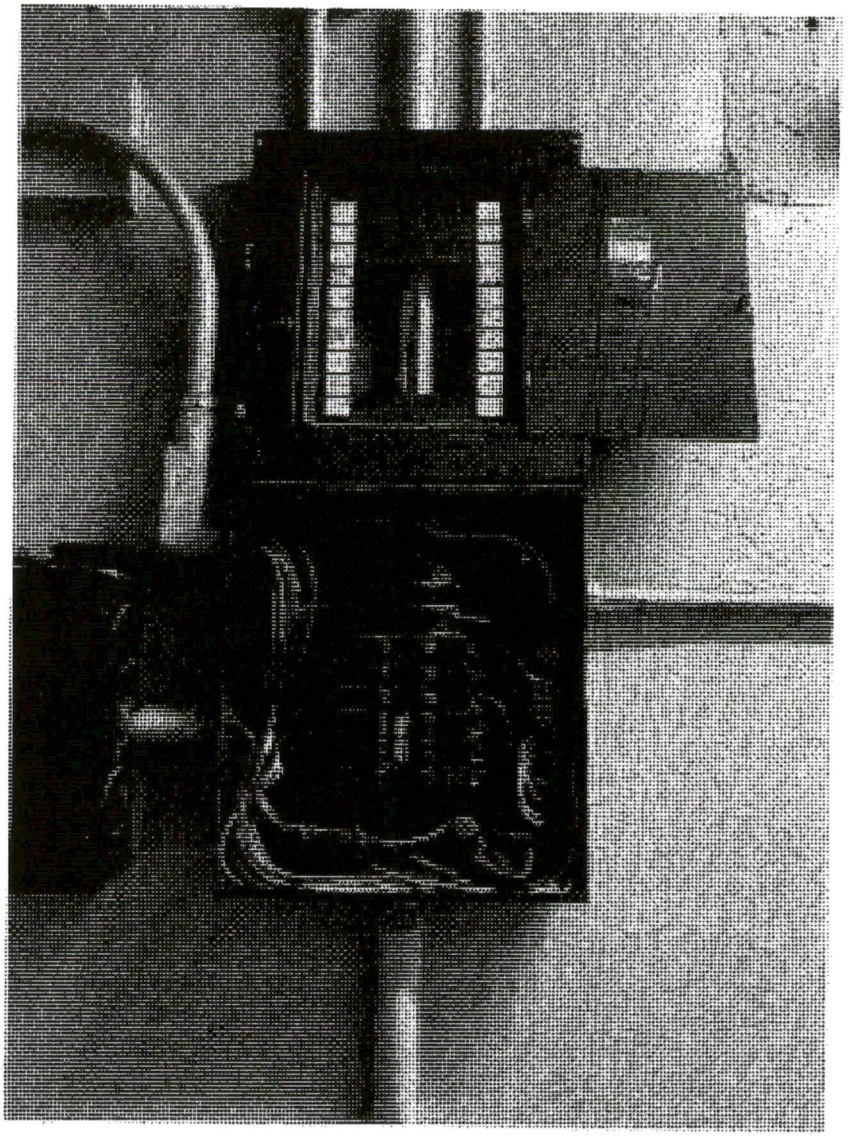
SDX-A is fed from SDX breaker #2 3 pole 15Amp breaker using 2 legs to SDXA with #10 couductors and #10 ground.

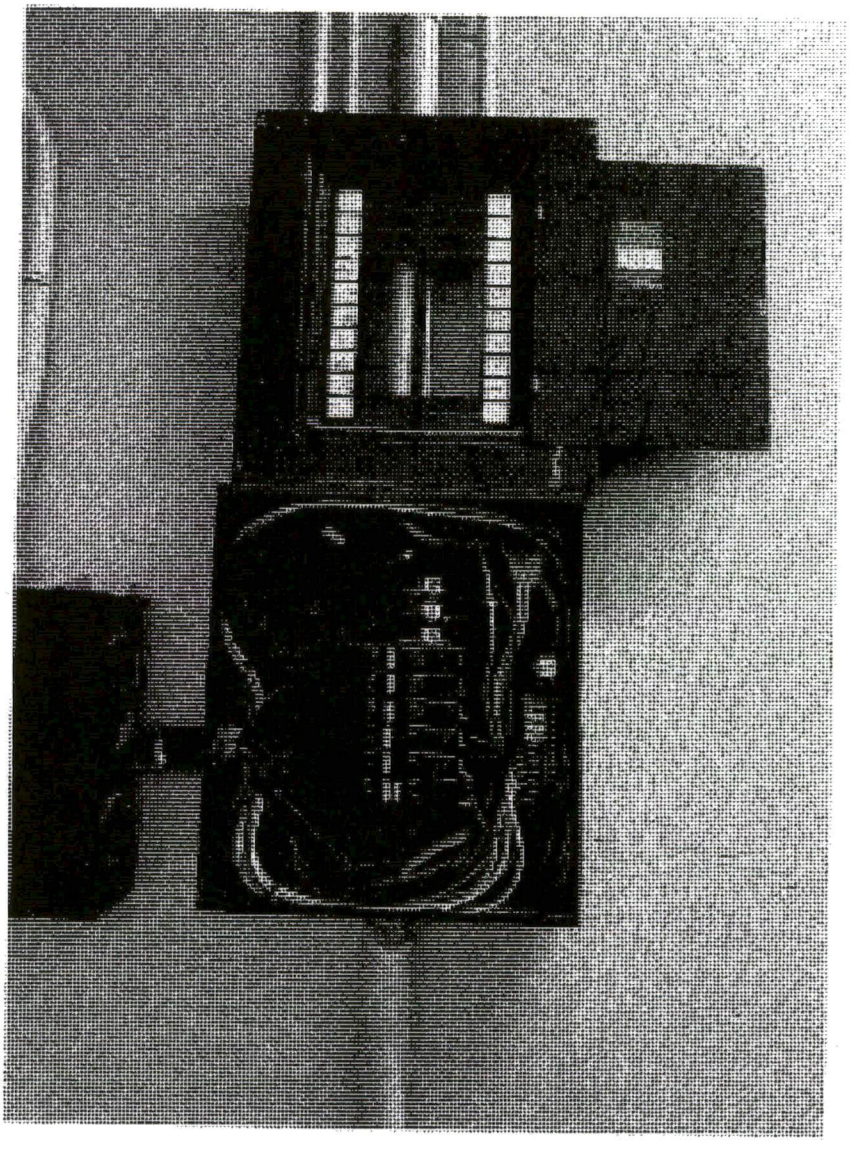
13) Confirm feeder from SD-12 to Panels P1m, Pm, and P3H. Confirm whether panels sub feed or have individual circuits. Note breaker position or positions and ratings.

Panel SD 12 50 Amp breaker daisy chain feeds panels P1M, P2H, and P3H, the conductors are 2/0 from SD12 to P1M and downsized to 1/0 for PM and 3H, the taps feeding the panels are #2.

No grounds are present in the system or bonds.



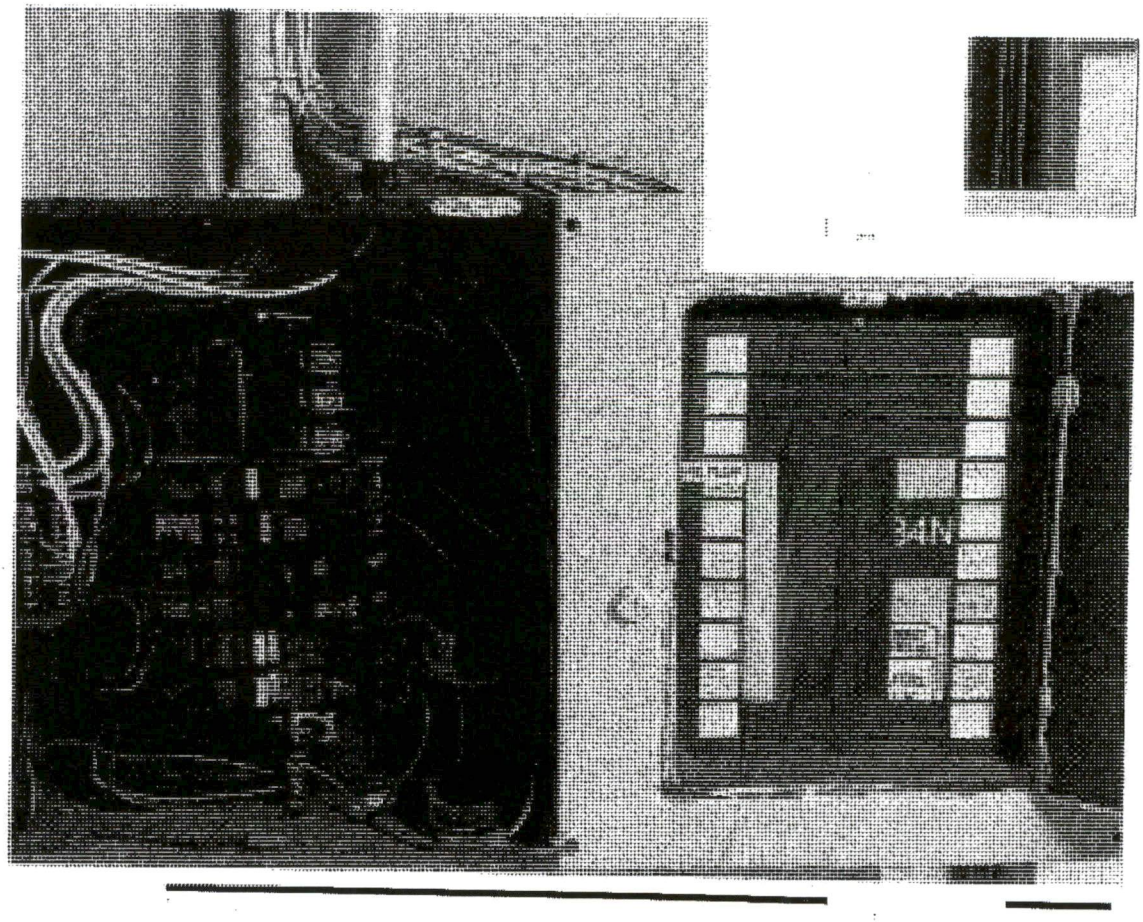


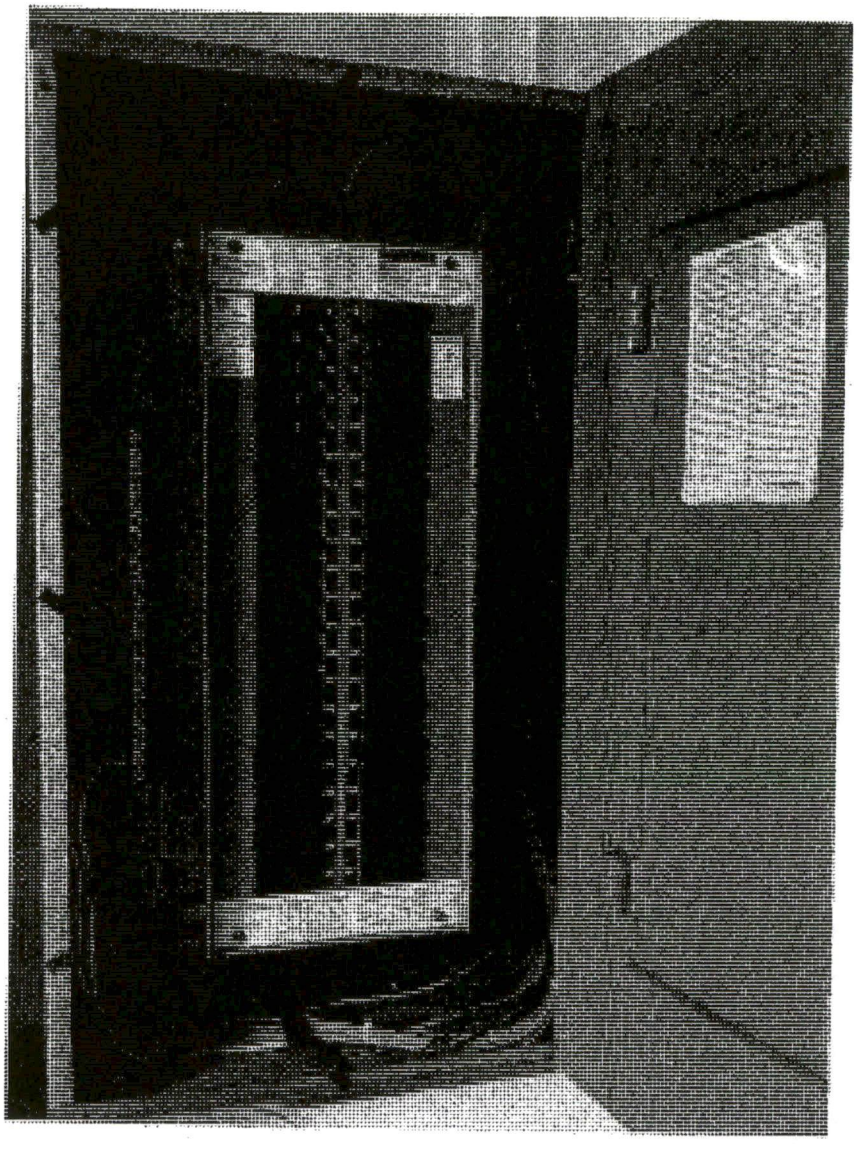


14) Determine source of feeder panel P3 in Chandler. Note feeder breaker rating and position. Note grounding provided.

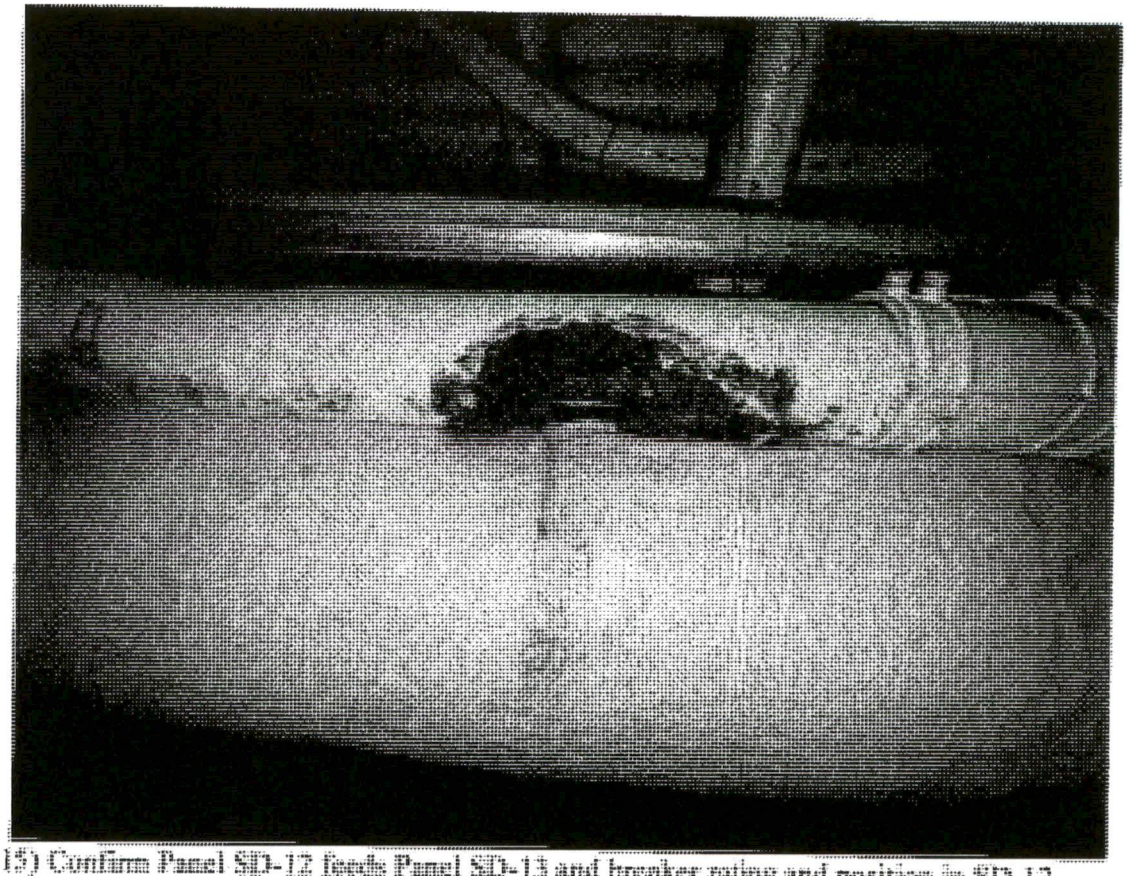
Panels P3, P2E, and P1L are daisy chained and tapped together fed from SD12 70-amp breaker #12 lower left with 1/0 THHN, no ground, the tap from main conductor to panels is downsized to #2 THHN

There are no bonds to the raceway.

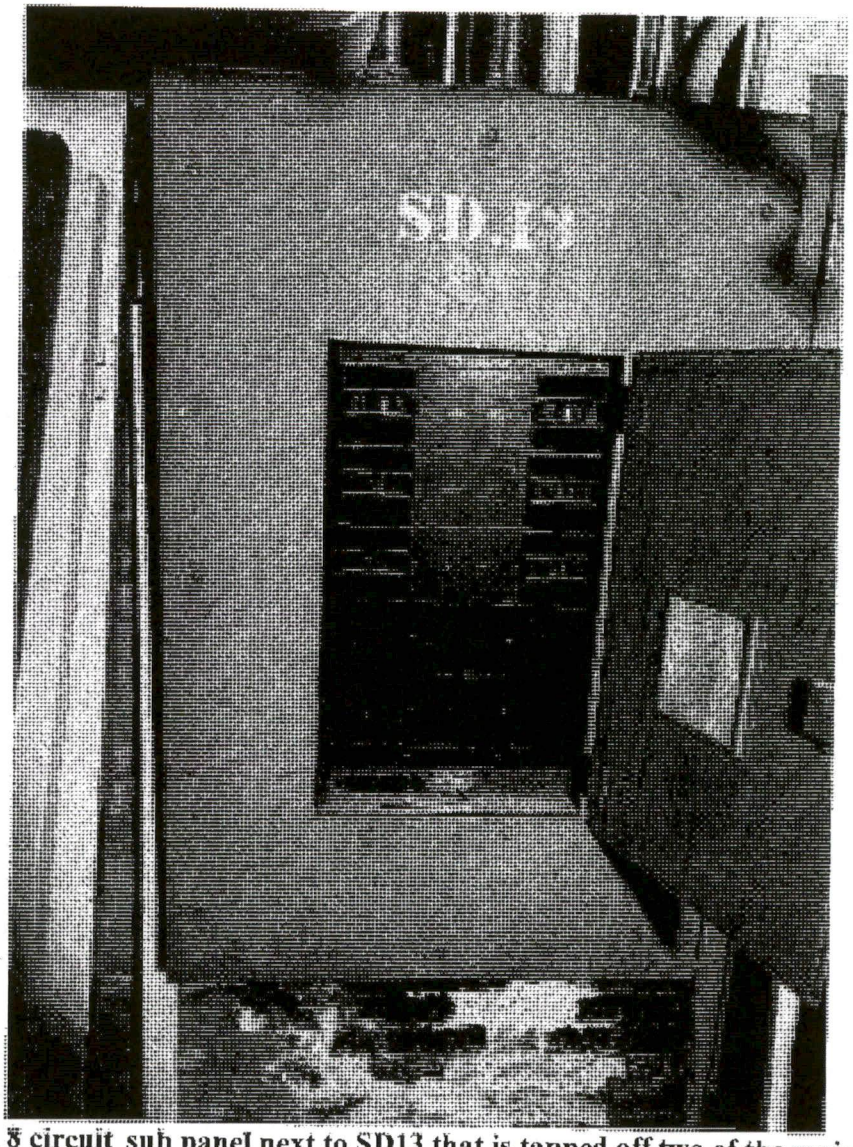




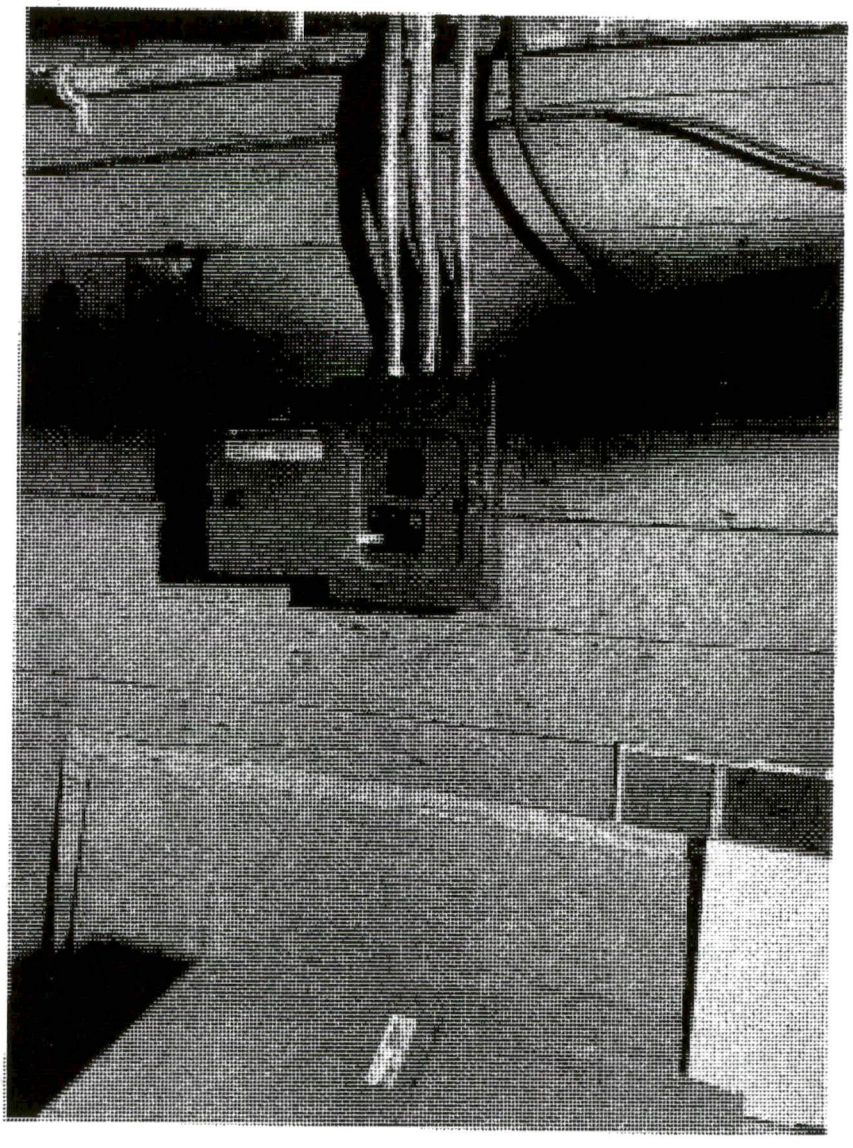
It is important to note that there is a rusted-out section of the 2" conduit in the basement the conductors can be seen inside the conduit



15) Confirm Panel SD-12 feeds Panel SD-13 and breaker rating and position in SD-12.
SD 13 is fed from SD12 breaker #8 70 Amp breaker with cloth #2 conductors and no ground



There is an 8 circuit sub panel next to SD13 that is tapped off two of the main lugs of SD13 with #8 and no overcurrent protection

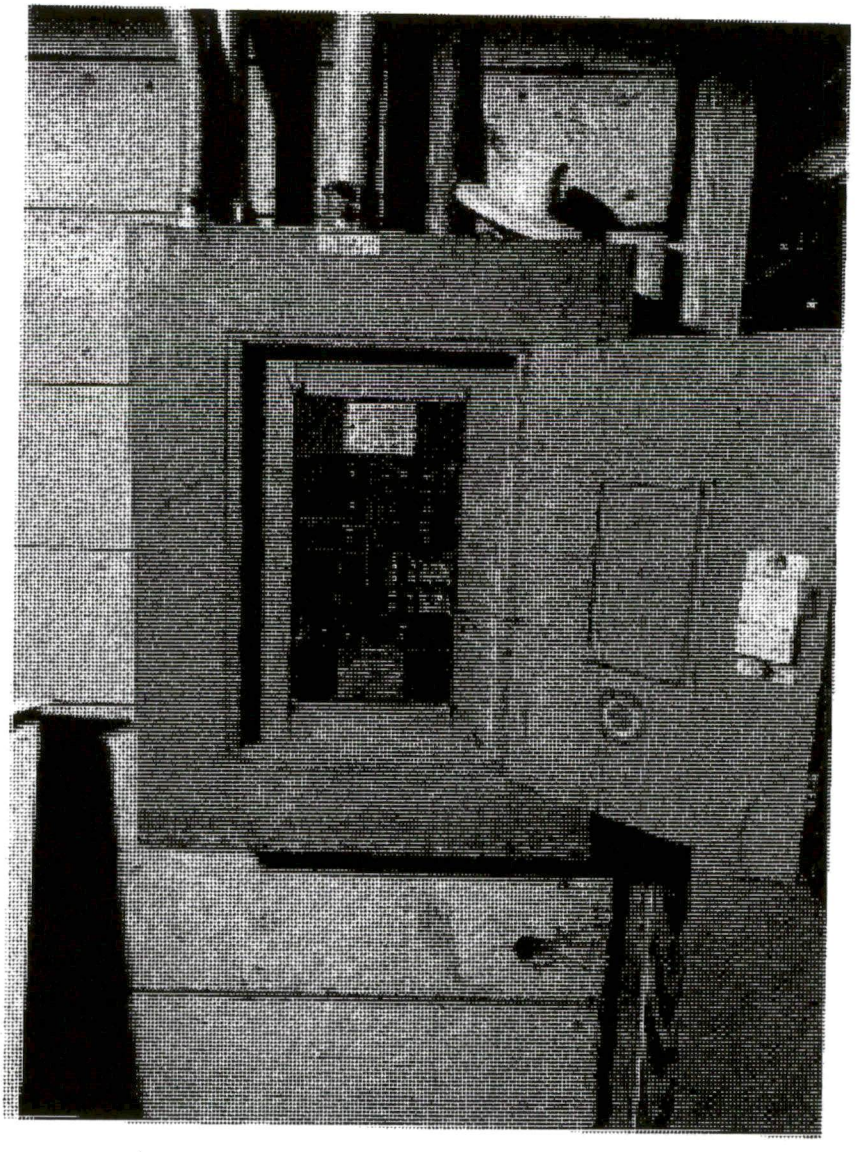


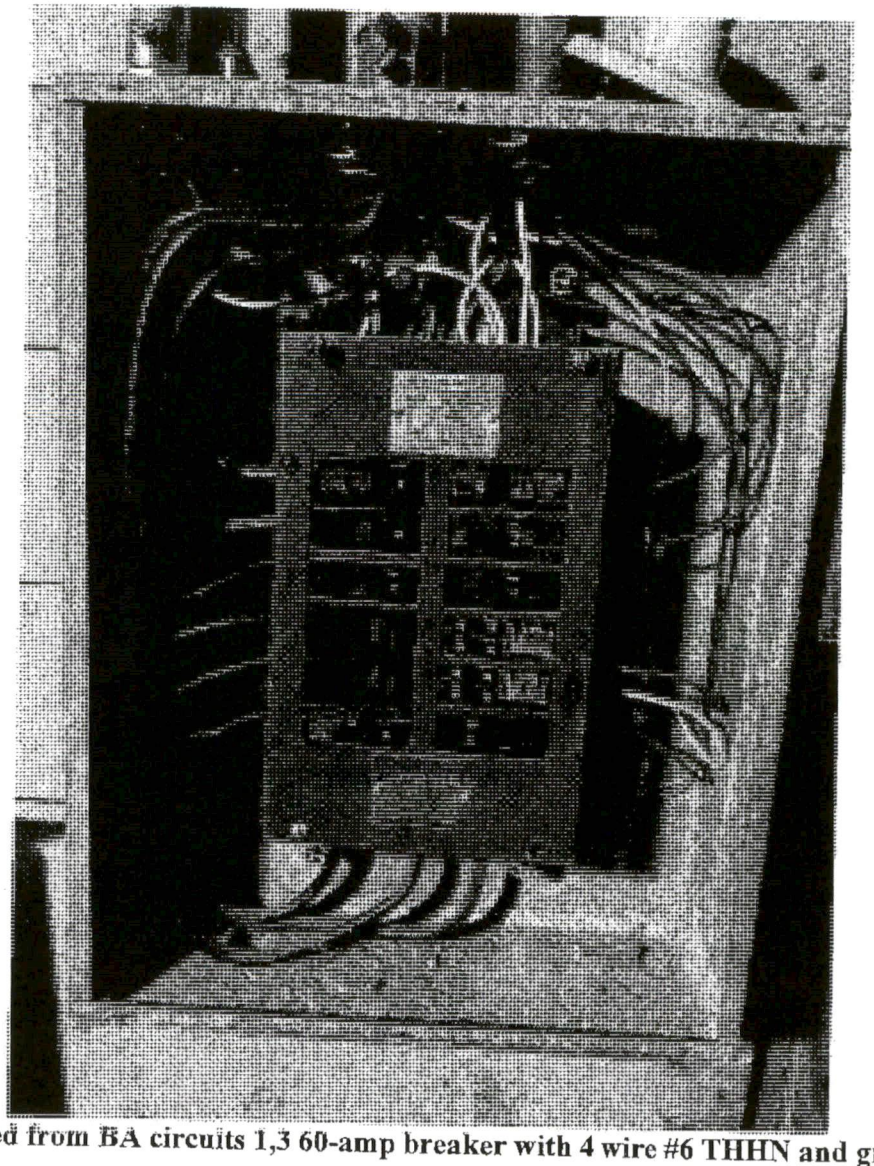
16) Determine source of feeder for panel PO, first floor North Pavilion, and breaker rating and position in feeding panel.

P2N is fed from SD13 50 Amp breaker #4 with 3/0 THHN no ground. We believe P1N is breaker 3 50-amp breaker and in the off position no longer in service.

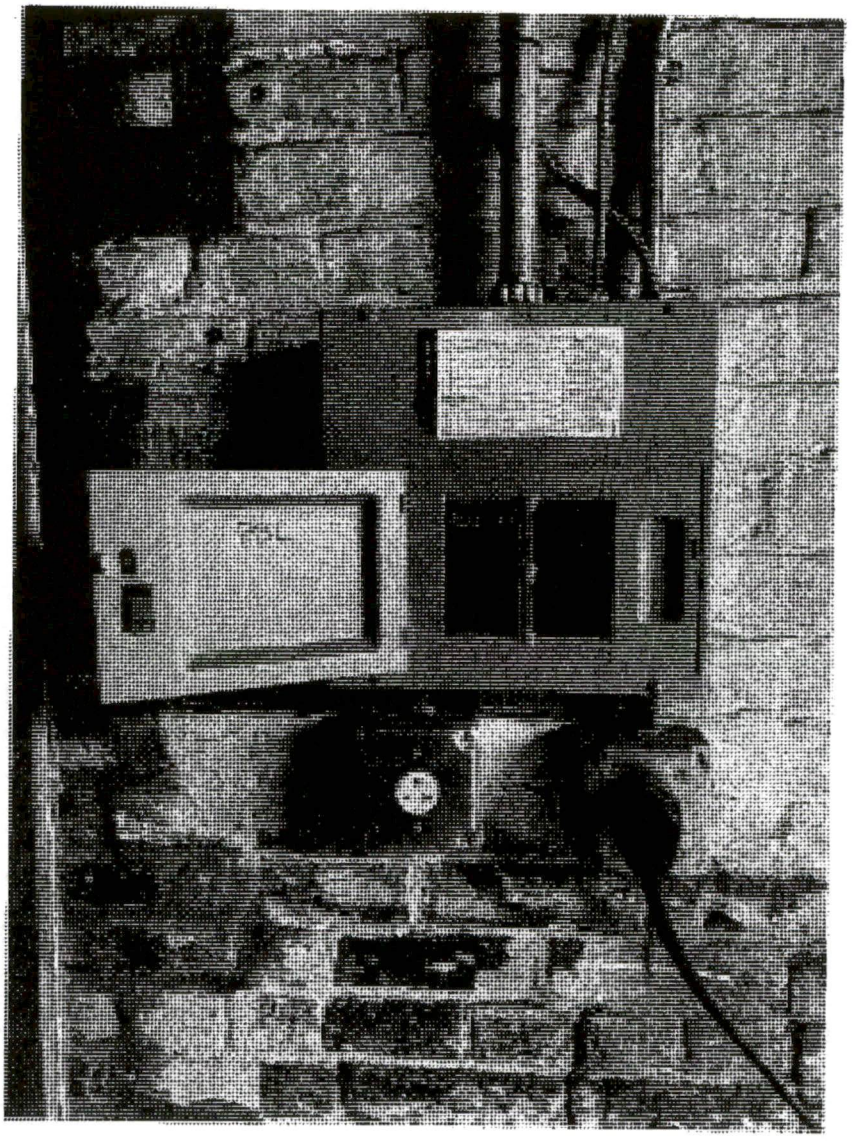
17) Confirm Panel SD-13 feeds Panel BA which sub feeds Panel PBL. Note breaker positions and ratings for feeders.

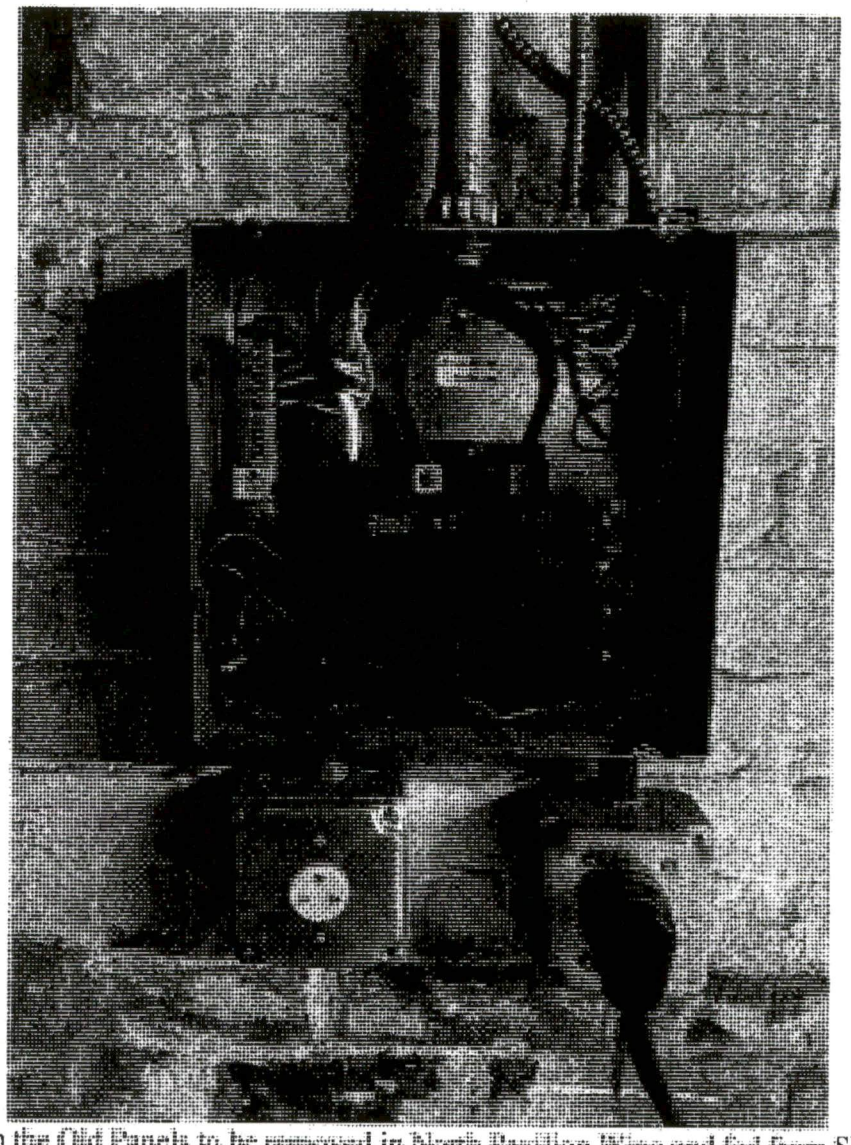
Panel BA is fed from SD13 35 Amp breaker #2 THHN conductors and cloth #2 conductors neutral, no ground.





PBL is fed from BA circuits 1,3 60-amp breaker with 4 wire #6 THHN and ground





18) Confirm the Old Panels to be removed in North Pavilion Wing and fed from SD-13 can be demolished without having to transfer any wiring splices that may exist within them.

We have not been able to investigate this due to time constraints at the end of the day.

19) Confirm the Panel SD-12 has a feeder to the vicinity of SD-10 and 10A that then powers the old kitchen panel. Note breaker rating and position. Is there any load or loads still active in the Old Kitchen area for lights, etc. or can this be removed with no other work required.

There is a circuit from SD10 with a breaker labeled as mechanical cow in flexible conduit going through the old kitchen area to a junction box in the kitchen, other than that all circuits in the kitchen appears to be dead other than a EBU circuit fed from a small panel outside of the kitchen (panel KSP)

Appendix “D"

ELECTRIC PANEL SCHEDULE

Panel: P1E		Normal:			
		Emergency:		Fed From:	

Mfg:			Mounting:	RECESSED
120-208 Voltage:	Phase: 2		Circuits:	6 - BUSS FUSE
MLO Main Lugs (amps)			Main Breaker: (amps)	— NA

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	1	20	1	2	20	1	
	1	20	3	4	20	1	
	1	15	5	6	15	1	
			7	8			
			9	10			
			11	12			
			13	14			
			15	16			
			17	18			
			19	20			
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
LINE but Not being USED			59	60			
			61	62			
			63	64			

Fed from below w/ 1" conduit RECESSED IN WALL
2 cloth #6's ? 1 cloth #8 Neutral No Ground

ELECTRIC PANEL SCHEDULE

			Normal:		
Panel:	LPB-B		Emergency:	Fed From:	LPB-A

BRYANT	Mfg:			Mounting:	SURFACE
120/208	Voltage:	Phase: 2		Circuits:	8 CKT PANEL
MLO	Main Lugs	3 CONDUCTOR		Main Breaker:	N/A
	(amps)	ISOLATED NEUTRAL / NO GROUND	(amps)		

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
EMPTY	—	—	1	2	20	1	
	1	20	3	4	—	—	EMPTY
	1	20	5	6	20	1	
	1	20	7	8	—	—	EMPTY
			9	10			
			11	12			
			13	14			
			15	16			
			17	18			
			19	20			
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/ #6 TW

ELECTRIC PANEL SCHEDULE

Panel: NEW P2B		Normal:		Fed From:	
		Emergency:			

EATON	Mfg:			Mounting:	SURFACE
120/208	Voltage:	Phase: 3		Circuits:	30 CKT PANEL
N/A	Main Lugs (amps)	5 Conductor ISOLATED Neutral & Ground		Main Breaker: (amps)	CKTS 1, 3, 5 100

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	3		1	2	20	1	
			3	4	20	1	
		100	5	6	20	1	
	1	20	7	8	20	1	
	1	20	9	10	20	1	
	1	20	11	12	20	1	
	1	20	13	14	20	1	
	1	20	15	16	20	1	
	1	20	17	18	20	1	
	1	20	19	20	20	1	
	1	20	21	22	20	1	
	1	20	23	24	20	1	
	1	20	25	26	20	1	
	1	20	27	28	20	1	
	1	20	29	30	20	1	
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/ #1 AWG XHHW

ELECTRIC PANEL SCHEDULE

Panel: LPB-A	Normal:	Fed From: SD-4
	Emergency:	

Mfg: SQUARE D	Phase: 3	Mounting: SURFACE	
Voltage: 120/208		Circuits: 20 CKT PANEL	
Main Lugs: MLO	4 CONDUCTOR	Main Breaker: N/A	
100 (amps)	ISOLATED NEUTRAL / NO GROUND	(amps)	

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	1	20	1	2	20	1	
	1	20	3	4	20	1	
	1	20	5	6	20	1	
	1	20	7	8	20	1	
	1	20	9	10	15	1	
	1	20	11	12	20		
	1	30	13	14		2	
	1	30	15	16	30	1	
	1	40	17	18	40	1	
	1	40	19	20	15	1	
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/#6 TW 4/ CONDUCTOR

ELECTRIC PANEL SCHEDULE

Panel: PBM		Normal:	
		Emergency:	Fed From: 35 AMP SD-11 BREAKER CKTS 8, 10, 12

CUTLER HAMMER	Mfg:		Mounting:	SURFACE
120-208	Voltage:	Phase: 3	Circuits:	12
MLO	Main Lugs (amps)		Main Breaker: (amps)	N/A

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	1	20	1	2	20	1	
	1	20	3	4	20	1	
	1	20	5	6	20	1	
	1	20	7	8	20	1	
	2	20	9	10	15	1	
			11	12	20	1	
			13	14			
			15	16			
			17	18			
			19	20			
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

#8

ELECTRIC PANEL SCHEDULE

Panel: P-4B		Normal:		Fed From: 3D36
		Emergency:		

BRYANT	Mfg:		Mounting: SURFACE
120/208	Voltage:	Phase:	Circuits: 30
MLO	Main Lugs (amps)		Main Breaker: NONE (amps)

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
NOT USED			1	2			FEED 1/0
			3	4			
			5	6			
T		15/15	7	8	15/15	T	
T		15/15	9	10	15/15	T	
T		20/20	11	12	20/20	T	
T		20/20	13	14	20/20	T	
T		20/20	15	16	20/20	T	
		20	17	18	20/20	T	
		40	19	20	20/20	T	
TSP	T	20	21	22	20	S	
		20	23	24	20	S	
		40	25	26	20	S	
		20	27	28	20/20	T	
	2P	20	29	30	20/20	T	
	T	20/20	31	32	20		
			33	34			
	S	20	35	36			
	S	20	37	38			
	B		39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

ELECTRIC PANEL SCHEDULE

Panel: PBG		Normal:	
		Emergency:	Fed From: SD-11

BREAKER - 16 - CKT 3 44/46

SQUARE D	Mfg:			Mounting:	SURFACE
120-208	Voltage:	Phase: 3		Circuits:	
MLO	Main Lugs			Main Breaker:	— NA
50 (amps)				(amps)	

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	1	20	1	2	20	1	
	1	20	3	4	20	1	
	1	20	5	6	20	1	
	1	20	7	8	20	1	
	1	20	9	10	20	1	
	2		11	12	30		
		20	13	14		2	
	1	20	15	16	15	1	
	1	20	17	18	20	1	
	1	20	19	20	15	1	
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/ #4 AWG

ELECTRIC PANEL SCHEDULE

		Normal:		
Panel: PBF		Emergency:	Fed From:	SD-11 BREAKER - 13 CKTS 31, 33, 35

GE	Mfg:		Mounting:	SURFACE
120-208	Voltage:	Phase: 3	Circuits:	
MLO	Main Lugs		Main Breaker:	— N/A
100 AMP (amps)			(amps)	

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	1	20	1	2	20	/	
	1	20	3	4	/	2	
	1	20	5	6	30	/	
	1	20	7	8	/	2	
	1	20	9	10	50	/	
	1	20	11	12	/	2	
	1	20	13	14	20	1	
	1	20	15	16	20	1	
	1	15	17	18	20	1	
	1	15	19	20	20	1	
	1	15	21	22	20	1	
	1	15	23	24	20	1	
	1	15	25	26	20	1	
	1	20	27	28	20	1	
	1	20	29	30	20	1	
	1	20	31	32	20	1	
	1	20	33	34	20	1	
	1	20	35	36	20	1	
	1	20	37	38	20	1	
	1	20	39	40	20	1	
	1	20	41	42	20	1	
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/ #2 AWG THHN

ELECTRIC PANEL SCHEDULE

2nd Floor Recess		Normal:	
Panel: P 2D		Emergency:	Fed From: 2 LEGS of SD#1

SQD Multi Breaker Mfg:			Mounting:	RECESSED
120/208 Voltage:		Phase:	Circuits:	8
MLO Main Lugs			Main Breaker:	—
(amps)			(amps)	

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	1	20	1	2	15	1	
	1	15	3	4	15	1	
	1	15	5	6	15	1	
	1	15	7	8	15	1	
			9	10			
			11	12			
			13	14			
			15	16			
			17	18			
			19	20			
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

ELECTRIC PANEL SCHEDULE

Panel: PBH		Normal:			
		Emergency:	Fed From:	SD-11	
				BREAKER 12 CKTS 32, 34, 36	
BRYANT	Mfg:		Mounting:	SURFACE	
120-208	Voltage:	Phase:	Circuits:		
MLO	Main Lugs		Main Breaker:	— N/A	
70	(amps)		(amps)		

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
OPEN			1	2			FED
			3	4			
			5	6			
	1	15	7	8	15	1	
	1	15	9	10	15	1	
	1	15	11	12	15	1	
	1	15	13	14	15	1	
	1	15	15	16	15	1	
	1	15	17	18	15	1	
	1	15	19	20	15	1	
	1	20	21	22	15	1	
	1	20	23	24	15/15	1	TANDUM
TANDUM	1	20/20	25	26	20/20	1	TANDUM
TANDUM	1	20/20	27	28	20/20	1	TANDUM
	1	15	29	30	20/15	1	TANDUM
BLANK			31	32		BLANK	
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED FROM SD-11 W/ #2 CLOTH

ELECTRIC PANEL SCHEDULE

Panel: [redacted] PSB-1	Normal:		
	Emergency:	Fed From:	SD-10 - ~~EH~~ BENE 7 OKA SP

BRYANT	Mfg:	Phase:	Mounting:	
	Voltage:		Circuits:	24
120/208	Main Lugs		Main Breaker:	MLO
(amps)			(amps)	

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
NOT USED			1	2			FEED
			3	4			
			5	6			
Empty			7	8		15	Empty
Empty			9	10			Empty
		15	11	12		20	
		15	13	14		15	
		15	15	16		15	
		15	17	18		15	
		20	19	20		15	
		15	21	22		15	
		20	23	24		20	
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

ELECTRIC PANEL SCHEDULE

Panel: P3D		Normal:		Fed From: SD 36
		Emergency:		

WESTINGHOUSE	Mfg:		Mounting: SURFAC
120/208	Voltage:	Phase: 3	Circuits: 20
MLO	Main Lugs (amps)		Main Breaker: NONE (amps)

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
~~SPARE~~ NOT USED			1	2			FEED MLO
			3	4			
			5	6			
TANDEM		20/20	7	8	20/20		
		20/20	9	10	20		
		20/20	11	12	20		
			13	14		2	
	3	15	15	16	30		
			17	18		2	
BLANK			19	20	BLANK		
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

ELECTRIC PANEL SCHEDULE

Panel: PSA		Normal:	
		Emergency:	Fed From:

	Mfg:	Phase:	Mounting:	
	Voltage:		Circuits:	
MLO	Main Lugs		Main Breaker:	/
(amps)			(amps)	

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	1	20	1	2			
	1	20	3	4			
	1	20	5	6			
		20	7	8			
	1	20	9	10			
	1	20	11	12			
			13	14			
			15	16			
			17	18			
			19	20			
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

IS. NUTRIA 1 NO Ground #8 Cloth SER/ROMEX

ELECTRIC PANEL SCHEDULE

Panel: P2F		Normal:		Fed From:	LDP3-2, 4, 6 CKTS
		Emergency:			

Mfg:	Cutler Hammer	Phase: 3	Mounting:	Surface
Voltage:	120/208		Circuits:	42 CKT PANEL
Main Lugs	N/A		Main Breaker:	CKTS 37, 39, 41
(amps)	ISOLATED NEUTRAL & GROUND		(amps)	100

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	1	15	1	2	15	1	
	1	15	3	4	15	1	
	1	15	5	6	15	1	
	1	15	7	8	15	1	
	1	20	9	10	20	1	
	1	20	11	12	20	1	
	1	20	13	14	20	1	
	2		15	16	20		
		20	17	18		2	
	1	20	19	20			Empty
	1	20	21	22			Empty
Empty			23	24			Empty
			25	26			Empty
			27	28			Empty
			29	30			Empty
			31	32			Empty
			33	34			Empty
			35	36			Empty
			37	38			Empty
			39	40			Empty
Empty			41	42			Empty
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/ #2 AWG THHN & 1 CONDUCTOR W/ GROUND

ELECTRIC PANEL SCHEDULE

		Normal:		
Panel: P1I		Emergency:	Fed From:	LDP3 CKTS 8,10,12

WESTINGHOUSE	Mfg:	Phase: 3	Mounting:	SURFACE
120/208	Voltage:		Circuits:	32 CKT PANEL
N/A	Main Lugs (amps)	ISOLATED NEUTRAL NO GROUND	Main Breaker: (amps)	CKTS 1,3,5 100

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
			1	2	15	1	
FED			3	4	15	1	
			5	6	15	1	
	2		7	8	20	1	
		20	9	10	20		
	2		11	12		2	
		20	13	14	20	1	
	1	20	15	16	20	1	
	2		17	18	20	1	TANDEM
		20	19	20	20		
EMPTY			21	22		2	
			23	24			EMPTY
			25	26			
			27	28			
			29	30			
EMPTY			31	32			EMPTY
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED from Below w/ #2 THHN 4 conductor

ELECTRIC PANEL SCHEDULE

Panel: P1L	Normal:		
	Emergency:	Fed From:	SD 12 BKR#12

CUTTER HAMMER	Mfg:	Phase: 3	Mounting:	SURFACE
120/208	Voltage:		Circuits:	42 CKT PANEL
MLO	Main Lugs		Main Breaker:	N/A
100 (amps)	ISOLATED NEUTRAL NO GROUND		(amps)	

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	1	15	1	2	15	1	
	1	15	3	4	15	1	
	1	15	5	6	15	1	
	1	20	7	8	15	1	
	1	20	9	10	20	1	
	1	20	11	12	20	1	
	1	20	13	14	20	1	
	1	20	15	16	20	1	
	1	20	17	18	20	1	
	1	20	19	20	20	1	
	1	20	21	22	20	1	
	1	20	23	24	20	1	
	1	20	25	26	20	1	
	1	20	27	28	20		
	1	20	29	30		2	
	1	20	31	32	20	1	
Empty			33	34	20	1	
Empty			35	36			Empty
Empty			37	38			Empty
Empty			39	40	20		
Empty			41	42		2	
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

4 CONDUCTOR NO GROUND

FED W/ #2 AWG THHN TAPPED OFF 1/0 AWG THW

ELECTRIC PANEL SCHEDULE

Panel: P2E		Normal:	
		Emergency:	Fed From: SD 12 - BKR 12

CUTTER HAMMER	Mfg:	Phase: 3	Mounting:	SURFACE
120/208	Voltage:		Circuits:	42 CKT PANEL
MLO	Main Lugs		Main Breaker:	N/A
100 (amps)	ISOLATED NEUTRAL NO GROUND		(amps)	

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	1	15	1	2	15	1	
	1	15	3	4	15	1	
	1	15	5	6	15	1	
	1	20	7	8	20	1	
	1	20	9	10	20	1	
	1	20	11	12	20	1	
	1	20	13	14	20	1	
	1	20	15	16	20	1	
	1	20	17	18	20	1	
	1	20	19	20	20	1	
	1	20	21	22	15	1	
	1	20	23	24	15	1	
	1	20	25	26	20	1	
	2		27	28	20	1	
		20	29	30	20	1	
Empty			31	32			Empty
↓			33	34			↓
			35	36			
			37	38			
			39	40			
Empty			41	42			Empty
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FOUR CONDUCTOR NO GROUND

FED W/ #2 AWG THHN TAPPED OFF 1/0 AWG THW

Panel: NPW-1		Normal:		Fed From: LDP3-A BKR #2
		Emergency:		

EATON	Mfg:		Mounting:	SURFACE
120/208	Voltage:	Phase: 3	Circuits:	42 CKT PANEL
MLO	Main Lugs		Main Breaker:	N/A
225 (amps)	ISOLATED NEUTRAL & GROUND (amps)			

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	3		1	2	20		
			3	4		2	
		100	5	6	20		
	2		7	8		2	
		20	9	10	20		
	2		11	12		2	
		20	13	14	20		
	1	20	15	16		2	
	1	20	17	18	20	1	
	1	20	19	20	20	1	
	1	20	21	22	20	1	
	3		23	24	20	1	
			25	26	20	1	
		100	27	28	20	1	
	1	20	29	30	20	1	
	1	20	31	32	20	1	
	1	20	33	34	20	1	
	1	20	35	36	20		
	1	20	37	38		2	
	1	20	39	40	30		
	1	20	41	42		2	
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W 4 CONDUCTOR W/ #6 GRND THHN
250 KCMIL THHN

ELECTRIC PANEL SCHEDULE

Panel: HDP-P3-A1		Normal:		Fed From: HDP3A BRKR #4
		Emergency:		

Cutler Hammer Mfg:			Mounting:	SURFACE
480/277 Voltage:	Phase: 3		Circuits:	42 CKT PANEL
MLO Main Lugs			Main Breaker:	N/A
225 (amps)	ISOLATED Neutral & Ground	(amps)		

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	3		1	2	20		
			3	4			
		90	5	6		3	
	3		7	8	20		
			9	10			
		20	11	12		3	
	3		13	14	20	1	
			15	16	20	1	
		20	17	18	20	1	
	1	20	19	20	20	1	
	1	20	21	22	20	1	
	1	20	23	24	20	1	
	1	20	25	26	20	1	
	1	20	27	28	20	1	
	1	20	29	30	20	1	
	1	20	31	32	20	1	
	1	20	33	34	20	1	
	1	20	35	36	20	1	
	1	20	37	38	20	1	
	1	20	39	40			
Empty			41	42			Empty
			43	44			Empty
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/ 4 CONDUCTOR W/ 2/0 AWG THHN 4/0 AWG THHN

ELECTRIC PANEL SCHEDULE

Panel: PPB-2	Normal:		
	Emergency:	Fed From:	3 12 BRKR#7

GE	Mfg:			Mounting:	SURFACE
120/208	Voltage:	Phase: 2		Circuits:	24 CKT PANEL
MLO	Main Lugs			Main Breaker:	N/A
70	(amps)	ISOLATED NEUTRAL GROUND			(amps)

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	1	20	1	2	20	1	
	1	20	3	4	20	1	
	1	20	5	6	15	1	
	1	20	7	8	20	1	
	1	20	9	10	20	1	
	1	20	11	12	20	1	
			13	14	20	1	
			15	16			
			17	18			
			19	20			
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
SEPERATE ISOLATED #6 THHN GRND			63	64	TO WATER MAIN		

FED W/#2 cloth 3 CONDUCTOR SPLICED IN JB NEXT PANEL to #2 THHN 2 phase

ELECTRIC PANEL SCHEDULE

Panel: PPB-1		Normal:		
		Emergency:	Fed From:	PANEL P1, BKRS 25, 27, 29

SIEMENS	Mfg:		Mounting:	SURFACE
120/240	Voltage:	Phase: 3	Circuits:	24 CKT PANEL
NLO	Main Lugs		Main Breaker:	N/A
40	(amps)	ISOLATED NEUTRAL & GROUND	(amps)	

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	1	20	1	2	15		
	1	20	3	4		2	
	1	20	5	6	20	1	
	1	20	7	8	20	1	
	1	20	9	10	20	1	
	1	20	11	12	20	1	
	1	20	13	14	20	1	
	1	20	15	16			Empty
Empty			17	18			↓
Empty			19	20			Empty
Empty			21	22			
Empty			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/ 2/conductor w/ #10 ground THHN
#8 THHN

ELECTRIC PANEL SCHEDULE

Panel: NPW-2		Normal:	
		Emergency:	Fed From: PANEL NPW-1 CKTS 1,3,5

EATON	Mfg:		Mounting: SURFACE	
120/208	Voltage:	Phase: 3	Circuits: 42 CKT PANEL	
MLO	Main Lugs		Main Breaker: N/A	
100 (amps)	ISOLATED NEUTRAL & GROUND		(amps)	

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	2		1	2	20		
		30	3	4		2	
	2		5	6	20		
		30	7	8		2	
	2		9	10	20		
		30	11	12		2	
	1	20	13	14	20	1	
	1	20	15	16	20	1	
	1	20	17	18	20	1	
	1	20	19	20	20	1	
	1	20	21	22	20	1	
	1	20	23	24	20	1	
	1	20	25	26	20	1	
	1	20	27	28	20	1	
	1	20	29	30	20	1	
	1	20	31	32	20	1	
	1	20	33	34	20	1	
	1	20	35	36	20	1	
	1	20	37	38	20	1	
	1	20	39	40	20	1	
	1	20	41	42	20	1	
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/ 4 CONDUCTOR W/ #8 GROUND THHN
#1 AWG THHN THHN

ELECTRIC PANEL SCHEDULE

		Normal:			
Panel: SDX-A		Emergency:	Fed From:	SDX - BRKR #2	

BRYANT	Mfg:	Phase: 2	Mounting:	SURFACE	
120/208	Voltage:		Circuits:	8 CKT PANEL	
MLO	Main Lugs		Main Breaker:	N/A	
	(amps)	ISOLATED NEUTRAL & GROUND	(amps)		

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
Empty			1	2			Empty
Empty			3	4			Empty
Empty			5	6	20	1	
	1	20	7	8			Empty
			9	10			
			11	12			
			13	14			
			15	16			
			17	18			
			19	20			
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/ 2 #10's - W/ #10 NEUTRAL & #10 GROUND

ELECTRIC PANEL SCHEDULE

Panel: P2	Normal:	Emergency:	Fed From: LSP3-A BKR #6

Cutler Hammer Mfg:	Phase: 3	Mounting:	Surface
120/208 Voltage:		Circuits:	42 CKT Panel
MLO Main Lugs		Main Breaker:	N/A
200 (amps) Isolated Neutral & Ground			(amps)

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	2		1	2	20		
		20	3	4		2	
	2		5	6	20		
		30	7	8		2	
	2		9	10	20		
		30	11	12		2	
	1	20	13	14	20		
	1	20	15	16		2	
	1	20	17	18	20		
	1	20	19	20		2	
	1	20	21	22	20	1	
	1	20	23	24	20	1	
	1	20	25	26	20	1	
	1	20	27	28	20	1	
	1	20	29	30	20	1	
	1	20	31	32	20	1	
	1	20	33	34	20	1	
	1	20	35	36	20	1	
	1	20	37	38	100		
	1	20	39	40			FEED for SPY
	1	20	41	42		3	
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED w/ 3/0 AWG THWN w/ #6 BARE Ground 4 conductor w/ Ground NO Bond

ELECTRIC PANEL SCHEDULE

Panel: LP101	Normal:		
	Emergency:	Fed From:	LDP3-A BKR 3

EATON	Mfg:	Phase: 3		Mounting:	SURFACE
120/208	Voltage:			Circuits:	30 CKT PANEL
MLO	Main Lugs			Main Breaker:	N/A
200 (amps)	ISOLATED NEUTRAL & GROUND			(amps)	

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	1	20	1	2	20		
	1	20	3	4	20		
	1	20	5	6	20		
	1	20	7	8	20		
	1	20	9	10	20		
	1	20	11	12	20		
	2		13	14	20		
		30	15	16	20		
	1	20	17	18		2	
	1	20	19	20	20		
	1	20	21	22		2	
	1	20	23	24	20		
	3		25	26		2	
			27	28	20		
		100	29	30		2	
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/ 4/0 AWG 4 CONDUCTOR W/ 4/0 BARE GROUND THHN BONDED W/ BUSHING

ELECTRIC PANEL SCHEDULE

Panel: LP102		Normal:		Fed From: LP101 CKT 25,27,29
		Emergency:		

EATON	Mfg:	Phase: 3	Mounting:	SURFACE
120/208	Voltage:		Circuits:	42 CKT PANEL
MLO	Main Lugs		Main Breaker:	N/A
100	(amps)	Isolated Neutral & Ground		(amps)

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	2		1	2	20		
		20	3	4		2	
	2		5	6	20		
		20	7	8		2	
	1	20	9	10	1	20	
	1	20	11	12	1	20	
	1	20	13	14	1	20	
	1	20	15	16	1	20	
	3		17	18	1	20	
			19	20	1	20	
		20	21	22	1	20	
	1	20	23	24	1	20	
	3		25	26	1	20	
			27	28	1	20	
		20	29	30	1	20	
	1	20	31	32	1	20	
	1	20	33	34	1	20	
	1	20	35	36	1	20	
	1	20	37	38	1	20	
	1	20	39	40	1	20	
	1	20	41	42	1	20	
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

Fed w/ #2 AWG THHN w/ #6 Ground THHN

NO Bond

ELECTRIC PANEL SCHEDULE

Panel: PBI		Normal:	
		Emergency:	Fed From: SD12-A CKT 3 19,21,23

CUTLER HAMMER	Mfg:		Mounting:	SURFACE
120/208	Voltage:	Phase: 2	Circuits:	12 CKT PANEL
MLO	Main Lugs		Main Breaker:	N/A
125	(amps)	ISOLATED NEUTRAL NO GROUND		(amps)

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	1	30	1	2	20	1	
	1	30	3	4	20	1	
	1	30	5	6	30	1	
	1	20	7	8	20	1	
	1	20	9	10	20	1	
	1	20	11	12	20	1	
			13	14			
			15	16			
			17	18			
			19	20			
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/ 2 #6 TW & #1 AWG THWN NEUTRAL NO GROUND

ELECTRIC PANEL SCHEDULE

Panel: P3F		Normal:		Fed From: SD 12-A
		Emergency:		

BENJAMIN Electric	Mfg:	Phase: 2	Mounting: RECESSED
120/208	Voltage:		Circuits: 42 CKT BUSS PANEL
MLO	Main Lugs		Main Breaker: N/A
(amps)	ISOLATED NEUTRAL NO GROUND		(amps)

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	1	20	1	2	20	1	
	1	15	3	4	15	1	
	1	20	5	6	15	1	
			7	8			
			9	10			
			11	12			
			13	14			
			15	16			
			17	18			
			19	20			
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

ELECTRIC PANEL SCHEDULE

Panel: P3		Normal:		Fed From:
		Emergency:		

BRYANT	Mfg:	Phase: 3	Mounting:	SURFACE
120/208	Voltage:		Circuits:	20 CKT PANEL
MLO	Main Lugs		Main Breaker:	N/A
(amps)	ISOLATED Neutral NO Ground			(amps)

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
Empty			1	2			FED
Empty			3	4			
Empty			5	6			
	1	15	7	8	15	1	
TANDEM	1	20	9	10	15	1	
	1	20	11	12	20		
	1	20	13	14		2	
TANDEM	1	20	15	16	20	1	TANDEM
	1	20	17	18	20	1	TANDEM
Empty			19	20			Empty
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/ 1/0 THW 4 CONDUCTOR NO GROUND

ELECTRIC PANEL SCHEDULE

Panel: P3G		Normal:		Fed From:	LDP3A-BRKR 5
		Emergency:			

GE	Mfg:	Phase: 3		Mounting:	SURFACE
120/208	Voltage:			Circuits:	42 CKT PANEL
THLO	Main Lugs			Main Breaker:	N/A
200 (amps)	ISOLATED NEUTRAL & GROUNDS (amps)				

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	2		1	2	20	1	
		30	3	4	20	1	
	2		5	6	20		
		20	7	8		2	
	1	20	9	10	20	1	
			11	12			
			13	14			
			15	16			
			17	18			
			19	20			
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/ 3/0 THHN W/ #6 GROUND

ELECTRIC PANEL SCHEDULE

Panel: P1		Normal:		
		Emergency:	Fed From:	P2 - CKT 3

CUTLER-HAMMER	Mfg:	Phase: 3	Mounting:	SURFACE
120/208	Voltage:		Circuits:	30 CKT PANEL
MLO	Main Lugs		Main Breaker:	N/A
100	(amps)	Isolated Neutral & Ground	(amps)	

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	2		1	2	20	1	
		15	3	4	20	1	
	1	20	5	6	20	1	
	1	20	7	8	20	1	
	1	20	9	10	20	1	
	1	20	11	12	20	1	
	1	20	13	14	20	1	
	1	20	15	16	20	1	
	1	20	17	18	20	1	
	1	20	19	20	20	1	
	1	20	21	22	20	1	
	1	20	23	24	20	1	
	3		25	26	20	1	
			27	28	20	1	
		40	29	30	20	1	
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/ #2 AWG W/ #6 GROUND 4 CONDUCTOR W/GROUND

ELECTRIC PANEL SCHEDULE

			Normal:		
Panel: [redacted] P2H			Emergency:	Fed From:	

BRYANT	Mfg:			Mounting:	SURFACE
120/208	Voltage:	Phase: 3		Circuits:	20 CKT PANEL
N/A	Main Lugs			Main Breaker:	N/A
	(amps)	ISOLATED NEUTRAL NO GROUND			(amps)

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
Empty			1	2			
Empty			3	4			(FED)
Empty			5	6			
Tandem 15/20	1	15/20	7	8	15	1	
Tandem 15/20	1	15/20	9	10	15	1	
Tandem 15/20	1	15/20	11	12	15	1	
Tandem	1	20	13	14	20	1	
Tandem	1	20	15	16	20	1	
Tandem	1	20	17	18	20	1	Tandem
Empty			19	20			Empty
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FEED W/ 1/0 THHN THEN 4 CONDUCTOR NO GROUNDS SPLICED IN PANEL TO FEED W/ #2 AL THHN

ELECTRIC PANEL SCHEDULE

Panel: SDX		Normal:		Fed From: SD 12 BRKR #8
		Emergency:		

TRUMBELL ELECT MFG Mfg:	Phase: 3	Mounting:	SURFACE
120/208 Voltage:		Circuits:	6 CKT PANEL
MLO Main Lugs		Main Breaker:	
70 (amps)	ISOLATED NEUTRAL NO GROUND		(amps)

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	3	15	1	2	15	3	
	3	15	3	4	15	3	
	3	15	5	6	15	3	
			7	8			
			9	10			
			11	12			
			13	14			
			15	16			
			17	18			
			19	20			
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/ #2 AWG CLOTH 4 CONDUCTOR NO GROUND

ELECTRIC PANEL SCHEDULE

		Normal:			
Panel: P1,H		Emergency:	Fed From:	LDP-3 CKT 1,3,5	

WESTINGHOUSE	Mfg:	Phase: 3	Mounting:	SURFACE	
120/208	Voltage:		Circuits:	32 CKT PANEL	
N/A	Main Lugs		Main Breaker:	CKT 1,3,5	
(amps) 100 RATED		NEUTRAL NO GROUND (amps)		100	

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
FEED			1	2	80		
			3	4			
			5	6		3	
EMPTY			7	8	15		
			9	10			
			11	12		3	
			13	14	15	1	
			15	16			EMPTY
			17	18			
			19	20			
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
EMPTY			31	32			EMPTY
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED FROM BELOW W/ #2 THHN 4/ CONDUCTOR

ELECTRIC PANEL SCHEDULE

Panel: SD-12-SP		Normal:	
		Emergency:	Fed From: SD-12

BRYANT	Mfg:	Phase: 3	Mounting:	SURFACE
120/208	Voltage:		Circuits:	24 CKT PANEL
N/A	Main Lugs		Main Breaker:	CKT 2,4,6
(amps)	ISOLATED NEUTRAL NO GROUND		(amps)	

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
Empty			1	2			FEED
Empty			3	4			
Empty			5	6			
	1	20	7	8	20	1	
	2		9	10	20	1	
		30	11	12	20	1	
	1	20	13	14	20	1	
	1	20	15	16	30		
	1	15	17	18		2	
	2		19	20	20	1	
		30	21	22	30		
	1	20	23	24		2	
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/ #3 AWG THHN 2/ CONDUCTOR NO GROUND ISOLATED NEUTRAL

ELECTRIC PANEL SCHEDULE

Panel: SDL2-A	Normal:		
	Emergency:	Fed From:	LDP3 CKTS 13, 15, 17

BRYANT	Mfg:		Mounting:	SURFACE
120/208	Voltage:	Phase: 3	Circuits:	24 CKT PANEL
N/A	Main Lugs		Main Breaker:	CKT 19, 21, 23
	(amps) ISOLATED NEUTRAL NO GROUND		(amps)	

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
TANDEM	1	20	1	2	20	1	TANDEM
	1	15	3	4	15	1	
	1	15	5	6	15	1	
	1	20	7	8	15	1	
	1	20	9	10	20	1	
	2		11	12	20	1	
		40	13	14	20		
	1	15	15	16		2	
	1	20	17	18	20	1	
FEED			19	20			EMPTY
			21	22			EMPTY
			23	24			EMPTY
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/ #1 AWG 4 CONDUCTOR THWN ISOLATED NEUTRAL NO GROUND

ELECTRIC PANEL SCHEDULE

		Normal:		
Panel: 3D-12		Emergency:	Fed From:	LDP3-A Brkr #7

Trumbell Electric	Mfg:	Phase: 3	Mounting:	SURFACE
120/208	Voltage:		Circuits:	14 CKTS
MLO	Main Lugs		Main Breaker:	N/A
400 (amps)	Isolated Neutral		(amps)	

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	3	35	1	2	50	3	
	3	200	3	4	50	3	
	3	50	5	6	50	3	
	3	70	7	8	70	3	
	3	70	9	10	70	3	
	3	100	11	12	50	3	
	3	150	13	14	125	3	
			15	16			
			17	18			
			19	20			
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/4 500 MCM XHHW-2 W/#6 BARE COPPER GROUND

ELECTRIC PANEL SCHEDULE

Panel: P1K		Normal:		Fed From:	
		Emergency:			

SQUARE D	Mfg:		Mounting:	RECESSED
120/208	Voltage:	Phase: 2	Circuits:	6 CKTS
MLO	Main Lugs	BUS FUSE	Main Breaker:	N/A
(amps)		PANEL	(amps)	

ISOLATED NEUTRAL / NO GROUND

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	1	15	1	2	15	1	
	1	20	3	4	15	1	
	1	15	5	6	20	1	
			7	8			
			9	10			
			11	12			
			13	14			
			15	16			
			17	18			
			19	20			
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

ELECTRIC PANEL SCHEDULE

		Normal:		
Panel: P1N		Emergency:	Fed From:	SD B BKR

ARRAY	Mfg: JUMPER FROM B TO C PHASE		Mounting:	SURFACE
120/208	Voltage:	Phase: 2	Circuits:	12 CKT PANEL
MLO	Main Lugs		Main Breaker:	N/A
(amps)	ISOLATED NEUTRAL & NO GROUND		(amps)	

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	1	20	1	2	20	1	
	1	20	3	4	20	1	
	1	20	5	6	20	1	
Empty			7	8			Empty
Empty			9	10			Empty
Empty			11	12			Empty
			13	14			
			15	16			
			17	18			
			19	20			
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/ 3 CONDUCTORS & NO GROUND
#8 THHN

ELECTRIC PANEL SCHEDULE

Panel: PBL		Normal:	Fed From: PANEL 3A CKT 13
		Emergency:	

GE	Mfg:			Mounting:	SURFACE
120/208	Voltage:		Phase: 2	Circuits:	8 CKT PANEL
MLO	Main Lugs			Main Breaker:	N/A
60	(amps)	ISOLATED NEUTRAL & GROUND			(amps)

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	1	20	1	2	50		
	1	20	3	4		2	
	1	20	5	6	15		
	1	20	7	8		2	
			9	10			
			11	12			
			13	14			
			15	16			
			17	18			
			19	20			
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/ 4 #6 THHN

ELECTRIC PANEL SCHEDULE

		Normal:			
Panel: 13A		Emergency:	Fed From:	S/S 13 BKR #6	

	Mfg:		Mounting:	SURFACE	
120/208	Voltage:	Phase: 3	Circuits:	42 CKT PANEL	
	Main Lugs		Main Breaker:	N/A	
	(amps)	ISOLATED NEUTRAL W/ GROUND	(amps)		

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	2		1	2	20	1	
		60	3	4	15	1	
	1	20	5	6	20	1	
	2		7	8	20	1	TANDEM
		20	9	10	20	1	TANDEM
	1	20	11	12	20	1	
			13	14			
			15	16			
			17	18			
			19	20			
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/ 2/ CONDUCTOR #2 THHN (1)#6 NEUTRAL #2

ELECTRIC PANEL SCHEDULE

Panel: [redacted] P3H		Normal:		Fed From:	
		Emergency:			

BRYANT	Mfg:	Phase: 3	Mounting:	SURFACE
120/208	Voltage:		Circuits:	20 CKT PANEL
N/A	Main Lugs		Main Breaker:	CKTS 2,4,6
(amps)	ISOLATED Neutral NO GROUND		(amps)	

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
Empty			1	2			
Empty			3	4			Fed
Empty			5	6			
	1	15	7	8	15		
	1	15	9	10	15		
	1	15	11	12	20		
Tandem	1	20	13	14	20		
Tandem	1	20	15	16	20	1	Tandem
Tandem	1	20	17	18	20	1	Tandem
Empty			19	20			Empty
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

Fed w/ 1/0 THHN ~~[redacted]~~ NO Ground & Conductor

ELECTRIC PANEL SCHEDULE

Panel: P2N		Normal: / Emergency:	Fed From: SD-13 BKR #4

Bus/Duct	Mfg:	Phase: 3	Mounting:	RECESSED
120/208	Voltage:		Circuits:	42 CKT PANEL
N/A	Main Lugs (amps)	ISOLATED NEUTRAL NO GROUND	Main Breaker: (amps)	CKT 24

Function	Pole	Amps	Circuit No.		Amps	Pole	Function
Empty			1	2			
Empty			3	4			FEED
Empty			5	6			
	1	20	7	8	20	1	
	1	20	9	10	20	1	
	1	20	11	12	20	1	
	1	20	13	14	20	1	
	1	20	15	16	20	1	
	1	20	17	18	20	1	
	1	20	19	20	20	1	
	1	20	21	22	20	1	
	1	20	23	24	20	1	
	1	20	25	26	20	1	
	1	20	27	28	20	1	
	1	20	29	30	20	1	
	1	20	31	32	20	1	
	1	20	33	34	20	1	
	1	20	35	36	20	1	
	1	20	37	38	20	1	
	1	20	39	40	20	1	
Empty	1		41	42			Empty
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FEEDERS - LIVE
NOTED * ALL BREAKERS IN OFF POSITION

FED W/ 4 CONDUCTOR NO GROUND
3/0 AWG THHN

ELECTRIC PANEL SCHEDULE

		Normal:		
Panel: SD B		Emergency:	Fed From:	SD 12 BKR #8

TRUMBELL	Mfg:	Phase: 3	Mounting:	SURFACE	
120/208	Voltage:		Circuits:	8 CKT PANEL	
MLO	Main Lugs		Main Breaker:	N/A	
	(amps)	ISOLATED Neutral NO Ground		(amps)	

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	3		1	2	3		
			3	4			
		20	5	6		50	
	3		7	8	3		
			9	10			
		50	11	12		20	
	3		13	14	3		
			15	16			
		20	17	18		35	
			19	20			
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

ELECTRIC PANEL SCHEDULE

Panel: [redacted] P1M	Normal:	
	Emergency:	Fed From:

Mfg: BRY/ANT	Phase: 3	Mounting: SURFACE
Voltage: 120/208		Circuits: 20 CKT PANEL
Main Lugs: N/A		Main Breaker: CKT 3 2,4,6
(amps)	ISOLATED NEUTRAL NO GROUND	(amps)

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
Emph/			1	2			
Emph/			3	4			FEED
Emph/			5	6			
	1	15	7	8	15	1	
	1	15	9	10	15	1	
	1	15	11	12	15	1	
Tanbark	1	15	13	14	20	1	Tanbark
Tanbark	1	20	15	16	20	1	Tanbark
	1	20	17	18	20	1	
Emph/			19	20			Emph/
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/ 1/0 THHN 4 CONDUCTOR NO GROUND SPLICED IN PANEL TO FEED W/ #2 AWG THHN

ELECTRIC PANEL SCHEDULE

Panel: P3E		Normal:		Fed From:	3S-11 BRKR 15
		Emergency:			

CUTLER HAMMER	Mfg:	Phase: 3		Mounting:	SURFACE
120/208	Voltage:			Circuits:	30 CKT PANEL
TYLO	Main Lugs			Main Breaker:	N/A
100	(amps)	ISOLATED NEUTRAL & GROUNDS	(amps)		

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	1	20	1	2	20	1	
	1	20	3	4	20	1	
	1	20	5	6	20	1	
	1	20	7	8	20	1	
	1	20	9	10	20	1	
	1	20	11	12	20	1	
	1	20	13	14	20	1	
	1	20	15	16	20	1	
	1	20	17	18	20	1	
	1	20	19	20	20	1	
	1	20	21	22	20		
	1	20	23	24		2	
	2		25	26	20	1	
		20	27	28	20	1	
	1	15	29	30	20	1	
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED FROM BELOW W/ 3/0 XHHW SPLICED IN PANEL TO 2#6 THHN TO M

ELECTRIC PANEL SCHEDULE

Panel: P2E		Normal: / Emergency:	Fed From: SPH BREAKER

Mfg: BRYANT	Phase: 3	Mounting: SURFACE
Voltage: 120/208		Circuits: 20 CKT PANEL
Main Lugs N/A (amps)		Main Breaker: CKTS 2,4,6-1,3,5 (amps)

ISOLATED NEUTRAL & NO GROUND

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
			1	2			
FEED			3	4			FEED
			5	6			
TANDEM	20	1	7	8	20	1	TANDEM
TANDEM	20	1	9	10	20	1	TANDEM
TANDEM	20	1	11	12	20	1	
TANDEM	20	1	13	14	20	1	TANDEM
TANDEM	15	1	15	16	15	1	TANDEM
TANDEM	15	1	17	18	15	1	TANDEM
EMPTY			19	20			EMPTY
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED W/ 3/0 THWN SPLICED IN PANEL TO 2/0 THWN

ELECTRIC PANEL SCHEDULE

		Normal:			
Panel: PIT		Emergency:		Fed From:	SD11 BREAKER 15

BRYANT	Mfg:			Mounting:	SURFACE
120/208	Voltage:	Phase: 3		Circuits:	20 CKT PANEL
N/A	Main Lugs	NEUTRAL		Main Breaker:	CKT 4, 6, 8
	(amps)	ISOLATED ~~GROUND~~		NO GROUND (amps)	60 AMP

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
Empty			1	2			Empty
Empty			3	4			
Empty			5	6	60	3	MAIN
Empty	~~1~~	~~35~~	7	8			
	1	20	9	10	20	1	
	1	20	11	12	20	1	
Empty			13	14	20	1	
Empty			15	16	20	1	
Empty			17	18	20	1	
Empty			19	20			Empty
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

FED WITH 3/0 - NO GROUND

NEXT TO D202C **ELECTRIC PANEL SCHEDULE**

Panel: P2PC		Normal:		Fed From:	
		Emergency:			

BRYANT	Mfg:	Phase:	Mounting:	RECESSED
120/208	Voltage:		Circuits:	~~42~~ 32
MLO	Main Lugs		Main Breaker:	NONE 250 AL
(amps)			(amps)	

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
			1	2			FEED 250 MCM AL
			3	4			
			5	6			
	3P		7	8	20	1	
		~~15~~	9	10	~~20~~	~~1~~	
			11	12	20	1	
TANDEM	~~2~~ 1	~~40~~ 20	13	14	20		
			15	16	20		
	~~2~~ 1	~~20~~	17	18	20		
		20	19	20	20		
TANDEM		~~20~~ 20	21	22	20		
		20	23	24	20		
		20	25	26	20		
		20	27	28	20		
		20	29	30	~~20~~ 20	1	TANDEM
BLANK			31	32	BLANK		
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

ELECTRIC PANEL SCHEDULE

	Normal:		BREAKER 5
Panel: PBI RM A76C	Emergency:	Fed From: SD II - ~~CKT 5~~ CKT 13, ~~15~~, 17	

Mfg:			Mounting:	SURFACE
120/208 Voltage:	Phase:		Circuits:	16
MLO Main Lugs	2 Pole		Main Breaker:	—
(amps)			(amps)	

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
Feeds			1	2			NOT USED
			3	4			
		15	5	6	15		GFCI
		15	7	8	15		GFCI
GFCI		15	9	10	15		GFCI
	2	~~20~~	11	12	15		FIRE ALARM
			13	14	~~15~~	T	
		20	15	16	20		
			17	18			
			19	20			
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

ELECTRIC PANEL SCHEDULE

	Normal:	LPD-2 200A	
Panel: SD N	Emergency:	Fed From:	

Mfg:	Phase:	Mounting:	
Voltage:		Circuits:	
Main Lugs		Main Breaker:	
(amps)		(amps)	

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
			1	2	20		NOT USED THHN
Blank			3	4			
			5	6			
			7	8		35	THHN #8
	3	35	9	10			
#2 USED —			11	12			
NOT USED		90	13	14			
#2 THHN USED —			15	16		200	THHN
			17	18			
			19	20			
Cloth		35	21	22		50	
			23	24			
NOT USED			25	26			
		70	27	28		70	UNUSED
			29	30			
			31	32			
		70	33	34		70	Cloth
			35	36			
			37	38			Cloth
THHN #0		100	39	40		100	
			41	42			
			43	44			THHN #4
THHN			45	46		50	
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	52			
			63	64			

ELECTRIC PANEL SCHEDULE

		Normal:	
Panel: P1F		Emergency:	Fed From:

BRYANT	Mfg:		Mounting:	SURFACE
120-208	Voltage:	Phase: 3	Circuits:	20
TMLO	Main Lugs		Main Breaker:	— N/A
(amps)			(amps)	

Function	Pole	Amps	Circuit No.		Amp	Pole	Function
Empty			1	2			Empty
Empty			3	4			
Empty			5	6			FEED 4,6,8
Empty			7	8			
TANDUM	1	20	9	10	20	1	TANDUM
	1	20	11	12	20	1	TANDUM
TANDUM	1	20	13	14	20	1	TANDUM
TANDUM	1	20	15	16	20	1	TANDUM
TANDUM	1	20	17	18	20	1	
TANDUM	1	20	19	20	20	1	
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
Isolated Neutral			61	62		No	Ground
			63	64			

FED from below the panel through floor 1 1/2 Conduit
Cloth #2's butt spliced to #2 THW in Trough below panel

ELECTRIC PANEL SCHEDULE

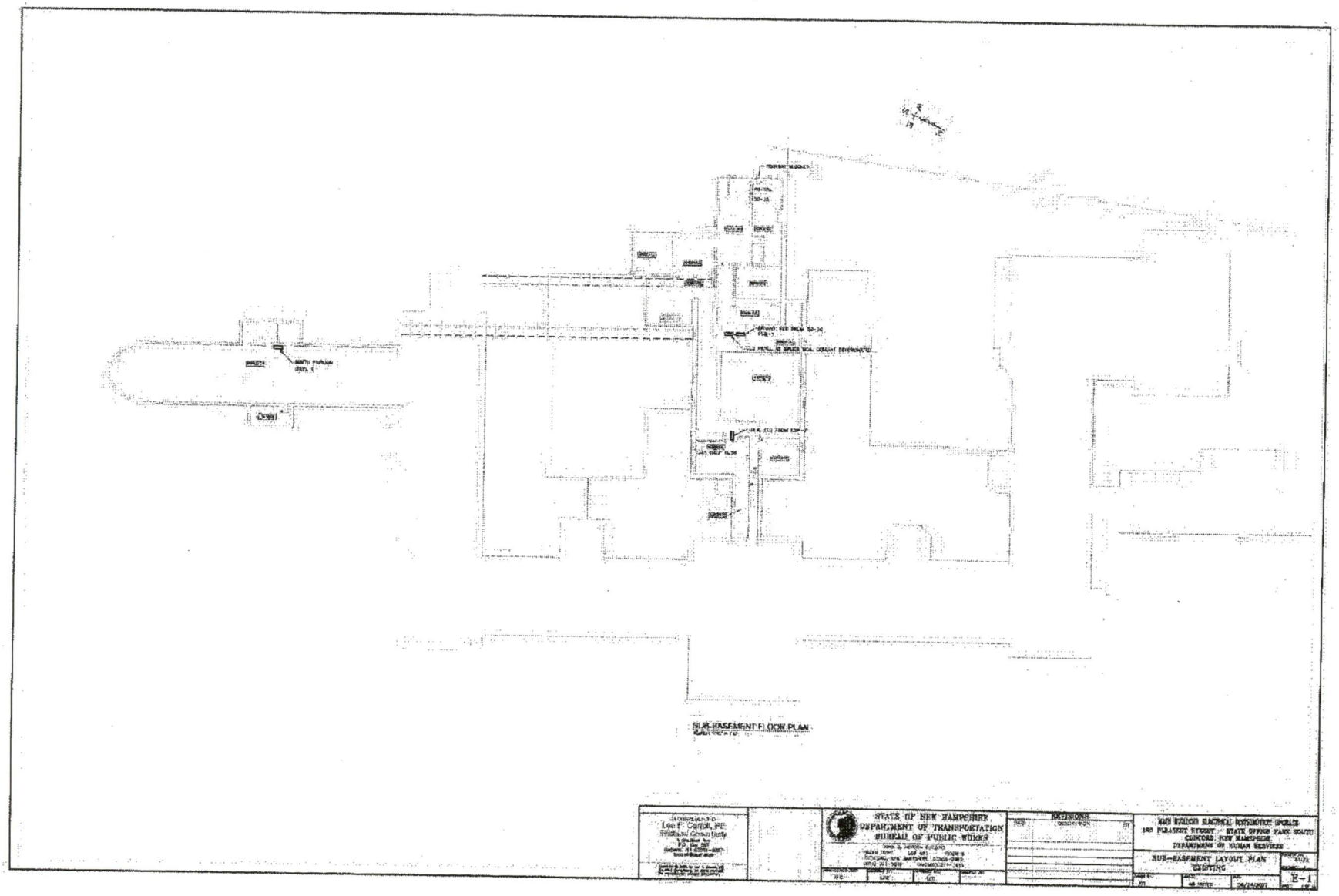
	Normal:		
Panel: P1G	Emergency:	Fed From:	

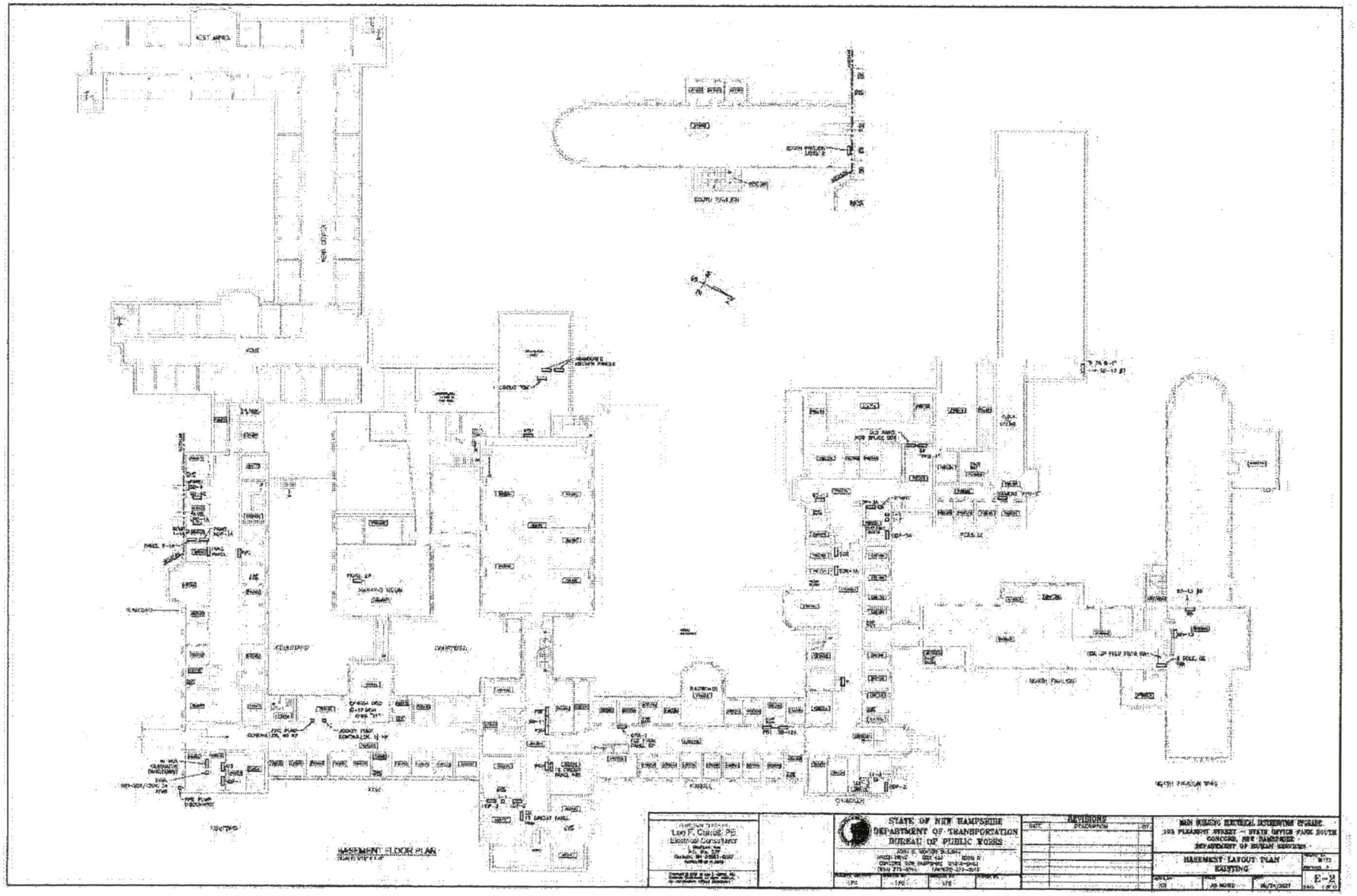
CUTLER HAMMER Mfg:	Phase: 3	Mounting:	SURFACE
120 - 208 Voltage:		Circuits:	30
MLO Main Lugs		Main Breaker:	— NA
100 AMP (amps)		(amps)	

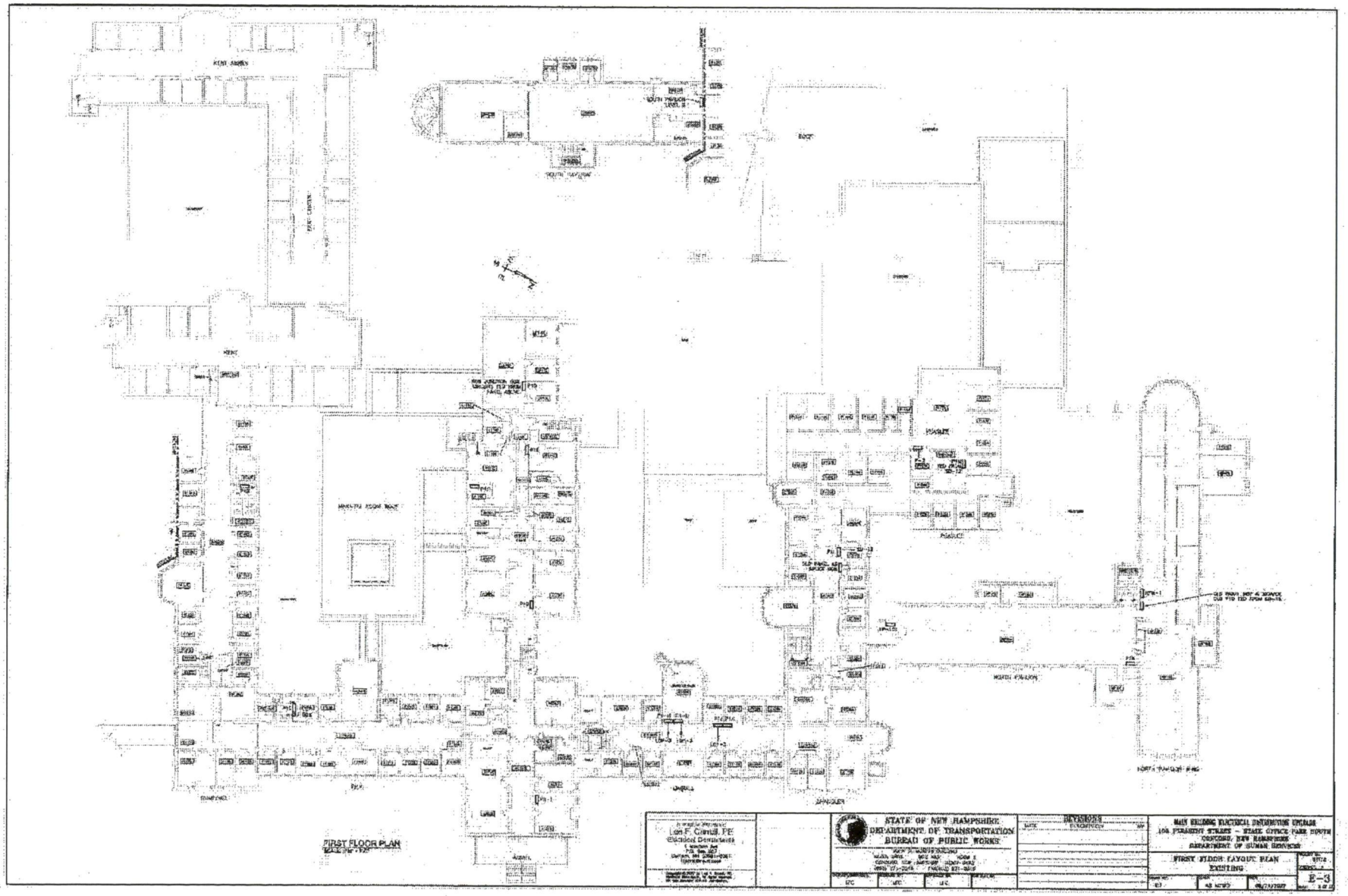
Function	Pole	Amps	Circuit No.		Amp	Pole	Function
	1	15	1	2	15	1	
	1	15	3	4	15	1	
	1	15	5	6	15	1	
	1	15	7	8	15	1	
	1	15	9	10	15	1	
	1	15	11	12	20	1	
	1	15	13	14	20	1	
	1	20	15	16	20	1	
	1	15	17	18	20		
	1	20	19	20		2	
	1	20	21	22	BLANK		
	1	20	23	24	20	1	
	1	20	25	26	20	1	
	2		27	28	20	1	
		30	29	30	20	1	
			31	32			
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	4			
			55	56			
			57	58			
			59	60			
			61	62			
			63	64			

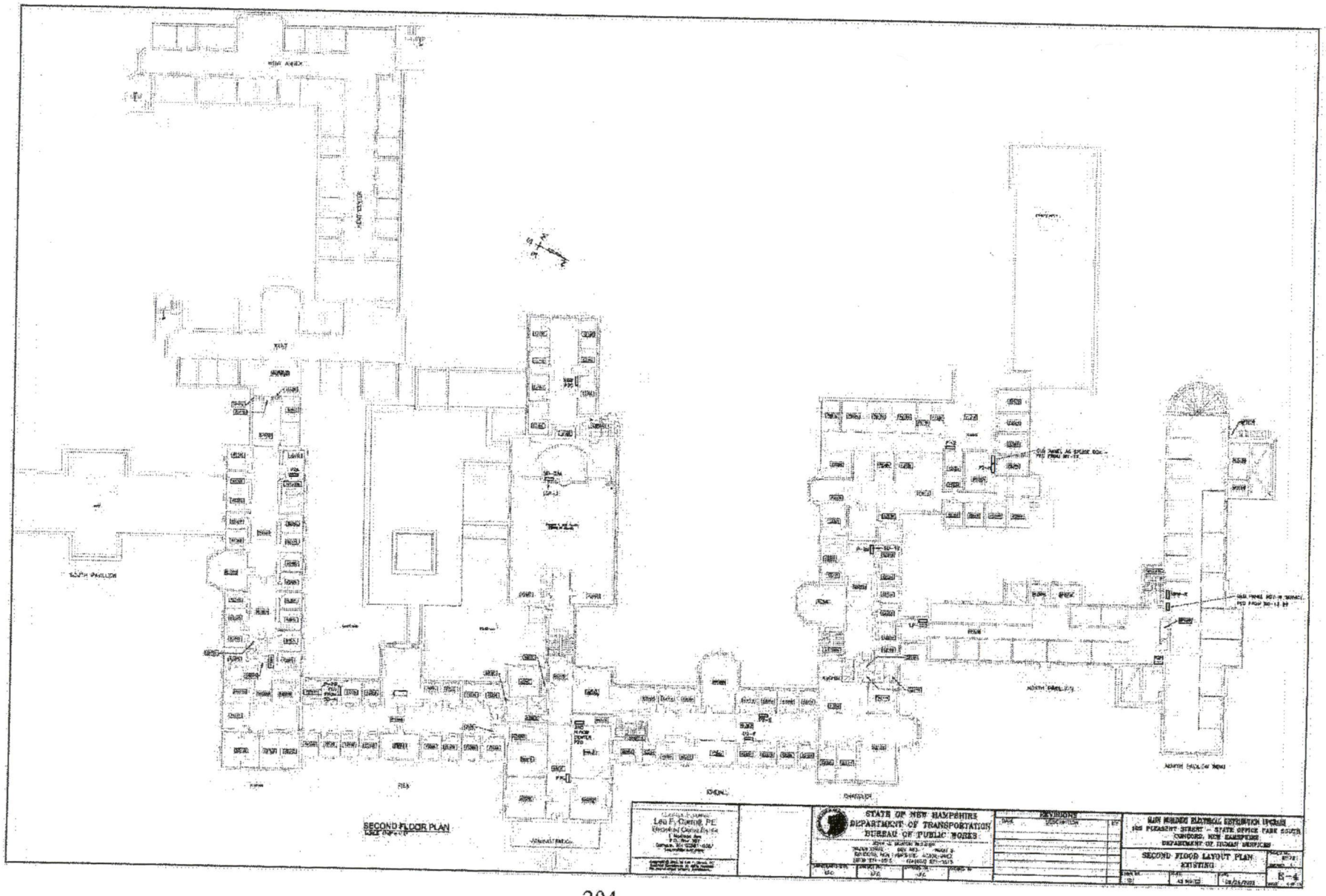
FED FROM BELOW PANEL THROUGH FLOOR #2AWG THHN ISOLATED NEUTRAL & GROUND 4 CONDUCTOR W/ #8 GRND 1 1/2" E

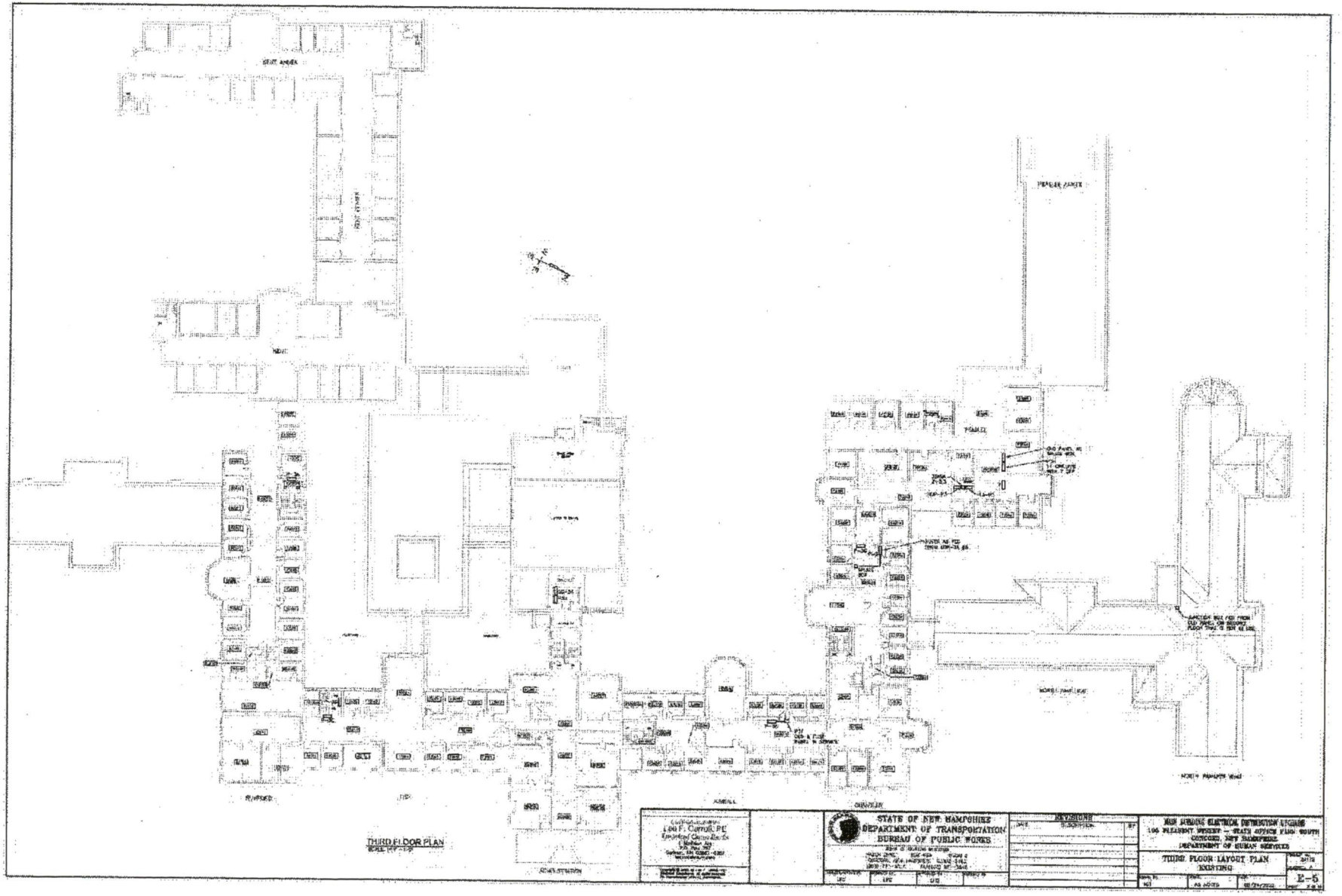
Appendix “E"

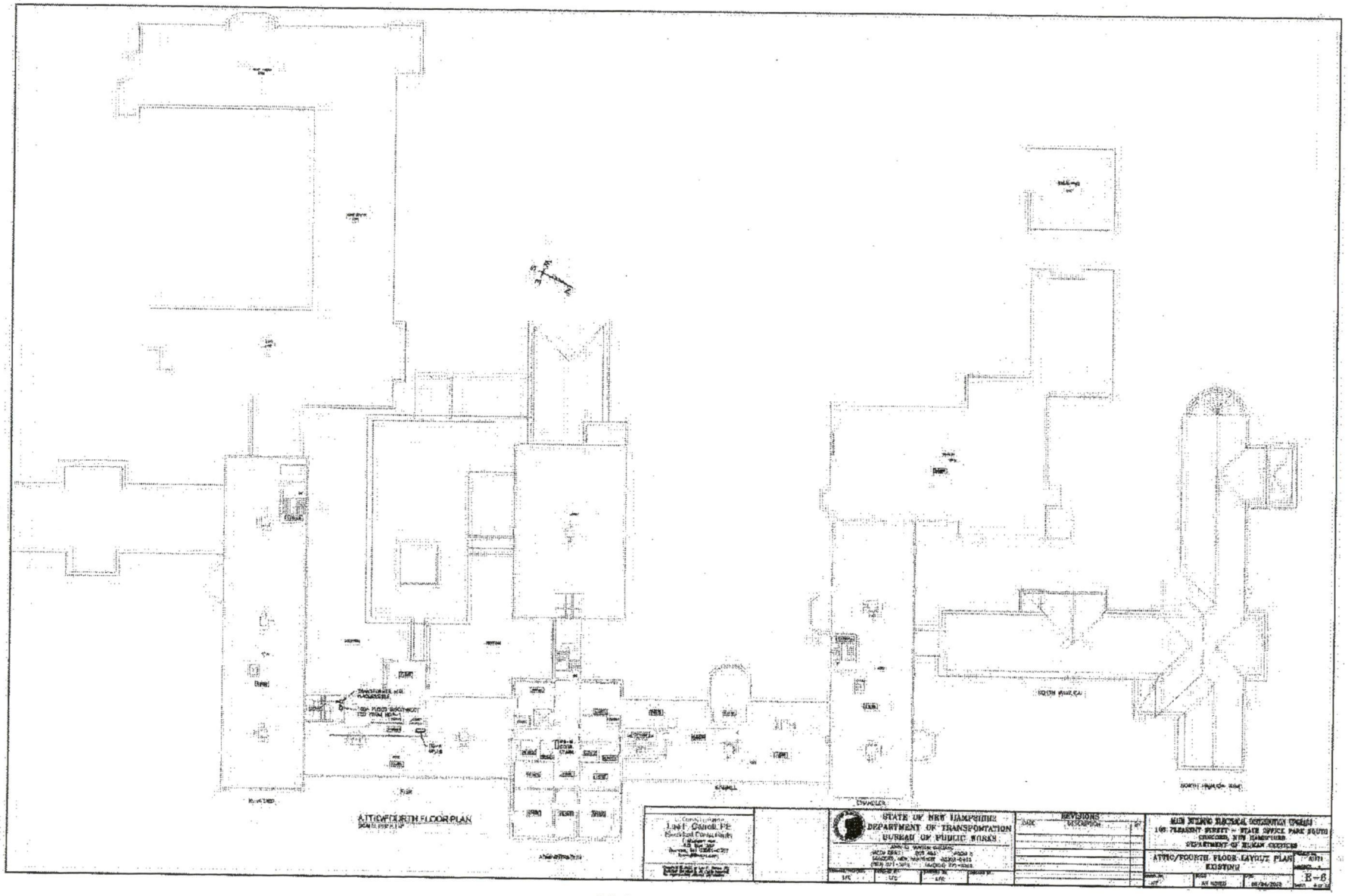

SUB-BASEMENT FLOOR PLAN
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PUBLIC WORKS
SUB-BASEMENT LAYOUT PLAN
DRAWING
E-1

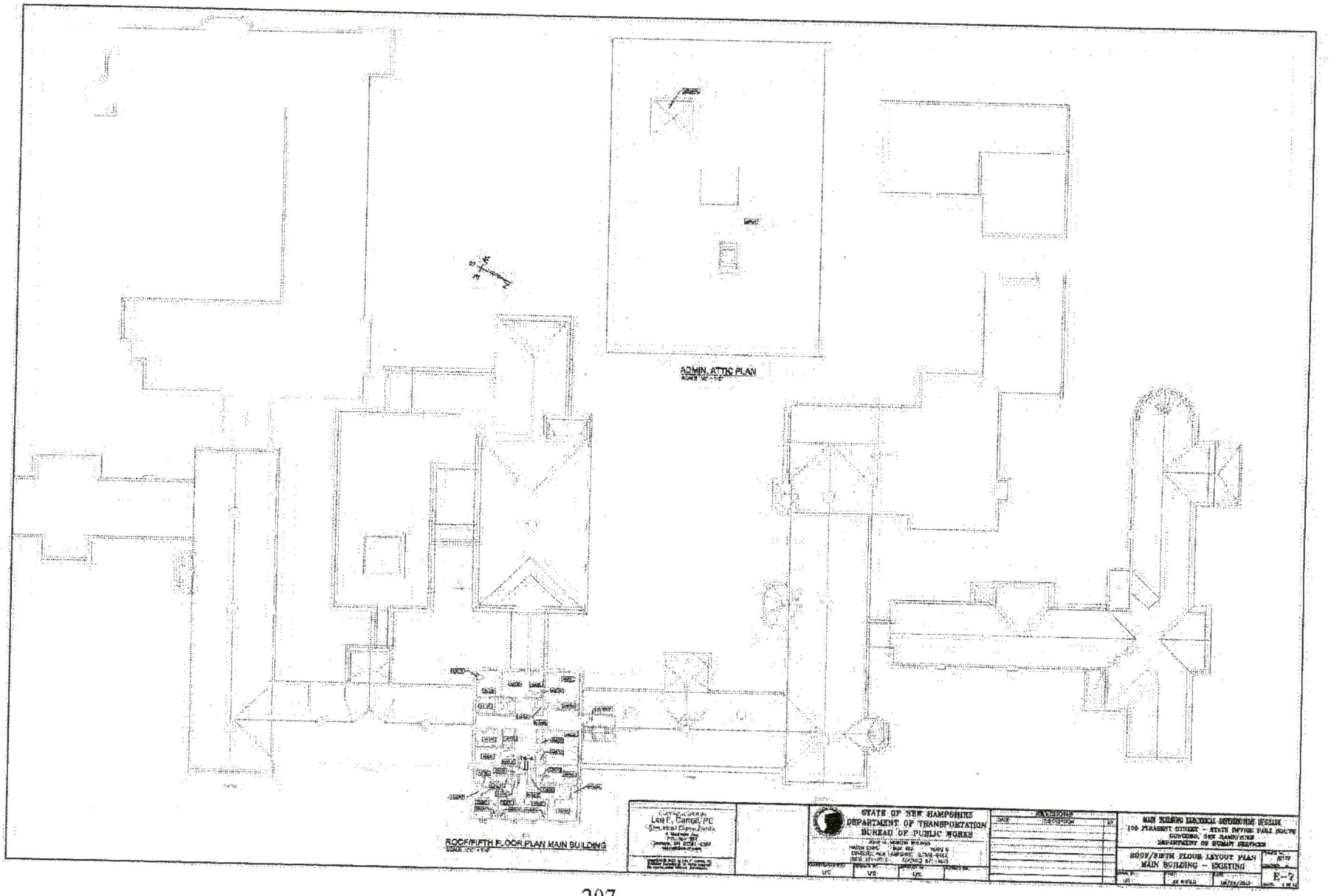

BASEMENT FLOOR PLAN
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PUBLIC WORKS
REVISIONS
MAIN BUILDING ELECTRICAL DISTRIBUTION UPGRADE
BASEMENT - LAYOUT PLAN
EXISTING
E-12

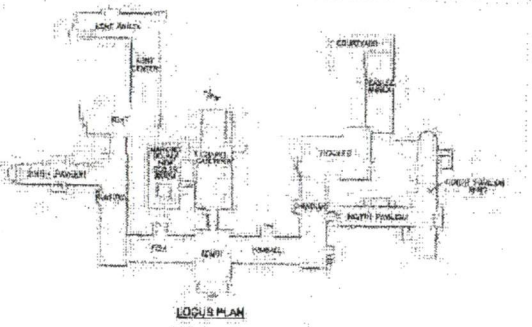

FIRST FLOOR PLAN
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PUBLIC WORKS
FIRST FLOOR LAYOUT PLAN
EXISTING
E-3

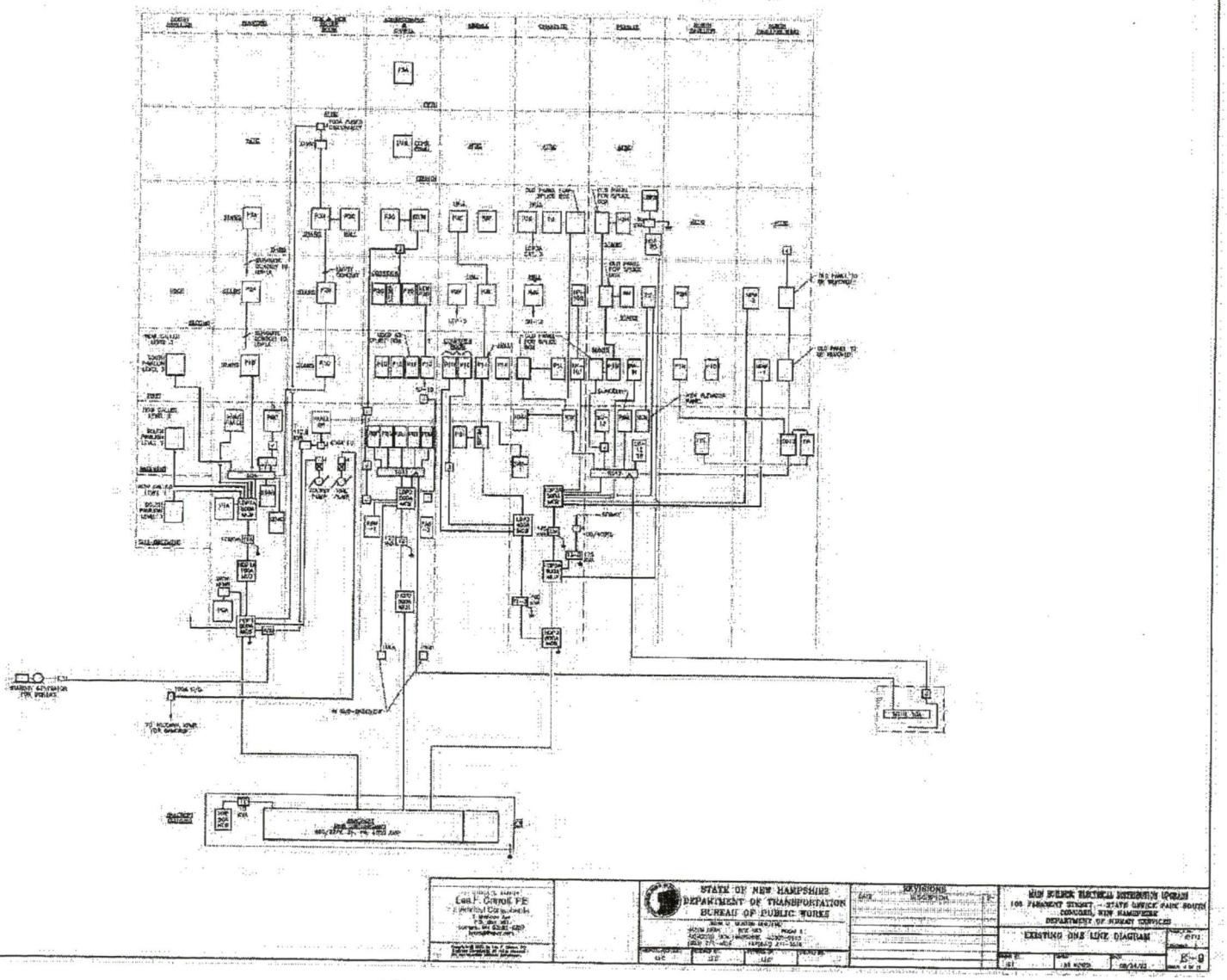

SECOND FLOOR PLAN
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PUBLIC WORKS
REVISIONS
SECOND FLOOR LAYOUT PLAN
EXISTING
E-4

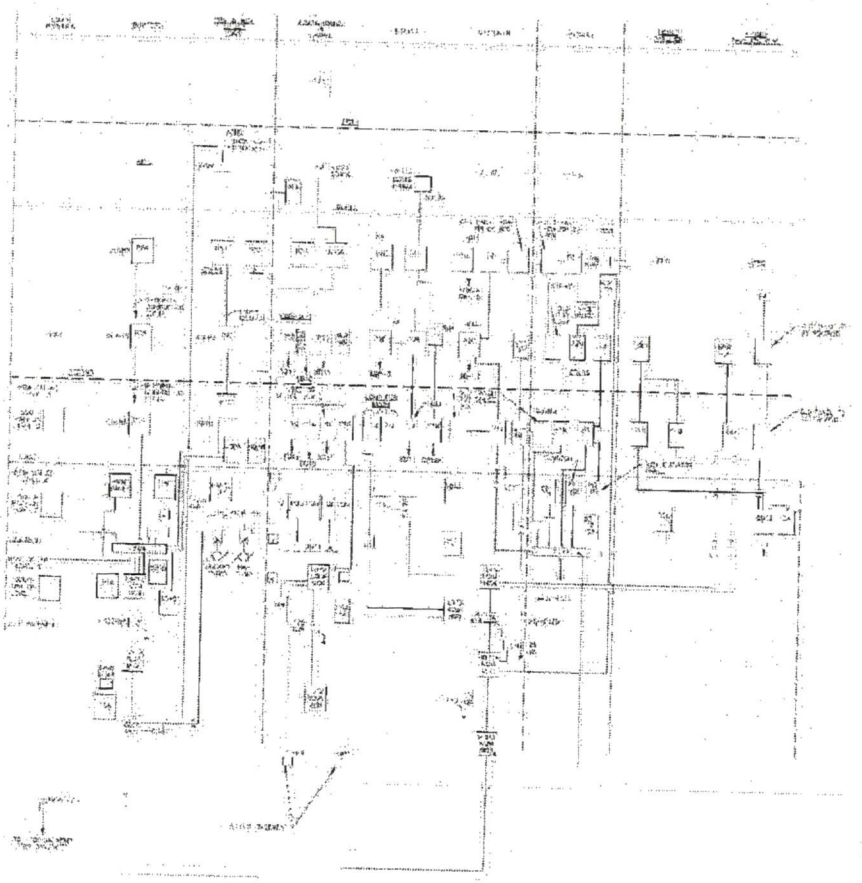

THIRD FLOOR PLAN
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PUBLIC WORKS
REVISIONS
THIRD FLOOR LAYOUT PLAN
EXISTING
E-5


ATTIC/FOURTH FLOOR PLAN
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PUBLIC WORKS
REVISIONS
ATTIC/FOURTH FLOOR LAYOUT PLAN
EXISTING
E-6


ADMIN. ATTIC PLAN
ROOF/FIFTH FLOOR PLAN MAIN BUILDING
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PUBLIC WORKS
MAIN BUILDING ELECTRICAL DISTRIBUTION UPGRADE
ROOF/FIFTH FLOOR LAYOUT PLAN
MAIN BUILDING - EXISTING
E-7


LOCUS PLAN


STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PUBLIC WORKS
REVISIONS
EXISTING ONE LINE DIAGRAM
E-9



Leo F. Carroll, PE
Electrical Consultants

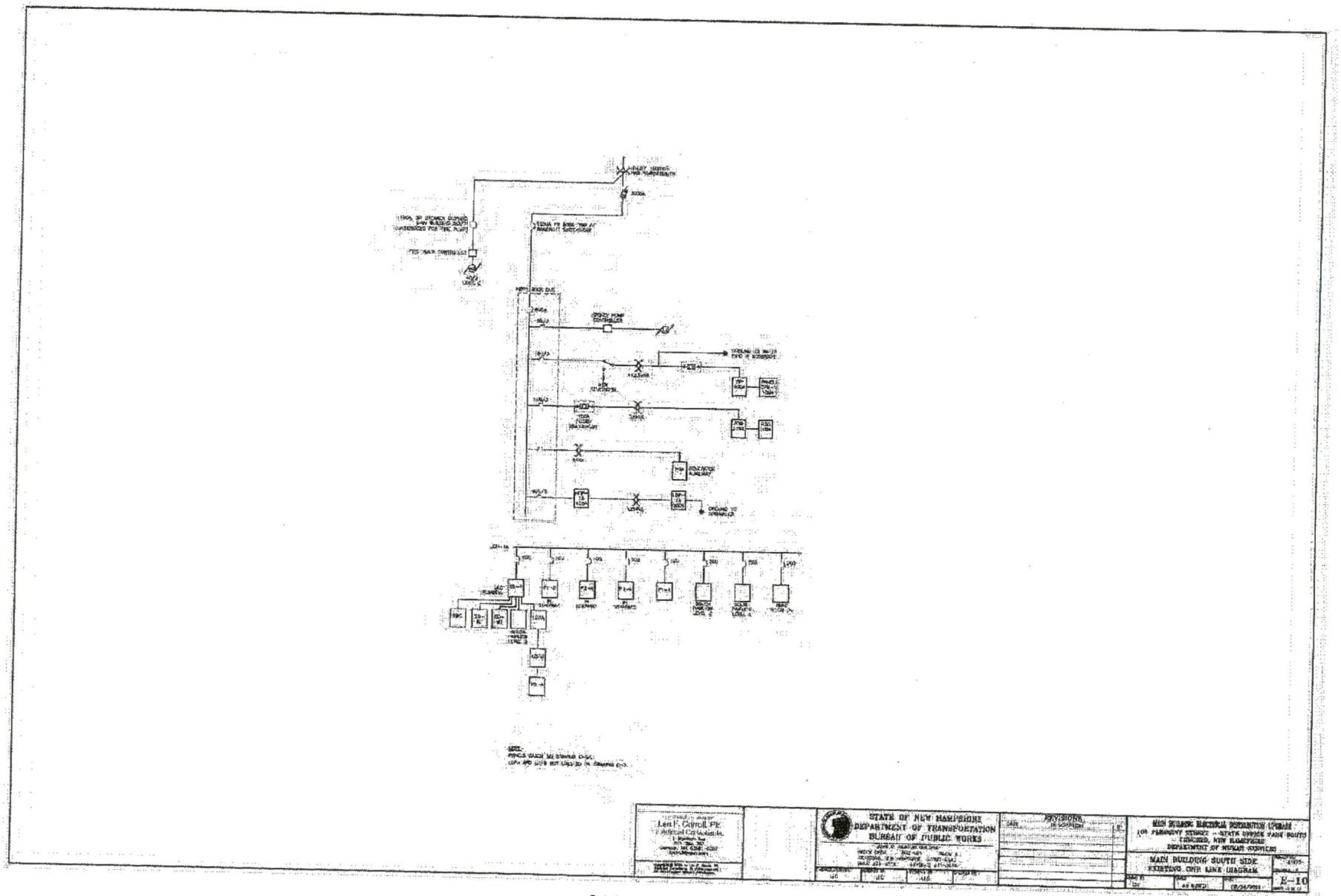
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PUBLIC WORKS

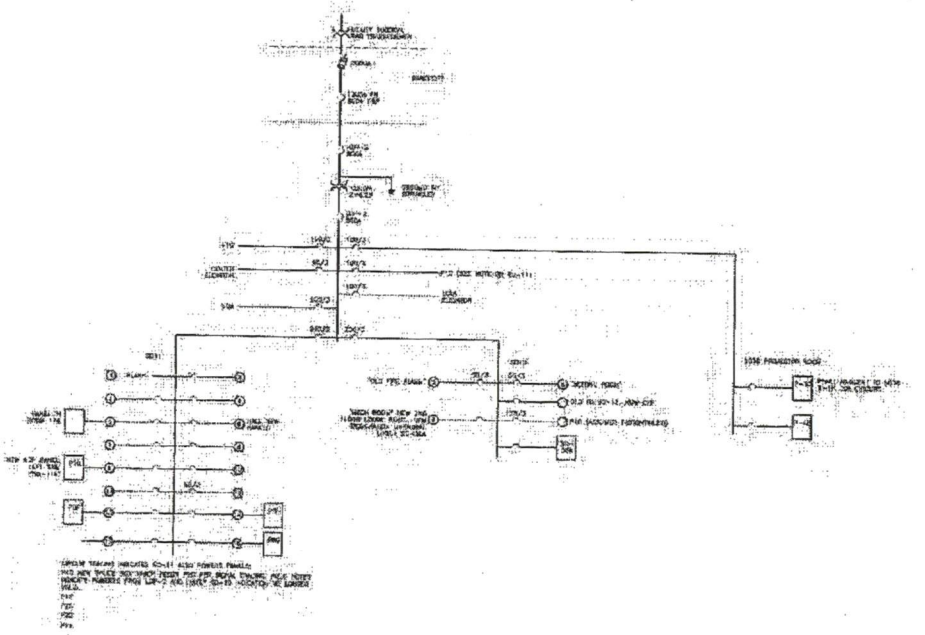
REVISIONS

NEW BUILDING ELECTRICAL DISTRIBUTION SYSTEM
CONCORD, NEW HAMPSHIRE
DEPARTMENT OF HUMAN SERVICES

EXISTING ONE LINE DIAGRAM
BASED ON CIRCUIT TRACING

E-5A

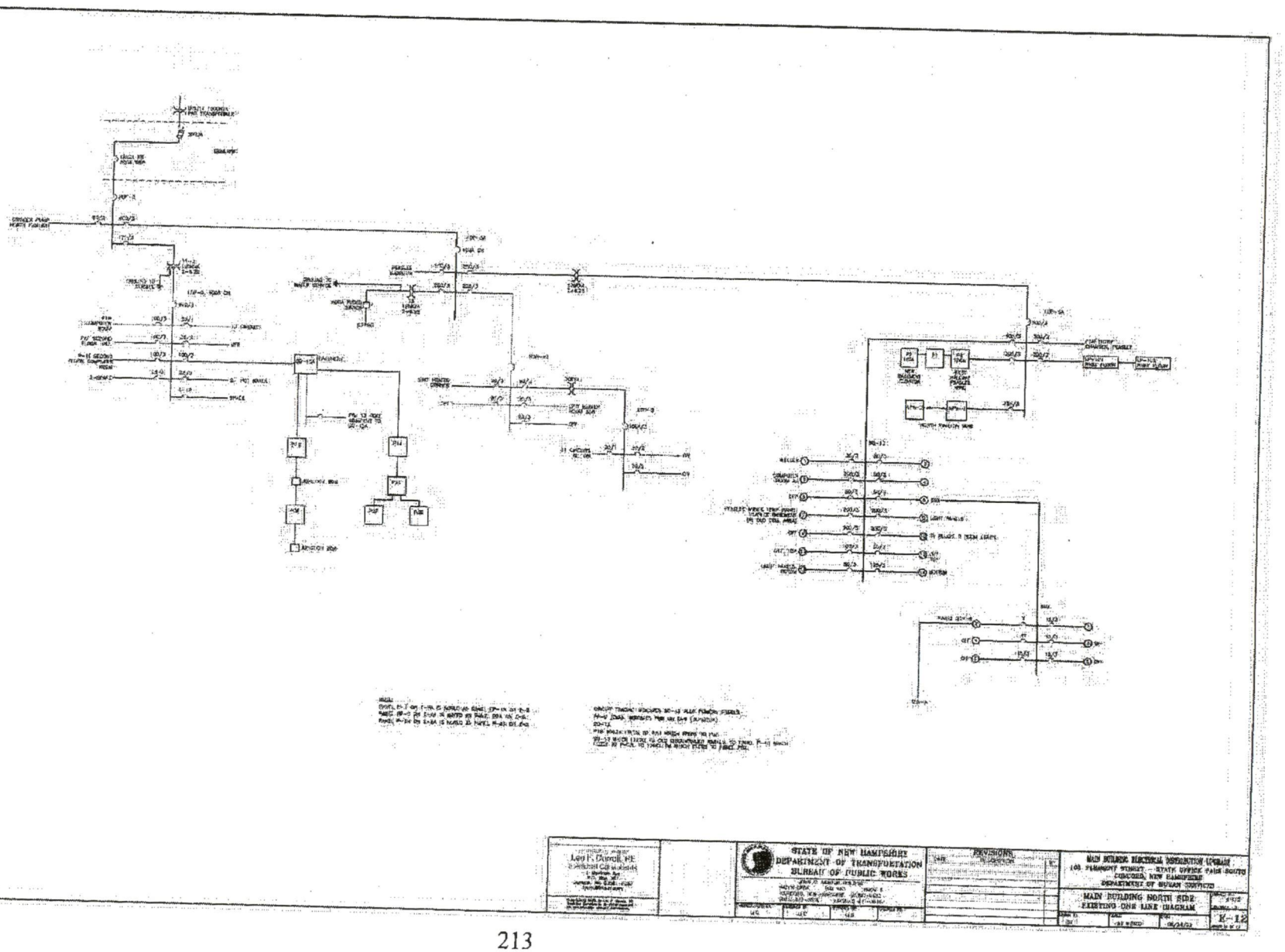

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PUBLIC WORKS
REVISIONS
MAIN BUILDING SOUTH SIDE
EXISTING ONE LINE DIAGRAM
E-10



STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PUBLIC WORKS

MAIN BUILDING ELECTRICAL DISTRIBUTION UPGRADE
MAIN BUILDING CENTER
EXISTING ONE LINE DIAGRAM

E-11


STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PUBLIC WORKS
MAIN BUILDING ELECTRICAL DISTRIBUTION UPGRADE
MAIN BUILDING NORTH SIDE
EXISTING ONE LINE DIAGRAM
K-12

Appendix “F"

Panelboard and switchboard information Noted by Report Writer During Site Review Meetings:

The following notes field information documented by the report writer during various initial site reviews prior to circuit tracing by Richardson Engineering.

North Buildings:
HDP-1, Cutler Hammer, 800 A Main Breaker, 480/277 V, 3 phase, 4 wire.

HDP-1A, Cutler Hammer, 400 A Main Lug Only, Type PRL, 1 - 200 A breaker feed to transformer T1A.

LDP-1A, Cutler Hammer, 600 A bus with 500 A main breaker, 4-200 A< 3 pole and 4- 100 A, 3p feeder breakers

BP, Eaton, 400 A bus with 300 A main breaker, 42 pole with 1-100 A, 3 P feeder to panel CPR-1

CPR-1, Square D, NQ430LIC with 60 A main breaker, 30 pole. 17 - 1 pole spaces, 2-20A, 3 pole, 1-20 A, 2 pole, 1 -20 A, 1 pole feeder breakers.

P3B Cutler Hammer 225 A, 42 Pole, 1 - 100A, 3 pole for feeder to P2B. 11 -1 pole spaces.

P3C General Electric (older style) 100 A, MLO, 10 -1 pole mini twin, 2 - 1 pole full size, space 3 pole

P1C Cutler Hammer, 42 pole, 100 A, 38 - 1 pole, 2 - 2 pole 100 A.

P2B Cutler Hammer, 30 pole, 100 A full

SD-4B 200 A breaker - old - not in use

SD-4C Make/Model. 2 - 20 A, 1 pole

SD-4 Trumbull, 1 -150 A, 3 pole (South Pavilion Level 3. 1 - 125 A, 5 - 50 A, 1 -35 A, 1 - 25 A (all 3 pole.

South Pavilion, Level 3 Eaton, 200 A, 42 pole, 2016 date on NP, no spares or spaces (full)

South Pavilion Level 2 Cutler Hammer, 225 A, MLO, 42 pole, no spares or spaces (full)

South Pavilion Level 1 Cutler Hammer, 225 A, MLO, 42 pole, no spare or spaces (full)

P1B Cutler Hammer, 100 A, 30 poles, 1 - pole space open

P2A Cutler Hammer, 100 A, 42 pole, 7 - 1pole open spaces

P3A Cutler Hammer, 100 A, 30 pole, no spares or spaces (full)

P1A Cutler Hammer, 100 A, MLO, 18 pole, 3 - 1 pole open spaces

HVAC Room Eaton, 25 A, MLO, 42 pole, no spares or spaces (full)

SD-11A General Electric, 42 pole

SD-11B, Square D load center, 20 pole\
SD-11C Bryany, 26 pole panel

SD-11 Trumbull

HDP-2 Cutler Hammer, 800 A MCB

LDP-2 Cutler Hammer, 500 A MCB,

Lula General Electric, 18 pole, 1 - 2 pole, 30 A, 6 - 1pole A

PSB-1 Bryant, 12 pole, 12 - 1 pole breakers (full)

P1D Cutler Hammer PRL-1, 100 A, 30 pole, 2 - 2 p0le, 30 A; 3 -2p0le 20 A; 15 -1 pole 20 A; 5 - 1 pole spaces.

P1E Bulldog, 6 fuses

P1F Bryant, 12 pole, (9 twin mini, s full size 1 pole) no spares or spaces (full)

P1G Eaton, 30 pole, (3 - 2 pole A; balance 1 pole 20 A) no spares or spaces (full)

P2C No data

SD-36A Trumbull (Upper left - Only Main breaker "on" circuits 1-12 "off"; Upper right circuits 13 - 32, 17 circuits "on", 3 circuits "off"

P2D No data

P2G Eaton, PRL-1, 100 A MCB, 30 pole, date 3/19.

P3D Westinghouse, 2 - 2pole 30 A; 1 - 3 pole 15 A; 1 - 1 pole 15 A (twin mini); 3 - 1 pole 20 A (twin mini); 2 -1pole 20 A, 1 -1pole 15 A.

SD-36 Trumbull, 200 A, 9 breakers, all "on", 1 space

P4B Bryant 24 pole, (6- 1pole, 20 A; balance all twin mini breakers0 no spares or spaces (full)

P5A Square D, single phase panel, 6 pole.

P6A Old 6 fuse panel for attic lights. Fuses not tight in bases.

HDP-3 Cutler Hammer 800A MCB.

HDP-3A Cutler Hammer, PRL-4B, 400 A, MLO
HDP-P3 Cutler Jammer, PRL-2A, MLO, 1 -3pole, 90A; 4 -3 pole 20 A; 9 -1 pole 20 A "on", 15 - 1 pole, 20 A "off", 3 -1 pole space

LDP-3 Cutler Hammer, PRL-1, 400 A MCB, 4 - 2 pole, 20A; 1 - 2 pole 30 A; 4 - 3 pole 100 A; 13 - 1 pole 20 A; 1 - 1pole space

LDP-3A Cutler Hammer, PRL-$B, 500 A MCB,

LPB-3 Cutler Hammer, (dated 02/2000); 1 - 3 pole 100 A MCB; 12 - 2 pole, 20 A, 36 – 1 pole 20 A.

PBJ Cutler Hammer, 12 pole, fed from SD-12A

SD-a2A Bryant, 2 - 2pole 20 A, 4 - 1 pole 20 A twin mini, 10, 1 pole, 20 A.

P1H Bryant, 200 A MCB, 32 pole, 5 - 2pole 20 A; 3 -1pole 15 A; 3 -1pole 20 A; 1 -1pole 20 A twin mini (located in old computer room)

P1I 200 A MCB, 32 pole, 1-3pole 80 A; 1 3 pole 15 A; 1 - 1pole, 20 A (located in old computer room)

P1J Bryant, 20 pole, 10 1 pole spaces, 1 3 pole 60 A, (main); 6 1 pole 15 A; 1 1 p0l2 20 A.

P1K Square D fused panel 6 fuses, 4 15 A, 2 20 A, may be Edison based

P2E Cutler Hammer, 42 pole, 225 A bus, 2 2 pole A; 1 3 pole A; 15 1 pole, 20 A; 20 1 pole space

P3E Cutler Hammer PRL-1, 30 pole, 2 2 pole 20 A; 1 1 pole 15 A; 25 1 pol2 20 A

P3F 6 fuse panel with 1 space not useable; 3 15 a, 2 20 A.

SD-12 Trumbull

PPB-1 General Electric 24 pole, 11 spaces, single phase panel

PPB-2 (no data)

PPA-B1 (dungeon) Trumbull, 1 1 pole 20 A in use. Panel badly deteriorated.

SDX (no data)

SDX-1A Square D, 1 2 pole 20 A; 1 1 pole 20 A

P1L Cutler Hammer, 200 A, 42 pole, 1995 date, 5 1 pole spaces

LP-101 Eaton, 225 A bus, 2009 date, 30 pole, 4 2 pole 20 A; 1 2 pole 30 A; 1 3 pole 100 A (feed to LP102)

LP-102 Eaton, PRL-1A, 200 A, 42 pole, 4 2 pole 20 A; 2 3 pole 20 A; all others 1 pole 20 A. (No spaces or spares)

P2F Cutler Hammer, 42 pole, 225 A bus, 100 A MCB; 1 3 pole 20A; 2 2pole 20 A; 20 1 pole space, balance 1 pole 20 A.

PK2-1 Bryant, lots of twin mini breakers (fed from below??)

P3G Bryant, 20 pole (6 not useable), 1 2 pole 20 A; 3 1 pole 15 A; 3 1 pole 20 A (full size); 8 1 pole 20 A twin mini

P3H Bryant, 5 1 pole 20 A (twin mini); 2 1 pole 20 A; 1 1 pole 15 A

SD-13B (no data)

PBK (no data)

New Elevator Panel Siemens, 13 1 pole, 20 A; 11 spaces

P1M Bryant 20 pole, 4 1 pole 20 (twin mini); 8 1 pole 20 A, 8 spaces

P2H Bryant, 8 1 pole spaces; 5 1 pole 15 A; 7 1 pole 20 A

P2 Cutler Hammer, 42 pole, 1 3 pole 100 A (feed to new elevator panel); 39 1 pole 20 A

P3H (no data0

NPW-1 Eaton, 2012 date, 42 pole, 1 3 pole 100 A (feed to NPW-2); 1 3 pole 60 A; 5 2 pole 20 A

NPW-2 Eaton, 42 pole, no spares or spaces (full)

P3 Bryant, 14 pole, 3 1 pole 15 A; 1 2 pole 20 A; 3 1 pole 20 A; 3 20 A 1 pole twin mini (6 circuits0; 2 spaces

Old, discontinued panels in North Pavilion ITE not in use (to be removed)

DOCUMENT 00708

GENERAL CONDITIONS – DPW
Issued 2-05-2004; Revised as noted

PART	ITEM
1	DEFINITIONS
2	CONTRACT DOCUMENTS
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6	HAZARDOUS MATERIALS
7	SUBCONTRACTS
8	RESPONSIBILITY OF CONTRACTOR TO ACT IN EMERGENCY
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11	CONTRACTOR'S TITLE TO MATERIALS
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15	SUPERINTENDENCE BY CONTRACTOR
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17	SUBSTANTIAL COMPLETION AND FINAL INSPECTION
18	DEFAULT AND TERMINATION OF CONTRACT
19	TERMINATION OF CONTRACT WITHOUT FAULT
20	ASSIGNMENT PROVISION

PART 1 DEFINITIONS

A. **Addendum.** Written and/or graphic information issued before opening *Proposals* that modifies or interprets the *Bidding Documents* by additions, deletions, clarifications or corrections.

B. **Advertisement.** A public announcement in the form of an *Invitation to Bid*, inviting *Bids* for *Work* to be performed and/or *Materials* to be furnished.

C. **Alteration Order.** A written agreement between the *Contractor* and the *Department* that amends the *Contract* and identifies *Work* that affects either the *Contract Sum, Completion Date, Credit*, or any combination thereof.

D. **Alternate.** A proposed change in the *Work* described in the *Contract Documents* providing the *State* with an option to select between alternative materials, products or systems, or to add or delete portions of *Work*.

E. **Architect.** As defined in RSA 310-A:28, a person who, by reason of having acquired through professional education and practical experience an advanced training in building construction and architectural design and an extensive knowledge of building standards created to safeguard the public from hazards such as fire, panic, structural failure, and unsanitary conditions, is technically and legally qualified to practice architecture and who is licensed by the State of New Hampshire Board of Licensure for Architects to engage in the practice of architecture. The Architect has no contractual agreement with the *Contractor* and therefore shall not directly interact with the *Contractor*.

F. **Award.** The acceptance of a *Bid* prior to execution of *Contract*.

G. **Bid.** A complete and properly signed *Proposal*, submitted in accordance with the *Bidding Requirements*, to perform the *Work* for the amount or amounts stipulated therein.

H. **Bid Bond.** A form of a *Proposal Guaranty* executed by the *Bidder* and a *Surety* to guarantee that the *Bidder* will enter into a *Contract* within a specified time.

I. **Bid Opening Officer.** An authorized representative of the Department, who is responsible for opening and reading of *Bids*.

J. **Bidder.** A *Corporation*, *Partnership*, or *Proprietorship* submitting a *Proposal*, subsequent to meeting the Department's *Bidding Requirements*.

K. **Bidding Documents.** Collectively, the *Invitation to Bid*, *Bidding Requirements*, *Specifications*, *Drawings*, and *Addendum*.

L. **Bidding Requirements.** The documents that contain information regarding bidding procedures with which a *Bidder* must conform and a *Proposal* that a *Bidder* shall use to submit a *Bid*.

M. **Builders Risk Insurance.** A specialized form of property insurance that provides coverage for loss or damage during the course of construction.

N. **Calendar Day.** A day shown on the calendar.

O. **Certificate of Occupancy.** A document issued by the Office of the State Fire Marshal or its authorized representative certifying that all of, or a designated portion of a building, is approved for its designated use.

P. **Certificate of Full or Partial Substantial Completion.** A document prepared by the *Department* when the *Project* reaches *Substantial Completion and only* issued after review and acceptance of the *Contractor's Request for Certificate of Full or Partial Substantial Completion.*

Q. **Change Order.** A written agreement between the *Contractor* and the *Department* that identifies *Work* to be completed as part of an Allowance Item. Any change that affects either the *Contract Sum*, Contract Time or *Credit* shall be processed as an *Alteration Order.*

R. **Clerk of the Works.** An authorized representative identified by the *Department*, responsible for observing construction on the State's behalf for conformance with the *Contract Documents.*

S. **Commercial General Liability Insurance.** A broad form of liability insurance covering claims for bodily injury and property damage which combines under one policy coverage for business liability exposures, except those specifically excluded.

T. **Commissioner.** The Commissioner of the State of New Hampshire Department of Administrative Services.

U. **Completion Date.** The last day of the time allotted or the specific date established as identified in the *Contract Documents* for *Substantial Completion* of the *Work*, including any authorized extensions.

V. **Consultant.** The *Architect*, *Engineer*, and/or professional engaged to develop/provide *Drawings, Specifications* and/or other services for the *Project*. The Consultant has no contractual agreement with the *Contractor* and therefore all interaction between any Consultant and the *Contractor* shall be done thru the *Contract Administrator*.

W. **Contract.** The written agreement between the *Department* and the *Contractor* setting forth the obligations of the parties as outlined in the *Contract Documents*.

X. **Contract Administrator.** The *Department's* Division of Public Works Project Manager or other appointed representative having specific authority per RSA 228:5 to act on the *Department's* behalf and shall be responsible for general supervision, control, and direction over all matters pertaining to design, construction, maintenance standards, preservation, and administration of the *Contract*.

Y. **Contract Bond.** The approved form of security in compliance with RSA 447:16 executed by the *Contractor* and their *Surety* or Sureties, guaranteeing complete execution of the contract and all supplemental agreements pertaining thereto including the payment of all legal debts pertaining to the construction of the *Project*.

Z. **Contract Documents.** Collectively, the *Invitation To Bid, Bidding Requirements, Contract Bond, Specifications, Drawings, Addendum,* and other documents included in the *Contract*, and modifications, clarifications, authorized *Alteration Orders* and *Change Orders* issued after the execution of the *Contract,* to complete the *Project.* All documents shall be written in English.

AA. **Contract Sum.** The amount stated in the *Contract.* This sum shall be derived from the *Lump Sum Base Bid, Lump Sum Grand Total*, or *Negotiated Price*; modified to reflect the acceptance of any *Alternates.* The *Notice to Proceed* shall state the amount that the *State* is obligated to pay the *Contractor.*

BB. **Contractor.** The *Corporation, Partnership,* or *Proprietorship,* or any combination thereof, contracting with the State for performance of prescribed work.

CC. **Contractor's Request for Certificate of Full or Partial Substantial Completion.** A document prepared by the *Contractor* when the *Project* reaches *Substantial Completion.*

DD. **Contractual Liability.** Liability assumed by the *Contractor* under a *Contract.*

EE. **Corporation.** A legal entity organized under the laws of a particular jurisdiction who is legally authorized to do business in the State.

FF. **Credit.** Any Change that results in a reduction in the *Contract Sum* or *Lump Sum Grand Total* Items. All credits shall be processed by an *Alteration Order* and may include modifications to *Lump Sum Grand Total* Items.

GG. **Day.** Unless designated as a *Working Day*, or unless otherwise indicated, this term will mean a *Calendar Day.*

HH. **Department.** The State of New Hampshire Department of Administrative Services.

II. **Drawings (Plans).** The graphic and pictorial documents or reproductions thereof, which show the location, character, dimensions, and details of the prescribed work.

JJ. **Final Completion.** Term denoting that the *Work* has been completed in accordance with the terms and conditions of the *Contract Documents* and all *Punch List* items have been completed.

KK. **Final Payment.** Payment made by the *State* to the *Contractor*, upon *Final Completion.*

LL. **General Conditions.** The part of the *Contract Documents* establishing the rights, responsibilities and relationships of the parties.

MM. **Hazardous Material.** Shall include any material regulated by federal or state law and shall include but not limited to asbestos, toxic or hazardous waste, PCBs, combustible gases and materials, petroleum or radioactive material, or any other substances under any conditions and in such quantities as would pose a substantial danger to persons or property exposed to such substances.

NN. **Indemnification.** A contractual obligation by which one person or entity agrees to reimburse others for loss or damage arising from specified liabilities.

OO. **Invitation to Bid.** A portion of the *Bidding Documents*; the *Advertisement* for *Proposals* for *Work* or *Materials* on which *Bids* are requested. The *Advertisement* will indicate the time and place of the opening of *Proposals*, the type and location of *Work* to be performed, the character and quantity of the *Material* to be furnished and provide information on how to obtain *Drawings*, *Specifications* and *Proposal*.

PP. **Liability Insurance.** A contract under which an insurance company agrees to protect a person or entity against claims arising from a real or alleged failure to fulfill an obligation or duty to a third party who is a named or an incidental beneficiary.

QQ. **Lump Sum Base Bid.** One type of *Proposal* where the *Bid* is established by a single item price to perform all *Work* excluding any *Alternates* that may or may not become part of the *Contract*.

RR. **Lump Sum Grand Total.** One type of *Proposal* where the *Bid* is established as a total of various items to perform all *Work* excluding any *Alternates* that may or may not become part of the *Contract*.

SS. **Low Bid.** The *Bid* stating the lowest price proposed for performance of the *Work*, conforming to the *Bidding Documents*.

TT. **Lowest Responsible Bidder.** The *Bidder* who submits the lowest bona fide *Bid* and is considered by the Department to be fully responsible and qualified to perform the *Work* for which the *Bid* is submitted.

UU. **Material(s).** Any substance and/or product specified for use in the construction of the *Project* and its appurtenances.

VV. **Negotiated Price.** A *Proposal* modified by the *Lowest Responsible Bidder* thru communication with the Department and *Using Agency*(ies) in which changes are made to the *Proposal* and/or *Completion Date* as required to meet budget, funding or scheduling requirements.

WW. **Notice to Proceed.** A written notice to the *Contractor* to proceed with a portion of or all of the Contract Work; including the beginning of *Contract* time when applicable. The Notice to Proceed shall act as the final step in awarding the *Contract* or portion thereof.

XX. **Occurrence Policy.** An insurance policy that covers acts or omissions occurring during the policy term, regardless of when a claim against the insured is first asserted, even if the policy is no longer in existence.

YY. **Owner's Protective Liability Coverage.** Third-party legal liability insurance coverage protecting the *State* from claims arising from the construction process.

ZZ. **Partnership.** An association of two or more persons or entities to conduct a business that shares profits and losses at a certain proportion.

AAA. **Professional Engineer.** Referred to as Engineer. As defined in RSA 310-A:2, a person who by reason of advanced knowledge of mathematics and the physical sciences, acquired by professional education and practical experience, is technically and legally qualified to practice engineering, and who is licensed by or otherwise authorized by State of New Hampshire Professional Engineers Board to engage in the practice of engineering. The Engineer has no contractual agreement with the *Contractor* and therefore shall not directly interact with the *Contractor*.

BBB. **Project.** The total construction of the *Work* to be performed.

CCC. **Proposal.** A *Bidder's* offer, on *Department* prescribed forms, to perform stated work at the quoted price(s).

DDD. **Proposal Guaranty.** The security furnished with a *Proposal*, which shall be a *Bid Bond*, provides that the *Bidder* if awarded the *Contract* will execute such *Contract* in accordance with the requirements of the *Bidding Documents*.

EEE. **Proprietorship (Individual).** A form of business organization that is owned entirely by one person.

FFF. **Provide.** To furnish and install a product, materials, systems, and/or equipment, complete in place, fully tested and approved.

GGG. **Punch List.** A written document attached to the *Certificate of Substantial Completion* listing items to be completed or corrected prior to the *State*'s approval of *Final Payment*.

HHH. **Specifications.** The volume that is part of the *Contract Documents* which contain the *General Conditions*, *Supplementary General Conditions*, *Invitation to Bid*, and individual sections that consist of written requirements for material, equipment, construction systems, standards and workmanship, and other documents or reports as applicable.

III. **State.** The State of New Hampshire.

JJJ. **Subcontractor.** A *Corporation*, *Partnership*, *Proprietorship*, Joint Venture or any combination thereof, to whom the *Contractor* sublets any part of the *Contract*.

KKK. **Substantial Completion.** As determined by an inspection by the *Department* that the work or portion thereof is substantially complete, in accordance with the *Contract Documents*, such that the *State* may occupy or utilize the *Work* for its intended use without disruption or interference by the *Contractor* in completing or correcting any remaining unfinished or unacceptable *Work*.

LLL. **Substitution.** A *Material*, product or item of equipment in place of that specified.

MMM. **Superintendent.** The *Contractor's* authorized representative responsible for field supervision, coordination, and completion of the *Work*.

NNN. **Supplementary General Conditions.** A part of the *Contract Documents* which supplements and may also modify, change, add to or delete from provisions of the *General Conditions*.

OOO. **Surety.** A *Corporation*, *Partnership*, or *Proprietorship* other than the *Contractor*, executing a bond furnished by the *Contractor*.

PPP. **Umbrella Liability Insurance.** Insurance providing coverage in an amount above existing liability policies.

QQQ. **Unit Price.** An amount stated in a *Lump Sum Grand Total Bid* as a price per unit for an item or portion of the contract or for specific materials and/or services described in the *Contract Documents*.

RRR. **Using Agency.** The executive department, commission, independent establishment, public corporation which is an instrumentality of a state board, bureau, division, institution, service, office, officer, authority, administration or other establishment in the executive branch of the government, who are responsible for the facility and/or will occupy the facility after and/or during the Work. The Using Agency(ies) has/have no contractual agreement with the *Contractor* and therefore shall not direct the *Contractor* in any way.

SSS. **Work.** The construction and services required by the *Contract Documents* to furnish all labor, materials, equipment, and incidentals necessary to complete the duties, obligations, and requirements imposed by the *Contract*.

TTT. **Workers' Compensation Insurance.** Insurance covering the liability of an employer to employees for compensation and other benefits required by workers' compensation laws with respect to injury, sickness, disease or death arising from their employment.

UUU. **Working Day.** Any calendar day, except Saturdays, Sundays, and Contract designated legal holidays.

PART 2 CONTRACT DOCUMENTS

2.1 The Contract Documents consist of the Invitation to Bid, Contract Agreement, General Conditions, Supplementary General Conditions, Drawings and Specifications, including all Addenda issued prior to execution of the Contract, wage scales where applicable, Bonds where required, insurance certificates, other documents listed in the Agreement and Modifications issued after the execution of the Contract, Change Orders and Alteration Orders issued in accordance with Part 12 of the General Conditions.

A. Hierarchy of the Contract Documents shall be interpreted according to the following classes:

1. Department approved modifications to the Contract Documents after execution of the Contract.
2. Addenda.
3. Supplemental General Conditions.
4. General Conditions.
5. Division 1 – General Requirements.
6. Remaining Specifications.
7. Larger Scale Drawings & Details.
8. Remaining Drawings.

2.2 A fully executed Contract shall not be in effect until approved by the Governor and Council and an issuance of the Notice to Proceed by the Division.

2.3 This Contract is executed in a number of counterparts, each of which is an original and constitutes the entire agreement between the parties. This Contract shall be construed according to the laws of the State. No portion of this Contract shall be understood to waive the sovereign immunity of the State. This Contract shall not be amended, except as specified in Parts 13 and 20.

2.4 The Contract Documents are complementary and anything called for by one of the Contract Documents and not called for by the others shall be of like effect as if required by all.

2.5 Should the Contract Documents contain inconsistencies within a class identified in Item 2.1A, the Contractor shall provide the better quality or greater quantity of work and/or materials. The Contractor shall identify any perceived discrepancies to the Contract Administrator prior to proceeding.

2.6 The Contractors and all Subcontractors shall refer to all of the Contract Documents, including those not specifically showing the work of their specialized trades, and shall perform all work reasonably inferable from them as being necessary to produce the intended results in compliance with applicable Federal, State, and Local codes.

2.7 All indications or notations which apply to one of a number of similar situations, materials or processes shall be deemed to apply to all such situations, materials or processes wherever they appear in the work, except where a contrary result is clearly indicated by the Contract Documents.

2.8 Where codes, standards, requirements, and publications of public and private bodies are referred to in the Contract Documents, such references shall be understood to be to the latest final and complete revision at the time of receiving Bids unless specifically identified, except where otherwise indicated.

2.9 Where no explicit quality or standards for materials or workmanship is established for work, such work is to be consistent with the best quality workmanship standards of the applicable trade.

2.10 All manufactured articles, materials, and equipment shall be applied, assembled, installed, connected, erected, tested, cleaned, and conditioned in accordance with the manufacturer's written or printed directions and instructions, unless specifically indicated otherwise in the Contract Documents.

2.11 The Drawings are made to scale as identified therein, but all working dimensions shall be taken from the figured dimensions and by actual measurements at the job; in no case by scaling. The Contractor shall study and compare all of the Drawings and verify all figures before laying out or constructing work. The Contractor shall be responsible for errors in his/her work that might have been avoided thereby. Whether or not an error is believed to exist, deviation from the Drawings and the dimensions given thereon shall be made only after approval in writing from the Contract Administrator.

2.12 All Drawings and Specifications and copies thereof are the property of the State and shall not be used by the Contractor or Subcontractor on other Projects.

PART 3 NOTICE

3.1 Any written notice by either party to the Contract shall be sufficiently given if delivered to or at the last known business address of the person, partnership or corporation constituting the other party to the Contract, or to his/her, their, or its duly authorized agent, representative, or officer, or when sent by registered mail to such last known business address. The last known business address shall be that location which is last provided in writing.

3.2 The parties shall provide their physical location/address, mailing address, telephone number, fax number, and, where available, pager number(s), email address(es), and other methods of contact for all persons associated with the Contract.

PART 4 ACCESS TO THE WORK

4.1 The Contractor shall provide for access to the work, at all times, for observation and/or inspection by the Department, Architect, Consultant, Engineer and government officials having jurisdiction. The Contractor shall provide proper facilities for such access and inspection.

PART 5 ACCIDENT PROTECTION

5.1 It is a condition of this Contract, and shall be made a condition of each subcontract entered into pursuant to the Contract, that the Contractor, any Subcontractors, or Independent Contractors shall not require any laborer or mechanic employed in the performance of the Contract to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous to the laborer's health or safety as determined by construction safety and health standards of the Occupational Safety and Health Administration, United States Department of Labor, which standards include, by reference, the established Federal Safety and Health Regulations for Construction. These standards and regulations comprise Part 1910 and Part 1926 respectively of Title 29 of the Code of Federal Regulations, as may be revised from time to time. In the event any revisions in the Code of Federal Regulations are published, such revisions will be deemed to supersede the appropriate Part 1910 and Part 1926, and be effective as of the date set forth in the revised regulation.

PART 6 HAZARDOUS MATERIALS

6.1 **The Contractor will coordinate with the State Abatement Contractor to allow for abatement of areas where the The Contractor's work requires making penetrations or interface with material that is hazardous**. The Contractor shall also be aware of laws and regulations relating to hazardous materials that may be encountered during construction operations, either within project limits or at material sites off the project. The health and safety of employees, the general public, and the potential of damage to the overall environment is possible if hazardous materials are not recognized, reported, and the appropriate action taken to dispose of, remove from the site, or otherwise contain the possible contaminants.

6.2 If any abnormal condition is encountered or exposed that indicates the presence of a hazardous material or toxic waste, construction operations shall be immediately suspended in the area and the Contract Administrator notified. No further work shall be conducted in the area of the contaminated material until the site has been investigated and the Department has given approval to continue the work in the area. The Contractor shall fully cooperate with the State to perform any remedial work as directed. Work shall continue in other areas of the Project unless otherwise directed.

6.3 Exposure to hazardous materials may result from contact with, but not necessarily limited to, such items as drums, barrels, and other containers, waste such as cars, batteries, and building construction debris. Containers leaking unknown chemicals or liquids, abandoned cars leaking petroleum products, batteries leaking acid, construction debris which may include asbestos, or any other source of suspected hazardous material found within excavation areas or stockpiled on land within construction limits shall be referred to the Department of Environmental Services and Contract Administrator so that a proper identification of the materials may be made and disposal procedures initiated as required.

6.4 Disposition of the hazardous material or toxic waste shall be made under the requirements and regulations of the Department of Environmental Services. Work required to dispose of these materials and any remedial work shall be performed under a Supplemental Agreement or Contract item, if included in the Contract.

PART 7 SUBCONTRACTS

7.1 Nothing contained in the Specifications or Drawings shall be construed as creating any contractual relationship between any Subcontractor and the State. The Sections of the Specifications are not intended to control the Contractor in dividing the work among Subcontractors or to limit the work performed by any trade.

7.2 The Contractor shall be as fully responsible for the acts and omissions of Subcontractors and of persons employed by them, as he/she is for the acts and omissions of persons directly employed by him/her.

7.3 The Contractor shall, without additional expense to the State, utilize the services of specialty Subcontractors, as required to complete the work.

7.4 The Commissioner will not undertake efforts to settle or resolve any differences between the Contractor and Subcontractors or between Subcontractors.

7.5 The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind Subcontractors to the Contractor by the terms of the General Conditions and other Contract Documents insofar as applicable to the work of Subcontractors and to give the Contractor the same power to terminate any subcontract that the Commissioner may exercise over the Contractor under any provisions of the Contract Documents.

PART 8 RESPONSIBILITY OF CONTRACTOR TO ACT IN EMERGENCY

8.1 In case of any emergency that threatens loss or injury of property, and/or safety of life, the Contractor shall act as the situation may warrant. He/she shall notify the Contract Administrator thereof immediately thereafter. Any compensation claimed by the Contractor together with substantiating documents in regard to expense, shall be submitted to the Contract Administrator and the amount of compensation shall be determined by agreement.

8.2 In the event the Department learns of an emergency that threatens loss or injury of property, and/or safety of life, the Department shall notify the Contractor using the contact information provided pursuant to PART 3 herein. The Department may, but shall have no duty to take reasonable steps to mitigate the damage or loss to the Contractor. In either event, the Department shall have no duty to undertake any specific acts and shall have no liability for actions or inactions taken absent gross negligence.

PART 9 MUTUAL RESPONSIBILITY OF CONTRACTORS

9.1 If the Contractor or any of his/her Subcontractors or employees causes loss or damage to any separate Contractor or Subcontractor on the work, the Contractor or Subcontractor agrees to settle with such separate Contractor or Subcontractor by agreement, if he/she will so settle. If such separate Contractor or Subcontractor sues the State because of any loss so sustained, the Commissioner shall notify the Contractor and/or their Subcontractors, who shall indemnify and hold harmless the State against any expenses or judgment arising therefrom.

PART 10 PAYMENTS TO CONTRACTOR

10.1 The State will process payments to the Contractor each month on the basis of duly certified and approved estimates of the work performed during the preceding period. In preparing estimates, the material delivered on the site and any preparatory work done may be taken into consideration. Payments will only be approved in an amount no greater than the percentage of project completion, as determined by the Contract Administrator.

10.2 At least ten (10) days before the end of the billing period, the Contractor shall submit to the Contract Administrator, an itemized Requisition for Payment, supported by such data substantiating the Contractor's right to payment as the Commissioner may require. If payment is to be made for materials or equipment not incorporated in the work, but delivered and suitably stored at the site, or at some other location agreed upon in writing, such payment shall be conditional upon inspection and/or observation by the Department and submission by the Contractor of bills of sale or such other procedure satisfactory to the Commissioner to establish the State's title to such materials or equipment or otherwise protect the State's interest including applicable insurance and transportation to the site.

10.3 Immediately upon receipt of the Monthly Requisition for Payment, Contractor shall post same at the Contractor's Field Office or project site in a location where Subcontractors have clear access.

10.4 Retainage:

A. Contract Payment Withheld: A 5% retainage shall be withheld from each Progress Payment until issuance of a Certificate of Substantial Completion.. The balance remaining after the specified percentage has been retained, less all previous payments, will be certified for payment on each partial estimate.

10.5 Retainage will be released at Final Payment.

A. After the Certificate of Substantial Completion has been issued, upon written application by the Contractor and with the approval of the Surety, the Commissioner may release a portion of the retained amount.

10.6 Payment for Material On Hand:

A. Partial payments are made for materials to be incorporated in the Work, provided the materials meet the requirements of the Contract and are delivered on, or in the vicinity of, the Project site and stored in acceptable places. Partial payments will not exceed 90 percent of the Contract unit price for the item or the amount supported by copies of paid invoices, freight bills, or other supporting documents required by the Department. The quantity paid will not exceed the corresponding quantity estimate in the Contract. No partial payment will be made on living or perishable materials until incorporated in the Work.

B. When material payments exceed $100,000 or 10 percent (10%) of the total contract amount, whichever is less, notarized copies of paid invoices or copies of canceled checks for all such materials must be submitted to the Contract Administrator within 45 days of the end date of the estimate on which the material allowance was paid. Failure to provide

such documentation will result in the deduction of such material allowance from future estimates until documentation is provided.

C. All material and work covered by partial payments made shall thereupon become the sole property of the State, but this provision shall not be construed as relieving the Contractor of the sole responsibility of all materials and work upon which payments have been made or the restoration of any damaged work or as a waiver of the right of the State to require the fulfillment of all the terms of the Contract.

10.7 Payment for Material Not on Hand:

A. Upon receipt of a written request by the Contractor, partial payment may be made for acceptable, fully-fabricated, nonperishable materials not delivered that are unique to the Project provided the materials meet the requirements of the Contract and are stored in excess of 30 days at locations approved by the Department, and provided all required certificates of compliance, mill test reports, shop inspector's acceptance and any other required materials certification have been furnished. Materials shall be identifiable and accessible for inspection. Storage areas shall provide adequate protection so that such materials will meet the Contract requirements upon delivery to the site.

B. Partial payment will be based on the actual cost to the Contractor as indicated on invoices furnished to the Contract Administrator. When material payments exceed $100,000 or 10 percent of the total contract amount, whichever is less, notarized copies of paid invoices or copies of canceled checks for all such materials must be submitted to the Contract Administrator within 45 days of the end date of the estimate on which the material allowance was paid. Failure to provide such documentation will result in the deduction of such material allowance from future estimates until documentation is provided. Payment shall not exceed 90 percent of the bid price. NO payment will be made on materials for any item in the contract whose total dollar value is less than $5,000. Approval of partial payment will not constitute final acceptance of the materials for use in completing items of work.

10.8 Release of Claims:

A. Neither the final payment nor any part of the retained percentage shall become due until the Contractor shall deliver a complete release of all claims arising under and by virtue of this Contract, including claims for all Subcontractors and suppliers of either materials or labor, plus a release of the Contract Bond and a statement that all Subcontractors and suppliers have been paid. The Commissioner, may pay any and all such claims, in whole or in part, and deduct the amount or amounts so paid from any partial or final payment.

10.9 Final Payment:

A. Application for Final Payment received from the Contractor will be processed for payment not less than 90 days after project acceptance and final completion unless accompanied by a release of the Contract Bond. This payment shall be the amount of the Contract, amended by approved alteration orders, less previous payments minus liquidated damages, additional penalties or holdbacks. All prior partial estimates and payments shall be subject to correction in the final estimate and payment.

10.10 Acceptance of Final Payment Constitutes Release:

A. The acceptance of the Final Payment by the Contractor shall be and shall operate as a release to the Contractor of all claims and of all liability to the State for all things done or furnished in connection with this work. No payment, however, final or otherwise, shall operate to release the Contractor and its Sureties from any obligations under this Contract or the Contract Bond. Acceptance of Final Payment shall not impact any warrantees provided by the Contractor with respect to this project.

PART 11 CONTRACTOR'S TITLE TO MATERIALS

11.1 No materials or supplies for the work shall be purchased by the Contractor or any Subcontractor subject to any chattel mortgage or under a conditional sale or other agreement by which an interest is retained by the seller. The Contractor warrants that good title has been obtained for all materials and supplies for which partial payment has been accepted. If any claim is made with respect to materials provided by the Contractor, Subcontractors, or Independent Contractors, the Contractor shall defend any such claim and shall pay any judgment or settlement thereon.

PART 12 CHANGES IN WORK

12.1 No charge for any extra work or material will be allowed without a fully executed Alteration Order. (Refer to Specification Section 01200-Price and Payment Procedures)

12.2 The Commissioner or his/her designee may, at any time, by a written order, and without notice to the Sureties, make changes in the Drawings and Specifications and Completion Date of the Contract and within the general scope thereof.

12.3 If any part of the work as installed be at variance with the Contract requirements, the Department may allow all or any part of such work to remain in place, if found to be in the best interest of the State, subject to proper adjustment in the Contract Price. Acceptance of installed work in one instance or in any instance does not constitute a waiver of Specifications, General Conditions or contract requirements.

PART 13 PATENTS

13.1 The Contractor shall hold the State and its officers, agents, servants, and employees harmless from liability of any nature including cost and expenses, for or on account of any patented or unpatented invention, process, article or applicable items manufactured or used in the performance of the Contract, including its use, unless otherwise specifically stipulated in the Contract Documents.

PART 14 ASSIGNMENTS

14.1 The Contractor shall not assign the whole or any part of this Contract or any monies due or to become due, hereunder, without the written consent of the Commissioner and of all Sureties executing any Bonds on behalf of the Contractor if in connection with said Contract.

PART 15 SUPERINTENDENCE BY CONTRACTOR

15.1 The Contractor shall have on the project site, at all times when work is being performed, a competent English speaking Superintendent capable of reading and thoroughly understanding the contract documents and thoroughly experienced in the type of work being performed, satisfactory to the Department. The Contractor shall not change superintendents without permission from the Department and shall submit a request in writing with justification for such a change.

A. The Superintendent shall be responsible for verifying that all materials, installation, coordination, and workmanship are in conformance with the contract documents.

B. Unless the Department has granted prior written approval, the Superintendent shall not, himself, engage in "hands-on" construction work.

C. In the event the Superintendent fails or refuses to perform functions mentioned above as determined by the Department, the Contractor agrees to a stipulated penalty of $1,200.00 per day, in addition to any liquidated damages provided hereunder.

PART 16 FAILURE TO COMPLETE WORK ON TIME

16.1 If the Contractor fails to complete all of the work or sections of the Project, if sections are indicated, within the time specified in the Contract or within any additional time allowed, for each working day the Liquidated Damages identified in 16.3 will be deducted from any money due the Contractor. This deduction will be made, not as a penalty, but as fixed, agreed liquidated damages for inconvenience to the State and for reimbursing the Department and Using Agency the cost of the Administration of the Contract, including personnel, time, engineering and inspection. Should the amount of money otherwise due the Contractor be less than the amount of such liquidated damages, the Contractor and its Surety shall be liable to the State for such deficiency.

16.2 If the Division of Public Works Design & Construction permits the Contractor to continue and finish the work after the time fixed for its completion, it shall in no way operate as a waiver on the part of the State of any of its rights under the Contract. When the final acceptance has been duly made by the Department, any liquidated damage charges shall end.

16.3 The fixed, agreed, liquidated damages shall be assessed in accordance with the following schedule:

Original Contract Amount, Plus Any Extras, Alteration Orders, and Alternates		Amount of Liquidated Damages Per Working Day
From More Than:	To and Including:	
$0	$25,000.00	$200.00
$25,000.00	$50,000.00	$250.00
$50,000.00	$100,000.00	$400.00
$100,000.00	$500,000.00	$450.00
$500,000.00	$1,000,000.00	$800.00
$1,000,000.00	$2,000,000.00	$1,200.00
$2,000,000.00	$5,000,000.00	$1,600.00
$5,000,000.00	$10,000,000.00	$2,000.00
$10,000,000.00	and above	$2,400.00

PART 17 SUBSTANTIAL COMPLETION AND FINAL INSPECTION

17.1 The Contractor shall provide a signed Substantial Completion Application to the Contract Administrator when the work is believed to be substantially complete, in accordance with specification section 01700, accompanied by a list of items, referred to as the Punch List, to be completed or corrected. The failure to include any items of such list does not alter the responsibility of the Contractor to complete all work in accordance with the Contract Documents. On the basis of an inspection by the Department who determines that the work is substantially complete, a Certificate of Substantial Completion will be issued.

A. The Certificate of Substantial Completion shall:
   1. Include any modifications to the Punch List or value as determined by the Department.
   2. Establish the Date of Substantial Completion.
      a. Warranties required by the Contract Documents shall commence on the Date of Substantial Completion unless otherwise provided in the Certificate of Substantial Completion.
   3. Identify the responsibilities of the State and the Contractor for security, maintenance, heat, utilities, and damage to the work and insurance.
   4. Fix the time limit within which the Contractor shall complete the items listed herein.

17.2 Partial Occupancy or Use: The State may take occupancy or use of completed or partially completed portions of the work upon written agreement between the Commissioner and the Contractor. Said partial occupancy or use shall have the approval of the insurer and Code enforcement authorities having jurisdiction. Said partial occupancy or use, (whether substantial completion has been obtained or not) provided the Department and Contractor have agreed upon written terms detailing each of the entities responsibilities in their entirety, may be exercised under these General Conditions.

A. A Written agreement shall stipulate the time period for completion of all Work and the commencement date for all applicable contract warranties. Said written agreement shall be preceded by a Contractor generated listing of all incomplete Work, meeting with the approval of the Department, before partial occupancy or use is taken by the State with prior approval of the Division.

17.3 If the Contractor fails to complete the items on the "punch list," by the date specified on the Substantial Completion Certificate, then in addition to the corrective measures listed in the Certificate of Substantial Completion, the State may use the monies still due the Contractor to have such items completed and the Contractor shall lose any claim to the monies so used. The Surety may be notified of any delay or failure to complete the work.

17.4 Upon written notice that the work is ready for final inspection and acceptance, the Department shall promptly make such inspection, to determine the work is acceptable under the Contract Documents and the Contract fully performed. The Contractor shall submit a request for payment, specifically identifying Final Payment. The Contractor shall provide all certificates and reports, as required, throughout the contract and shall coordinate their preparation and submission prior to request for final payment. Failure to submit such certificates and reports shall be considered default of contract.

PART 18 DEFAULT AND TERMINATION OF CONTRACT

18.1 If the Contractor:

A. Fails to begin work under Contract within the time identified in specification section 01100.

B. Fails to perform the work with sufficient workers and equipment, or with sufficient materials to assume prompt completion of said work, or

C. Performs the work unsuitably or neglects or refuses to remove materials or to perform anew such work as may be rejected as unacceptable and unsuitable, or

D. Discontinues the prosecution of the work, or

E. Fails to resume work, which has been discontinued, within a reasonable time after notice to do so, or

F. Becomes insolvent or has declared bankruptcy, or commits any act of bankruptcy or insolvency, or

G. Makes an assignment for the benefit of creditors, or

H. For any other causes whatsoever, fails to carry on the work in an acceptable manner.

18.2 The Commissioner will give notice, in writing, to the Contractor and his Surety for such delay, neglect, and default for any item identified above.

A. Upon receipt of Notification of Default and the Contractor or Surety does not proceed in accordance with said Notification, then the Commissioner will Terminate the Contract. Upon which, the Commissioner shall have full power and authority, without violating the Contract, to assume the prosecution of the work. The Commissioner may enter into one or more agreements for the completion of said Contract according to the terms and conditions thereof, or use such other methods as will be required for the completion of said Contract in an acceptable manner.

1. All extra costs and charges incurred by the Department as a result of such delay, neglect or default, together with the cost of completing the work under the Contract will be deducted from any monies due or which may become due said Contractor. If such expenses exceed the sum that would have been payable under the Contract, then the Contractor and the Surety shall be liable and shall pay to the Department, the amount of such excess.

PART 19 TERMINATION OF CONTRACT WITHOUT FAULT

19.1 Except in cases controlled by the preceding section, the Commissioner, for any cause, including, but not limited to an order of any Federal authority or petition of the Contractor due to circumstances beyond its control may, by written notice to the Contractor and the Surety, with the concurrence of the Governor and Council, terminate the Contract or any portion thereof subject to the Condition(s) A, B, C, and D provided below.

19.2 Notwithstanding anything to the contrary contained in these conditions, it is understood and agreed by the parties hereto that all obligations of the Department hereunder, including the continuance of payments, are contingent upon the availability and continued appropriation of State and/or Federal Funds, and in no event shall the Department be liable for any payments hereunder in excess of such available or appropriated funds. In the event of a reduction, termination or failure to appropriate any or all such available funds or appropriations or a reduction of expenditures of State funds by the Advisory Budget Control Committee, the Commissioner may, by written notice to the Contractor and Surety, immediately terminate this Contract in whole or in part in accordance with the following conditions:

A. When a Contract, or portion thereof, is terminated before completion of all items of work in the Contract, payment will be made for the actual items of work completed. Payment of items of work not completed at time of termination shall be the greater of the following amounts:

1. A percentage of the Contract unit price, which percentage shall be the percentage of completion of the particular item at time of termination.
2. Such amount as shall be mutually agreed upon by the parties. No claim for loss of anticipated profits on items or units of work not completed will be allowed.

B. Reimbursement for organization of the work and mobilization, when not otherwise included in the Contract, shall be made where the volume of work completed is too small to compensate the Contractor for these expenses under the Contract; the intent being that an equitable settlement be made with the Contractor.

C. Acceptable materials, obtained or ordered by the Contractor for the work, and that are not incorporated in the work shall, at the option of the Contractor, be purchased from the Contractor based upon the delivered cost of the materials at such points of delivery as may be designated by the Department. The Contractor shall do everything possible to cancel unfilled orders.

D. Termination of a Contract, or a portion thereof, shall not relieve the Contractor of its responsibilities for the work completed nor shall it relieve the Surety of its obligations for and concerning any claims arising out of the work performed.

PART 20 ASSIGNMENT PROVISION

20.1 The Contractor hereby agrees that it will assign to the State, all causes of action that it may acquire under the anti-trust laws of New Hampshire and the United States as a result of conspiracies, combinations of contracts in restraint of trade which affect the price of goods or services obtained by the State under this Contract, if so requested by the State.

END OF SECTION

DOCUMENT 00818

SUPPLEMENTARY CONDITIONS – DPW

PART 1 GENERAL

1.1 SUMMARY

A. The following supplements modify, change, delete or add to the General Conditions. Where any part of the General Conditions are modified or voided by these sections, the unaltered provisions of that part shall remain in effect.

1.2 MODIFICATIONS TO VARIOUS ARTICLES OF THE GENERAL CONDITIONS

A. Part 10, Payments to Contractor
   1. Delete Item 10.5 and replace with the following.
      a. As each line item of the schedule of values is certified by the Contract Administrator and the surety company as completed, that portion of the retained funds which is allocable to the completed line item shall be released to the prime contractor, who shall, within 15 days of its receipt, release to the subcontractor responsible for the completed work, the full amount of any retainage withheld.
      b. Upon final completion of the work, retained amounts of progress payments not previously released to the contractor shall be included in the final payment to the contractor.

B. Part 16, Failure to Complete Work on Time
   1. Remove the liquidated damages schedule of item 16.3 and replace with the following schedule:

Original Contract Amount, Plus Any Extras, Alteration Orders, and Alternates		Amount of Liquidated Damages Per Working Day
From More Than:	To and Including:	
$0	$25,000.00	$200.00
$25,000.00	$50,000.00	$250.00
$50,000.00	$100,000.00	$400.00
$100,000.00	$500,000.00	$450.00
$500,000.00	$1,000,000.00	$800.00
$1,000,000.00	$2,000,000.00	$1,200.00
$2,000,000.00	$5,000,000.00	$1,600.00
$5,000,000.00	$10,000,000.00	$2,000.00
$10,000,000.00	and above	$2,400.00

END OF DOCUMENT

SECTION 01100

SUMMARY

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Contract description.

B. Contractor's use of site and premises.

C. State occupancy.

D. Specification Conventions.

1.2 CONTRACT DESCRIPTION

A. Work of the Project includes replacement of the electrical distribution system and minor architectural and fire sprinkler work supporting that effort.

B. SITE EXAMINATION
1. Examine Project site before submitting a Bid.
2. A visit to Project site has been arranged for Bidders on 6/3/25 and 6/6/25 at 10:30 AM

C. Perform Work of Contract under stipulated lump sum grand total contract with State in accordance with Conditions of Contract.

D. The Contractor shall, except as otherwise specifically stated in the Contract Documents, provide and pay for all materials, labor, tools, equipment, water, heat, fuel, light, power, transportation, superintendence, temporary construction of every nature, and all other services and facilities of every nature whatsoever necessary to execute, complete, and deliver the work within the specified time.

E. Work under this contract will include:
1. Minor Demolition: State has contracted for demolition of the existing finishes required to run horizontal distribution and construct vertical chases and electrical closets.

F. State's Responsibilities:
1. Arrange for and deliver State-reviewed Shop Drawings, Product Data, and Samples, to Contractor.
2. Arrange and pay for delivery to site.
3. On delivery, inspect products jointly with Contractor.

4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
5. Arrange for manufacturers' warranties, inspections, and service.

G. Contractor's Responsibilities:
1. Review State-reviewed Shop Drawings, Product Data, and Samples.
2. Receive and unload products at site; inspect for completeness or damage jointly with State.
3. Handle, store, install and finish products.
4. Repair or replace items damaged after receipt.

1.3 CONTRACTOR'S USE OF SITE AND PREMISES

A. Limit use of site and premises to allow:
I. State occupancy.
2. Work by Others and Work by State.
3. Use of site and premises by the public.

B. Access to Site: Normal working hours.

C. Emergency Building Exits During Construction: Shall be maintained and all building entrances and exits shall remain functional.

D. Construction Operations: Limited to areas noted on Drawings.

E. Time Restrictions for Performing Interior Work: Normal working hours of 7:00 am to 3:30 pm, Monday through Friday with the following restrictions:
1. No access during the following observed holidays:
a. New Year's Day.
b. Martin Luther King Jr. Civil Rights Day.
c. President's Day.
d. Memorial Day.
e. Independence Day.
f. Labor Day.
g. Veterans' Day.
h. Thanksgiving Day.
i. Day after Thanksgiving.
j. Christmas Day.
2. Access for work outside of normal working hours shall be requested in writing to the Contract Administrator, at least one week in advance. The Contract Administrator may accept or reject the request.

F. Utility Outages and Shutdown: Shall be coordinated with the building users to minimize disruption of services, and will require work to take place ontside of normal working hours.

1.4 STATE OCCUPANCY

A. The State will occupy the site premises during the entire period of construction. Stage/Phase of construction for the conduct of normal operations.

B. Cooperate with State to minimize conflict, and to facilitate State's operations.

C. Schedule the Work to accommodate State occupancy.

1.9 SPECIFICATION CONVENTIONS

D. These specifications are written in imperative mood and streamlined form. This imperative language is directed to the Contractor, unless specifically noted otherwise. The words "shall be" are included by inference where a colon (:) is used within sentences or phrases.

END OF SECTION

SECTION 01200

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Allowances.

B. Testing and inspection allowances.

C. Schedule of values.

D. Requisition for payment.

E. Change procedures.

F. Defect assessment.

1.2 ALLOWANCES

A. Allowance: Include in the Contract, a stipulated sum/price of $100,000.00 for use upon the Bureau's instruction. This Allowance will make money available for modifications and/or additions to contract items due to owner-initiated changes, or for unknown, latent or differing existing conditions, or for the removal of hazardous materials that are encountered by construction.

B. Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, equipment rental, overhead and profit will be included in Change Orders authorizing expenditure of funds from this Allowance. The cost of the bond for the amount of Allowance shall be included as part of the lump sum base bid.

C. Funds will be drawn from an Allowance only by Change Order. Contractor can proceed with Change Order Work against Allowance with direction from the Contract Administrator. The Contractor shall not proceed with any work that will exceed the amount of Allowance remaining.

D. Credits can only be added to an Allowance by Alteration Order. The Contractor may not use a credit until an Alteration Order is fully executed.

E. Notwithstanding the Contractor's objection, the Contract Administrator may at any time reduce the funds remaining in the Allowance by Alteration Order.

F. At Final Payment of the Contract, funds remaining in the Allowance will be credited to the State.

1.3 TESTING AND INSPECTION

A. Contractor to include costs for Testing and Inspecting in their bid: Cost of engaging testing and inspecting agency; execution of tests and inspecting; and reporting results.

1.4 SCHEDULE OF VALUES

A. Submit printed schedule on AIA Form G703 - Continuation Sheet for G702. Contractor's standard form or electronic media printout will be considered.

B. Submit Schedule of Values in duplicate within 15 days after date of issuance of Notice to Proceed. Failure to submit within specified time period will constitute Default of Contract.

C. Format: Utilize Table of Contents of these Specifications. Identify each line item with number and title of major specification Section. Identify bonds and insurance and allowances

D. Include a separate line item for the amount of each Allowance specified in this section. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by unit cost to achieve total for each item.

E. Revise schedule to list approved Alteration Orders, with each Requisitions For Payment.

1.5 REQUISITION FOR PAYMENT

A. Submit three copies of each application on the Bureau's Requisition for Payment Form.

B. Content and Format: Items on the Requisition for Payment shall be consistent with the items on the Proposal Form. Utilize the Schedule of Values as documentation for payment items.

C. Submit updated construction schedule with each Requisition for Payment.

D. Payment Period: Submit at intervals stipulated in Document 00708 General Conditions – NHDAS-DPW, Item 10.

E. Submit with transmittal letter as specified in Section 01330.

F. Substantiating Data: When the Contract Administrator requires substantiating information, submit data justifying dollar amounts in question.

G. Include the following with Requisition for Payment, payment will not be processed if any items are missing or incomplete:
1. Current construction photographs specified in Section 01330.
2. Record documents as specified in Section 01700, for review by the Contract Administrator, which will be returned to Contractor.
3. Affidavits attesting to off-site stored products.
4. Construction progress schedules, revised and current as specified in Section 01330.

1.6 CHANGE PROCEDURES

A. Submittals: Submit name of individual authorized to receive change documents, and be responsible for informing others in Contractor's employ or Subcontractors of changes to the Work.

B. The Contract Administrator will advise of minor changes in the Work not involving adjustment to Contract Sum/Price or Contract Time, or that may be necessary to carry out the work included in the Contract, by issuing supplemental instructions.

C. The Contract Administrator may issue a Proposal Request including a detailed description of proposed change(s) with supplementary or revised Drawings and specifications; a change in Contract Time for executing the change. The Contractor will prepare and submit estimate within ten days.

D. Contractor may propose changes by submitting a request for change(s) to the Contract Administrator , describing proposed change and its full effect on the Work. Each request shall be a separate item and sequentially numbered. Include a statement describing reason for the change, and effect on Contract Sum/Price and Contract Time with full documentation and a statement describing effect on Work by separate or other Contractors.

E. Stipulated Sum/Price Change Order: Based on Proposal Request and Contractor's fixed price quotation or Contractor's request for Change Order as approved by the Contract Administrator. Submit the breakdown of the following items on a Bureau Stipulated Sum/Price Change Order Form for review and approval by the Contract Administrator:

1. The Contractor shall include the following indirect costs for work performed by the General Contractor as part of the Contractors' price:
   a. Worker's Compensation and Employee Liability.
   b. Unemployment and Social Security Taxes.
2. In addition to the above indirect costs the General Contractor shall be allowed the following markups:
   a. Twenty percent (20%). Said twenty percent (20%) shall be all inclusive for overhead, supervision, and profit for Work performed by the General Contractor
   b. Materials (Actual Cost + 10%): For all materials entering permanently into the work plus freight charges thereon, and for all labor not entered directly on his payroll, the Contractor will receive the actual cost, as shown by original receipted bills forwarded to the Contract Administrator, to which cost will be added an amount equal to ten percent (10%) of the sum thereof. Bills presented by the Contractor for material taken back from his stock will be subject to the ten percent (10%) allowance if approved by the Contract Administrator.
   c. Equipment (Reasonable Rental Charge + 0%): For any trucks, machinery or special equipment, the Contractor will receive a reasonable rental charge to which sum no percentage will be added. This rental charge shall be agreed upon in writing before the work is begun and shall include an operator and all fuel, lubricants, and the upkeep of the

equipment. Equipment does not include small tools and accessories for small tools.

d. Ten percent (10%) on that part of work performed by Subcontractors.

e. The same percentages above shall apply to Subcontractors.

3. On any change that involves a net credit to the State, no allowance for overhead, supervision and profit shall be figured.

4. Extension of Contract Time: State any requests for extension of Contract Time with justification for such a request.

F. Unit Price Change Order: For contract unit prices and quantities, the Change Order will be executed on fixed unit price basis. For unit costs or quantities of units of work which are not pre-determined, execute Work under Construction Change Directive. Changes in Contract Sum/Price or Contract Time will be computed as specified for Time and Material Change Order.

G. Construction Change Directive : The Contract Administrator may issue directive, signed by the Bureau Director or Deputy Director, instructing the Contractor to proceed with change in the Work, for subsequent inclusion in a Time and Material Change Order. Document will describe changes in the Work, and designate method of determining any change in Contract Sum/Price or Contract Time. Promptly execute change. Failure to comply will result in Default of Contract.

H. Time and Material Change Order: Submit itemized account and supporting data within 10 days of completion of change. The Contract Administrator will determine change allowable in Contract Sum/Price and Contract Time as provided in Contract Documents.

1. Maintain detailed records of work done on Time and Material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.

2. Document each quotation for change in cost or time with sufficient data to allow evaluation of quotation. If acceptable, a Change Order for a Not to Exceed Amount will be prepared.

3. The Contractor as payment in full, including superintendence and overhead, shall accept the compensation herein provided and profit, for extra work performed. For all such work, the Contractor shall furnish certified copies of the payrolls on forms provided for that purpose, invoices of all materials, and such other information as may be required by the Contract Administrator. Submit the breakdown of items on a Bureau Time and Material Change Order Form for review and approval by the Contract Administrator:

a. Labor (Actual wage + 40%): The Construction Superintendent is responsible for logging the time for each individual. For all laborers and foremen engaged on the specific operation and entered directly on the Contractor's payroll, the Contractor will receive the actual rate of wage for each and every hour said laborers and Foremen are actually engaged in such work to which will be added an amount equal to forty percent (40%) of the sum thereof, which percentage shall include the cost percentages of the following items as applied to the labor cost involved:

1) Contract Bond Premium.

2) Public Liability Insurance.

3) Worker's Compensation Insurance.

4) Federal Social Security.
5) Unemployment Compensation Taxes

b. Materials (Actual Cost + 10%): For all materials entering permanently into the work plus freight charges thereon, and for all labor not entered directly on his payroll, the Contractor will receive the actual cost, as shown by original receipted bills forwarded to the Contract Administrator, to which cost will be added an amount equal to ten percent (10%) of the sum thereof. Bills presented by the Contractor for material taken back from his stock will be subject to the ten percent (10%) allowance if approved by the Contract Administrator.

c. Equipment (Reasonable Rental Charge + 0%): For any trucks, machinery or special equipment, the Contractor will receive a reasonable rental charge to which sum no percentage will be added. This rental charge shall be agreed upon in writing before the work is begun and shall include an operator and all fuel, lubricants, and the upkeep of the equipment. Equipment does not include small tools and accessories for small tools.

4. In addition to the above costs the General Contractor shall be allowed the following markups:
   a. Twenty percent (20%). Said twenty percent (20%) shall be all inclusive for overhead, supervision, and profit for Work performed by the General Contractor
   b. Ten percent (10%) on that part of work performed by Subcontractors.
   c. The same percentages above shall apply to Subcontractors.
5. Extension of Contract Time: State any requests for extension of Contract Time with justification for such a request.

I. Any Changes that result in a credit to any portion of the contract and/or a change in the Contract Time must be processed as an Alteration Order except as provided for in Item 1.2E.

J. Execution of Alteration Orders: Bureau of Public Works will issue Alteration Orders per the following procedures.
1. The Contract Administrator reviews cost for Change in Work with the Using Agency and Consultant(s). If needed the Contract Administrator will request additional items, back-up information, and request any possible changes or clarifications.
2. Bureau Accountant will prepare an Alteration Order on a Bureau form.
3. Bureau Director or Deputy Director will issue the Alteration Order to the Contractor for review and signature.
4. Contractor submits signed Alteration Order to the Bureau Director.
5. The Bureau completes the Alteration Order with the signature of the Bureau Director or Deputy Director.
6. A fully signed and executed Alteration Order is issued to Contract Administrator, Clerk of the Works, Contractor, and Using Agency.

K. Execution of Change Orders: The Contractor is responsible for preparing and updating a spreadsheet log itemizing all Proposed Changes. A separate spreadsheet shall be completed for each Allowance Item. The spreadsheet shall include columns for Proposed

Change Number, Description, Amount of Change, Status, and Approved Amounts. In addition a current balance remaining shall be included. Change Orders will be processed per the following procedures:

1. The Contract Administrator reviews cost for Change in Work with the Using Agency and Consultant(s). If needed the Contract Administrator will request additional items, back-up information, and request any possible changes or clarifications.
2. Contract Administrator and Using Agency Representative signs Change Order.
3. Contractor can proceed with Change Order Work with direction from the Contract Administrator.
4. Contractor shall not proceed with any work that will exceed the amount of Allowance remaining.
5. Fully signed and executed Change Order is issued to the Contract Administrator, Clerk of the Works, Contractor, and the Using Agency.

L. Correlation Of Contractor Submittals:

1. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Alteration Order as separate line item and adjust Contract Sum/Price.
2. Promptly revise progress schedules to reflect change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.
3. Promptly enter changes in Project Record Documents.

1.7 DEFECT ASSESSMENT

A. Replace the Work, or portions of the Work, not conforming to specified requirements.

B. If, in the opinion of the Contract Administrator, it is not practical to remove and replace the Work, the Contract Administrator will direct appropriate remedy or adjust payment.

C. The defective Work may remain, but unit sum/price will be adjusted to new sum/price at discretion of the Contract Administrator.

D. Defective Work will be repaired to instructions of and acceptance by the Contract Administrator, and unit sum/price will be adjusted to new sum/price at discretion of the Contract Administrator.

E. Authority of the Contract Administrator to assess defects and identify payment adjustments, is final.

F. Non-Payment For Rejected Products: Payment will not be made for rejected products for any of the following:

1. Products wasted or disposed of in a manner that is not acceptable.
2. Products determined as unacceptable before or after placement.
3. Products not completely unloaded from transporting vehicle.
4. Products placed beyond lines and levels of required Work.
5. Products remaining on hand after completion of the Work.
6. Loading, hauling, and disposing of rejected products.

END OF SECTION

SECTION 01300

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Coordination and project conditions.

B. Permits and fees.

C. State Labor Requirements

D. Preconstruction meeting.

E. Site mobilization meeting.

F. Progress meetings.

G. Pre-installation meetings.

H. Cutting and patching.

I. Special procedures.

1.2 COORDINATION AND PROJECT CONDITIONS

A. Coordinate scheduling, submittals, and Work of various sections of the Specifications to ensure efficient and orderly sequence of installation of interdependent construction elements [, with provisions for accommodating items installed later].

B. Comply with the "Underground Utility Damage Prevention System" per NH RSA 374 Sections 48 through 56 by notification to DIG-SAFE SYSTEM, Inc., of intent to excavate within 100 feet of an underground utility. Contact DIG-SAFE at 1-888-334-7233 (1-888-DIG-SAFE) or on-line at http://www.digsafe.com at least seventy-two (72) hours in advance of starting any excavation. Saturday, Sundays, and legal holidays are not included in the computation of the required seventy-two (72) hour notice.

C. Maintain proper environmental conditions for installation of all building components and materials. This shall include but not be limited to manufacturers recommended temperature and humidity requirements. Maintain a weather tight building envelope and protect new work from any kind of spillage.

D. Prior to the start of any Work, provide an independent company to locate utilities potentially affected by the Work and as shown and/or identified in the Contract Documents. All utilities shall be identified by the Contractor on the Record Drawings.

E. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, operating equipment.

F. Coordinate space requirements, supports, and installation of mechanical and electrical Work indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

G. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.

H. Coordinate completion and clean-up of Work of separate sections in preparation for Substantial Completion [and for portions of Work designated for State's [partial] occupancy].

I. After State occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of State's activities.

1.3 PERMITS AND FEES

A. Obtain and pay for all construction licenses, permits, and fees as may be required by law for construction of State's facility, and pay for all fees and charges, and use of the property other than the site of the work for storage of materials or other purposes. This includes permits and fees for State ADA (if required) and SHPO (if required).

1. Per **"Saf-C 8100 State Building Permit System"** a Building Permit shall be obtained by the Contractor from the **Office of the State Fire Marshal (SFMO).**
2. **A Construction Permit has been applied for by the Division of Public Works.**
   a. A complete set of Construction Documents has been submitted to the State Fire Marshal Office for review by DPW.
   b. An application for building permit has been submitted to the State Fire Marshal Office by DPW to initiate review.
   c. A copy of the SFMO **approval letter** will be transmitted to the awarded Contractor at the pre-construction meeting. This will include the original SFMO application number.
   d. A copy of the **permission to sign as owner agent letter** will be transmitted to the awarded Contractor at the pre-construction meeting; and is included at the end of this section.
3. After award, DPW will notify the SFMO of the identity of the awarded Contractor.
4. After award, the Contractor will create a Collaborator Profile through the SFMO permitting software MYGOV, if one is not already created.
   a. Instructions for becoming a 'Collaborator' on MYGOV are attached at the end of this section.
   b. Public Portal here: https://public.mygov.us/divisionoffiresafety_nh

c. "AGENCY" on MYGOV site refers to the "State of New Hampshire Division of Fire Safety."

d. Contractor will need to RE-APPLY for permit by completing a new application and paying the required fees for each permit required.

e. Contractor will need to submit electronic drawings for 'review' by the SFMO. Since the SFMO has already reviewed the set. This review should take no more than a couple days. Actual review will have been completed. If 'review' takes more than 5 working days, please notify the Contract Administrator.

f. Contractor will need to submit a scan of the SFMO approval letter, received at the pre-construction meeting.

5. **Permit applications for the Trades (Mechanical, Mechanical gas, Electrical, Fire Protection, Plumbing and SWPPP) are 'sub-permits' to the Building Construction Permit and each requires a separate application and payment.**

6. **Application for ALL Permits must be submitted through MYGOV electronic permitting system. Direct questions to the State Fire Marshal's Office: (603) 223-4289; DOS.FMO.INSPEC@DOS.NH.GOV.**

7. **When applying for a permit you will need the following:**
   a. Drawings and Specifications in electronic format. (Bid Documents).
   b. A copy of the **SFMO approval letter** (Letter will be given to the Contractor by DPW at the pre-construction meeting).
   c. **Basic Project Information** including address, project name, description (ref Section 01100 "summary"), etc.
   d. **Basic Contractor/Subcontractor/Design Professional information**
   e. A copy of **Permission to Sign Letter** from the DAS Commissioner must be copied and attached to EVERY APPLICATION by the applicant.
   f. **Payment** for the permit fee.

8. **Please direct all questions related to permitting process and fees to District Chief Phil Biron at the Office of the State Fire Marshal – (603) 223-4289.**

9. **Fees for all re-inspections shall be paid by the Contractor as stated on the application form.**

10. **Immediately upon receipt of Permits from the Office of the Fire Marshal, Contractor shall transmit copies to the Contract Administrator.**

11. **NOTE: along with Permits the State Fire Marshal's Office will issue:**
    a. A list of required inspections will be provided on the issued permit and the MYGOV Portal. All inspections will be maintained in the MYGOV Portal and available through the Collaborator Profile.
    b. A set of 'approved' drawings bearing the SFMO stamp and signature. This set, or a set covered by the 'approved' cover sheet shall become the record set on site and be maintained throughout the project for use by the SFMO and Clerk of the Works.
    c. Permits may be applied for, and Inspections may be requested at MYGOV, and at DOS.FMO.INSPEC@DOS.NH.GOV and by telephone at (603) 223-4289.

12. **Contractor shall post all paid Permits at the Contractor's Field Office or project site in a conspicuous location prior to beginning the work.**

13. **Fees for interface with municipal (Town or City) and/or Private Infrastructure (Liberty, Eversource, Etc.) must be applied for and paid for separately from this permit process. The General Contractor is responsible**

to apply for, obtain and pay for required permits from each municipality and/or Private company as required. Unless noted otherwise in the Construction Documents.

B. Pay all applicable Federal, State, and Local sales and other taxes, except taxes and assessments on the real property comprising the site of the Project.

C. **The Contractor's attention is called to RSA 72-B, Excavation Tax and related administrative rules of the Department of Revenue Administration, which among other provisions, levies a tax on earth and excavations as defined in RSA 155-E. The Contractor is required, on a yearly basis, to file a Notice of Intent to Excavate in each municipality where excavation operations are anticipated. Additionally, the Contractor shall post the Excavation Tax Certificate, received from the Dept of Revenue Administration, at the contractor's project bulletin board.**

D. **Contractor must file with the Federal Aviation Administration in accordance with CFR Title 14 Part 77.9 at least 45 days prior to construction.**

1.4 STATE LABOR REQUIREMENTS

A. Work Certificate for Contractors Before Beginning Their Work on Public Projects

1. Pursuant to RSA 21-I:80 and RSA 228:4-b, prior to any work being done by an individual contractor, such contractor, including ALL subcontractors and independent contractors, shall provide a Work Certificate for Contractors Before Beginning their Work on Public Projects (Work Certificate) to the Contract Administrator. Sample form can be obtained at http://das.nh.gov/publicworks/pwdocuments.asp
2. The Work Certificate of this Contractor is required to be provided for APPROVAL of the Contract. This Work Certificate shall be provided to the Contractor during the Contract approval process by the NH DOT Bureau of Finance & Contracts. All required information shall be completed with attached documentation and shall be returned to the NH Department of Transportation, Bureau of Finance and Contracts.
3. Subcontractors, including main and lower tier, will not be allowed to perform any work until their Work Certificates have been submitted to the Contract Administrator via this Contractor.
4. This Contractor shall maintain a log of all submitted subcontractor Work Certificates on-site. The log shall identify all main and lower-tier subcontractors and the status of the Work Certificate submission. This log shall be reviewed at each Progress Meeting to coordinate scheduled work with required Work Certificate submissions. An up-dated log shall be submitted with each Payment Application.
5. This Contractor shall keep a copy of all Work Certificates on the jobsite, either in electronic or hardcopy form.

B. The Contractor shall obey all applicable State and Federal Labor laws.

C. Pursuant to RSA 21-I:81-a, the Contractor shall provide to the Contract Administrator a list of the names and addresses of the CEO, CFO, other LLC principals, and each

subcontractor to be used in the performance of the contract. This list shall be provided at the Preconstruction meeting. The name and address of each subcontractor shall be provided on the Subcontractor/Employee Master List (below).

D. The Contractor shall maintain a Subcontractor/Employee Master List (Master List) of all personnel performing work on the job site, including the Contractor's employees, all subcontractors and subcontractor employees, and all independent contractors. Pursuant to RSA 21-I:81-b, the Master List shall identify which entity has hired each subcontractor and independent contractor and which entity is providing Workers Compensation coverage for the on-site personnel. The Master List shall also confirm that each employee has an OSHA-10 certification as required per RSA 277:5-a. Subcontractors and independent contractors will not be allowed to perform any work until they have been correctly identified on the Master List. A sample Master List document, created in Microsoft Word, can be obtained at http://das.nh.gov/publicworks/pwdocuments.asp . The initial Master List submission shall be at the Preconstruction meeting.

E. The Master List shall be posted on the jobsite and updated as needed to reflect any new subcontractors and independent contractors. The Master List shall be reviewed at each Progress Meeting. On a monthly basis, the Contractor shall provide to the Contract Administrator a .pdf or Microsoft Word file of the Master List, showing all current subcontracts.

F. The Contractor shall maintain a daily log-in sheet of all personnel performing work on the jobsite. Personnel shall list their name, name of employer or identify themselves as independent contractors. No contractor, subcontractor or independent contractor performing work on the job site shall be allowed on site without first signing the daily log-in sheet.

G. The Contractor shall verify that personnel listed on the daily log-in sheet are also listed on the Master List. If personnel are not listed on the Master List, they will not be allowed on site until their employer has certified, in writing, that the employee is covered under Workers Compensation coverage for the appropriate work classification noted on the Work Certificate.

H. The Contractor shall post six (6) mandatory labor posters in a conspicuous, weather-tight place at the jobsite: Protective Legislation Law; Criteria to Establish an Employee or Independent Contractor; NH Minimum Wage Law; and Whistleblowers Protection Act; Workers Right to Know; Equal Pay Law. These posters can be found at the NH Dept. of Labor website https://www.nh.gov/labor/forms/mandatory-posters.htm

I. The Contractor shall maintain, on the jobsite, copies of OSHA-10 certificates for all personnel listed on the Master List and required per RSA 277:5-a to have OSHA-10 certificates.

1.5 PRECONSTRUCTION MEETING

A. The Contract Administrator will schedule meeting at the Project site prior to Contractor occupancy.

B. Attendance Required unless otherwise waived: Contract Administrator, Clerk of the Works, Using Agency Representative(s), Contractor, Contractor's Superintendent, and major Subcontractors.

C. Potential Agenda Topics:

1. Distribution of Contract Documents. The Contract is responsible for any and all reproduction of Contract Documents.
2. The Contractor shall submit Work Certificate(s) (as defined in this Section) for the Contractor and all known subcontractors.
3. Submission of Work Certificate Log.
4. Submission of names and addresses of the Contractor's CEO, CFO, other LLC principals, and each subcontractor. The name and address of each subcontractor shall be reported on the Master List.
5. Submission of Master List of subcontractors and all personnel expected to be on site.
6. Review daily log-in sheet requirement and format. Contractor shall verify that personnel listed on log-in sheet are also on Master List.
7. Review file of OSHA-10 certificates for all on-site personnel required to be certified per RSA 277:5-a.
8. Verify that all mandatory labor posters are posted in a conspicuous, weather-tight place.
9. Submission of list of products, schedule of values, and progress schedule.
10. **Submittal and posting of Excavation Tax Certificate, as required per RSA 72-B if over 1000CY of material are anticipated to be removed from the site.**
11. Designation of personnel representing parties in Contract.
12. Use of premises by State and Contractor.
13. State's requirements and occupancy.
14. Construction facilities and controls provided by State.
15. Temporary utilities provided by State.
16. Security and housekeeping procedures.
17. Schedules.
18. Traffic Control Plan.
19. Application for payment procedures.
20. Procedures for testing.
21. Procedures for maintaining record documents.
22. Requirements for start-up of equipment.
23. Inspection and acceptance of equipment put into service during construction period.

D. Contract Administrator shall record minutes and distribute copies within two days after meeting to participants, with one copy to each person in attendance and one to those affected by decisions made.

1.6 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at maximum Bi-weekly intervals.

B. Attendance Required (unless otherwise waived): Contract Administrator, Clerk of the Works, Using Agency Representative(s), Contractor, Contractor's Superintendent, and major Subcontractors.

C. Potential Agenda Topics:
1. Review minutes of previous meetings.
2. Review of Work progress.
3. Field observations, problems, and decisions.
4. Identification of problems impeding planned progress.
5. Review of submittals schedule and status of submittals.
6. Review Work Certificate Log.
7. Review Master List of subcontractors and on-site personnel.
8. Review daily log-in sheets. Contractor shall verify that all personnel on log-in sheets are on Master List and all OSHA-10 certificates required per RSA 277:5-a are on file.
9. Review of off-site fabrication and delivery schedules.
10. Maintenance of progress schedule.
11. Corrective measures to regain projected schedules.
12. Planned progress during succeeding work period.
13. Traffic Control Plan.
14. Coordination of projected progress.
15. Maintenance of quality and work standards.
16. Effect of proposed changes on progress schedule and coordination.
17. Other business relating to Work.

D. Contractor shall record minutes and distribute copies within two days after meeting to participants, with one copy to each person in attendance and one to those affected by decisions made.

1.7 PRE-INSTALLATION MEETING(S)

A. When required in individual specification sections, convene pre-installation meetings at Project site prior to commencing work of specific section.

B. Require attendance of parties directly affecting, or affected by, Work of specific section.

C. Notify the Contract Administrator seven days in advance of meeting date.

D. Contractor shall prepare agenda and preside at meeting:
1. Review conditions of installation, preparation and installation procedures.
2. Review coordination with related work.

E. Contractor shall record minutes and distribute copies within two days after meeting to participants, with one copy to each person in attendance and one to those affected by decisions made.

PART 2 EXECUTION

2.1 CUTTING AND PATCHING

A. Employ skilled and experienced installer to perform cutting and patching.

B. Submit written request in advance of cutting or altering elements affecting:
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.
5. Work of State 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 to avoid damage to other Work, and to provide proper surfaces to receive patching and finishing.

E. Cut masonry and concrete materials using masonry saw or core drill.

F. Restore Work with new products 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, roof, or floor construction; completely seal voids.

I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated, UL approved material in accordance with Section 07840 to full thickness of penetrated element.

J. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for assembly, refinish entire unit.

K. Identify hazardous substances or conditions exposed during the Work to the Contract Administrator for decision or remedy.

2.2 SPECIAL PROCEDURES

A. Materials: As specified in product sections; match existing with new products and salvaged products for patching and extending work.

B. Employ skilled and experienced installer to perform alteration work.

C. Cut, move, or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion.

D. Remove unsuitable material not marked for salvage, including rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.

E. Remove debris and abandoned items from area and from concealed spaces.

F. Prepare surface and remove surface finishes to permit installation of new work and finishes.

G. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity. Provide temporary heating, cooling and dehumidification systems for specific product requirements identified within specification sections.

H. Remove, cut, and patch Work in manner to minimize damage and to permit restoring products and finishes to original or specified condition.

I. Refinish existing visible surfaces to remain in renovated rooms and spaces, to specified or renewed condition for each material, with neat transition to adjacent finishes.

J. Where new Work abuts or aligns with existing, provide smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.

K. When finished surfaces are cut so that smooth transition with new Work is not possible, terminate existing surface along straight line at natural line of division and submit recommendation to Contract Administrator for review.

L. Where change of plane of 1/4 inch or more occurs, submit recommendation for providing smooth transition to [Contract Administrator for review.

M. Trim existing doors to clear new floor finish. Refinish trim to original or specified condition.

N. Replace portions of existing surfaces, which are damaged, lifted, discolored, or showing other imperfections, which do not conform to product specifications.

O. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.

P. Finish surfaces as specified in individual product sections.

END OF SECTION

State of New Hampshire

DEPARTMENT OF ADMINISTRATIVE SERVICES
25 Capitol Street
Concord, New Hampshire 03301
(603) 271-3201 | Office@das.nh.gov

Charles M. Arlinghaus
Commissioner

Catherine A. Keane
Deputy Commissioner

Sheri L. Rockburn
Assistant Commissioner

August 15, 2025

Sean P. Toomey, Fire Marshal
NH State Fire Marshal Headquarters
Incident Planning and Operations Center (IPOC)
110 Smokey Bear Blvd.
Concord, NH 03301

RE: Permission for contractors to sign permits for projects under contract with the Department of Administrative Services, Division of Public Works Design and Construction.

Dear Fire Marshal Toomey:

I hereby give my permission for contractors who have an active contract with the State of New Hampshire Department of Administrative Services, Division of Public Works Design and Construction, to sign construction permit applications as an agent of the "owner".

Sincerely,

Charles M. Arlinghaus
Commissioner

cma/dph

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Submittal procedures.

B. Construction progress schedules.

C. Subcontractor list.

D. Proposed products list.

E. Product data.

F. Shop drawings.

G. Samples.

H. Design data.

I. Test reports.

J. Certificates.

K. Manufacturer's instructions.

L. Manufacturer's field reports.

M. Construction photographs.

1.2 SUBMITTAL PROCEDURES

A. Contractor to provide and maintain a collaborative, secure, online software for electronic exchanging, reviewing, and archiving construction submittals, RFI's and other design and construction communications. This software is for the use of the Contract Administrator, Clerk of the Works, Owner's Representatives, Architect/Engineer and special consultants and shall allow privileges to read and write. Submittal Exchange is the preferred software supplier, or equal, as approved by the Contract Administrator.

B. Contractor to keep on site one hard-copy of all approved submittals for the Clerk of the Works.

C. At completion of the project the Contactor shall provide two (2) digital copies on compact discs or USB drives and one (1) hard copy in the form of a three-ring binder with all information from contract document software.

D. Transmit each submittal with Division accepted form.

E. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.

F. Identify Project, Contractor, subcontractor and supplier; pertinent drawing and detail number, and specification section number, appropriate to submittal.

G. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents. Incomplete items or items submitted without the Contractor's signed stamp of approval thereon will be returned rejected.

H. Schedule submittals to expedite Project Coordinate submission of related items. Deliver electronically.

I. For each submittal for review, allow 14 days excluding delivery time to and from Architect, Engineer and the Division and Contractor.
   1. All shop drawings to be returned to Contractor from the Contract Administrator. Direct return of shop drawings from Architect or Engineer to Contractor is not permitted unless the Clerk of the Works and DPW Contract Administer is copied.

J. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of completed Work.

K. Allow space on submittals for Contractor and Architect or Engineer review stamps.

L. When revised for resubmission, identify changes made since previous submission.

M. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.

N. Submittals not requested will not be recognized or processed.

O. Work shall not begin until submittal items related to the work have been approved and returned to General Contractor by the Contract Administrator.

1.3 CONSTRUCTION PROGRESS SCHEDULES

A. Submit initial schedules at PreConstruction Meeting.

B. Submit revised Progress Schedules with each Application for Payment.

C. Distribute copies of reviewed schedules to Project site file, subcontractors, suppliers, and other concerned parties.

D. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

E. Submit horizontal bar chart with separate line for each major portion of Work or operation, identifying first work day of each week.

F. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate early and late start, early and late finish, float dates, and duration.

G. Indicate estimated percentage of completion for each item of Work at each submission.

H. Submit separate schedule of submittal dates for shop drawings, product data, and samples, and dates reviewed submittals will be required from Architect or Engineer. Indicate decision dates for selection of finishes. Selection of finishes cannot occur until ALL finish items are submitted and products are approved.

I. Revisions To Schedules:
   1. Indicate progress of each activity to date of submittal, and projected completion date of each activity.
   2. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.
   3. Prepare narrative report to define problem areas, anticipated delays, and impact on Schedule. Report corrective action taken, or proposed, and its effect [including effect of changes on schedules of separate contractors].

1.4 SUBCONTRACTOR LIST

A. Submit list, at the PreConstruction Meeting, of subcontractors setting forth in detail the work for which they will be responsible. In addition, the General Contractor shall identify what work will be performed with the Bidder's own forces.

1.5 PROPOSED PRODUCT LIST

A. Within 15 days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

B. For products specified only by reference standards, indicate manufacturer, trade name, model or catalogue designation, and reference standards.

1.6 PRODUCT DATA

A. Product Data: Submit electronically for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.

B. Mark each Submittal to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

C. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

D. After review, produce copies and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents described in Section 01700.

1.7 SHOP DRAWINGS

A. Shop Drawings: Submit for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.

B. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. Submit electronically to Contract Administrator, Clerk of the Works, Architect, Engineer, Subconsultant, and Using Agency. Contractor to provide as part of close out procedures documents requested by the Agency.

D. After review, electronic copies will be distributed in accordance with SUBMITTAL PROCEDURES article and for record documents described in Section 01700.

1.8 SAMPLES

A. Samples: Submit for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.

B. Samples For Selection as Specified in Product Sections:
1. Submit to Contract Administrator for aesthetic, color, or finish selection.
2. Submit samples of finishes from full range of manufacturers' standard colors, textures, and patterns for Contract Administrator and Architect/Engineer selection and State approval.

C. Submit samples to illustrate functional and aesthetic characteristics of Products, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

D. Include identification on each sample, with full Project information.

E. Submit number of samples specified in individual specification sections; Contract Administrator will retain one sample and Architect or Engineer will retain one sample.

F. Reviewed samples which may be used in the Work are indicated in individual specification sections.

G. Samples will not be used for testing purposes unless specifically stated in specification section.

H. If requested by the Agency after review, produce duplicates and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents purposes described in Section 01700.

I. Submit for Contract Administrator's and Architect or Engineer's knowledge.

J. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.9 TEST REPORTS

A. Submit for Contract Administrator's and Architect or Engineer's and State's knowledge.

B. Submit test reports for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.10 CERTIFICATES

A. When specified in individual specification sections, submit certification by manufacturer, installation/application subcontractor, or Contractor, to Contract Administrator in quantities specified for Product Data.

B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or Product, but must be acceptable to the Contract Administrator.

1.11 MANUFACTURER'S INSTRUCTIONS

A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, adjusting, and finishing, to the Contract Administrator in quantities specified for Product Data.

B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.12 MANUFACTURER'S FIELD REPORTS

A. Submit reports for Contract Administrator's, and Architect and/or Engineer, and State's benefit.

B. Submit report electronically within 7 days of observation to the Contract Administrator for information.

C. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.13 CONSTRUCTION PHOTOGRAPHS

A. Provide photographs of construction throughout progress of Work produced by a photographer, acceptable to the Contract Administrator.

B. Photographs: Submit digital images via e-mail or on compact discs.

C. Take site photographs from differing directions and interior photographs indicating relative progress of the Work.

D. Take photographs as evidence of existing project conditions as follows:
   1. Interior views:
   2. Exterior views:

E. Identify each image. Identify name of Project, contract number orientation of view, date and time of view.

END OF SECTION

SECTION 01400

QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Quality control and control of installation.

B. Tolerances

C. References.

D. Safety

E. Mock-up requirements.

F. Supervision

G. Testing and inspection services.

H. Manufacturers' field services.

I. Examination.

J. Preparation.

1.2 QUALITY CONTROL AND CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality. Prior to acceptance of approved materials on site, establish & maintain controlled environmental conditions required for proper, sequential installations. Products affected by inadequate environmental control (in storage or installed) shall be removed, disposed of and replaced in-kind with no adjustment to the contract price or work schedule.

B. Comply with manufacturers' instructions, including each step in sequence.

C. When manufacturers' instructions conflict with Contract Documents, request clarification from the Contract Administrator before proceeding.

D. The Contractor shall notify the Contract Administrator of any discrepancies, ambiguities or obvious omissions found in the Contract Documents before proceeding with the work affected thereby. Such notification shall be made in writing requesting clarification and/or interpretation with reasonable promptness consistent with and reasonably inferable from the Contract Documents. If the Contractor fails to make such request, no excuse will thereafter be entertained for failure to carry out work in a satisfactory manner, and no monies will be paid for correcting of items.

E. The Contractor Administrator will have 14 days to respond to the Contractor RFI with any additional drawings, specifications or instructions required to define the work in greater detail or to permit the proper progress of the work.

F. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

G. Where, on any of the Drawings, a portion of the work is drawn out and the remainder is indicated in outline, the parts drawn out shall also apply to all other portions of the work.

H. Perform Work by persons qualified to produce required and specified quality.

I. Verify field measurements are as indicated on Shop Drawings or as instructed by manufacturer.

J. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.3 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. When manufacturers' tolerances conflict with Contract Documents, request clarification from the Contract Administrator before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

1.4 REFERENCES

A. Conform to reference standard by date prior to the date of receiving bids, except where specific date is established by code. The standard referred to, except as modified in the specifications, shall have full force and effect as though printed in the Specifications.

B. Obtain copies of standards where required by product specification sections.

C. When specified reference standards conflict with Contract Documents, request clarification from the Contract Administrator before proceeding.

D. Neither contractual relationships, duties, nor responsibilities of parties in Contract nor those of Architect or Engineer shall be altered from Contract Documents by mention or inference otherwise in reference documents.

E. The Contractor shall comply with all applicable Federal, State, Local laws, ordinances, regulations, and requirements to work hereunder, including building code requirements. If the Contractor ascertains at any time that any requirement of this Contract is at variance with applicable laws, ordinances, regulations or building code requirements, he/she shall notify the Contract Administrator in writing.

1.5 SAFETY

A. The Contractor shall, at all times, safely guard the State's property and persons from injury or loss in connection with this Contract. The Contractor shall, at all times, safely guard and protect their own work and that of adjacent property from damage. All passageways, guard fences, lights, and other facilities required for protection by Federal, State or Municipal laws and regulations must be provided and maintained.

B. Place upon the work or any part thereof, only such loads as are consistent with the safety of that portion of the work.

1.6 MOCK-UP REQUIREMENTS

A. Tests will be performed under provisions identified in this section and identified in respective product specification sections.

B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

C. Accepted mock-ups shall be comparison standard for remaining Work.

D. Where mock-up has been accepted by the Contract Administrator and is specified in product specification sections to be removed; remove mock-up and clear area when directed to do so by the Contract Administrator.

1.7 SUPERVISION

A. All work shall be done under the observation and inspection of the Contract Administrator.

B. The Contract Administrator may observe, examine and test materials and workmanship at any and all times during manufacture and/or construction, and at any and all places where such manufacture and/or construction is carried on.

C. The Contract Administrator shall suspend work that may be subject to damage by climatic conditions.

D. Prior to final acceptance, the Contract Administrator at any time before final acceptance of the entire work to make an examination of work already completed that was not specifically called for to receive an inspection prior to covering over, and shall require removing or tearing out same, the Contractor shall, upon request, promptly furnish all necessary facilities, labor, and materials. If such work is found to be defective in any material respect, due to the fault of the Contractor or his Subcontractors, he shall defray all expenses of such examination and of satisfactory reconstruction. If however, such work is found to meet the requirements of the Contract, the actual cost of labor and material necessarily involved in the examination and replacement, shall be completed per a Time and Material Alteration Order.

1.8 TESTING AND INSPECTION SERVICES

A. Employ and pay for services of an independent testing agency or laboratory acceptable to the State to perform specified testing.
   1. Prior to start of Work, submit testing laboratory name, address, and telephone number, and names of full time specialist and responsible officer.
   2. Submit copy of report of laboratory facilities inspection made by Materials Reference Laboratory of National Institute of Standards & Technology during most recent inspection, with memorandum of remedies of deficiencies reported by inspection.

B. The independent firm will perform tests, inspections and other services specified in individual specification sections and as required by the Contract Administrator and Authority having jurisdiction.
   1. Laboratory: Authorized to operate at Project location.
   2. Laboratory Staff: Maintain full time registered Engineer on staff to review services.
   3. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to National Institute of Standards and Technology or accepted values of natural physical constants.

C. Testing, inspections and source quality control may occur on or off project site. Perform off-site testing as required by the Contract Administrator.

D. Reports will be submitted by independent firm to the Contract Administrator [and Contractor], in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
   1. Notify the Contract Administrator and independent firm 24 hours prior to expected time for operations requiring services.
   2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.

F. Testing and employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

G. Re-testing or re-inspection required because of non-conformance to specified requirements shall be performed by same independent firm on instructions by the Contract Administrator. Payment for re-testing or re-inspection will be charged to Contractor.

H. Testing Agency/Laboratory Responsibilities:
   1. Test samples of mixes submitted by Contractor.
   2. Provide qualified personnel at site. Cooperate with the Contract Administrator and Contractor in performance of services.
   3. Perform specified sampling and testing of products in accordance with specified standards.

4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
5. Promptly notify the Contract Administrator and Contractor of observed irregularities or non-conformance of Work or products.
6. Perform additional tests required in accordance with specification sections.
7. Attend preconstruction meetings and progress meetings.

I. Testing Agency/Laboratory Reports: After each test, promptly submit two copies of report to the Contract Administrator and two to the Contractor. When requested by the Contract Administrator or Contractor, provide interpretation of test results. Include the following:
1. Date issued.
2. Project title and number.
3. Name of inspector.
4. Date and time of sampling or inspection.
5. Identification of product and specifications section.
6. Location in Project.
7. Type of inspection or test.
8. Date of test.
9. Results of tests.
10. Conformance with Contract Documents.

J. Limits On Testing Agency/Laboratory Authority:
1. Testing Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Testing Agency or laboratory may not approve or accept any portion of the Work.
3. Testing Agency or laboratory may not assume duties of Contractor.
4. Testing Agency or laboratory has no authority to stop the Work.

1.9 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, as applicable, and to initiate corrective instructions when necessary.

B. Submit qualifications of observer to the Contract Administrator 14 days in advance of required observations.

C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

D. Refer to Section 01330 - SUBMITTAL PROCEDURES, MANUFACTURERS' FIELD REPORTS article.

PART 2 EXECUTION

2.1 EXAMINATION

A. Verify existing site conditions, controlled environment, protective measures and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

B. Verify existing substrate is capable of structural support or attachment of new Work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections. Notify the Contract Administrator and the Clerk of the Works of conditions, which prevent start of work.

D. Verify utility services are available, of correct characteristics, and in correct locations.

2.2 PREPARATION

A. Maintain specific environmental controls required in individual sections.

B. Clean substrate surfaces prior to applying next material or substance.

C. Seal cracks or openings of substrate prior to applying next material or substance.

D. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Temporary Utilities:
   1. Temporary electricity.
   2. Temporary lighting for construction purposes.
   3. Temporary ventilation.
   4. Temporary sanitary facilities.

B. Construction Facilities:
   1. Field offices and sheds.
   2. Vehicular access.
   3. Parking.
   4. Progress cleaning and waste removal.
   5. Project identification.

C. Temporary Controls:
   1. Barriers.
   2. Enclosures and fencing.
   3. Security.
   4. Water control.
   5. Dust control.
   6. Noise control.
   7. Pest control.
   8. Pollution control.
   9. Rodent control.

D. Removal of utilities, facilities, and controls.

E. All work completed herein must conform to applicable state, federal requirements, and guidelines at the Contractor's expense as is necessary to complete the Work.

1.2 TEMPORARY ELECTRICITY

A. State will pay cost of energy used. Exercise measures to conserve energy. Utilize State's existing power service.

B. Do not disrupt State's use of service.

C. Complement existing power service capacity and characteristics as required for construction operations.

D. Provide power outlets, with branch wiring and distribution boxes located [at each floor as required for construction operations. Provide flexible power cords as required for portable construction tools and equipment.

Permanent convenience receptacles may not be utilized during construction.

1.3 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

A. Provide and maintain lighting for construction operations.

B. If required provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps for specified lighting levels.

C. Maintain lighting and provide routine repairs.

D. Permanent building lighting may be utilized during construction.

1.4 TEMPORARY VENTILATION

A. Ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

B. Utilize existing ventilation equipment. Extend and supplement equipment with temporary fan units as required to maintain clean air for construction operations.

1.5 TEMPORARY SANITARY FACILITIES

A. Existing designated facilities may be used during construction operations. Maintain daily in clean and sanitary condition.

B. At end of construction, return existing facilities to same or better condition as original condition.

1.6 FIELD OFFICES AND SHEDS

A. Designated existing spaces may be used for field offices and for storage:
1. To be determined by the Agency.

B. Clerk of the Works Office:
1. Separate space for sole use of Contract Administrator, Clerk of the Works and Architect/Engineer location to be determined by the Agency.

C. Storage Areas And Sheds: Size to storage requirements for products of individual Sections, allowing for access and orderly provision for maintenance and for inspection of products to requirements of Section 01600.

D. Preparation: Fill and grade sites for temporary structures sloped for drainage away from buildings.

E. Maintenance And Cleaning:
   1. Maintain approach walks free of mud, water, and snow.

F. Removal: At completion of Work remove buildings, foundations, utility services, and debris. Restore areas.

1.7 VEHICULAR ACCESS

A. Provide unimpeded access for emergency vehicles.

B. Provide and maintain access to fire hydrants and control valves free of obstructions.

C. Provide means of removing mud from vehicle wheels before entering streets.

D. Use existing on-site roads for construction traffic.

1.8 PARKING

A. Locate parking as approved by the Agency.

B. When site space is not adequate, provide additional off-site parking.

C. Use of designated areas of existing parking facilities used by construction personnel is permitted.

D. Do not allow heavy vehicles or construction equipment in parking areas.

E. Permanent Pavements and Parking Facilities:
   1. Avoid traffic loading beyond paving design capacity. Tracked vehicles not allowed.
   2. Use of permanent parking structures is[permitted not permitted.

F. Maintenance:
   1. Maintain traffic and parking areas in sound condition free of excavated material, construction equipment, products, mud, snow, and ice.
   2. Maintain existing and permanent paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.

G. Removal, Repair:
   1. Repair existing permanent facilities damaged by use, to original condition.

H. Mud From Site Vehicles: Provide means of removing mud from vehicle wheels before entering streets.

1.9 PROGRESS CLEANING AND WASTE REMOVAL

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing spaces.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and rubbish from site periodically dispose off-site.

E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.10 PROJECT IDENTIFICATION

A. Project Identification Sign: Exact location by DPW and the Agency
   1. One painted sign of construction and design as shown in sample attached to end of specification section Painted sign, 32 sq ft area, bottom 6 feet above ground.
   2. Content: Specific information to be determined after Award of Contract.
      a. Project number, title, logo and name of State Entity as indicated on Contract Documents.
      b. Names Commissioner and Governor.
      c. Names and titles of Architect/Engineer and Consultants.
      d. Name of Prime Contractor and major Subcontractors.
      e. Contract Amount.
      f. Legislation that authorized project.
   3. Graphic Design, Colors, Style of Lettering: As shown in attached sample at end of specification section.
   4. Lettering: Typeface – Times New Roman, Univers, Arial or CG Omega.

B. Project Informational Signs:
   1. Painted informational signs of same colors and lettering as Project Identification sign, or standard products.
   2. Provide sign at each field office, storage shed, and directional signs to direct traffic into and within site if required.
   3. No other signs are allowed except those required by law.

C. Design sign and structure to withstand 60 miles/hr wind velocity.

D. Sign Painter: Experienced as professional sign painter for minimum three years.

E. Finishes, Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.

F. Show content, layout, lettering, color, foundation, structure and sizes.

G. Sign Materials:
   1. Structure and Framing: New, or used, wood or metal, structurally adequate.
   2. Sign Surfaces: Exterior grade plywood with medium density overlay, minimum 3/4 inches thick, standard large sizes to minimize joints.
   3. Rough Hardware: Galvanized.

4. Paint and Primers: Exterior quality, two coats; sign background of WHITE color.
5. Lettering: Exterior quality paint, BLACK color.

H. Installation:
1. Install project identification sign prior to start of construction.
2. Erect at designated location.
3. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.
4. Install sign surface plumb and level, with butt joints. Anchor securely.
5. Paint exposed surfaces of sign, supports, and framing.

I. Maintenance: Maintain signs and supports clean, repair deterioration and damage.

J. Removal: Remove signs, framing, supports, and foundations at completion of Project and restore area.

1.11 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas to allow for State's use of site, and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.12 ENCLOSURES AND FENCING

A. Interior Enclosures:
1. Provide temporary partitions as required to prevent penetration of dust and moisture into State occupied areas, and to prevent damage to existing materials and equipment.
2. Construction: Framing and reinforced polyethylene, plywood, gypsum board sheet materials with closed joints and sealed edges at intersections with existing surfaces:

1.13 SECURITY

A. Security Program:
1. Protect Work existing premises and State's operations from theft, vandalism, and unauthorized entry.
2. Initiate program in coordination with State's existing security system at project mobilization.
3. Maintain program throughout construction period until directed by the Contract Administrator.

B. Entry Control:
1. Control entrance of persons and vehicles into Project site and existing facilities.
2. Allow entrance only to authorized persons with proper identification.
3. Maintain log of workers and visitors, make available to State on request.

4. Control entrance of persons and vehicles related to State's operations.
5. Coordinate access of State's personnel to site in coordination with Agency.

C. Personnel Identification:
1. Provide identification clothing to each person authorized to enter premises.

D. Restrictions:
1. Do not allow cameras on site or photographs taken except by written approval of the State.

1.14 DUST CONTROL

A. Execute Work by methods to minimize raising dust from construction operations.

B. Provide positive means to prevent air-borne dust from dispersing into facility spaces.

1.15 NOISE CONTROL

A. Provide methods, means, and facilities to minimize noise from produced by construction operations.

1.16 PEST CONTROL

A. Provide methods, means, and facilities to prevent pests and insects from facility.

1.17 POLLUTION CONTROL

A. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

B. Comply with pollution and environmental control requirements of authorities having jurisdiction.

1.18 RODENT CONTROL

A. Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

1.19 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Final Application for Payment inspection.

B. Clean and repair damage caused by installation or use of temporary work.

C. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to original condition.

STATE OF NEW HAMPSHIRE
CAPITAL IMPROVEMENT PROJECT

Concord Main Building Rewiring Phase 1

AUTHORIZATION: CHAPTER ###:# (*) (*) , Laws of 200* as amended by ###:## (*******), Laws of 200#

CONTRACT : $ 0.00

HONORABLE Kelly Ayotte, GOVERNOR

ARCHITECT
Richardson Engineering
South Berwick, Maine

CONTRACTOR
**********.
*********, NH

NEW HAMPSHIRE DEPARTMENT OF ADMINISTRATIVE SERVICES
DIVISION OF PUBLIC WORKS DESIGN & CONSTRUCTION

Scale: 1" = 1' - 0" (4' -0" x 8' -0" overall sign dimensions)

END OF SECTION

SECTION 01505

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Construction waste management plan.
   2. Construction waste recycling.
   3. Construction waste adaptive reuse.

1.2 PLAN REQUIREMENTS

A. Construction Waste Management Plan shall be developed with the following intent:
   1. Divert construction, demolition, and land clearing debris from landfill disposal.
   2. Redirect recyclable material back to manufacturing process.

B. Develop and implement a Construction Waste Management plan to be reviewed by the Contract Administrator for compliance with the following
   1. Divert 75 % of Project generated waste from landfills.

1.3 SUBMITTALS

A. Section 01330 - Submittal Procedures: Requirements for submittals.

B. Construction Plan: Submit construction waste management plan describing methods and procedures for implementation and monitoring compliance including the following:
   1. Project specific analysis of the projected jobsite waste to be generated. Include materials and estimated quantities (weight/volume) of projected waste.
   2. Construction waste materials anticipated for recycling and adaptive reuse.
   3. On site sorting and site storage methods.
   4. Name and location of landfill(s) to be used.
   5. Certification from the landfill of ability to receive the types of waste to be generated and of sufficient capacity to accept the waste.
   6. Transportation company hauling construction waste to waste processing facilities.
   7. Recycling and adaptive reuse processing facilities and waste type each facility will accept.

C. Submit documentation with each application for payment substantiating that the construction waste management plan goals are being achieved. Include the following information:
   1. Material category
   2. Trash: Quantity by weight deposited in landfills.

3. Salvaged, recovered and recycled material: Quantity by weight with destination for each type of material salvaged or recovered for resale, recycling, or adaptive reuse.

1.4 CLOSEOUT SUBMITTALS

A. Section 01700 - Execution Requirements: Requirements for submittals.

B. Waste Management final report: Prior to Completion, submit a written Waste Management Final report summarizing the types and quantities of materials recycled and disposed of under the Waste Management Plan. Include the name and location of disposal facilities. Include the following:
1. Material category
2. Total quantity of waste, by weight
3. Quantity of waste salvaged, both estimated and actual, by weight
4. Quantity of waste recycled, both estimated and actual, by weight
5. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste. (Compare to minimum requirement of 75% by weight of waste.)

1.5 CONSTRUCTION WASTE MANAGEMENT PLAN

A. Construction Waste Landfill Diversion: Minimum 75 percent by weight of construction waste materials for duration of Project through resale, recycling, or adaptive reuse.

B. Implement construction waste management plan at start of construction.

C. Review construction waste management plan at pre-construction meeting and progress meetings.

D. Distribute the Construction Waste Management Plan to subcontractors and others affected by Plan Requirements.

E. Oversee plan implementation, instruct construction personnel for plan compliance, and document plan results.

F. Manager: The Contractor shall designate on-site personnel responsible for instructing workers and overseeing and documenting results of the Waste Management Plan for the Project.

1.6 CONSTRUCTION WASTE RECYCLING

A. Use source separation method or co-mingling method suitable to sorting and processing method of selected recycling center.

B. Source Separation Method: Recyclable materials separated from trash and sorted into separate bins or containers, identified by waste type, prior to transportation to recycling center.

C. Co-Mingling Method: Recyclable materials separated from trash and placed in unsorted bins or container for sorting at recycling center.

D. Materials recommended for recycling include:
1. Packing materials including paper, cardboard, foam plastic, and sheeting.
2. Recyclable plastics.
3. Glass, clear and colored types.
4. Metals.
5. Gypsum products.
6. Carpeting.
7. Electrical panels and conductors

PART 2 EXECUTION

2.1 CONSTRUCTION WASTE COLLECTION

A. Collect construction waste materials in containers identified for specific waste materials and arrange for transportation to recycling centers or adaptive salvage and reuse processing facilities.

B. Maintain recycling and adaptive reuse storage and collection area in orderly arrangement with materials separated to eliminate co-mingling of materials required to be delivered separately to waste processing facility.

C. Store construction waste materials to prevent environmental pollution, fire hazards, hazards to persons and property, and contamination of stored materials.

D. Cover construction waste materials subject to disintegration, evaporation, settling, or runoff to prevent polluting air, water, and soil when not in use.

E. . Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid contamination of materials. Location shall be acceptable to the Contract Administrator.

2.2 CONSTRUCTION WASTE DISPOSAL

A. Deliver construction waste to waste processing facilities. Obtain receipt for deliveries.

B. Dispose of construction waste, not capable of being recycled or adaptively reused, by delivery to landfill, incinerator, or other legal disposal facility. Obtain receipt for deliveries.

END OF SECTION

SECTION 01600

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Products.

B. Product delivery requirements.

C. Product storage and handling requirements.

D. Product options.

E. Product substitution procedures.

F. Equipment electrical characteristics and components.

1.2 PRODUCTS

A. Furnish products of qualified manufacturers suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise.

B. All materials and equipment shall be new, except as specifically permitted by Contract Documents.

C. Furnish interchangeable components from same manufacturer for components being replaced.

D. The use of asbestos containing materials shall be prohibited.

1.3 PRODUCT DELIVERY REQUIREMENTS

A. Transport and handle products in accordance with manufacturer's instructions.

B. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.

C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.4 PRODUCT STORAGE AND HANDLING REQUIREMENTS

A. Store and protect products in accordance with manufacturers' instructions.

B. Store with seals and labels intact and legible.

C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

D. For exterior storage of fabricated products, place on sloped supports above ground.

E. Provide bonded off-site storage and protection when site does not permit on-site storage or protection only with prior approval from the Contract Administrator.

F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

G. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.

H. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.5 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers with or without provision for substitutions: Products of one of manufacturers named and meeting specifications, no options or substitutions allowed. Submit request for substitution for any manufacturer not named in accordance with the following article.

1.6 PRODUCT SUBSTITUTION PROCEDURES

A. Where Bidding Documents stipulate particular Products, substitution requests will ONLY be considered before receipt of Bids. Submit requests per the requirements specified in this section.

1. All requests shall be submitted to the Contract Administrator not later than eight (8) working days before the hour and day set for bid opening. Incomplete requests or requests received after this deadline will not be considered.
2. All requests that are approved and are acceptable to the Department will be issued as part of an Addendum to each Bidder who has received a set of bidding documents, so that all Bidders may avail themselves of the change in submitting their Proposals.

B. Substitutions [may] be considered after bid opening when a product becomes unavailable through no fault of the Contractor. The Contractor shall apply to the Contract Administrator, in writing, within ten (10) days of his realizing his inability to furnish the article specified, describing completely the substitution he desires to make. The Contractor shall include a dated written statement from the manufacturer outlining an explanation for the unavailability of the product. Substitutions for reasons of lead times, i.e., the time between when the Contractor orders necessary materials from the vendor

and anticipated delivery, will only be reviewed if the lead time is more than the length of the contract time. The Department may extend the contract time to accommodate the product specified. No additional costs from the Contractor will be considered due to the fact that the Contractor shall verify lead times and coordinate with contract time during the bidding phase.

C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

D. A request constitutes a representation that Bidder:
1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.
2. Will provide same warranty for Substitution as for specified product.
3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to the State.
4. Waives claims for additional costs or time extension which may subsequently become apparent.
5. Will reimburse Department and Architect and/or Engineer for review or redesign services associated with re-approval by authorities having jurisdiction.

E. Substitutions will not be considered when they are indicated or implied on Shop Drawing or Product Data submittals, without separate written request, or when acceptance will require revision to Contract Documents.

F. Substitution Submittal Procedure:
1. Submit three copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
2. Submit Shop Drawings, Product Data, and certified test results attesting to proposed product equivalence. Burden of proof is on proposer.
3. The Department will notify Bidders in writing of decision to accept by issuing an addendum.

PART 2 PRODUCTS

2.1 EQUIPMENT ELECTRICAL CHARACTERISTICS AND COMPONENTS

A. Wiring Terminations: Furnish terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Include lugs for terminal box.

B. Cord and Plug: Furnish minimum 6 foot (2 m) cord and plug including grounding connector for connection to electric wiring system. Cord of longer length is specified in individual specification sections.

END OF SECTION

SECTION 01700

EXECUTION REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Closeout procedures.

B. Final cleaning.

C. Starting of systems.

D. Demonstration and instructions.

E. Protecting installed construction.

F. Project record documents.

G. Operation and maintenance data.

H. Manual for equipment and systems.

I. Spare parts and maintenance products.

J. Product warranties and product bonds.

K. Clean air certification.

L. Maintenance service.

M. Guarantee of work.

1.2 CLOSEOUT PROCEDURES

A. Submit a signed Substantial Completion Application attesting that the Contract Documents have been reviewed, Work has been inspected, and that all Work is complete in accordance with Contract Documents and ready for Contract Administrator review. The Substantial Completion Application for use by the Contractor is attached to the end of this specification section. The Contract Administrator may modify this Agreement to accommodate any changes in Work.

1. Provide submittals to the Contract Administrator as required by the Contract Documents and as required by authorities having jurisdiction.

B. Only after completion of all Punch List items and submission of all items the Contractor shall submit a Final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

C. State will occupy all portions of building as specified in Section 01100.

1.3 FINAL CLEANING

A. Execute final cleaning prior to final project assessment.

B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

C. Clean equipment and fixtures to sanitary condition with cleaning materials appropriate to surface and material being cleaned.

D. Clean/Replace filters of operating equipment.

E. Remove waste and surplus materials, rubbish, and construction facilities from site.

1.4 STARTING OF SYSTEMS

A. Coordinate schedule for start-up of various equipment and systems.

B. Notify the Contract Administrator seven days prior to start-up of each item.

C. Verify tests, meter readings, and specified electrical characteristics agree with those required by equipment or system manufacturer.

D. Verify wiring and support components for equipment are complete and tested.

E. Submit a written report in accordance with Section 01330 that equipment or system has been properly installed and is functioning correctly.

1.5 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of products to State's personnel two weeks prior to date of Substantial Completion.

B. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with State's personnel in detail to explain all aspects of operation and maintenance.

C. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

D. Required instruction time for each item of equipment and system is specified in individual sections.

E. Electronic Video Demonstration and Instructions and deliver file to the Contract Administer.

1.6 PROTECTING INSTALLED CONSTRUCTION

A. Protect installed Work and provide special protection where specified in individual specification sections.

B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

1.7 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
1. Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Reviewed Shop Drawings, Product Data, and Samples.
6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by State.

C. Record information concurrent with construction progress, not less than weekly.

D. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
1. Manufacturer's name and product model and number.
2. Product substitutions or alternates utilized.
3. Changes made by Addenda and modifications.

E. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
1. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
2. Field changes of dimension and detail.
3. Conform into the Record Drawings Details/RFI's not on original Contract drawings.

F. Submit documents to the Contract Administrator at time of Substantial Completion.

G. In addition to the above requirements, record drawings shall also be submitted in AutoCAD (.dwg) format.

1.8 OPERATION AND MAINTENANCE DATA

A. Submit data electronically and bound in 8-1/2 x 11 inch (A4) text pages, three D side ring binders with durable plastic covers.

B. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, and subject matter of binder when multiple binders are required.

C. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.

D. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

E. Contents: Prepare Table of Contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:

1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Engineer(s), Contractor, Subcontractors, and major equipment suppliers.
2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
   a. Significant design criteria.
   b. List of equipment.
   c. Parts list for each component.
   d. Operating instructions.
   e. Maintenance instructions for equipment and systems.
   f. Maintenance instructions for [special] finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
3. Part 3: Project documents and certificates, including the following:
   a. Shop drawings and product data.
   b. Certificates.
   c. Originals of warranties and bonds.

1.9 MANUAL FOR MATERIALS AND FINISHES

A. Submit electronically and two copies of preliminary draft or proposed formats and outlines of contents before start of Work. The Contract Administrator will review draft and return one copy with comments.

B. For equipment, or component parts of equipment put into service during construction and operated by State, submit documents within ten days after acceptance.

C. Submit one copy of completed volumes 15 days prior to Substantial Completion. Draft copy be reviewed and returned after Substantial Completion, with Architect/Engineer comments. Revise content of document sets as required prior to final submission.

D. Submit two sets of revised final volumes in final form prior to final inspection.

E. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations. Include information for re-ordering custom manufactured products.

F. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

G. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Include recommendations for inspections, maintenance, and repair.

H. Additional Requirements: As specified in individual product specification sections.

I. Include listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.10 MANUAL FOR EQUIPMENT AND SYSTEMS

A. Submit electronically and two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Contract Administrator will review draft and return one copy with comments.

B. For equipment, or component parts of equipment put into service during construction and operated by State, submit documents within ten days after acceptance.

C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed by label machine.

D. Include color coded wiring diagrams as installed.

E. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions.

F. Include manufacturer's printed operation and maintenance instructions.

G. Include listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.

1.11 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Furnish spare parts, maintenance, and extra products in quantities specified in individual specification sections.

B. Deliver to Project site and place in location as directed by State; obtain receipt prior to final payment.

1.12 PRODUCT WARRANTIES AND PRODUCT BONDS

A. Obtain warranties and bonds executed in duplicate by responsible subcontractors, suppliers, and manufacturers, within ten days after Substantial Completion. All warranties start dates shall be the Substantial Completion Date, if project is phased all warranties to start at the date of Substantial Completion of each phase.

B. Execute and assemble transferable warranty documents and bonds from subcontractors, suppliers, and manufacturers.

C. Verify documents are in proper form, contain full information, and are notarized.

D. Co-execute submittals when required.

E. Include Table of Contents and assemble in three D side ring binder with durable plastic cover.

F. Submit prior to final Application for Payment.

G. Time Of Submittals:
   1. For equipment or component parts of equipment put into service during construction with State's permission, submit documents within ten days after acceptance.
   2. Make other submittals within ten days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing date of acceptance as beginning of warranty or bond period.

1.13 CLEAN AIR CERTIFICATION

A. The Contractor shall employ the services of a Certified Industrial Hygienist using a laboratory accredited by the American Industrial Hygiene Association to comply with **RSA 10-B, ENV-A 2200** Clean Air in State Buildings Rules (New Hampshire Air Program Rules).

B. Certification of properly collected and analyzed data that demonstrates compliance with said standards will be made by the Department of Environmental Services, Bureau of Environmental and Occupational Health, Radon Indoor Air Quality Program, 29 Hazen Drive, Concord, NH 03302-0095, telephone 603/271-3911) upon receipt of data submitted by the Certified Industrial Hygienist.

C. In accordance with Env-A 2200 & Env-A 2205 Standards, the following must be addressed:
   1. Ventilation.
   2. Noise.
   3. Radon.
   4. Carbon Dioxide.
   5. Asbestos.
   6. Formaldehyde.

7. Carbon Monoxide

D. The Contractor shall furnish the Clean Air Certification to the Contract Administrator **prior** to project Substantial Completion and before building occupancy.

1.14 GUARANTEE OF WORK

A. Except as otherwise specified, all work shall be guaranteed by the Contractor against defects resulting form the use of inferior materials, equipment or workmanship for one (1) year from the Date of Substantial Completion of the work.

B. If, within any guarantee period, repairs or changes are required in connection with guaranteed work, which in the opinion of the Contract Administrator, is rendered necessary as a result of the use of materials, equipment or workmanship which are inferior, defective, or not in accordance with the terms of the Contract shall, promptly upon receipt of notice from the Commissioner, and at his own expense:

1. Place in satisfactory condition in every particular, all such guaranteed work, correct all defects therein.
2. Make good all damage to the building or site, or equipment or contents thereof, which in the opinion of the Contract Administrator, is the result of the use of materials, equipment or workmanship which are inferior, defective, or not in accordance with the terms of the Contract.
3. Make good any work or material, or the equipment and contents of said building or site disturbed in fulfilling any such guarantee.

C. In any case, wherein fulfilling the requirements of the Contract or of any guarantee, embraced in or required thereby, the Contractor disturbs any work guaranteed under another contract, he shall restore such disturbed work to a condition satisfactory to the Contract Administrator and guarantee such restored work to the same extent as it was guaranteed under such other contracts.

D. If the Contractor, after notice, fails to proceed promptly to comply with the terms of the guarantee, the Commissioner may have the defects corrected and the Contractor and his/her Surety shall be liable for all expense incurred.

E. All special guarantees applicable to definite parts of the work that may be stipulated in the Specifications or other papers forming a part of the Contract shall be subject to the term of this paragraph during the first year of the life of such special guarantee.

F. Failure to adhere to guarantee terms may result in suspension or barring from the prequalification list, or, alternatively, the requirement of a Letter of Credit or other guaranty equal to a percentage of the Contract amount.

END OF SECTION

SECTION 02 41 19 - SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
1. Demolition and removal of selected portions of a building or structure.
2. Disconnecting, capping or sealing, and abandoning utilities.
3. Repair procedures for selective demolition operations.

1.3 DEFINITIONS

A. Remove: Remove and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain the Owner's property.

B. Remove and Salvage: Items indicated to be removed and salvaged remain the Owner's property. Remove, clean, and pack or crate items to protect against damage. Identify contents of containers and deliver to Owner's designated storage area.

C. Remove and Reinstall: Remove items indicated; clean, service, and otherwise prepare them for reuse; store and protect against damage. Reinstall items in the same locations or in locations indicated.

D. Existing to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Architect, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.

1.4 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.

B. Carefully remove items indicated to be salvaged in a manner to prevent damage and deliver promptly to the Owner.

1.5 SUBMITTALS

A. General: Submit in accordance with Division 01.

B. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

C. Proposed Dust-Control and Noise-Control Measures: Submit statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation. Identify options if proposed measures are later determined to be inadequate.

D. Schedule of Selective Demolition Activities: Indicate the following:
1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
2. Interruption of utility services.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Use of stairs.
5. Detailed sequence of selective demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.
6. Coordination of Owner's continuing occupancy of portions of existing building..
7. Locations of temporary partitions and means of egress.

E. Inventory of items to be removed and salvaged.

F. Inventory of items to be removed by Owner.

G. Record Drawings at Project closeout according to Division 01.
1. Identify and accurately locate capped utilities and other subsurface structural, electrical, or mechanical conditions.

H. Pre-demolition Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by selective demolition operations. Submit before Work begins.

1.6 QUALITY ASSURANCE

A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.

B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.

C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

D. Standards: Comply with ANSI A10.6 and NFPA 241.

E. Pre-demolition Conference: Conduct conference at Project site. Review methods and proceduresrelated to selective demolition including, but not limited to, the following:
1. Inspect and discuss condition of construction to be selectively demolished.

2. Review structural load limitations of existing structure.
3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
5. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.
6. Provide 72-hour minimum advance notice to participants prior to convening pre-demolition conference.

1.7 PROJECT CONDITIONS

A. Owner will occupy portions of the building immediately adjacent to selective demolition area. Conduct selective demolition so that Owner's operations will not be disrupted. Provide not less than 72 hours to Owner of activities that will affect Owner's operations.

B. Owner assumes no responsibility for condition of areas to be selectively demolished.
1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work. Hazardous materials will be removed by Owner under a separate contract.
1. If materials suspected of containing hazardous materials (i.e. asbestos, PCBs) are encountered, do not disturb; immediately notify Architect and Owner.
2. If lead paint is encountered, notify the Architect. As a minimum, comply with OSHA 1926.62 federal guidelines regarding safety of employees in exposure to lead in construction.

D. Storage or sale of removed items or materials on-site will not be permitted.

E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
1. Maintain fire-protection facilities in service during selective demolition operations.

1.8 SCHEDULING

A. Arrange selective demolition schedule so as not to interfere with Owner's on-site operations.

PART 2 - PRODUCTS

2.1 REPAIR MATERIALS

A. Use repair materials identical to existing materials.
1. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
2. Use materials whose installed performance equals or surpasses that of existing materials.

B. Comply with material and installation requirements specified in individual Specification Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to the Architect.

E. Engage a professional engineer to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.
   1. Engineer shall develop shoring and underpinning plans and procedures for removal of structural components indicated to be removed.

F. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES

A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.
   1. Do not interrupt existing utilities serving occupied or operating facilities, except when authorized in writing by Owner or authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to governing authorities.
      a. Provide not less than 72 hours' notice to Owner if shutdown of service is required during changeover.

B. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished.
   1. Owner will arrange to shut off indicated utilities when requested by Contractor.
   2. Where utility services are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary utilities that bypass area of selective demolition and that maintain continuity of service to other parts of building.
   3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.
   4. Existing piping, conduit, and panels to remain that are supported by walls and ceilings to be demolished, shall be temporarily re-supported to the existing structure until permanent construction is in place.

C. Utility Requirements: Refer to Divisions 23 and 26 Sections for shutting off, disconnecting, removing, and sealing or capping utilities. Do not start selective demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.3 PREPARATION

A. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
   1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
   2. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.

B. Temporary Partitions: Erect and maintain dustproof partitions and temporary enclosures and provide exhaust ventilation to limit dust and dirt migration and to separate areas from fumes and noise.

C. Core Drilling and Saw Cutting: All penetrations shall be fully planned and coordinated by the Contractor. Vacuum up water created by cutting operations to prevent damage to materials to remain.

D. Enclose openings to the exterior and to unconditioned spaces to prevent heat loss and maintain temperature at an acceptable level for Owner.

3.4 POLLUTION CONTROLS

A. Dust Control: Use water mist, temporary enclosures, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.
   1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

B. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
   1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent or ascent.

C. Cleaning: Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.5 SELECTIVE DEMOLITION

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
   1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
   2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations, and after until chance of fire has past.
5. Maintain adequate ventilation when using cutting torches.
6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
9. Break up and remove concrete slabs on grade and foundations where indicated.
10. Dispose of demolished items and materials promptly. On-site storage or sale of removed items is prohibited.
11. Remove and replace or reinstall existing construction as necessary to permit installation and alteration of mechanical and electrical work. Coordinate all removals with appropriate trades.
12. Return elements of construction and surfaces to remain to condition existing before start of selective demolition operations.

B. Existing Facilities: Comply with Owner's requirements for using and protecting stairs, walkways, building entries, and other building facilities during selective demolition operations.

C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.

D. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI-WP and its Addendum.
1. Remove residual adhesive and prepare substrate for new floor coverings by one of the methods recommended by RFCI.

3.6 BRACING

A. Locate bracing to clear columns, and other permanent work. If necessary to move a brace, install new bracing prior to removal of original brace.

B. Do not place bracing where it will be cast into or included in permanent work, except as otherwise acceptable to Architect.

C. Install internal bracing, if required, to prevent spreading or distortion to braced frames.

D. Maintain bracing until structural elements are re-braced by other bracing or until permanent construction is able to withstand pressures.

3.7 PATCHING AND REPAIRS

A. General: Promptly repair damage to adjacent construction caused by selective demolition operations.

B. Patching: Comply with Division 01.

C. Work Exposed to View: Do not cut or patch in a manner that would, in the Architect's opinion, result in a lessening of the building's aesthetic qualities. Generally, cut from exposed side into concealed spaces to avoid unnecessary damage to finish. Do not cut and patch in a manner that would result in substantial visual evidence of cut and patch work. Restore exposed finishes of patched areas in a manner, which eliminates evidence of patching and refinishing. For continuous surfaces, extend refinish to nearest intersection, with a neat transition to adjacent surfaces.

D. Repairs: Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
1. Completely fill holes and depressions in existing masonry walls that are to remain with an approved masonry patching material applied according to manufacturer's written recommendations.

E. Finishes: Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

F. Floors and Walls: Where walls or partitions that are demolished extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
1. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
2. Where patching occurs in a painted surface, apply primer and intermediate paint coats over patch and apply final paint coat over entire unbroken surface containing patch. Provide additional coats until patch blends with adjacent surfaces.
3. Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.

3.8 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.9 CLEANING

A. Sweep the building broom clean on completion of selective demolition operation.

B. Change filters on air-handling equipment exposed to demolition operations on completion of selective demolition operation.

END OF SECTION 02 41 19

SECTION 06 10 53 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. A. Section Includes:

1. Wood blocking and nailers.
2. Plywood backing panels.

1.2 DEFINITIONS

A. Rough Carpentry: Carpentry work not specified in other Sections and not exposed, unless otherwise indicated

B. Dimensional Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension

C. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. NELMA – Northeastern Lumber Manufacturers Association.
2. NLGA – National Grades Authority

1.3 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For the following, from ICC-ES:

1. Preservative-treated wood.
2. Power-driven fasteners.

2 PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agencyis indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood framing members that are less than 18 inches (460 mm) above the ground.
3. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners of Type 304 stainless steel.

B. Nails, Brads and Staples: ASTM F 1667

C. Power-Driven Fasteners: NES NER-272.
D. Wood Screws: ASME B18.6.1
E. Screws for Fastening to Metal Framing: length as recommended by screw manufacturer for material being fastened.

3 PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit.
B. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
C. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
D. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant treated plywood backing panels with classification marking of testing agency exposed to view.
E. Do not splice structural members between supports unless otherwise indicated.
F. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
G. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
   1. NES NER-272 for power-driven fasteners.
   2. Table 2304.10.1, "Fastening Schedule," in ICC's International Building Code.
   3. National Evaluation Report No. NER-272 for pneumatic or mechanical driven staples, P-nails, and fasteners.

3.2 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 06 10 53

SECTION 07 84 13 - PENETRATION FIRESTOPPING

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.

1.2 SUMMARY

A. Section Includes:
1. Penetrations in fire-resistance-rated walls.
2. Penetrations in horizontal assemblies.
3. Penetrations in smoke barriers.
4. Compliance with requirements of UL assemblies indicated for fire-rated construction.

B. Related Sections:
1. Division 07 Section "Joint Sealants" for non-fire-resistive joint sealants.
2. Division 09 Section "Gypsum Board" for firestopping where fire rated gypsum board assemblies butt adjacent construction including masonry, steel deck, joists,beams, floors, roofs and structural members.
3. Division 09 Section "Painting" for identification of walls with penetration firestopping.
4. Division 22 sections specifying duct and piping penetrations, including fire- suppression piping.
5. Division 26 sections specifying cable and conduit penetrations.

1.3 SUBMITTALS

A. General: Submit in accordance with Division 01 Section "Submittal Procedures."

B. Product Data: For each type of product indicated. Include installation instructions.

C. Product Schedule: For each penetration firestopping system. Include location and design designation of qualified testing and inspecting agency.
1. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping condition, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

D. Qualification Data: For qualified Installer.

E. Installer Certificates: From Installer indicating penetration firestopping has been installed in compliance with requirements and manufacturer's written recommendations.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A firm that has been approved by FM Global according to FM Global 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver through-penetration firestop system products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer; date of manufacture; lot number; shelf life, if applicable; qualified testing and inspecting agency's classification marking applicable to Project; curing time; and mixing instructions for multicomponent materials.

B. Store and handle materials for through-penetration firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not install penetration firestopping when ambient or substrate temperatures are outside limits permitted by penetration firestopping manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.

B. Install and cure penetration firestopping per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.7 COORDINATION

A. Coordinate Work of this Section with the work of other trades to assure the proper sequencing of each installation and to provide a fire- and smoke-resistant installation.

B. Coordinate construction of openings and penetrating items to ensure that penetration firestopping is installed according to specified requirements.

C. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping.

D. Notify Owner's testing agency at least seven days in advance of penetration firestopping installations; confirm dates and times on day preceding each series of installations.

E. Do not cover up through-penetration firestop system installations that will become concealed behind other construction until each installation has been examined by Owner's inspecting agency and building inspector, if required by authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. A/D Fire Protection Systems Inc.
2. Grace Construction Products.
3. Hilti, Inc.
4. Johns Manville.
5. Nelson Firestop Products.
6. NUCO Inc.
7. Passive Fire Protection Partners.
8. RectorSeal Corporation.
9. Specified Technologies Inc.
10. 3M Fire Protection Products.

11. Tremco, Inc.; Tremco Fire Protection Systems Group.
12. USG Corporation.

2.2 PENETRATION FIRESTOPPING

A. Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements required, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.
   1. Provide paintable through-penetration firestop products at locations exposed to view, except at mechanical, electrical and elevator machine rooms.

B. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
   1. Fire-resistance-rated walls include fire walls, fire-barrier walls, smoke-barrier walls and fire partitions.
   2. F-Rating: Not less than the fire-resistance rating of constructions penetrated.

C. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
   1. Horizontal assemblies include floors, floor/ceiling assemblies, and ceiling membranes of roof/ceiling assemblies.
   2. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
   3. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.

D. Penetrations in Smoke Barriers: Provide penetration firestopping with ratings determined per UL 1479, based on testing at a positive pressure differential of 0.30-inch wg.
   1. L-Rating: Not exceeding 5.0 cfm/sq. ft. of penetration opening at 0.30-inch wg and no more than 50-cfm cumulative total for any 100 sq. ft. at both ambient and elevated temperatures.

E. W-Rating: Provide penetration firestopping showing no evidence of water leakage when tested according to UL 1479.

F. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

G. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspecting agency for firestopping indicated.
   1. Permanent forming/damming/backing materials, including the following:
      a. Slag-wool-fiber or rock-wool-fiber insulation.
      b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
      c. Fire-rated form board.
      d. Fillers for sealants.
   2. Temporary forming materials.

3. Substrate primers.
4. Collars.
5. Steel sleeves.

2.3 FILL MATERIALS

A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.

B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.

C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized-steel sheet.

E. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.

F. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.

G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.

H. Pillows/Bags: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives. Where exposed, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed.

I. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

J. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:
   1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and non-sag formulation for openings in vertical and sloped surfaces, unless indicated firestopping limits use of non-sag grade for both opening conditions.

2.4 MIXING

A. For those products requiring mixing before application, comply with penetration firestopping system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated or required.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.

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

3.2 PREPARATION

A. Surface Cleaning: Clean out openings immediately before installing penetration firestopping to comply with manufacturer's written instructions and with the following requirements:
   1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping.
   2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping. Remove loose particles remaining from cleaning operation.
   3. Remove laitance and form-release agents from concrete.

B. Priming: Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent penetration firestopping from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing firestopping's seal with substrates.

3.3 INSTALLATION

A. General: Install penetration firestopping to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.

B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
   1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestopping.

C. Install fill materials for firestopping by proven techniques to produce the following results:
   1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
   2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
   3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

A. Penetration Identification: Identify penetration firestopping with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of firestopping edge so labels will be visible to anyone seeking to remove penetrating items or firestopping. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
   1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
   2. Contractor's name, address, and phone number.
   3. Designation of applicable testing and inspecting agency.
   4. Date of installation.
   5. Manufacturer's name.
   6. Installer's name.

B. Wall Identification: Identification of walls containing penetration firestopping systems is specified in Division 09 Section "Painting."

3.5 FIELD QUALITY CONTROL

A. Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E 2174.

B. Allow for 3 random samples of each type of firestopping system to be inspected. Reinstall disturbed samples to comply with requirements.

C. Where deficiencies are found or penetration firestopping system is damaged or removed because of testing, repair or replace penetration firestopping system to comply with requirements.
   1. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

D. Proceed with enclosing penetration firestopping system with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping system manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping material and install new materials to produce systems complying with specified requirements.

END OF SECTION 07 84 13

SECTION 07 92 00 - JOINT SEALANTS

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.

1.2 SUMMARY

A. This Section includes joint sealants for the following applications, including those specified by reference to this Section:
   1. Exterior joints in the following vertical surfaces and horizontal nontraffic surfaces:
      a. Construction and control joints in cast-in-place concrete.
      b. Control joints in unit masonry.
      c. Joints between different materials listed above.
      d. Perimeter joints between materials listed above and frames of doors, windows, and storefront assemblies.
      e. Other joints as indicated.
   2. Interior joints in the following vertical surfaces and horizontal nontraffic surfaces:
      a. Control joints on exposed interior surfaces of exterior walls.
      b. Perimeter joints of exterior openings where indicated.
      c. Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances.
      d. Joints between plumbing fixtures and adjoining walls, floors, and counters.
      e. Other joints as indicated.
   3. Interior joints in the following horizontal traffic surfaces:
      a. Isolation and control joints in exposed cast-in-place concrete slabs.
      b. Control joints in tile flooring.
      c. Other joints as indicated.

B. Related Sections include the following:
   1. Division 02 Section "Selective Demolition and Alterations" for removal of sealants around perimeter of existing doors, windows and storefront assemblies being removed.
   2. Division 07 Section "Through-Penetration Firestop System" for sealing penetrations in fire-resistance-rated construction.
   3. Division 09 Section "Gypsum Board" for sealing perimeter joints of gypsumboard partitions to reduce smoke, gas, and sound transmission.
   4. Divisions 22 and 26 for sealing of perimeter joints of plumbing, HVAC systems, automatic fire protection systems, telecommunication systems, and electrical systems.

1.3 PERFORMANCE REQUIREMENTS

A. Provide exterior elastomeric joint sealants that have been produced and installed to establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.4 SUBMITTALS

A. General: Submit in accordance with Division 01 Section "Submittal Procedures."

B. Product Data: For each joint-sealant product indicated.

C. Joint-Sealant Schedule: Include the following information:
1. Joint-sealant application, joint location, and designation.
2. Joint design, including width and depth of joint sealant, and backer rod or bond-breaker size and location.
3. Joint-sealant manufacturer and product name.
4. Joint-sealant formulation.
5. Joint-sealant color.
6. Primer for each substrate type.
7. Solvent wipe cleaner for each substrate type.
8. For sealants and sealant primers used inside the weatherproofing system, including printed statement of VOC content.

D. Samples for Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

E. Qualification Data: For Installer.

F. Field-Adhesion Test Reports: For each sealant test.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who has completed joint sealant applications similar in materials, design, and extent to that indicated for Project that have resulted in construction with a record of successful in-service performance.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, shelf/pot life, curing time, and mixing instructions for multi-component materials.

B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

C. Remove and replace materials, at no cost to Owner that cannot be applied within their stated shelf life.

1.7 PROJECT CONDITIONS

A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.

C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

1.8 SEQUENCING AND SCHEDULING

A. Coordinate Work of this Section with interfacing and adjoining Work for proper sequencing of each installation to ensure a weathertight installation.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

B. VOC Content of Interior Sealants: Provide sealants and sealant primers for use inside the weatherproofing system that comply with the following limits for VOC content when calculated according to 40 CFR 59, Part 59, Subpart D (EPA Method 24):
1. Architectural Sealants: 250 g/L.
2. Sealant Primers for Nonporous Substrates: 250 g/L.
3. Sealant Primers for Porous Substrates: 775 g/L.

C. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

D. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range of colors.

2.2 JOINT SEALANTS

A. Type 1 - General Purpose Exterior Sealant: Polyurethane; ASTM C920, Type S, Grade NS, Class 25; single component.
1. Sonolastic NP-1; Sonneborn, Division of ChemRex Inc.
2. Dymonic; Tremco.
3. Sikaflex-1a; Sika Corporation, Inc.
4. Dynatrol 1; Pecora Corporation.
5. Vulkem 116; Tremco.
6. Chem-Calk 900; Bostik Findley.

B. Type 2 - General Purpose Exterior Sealant: Single-component, non-sag, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, for Use NT. Shall be non-staining on brick per ASTM C 1248.
1. Dow Corning Corporation; 795.
2. GE Advanced Materials - Silicones; SilPruf NB SCS9000.
3. Pecora Corporation; 864NST.
4. Tremco Incorporated; Spectrem 3.

C. Type 3 - General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, single component, paintable.
1. Tremflex 834; Tremco.
2. AC-20; Pecora Corporation.
3. Chem-Calk 600; Bostik Findley.

D. Type 4 - Plumbing Fixture/Tile Sealant: Silicone; ASTM C920, Uses M and A; single component, mildew resistant, color selected by Architect.
1. 898 Silicone; Pecora Corporation.
2. Tremsil 200 Sanitary; Tremco, Inc.

E. Type 5 - Interior Floor Joint Sealant: Polyurethane, self-leveling; ASTM C920, Grade P, Class 25, Uses T, M and A; single component.
1. Sonolastic SL-1; Sonneborn, Division of ChemRex Inc.
2. Tremflex S/L; Tremco.
3. Sikaflex-1CSL; Sika Corporation, Inc.
4. NR-201; Pecora Corporation.
5. Vulkem 45; Tremco.
6. Chem-Calk 950; Bostik Findley.

2.3 JOINT-SEALANT BACKING

A. General: Provide sealant backings (backer rods) of material and type that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Plastic Foam Joint Fillers (Backer Rods): ASTME C 1330, Type C (closed-cell material with a surface skin), preformed, compressible, resilient, non-staining, non-waxing, non-extruding strips of flexible plastic foam of material indicated below and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
   1. Closed-cell polyethylene foam, nonabsorbent to liquid water and gas, non-outgassing in unruptured state.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.4 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
   1. Confirm that joint sealants removed in Division 02 Section "Selective Demolition and Alterations" have been completely removed and surfaces are ready to received new sealants where needed. If unacceptable conditions are encountered, prepare written report, endorsed by Applicator, listing conditions detrimental to performance of work.

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

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
   1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles and dust remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.
3. Remove laitance and form-release agents from concrete.
4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

B. Joint Priming: Prime joint substrates, where indicated or recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
1. Masonry and concrete surfaces shall be primed.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Installation of Sealant Backings (Backer Rods): Install sealant backings to comply with the following requirements:
1. Install sealant backings of type indicated to provide support of sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
   a. Do not leave gaps between ends of sealant backings.
   b. Do not stretch, twist, puncture, or tear sealant backings.
2. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and joint fillers or backs of joints.

D. Installation of Sealants: Install sealants using proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the same time sealant backings and primer are installed.
1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Non-sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
   1. Remove excess sealant from surfaces adjacent to joints.
   2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
   3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
   1. Extent of Testing: Test completed elastomeric sealant joints as follows:
      a. Perform 5 tests for the first 500 feet of joint length for each type of elastomeric sealant and joint substrate.
      b. Perform 1 test for each 1000 feet of joint length thereafter or 1 test per each floor per elevation, whichever is more frequent.
   2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
      a. For joints with dissimilar substrates, verify adhesion to each substrate separately; do this by extending cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
   3. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field-adhesion-test log.
   4. Inspect tested joints and report on the following:
      a. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.
      b. Whether sealants filled joint cavities and are free of voids.
      c. Whether sealant dimensions and configurations comply with specified requirements.
   5. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
   6. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

B. Evaluation of Field Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 JOINT-SEALANT SCHEDULE

A. Control, Expansion, and Soft Joints in Masonry and between Masonry and Adjacent Work: Type 2; colors as selected. Prime masonry.

B. Interior Ceramic Tile Expansion, Control, Contraction, and Isolation Joints in Horizontal Traffic Surfaces: Type 2; color as selected.

C. Joints between Plumbing Fixtures and Walls and Floors and Between Countertops and Walls: Type 4; colors as selected.

D. Interior Joints for Which No Other Sealant is Indicated: Type 3; colors as selected.

END OF SECTION 07 92 00

SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Standard and custom hollow metal doors and frames.
2. Light frames and glazing installed in hollow metal doors.

B. Related Sections:

1. Division 08 Section "Door Hardware".
2. Division 09 Sections "Painting" for field painting hollow metal doors and frames.

C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
6. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
7. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
8. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
9. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
10. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
11. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.
12. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
13. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
14. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.

B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.

C. Shop Drawings: Include the following:

1. Elevations of each door design.
2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of anchorages, joints, field splices, and connections.
6. Details of accessories.
7. Details of moldings, removable stops, and glazing.
8. Details of conduit and preparations for power, signal, and control systems.

D. Samples for Verification:

1. Samples are only required by request of the architect and for manufacturers that are not current members of the Steel Door Institute.

1.3 QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.

B. Quality Standard: In addition to requirements specified, comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.

1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.6 COORDINATION

A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. CECO Door Products.
2. Curries Company.
3. Steelcraft.

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.3 HOLLOW METAL DOORS

A. General: Provide 1-3/4 inch thick doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8 and ANSI/NAAMM HMMA 867.

B. Interior Doors: Face sheets fabricated of commercial quality cold rolled steel that complies with ASTM A 1008/A 1008M. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

1. Design: Flush panel.
2. Core Construction: Manufacturer's standard kraft-paper honeycomb, or one-piece polystyrene core, securely bonded to both faces.
3. Level/Model: Level 2 and Physical Performance Level B (Heavy Duty), Minimum 18 gauge (0.042-inch - 1.0-mm) thick steel, Model 2.
4. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet.
5. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
6. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

C. Basis of Design:

1. Curries Company Polystyrene Core: 707 Series.
2. Curries Company Steel-Stiffened: 747 Series.

2.4 HOLLOW METAL FRAMES

A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.

B. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.

1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
3. Manufacturers Basis of Design:

   a. Curries Company CM Series.
   b. Curries Company M Series.

C. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.5 FRAME ANCHORS

A. Jamb Anchors:

1. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.

B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.

2.6 LIGHT OPENINGS AND GLAZING

A. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator's shop. Fixed and removable stops to allow multiple glazed lites each to be removed independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.

B. Moldings for Glazed Lites in Doors: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.

C. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames.

D. Preformed Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.

2.7 FABRICATION

A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.

C. Hollow Metal Doors:

1. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.

D. Hollow Metal Frames:

1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.

    a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.

3. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.

4. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
5. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
6. Jamb Anchors: Provide number and spacing of anchors as follows:

    a. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
        1) Four anchors per jamb from 60 to 90 inches high.
        2) Five anchors per jamb from 90 to 96 inches high.
        3) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
        4) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.
7. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".

E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."

1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

2.8 STEEL FINISHES

A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).

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

3.2 PREPARATION

A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.

C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."

D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.

1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.

C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Standard Steel Doors:

a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.

D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow metal work immediately after installation.

C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

END OF SECTION 08 11 13

SECTION 09 29 00 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS:

A. All drawings and general provisions of the Contract, including General and Supplementary Conditions and other Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Interior gypsum board.
2. Tile backing panels.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and thatcorrespond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

A. Gypsum Board, Type X: ASTM C 1396/C 1396M.
   1. Thickness:
      a. 5/8 inch (15.9 mm) for all new work

b. 1/2 inch where abutting existing 1/2 inch gypsum board
2. Long Edges: Tapered.

B. Gypsum Ceiling Board: ASTM C 1396/C 1396M.
1. Thickness:
a. 5/8 inch (15.9 mm) for all new work
b. 1/2 inch where abutting existing 1/2 inch gypsum board
2. Long Edges: Tapered.

C. Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.
1. Thickness:
a. 5/8 inch (15.9 mm) for all new work
b. 1/2 inch where abutting existing 1/2 inch gypsum board
2. Long Edges: Tapered.
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.4 TILE BACKING PANELS

A. Same as Mold Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.
1. Core: 5/8 inch (15.9 mm), Type X.
2. Long Edges: Tapered.
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.5 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized-steel sheet.
2. Shapes:

a. Cornerbead.
b. LC-Bead: J-shaped; exposed long flange receives joint compound.
c. L-Bead: L-shaped; exposed long flange receives joint compound.
d. U-Bead: J-shaped; exposed short flange does not receive joint compound.
e. Expansion (control) joint.

2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.
2. Exterior Gypsum Soffit Board: Paper.
3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
4. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.

   a. Use setting-type compound for installing paper-faced metal trim accessories.

3. Fill Coat: For second coat, use setting-type, sandable topping compound.
4. Finish Coat: For third coat, use setting-type, sandable topping compound.

2.7 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

C. Sound-Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

D. Acoustical Sealant: Manufacturer's standard non-sag, paintable, non-staining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

PART 3 - EXECUTION

3.1 APPLYING AND FINISHING PANELS

A. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

B. Comply with ASTM C 840.

C. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

D. For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

E. Prefill open joints and damaged surface areas.

F. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

G. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 2: Panels that are substrate for tile.
3. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
   a. Primer and its application to surfaces are specified in Section 09 90 00 "Painting."

3.2 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

END OF SECTION 09 29 00

SECTION 09 90 00 - PAINTING

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.

1.2 SUMMARY

A. This Section includes the following:
1. Exposed exterior items and surfaces with low VOC coatings complying with New Hampshire DEP regulations (OTC regulations).
2. Exposed interior items and surfaces with low VOC coatings complying with New Hampshire DEP regulations (OTC regulations).
3. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

B. Related Sections include the following:
1. Review all sections for shop primed items requiring field painting.

1.3 DEFINITIONS

A. General: Standard coating terms defined in ASTM D 16 apply to this Section.
1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
2. Eggshell refers to low-sheen finish with a gloss range between 20 and 35 when measured at a 60-degree meter.
3. Satin refers to low-sheen finish with a gloss range between 15 and 35 when measured at a 60-degree meter.
4. Semigloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter.
5. Full gloss refers to high-sheen finish with a gloss range more than 70 when measured at a 60-degree meter.

1.4 SUBMITTALS

A. General: Submit in accordance with Division 01 Section "Submittal Procedures."

B. Product Data: For each paint system indicated. Include block fillers and primers.
1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.

2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material proposed for use.
3. Include printed statement of VOC content for each product.

C. Schedule: Provide schedule of all surfaces to be coated, with prime and finish coat material listed, and manufacturer's recommended wet film thickness.

D. Samples for Verification: For each type of paint system and in each color and gloss of topcoat for Owner's approval. Samples shall be retained by Owner to allow them to compare finishes as they are applied.
1. Submit Samples on rigid backing, 8 inches square.
2. Apply coats on Samples in steps to show each coat required for each system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

E. Manufacturer Certificates: Signed by manufacturers certifying that products with limit VOC amounts specified comply with requirements.

F. Qualification Data: For Applicator.

G. Product List for Operations and Maintenance Manuals: Provide a paint schedule of all finishes used for Project. Provide the following information:
1. Location by final room number or a clear description of area.
2. Paint system for each room, including manufacturer name, paint name and number for each primer and paint used within the room.
3. Product color by name and number for each paint product within the room.

1.5 QUALITY ASSURANCE

A. Applicator Qualifications: Engage an experienced Applicator who has completed painting system applications similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

B. Source Limitations: Obtain block fillers, primers and undercoat materials for each coating system from the same manufacturer as the finish coats.

C. Preparation for Preinstallation Conference: Test existing painted surfaces to determine the existing paint material in order to determine the proper materials and application methods to be used where new coatings are to be applied to existing coatings.
1. In accordance with Owner's standards, the method to determine whether a previous coating is oil based or water based, is to rub alcohol on surface with a clean, white cloth. If the paint comes off, the previous finish is water based; if not does not come off, it is oil based.

D. Benchmark Samples (Mockups): Provide a full-coat benchmark finish sample for each type of coating and substrate required. Duplicate finish of approved sample Submittals.
1. Architect will select one room or surface to represent surfaces and conditions for each type of coating and substrate to be painted.
   a. Wall Surfaces: Provide samples of at least 100 sq. ft.
   b. Small Areas and Items: Architect will designate items or areas required.

2. After permanent lighting and other environmental services have been activated, apply benchmark samples, according to requirements for the completed Work. Provide required sheen, color, and texture on each surface.
   a. After finishes are accepted, Architect will use the room or surface to evaluate coating systems of a similar nature.
3. Final approval of colors will be from benchmark samples.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

E. Preinstallation Conference: Conduct conference at Project site.
1. Meet with Owner, Architect, a representative of Facilities Operations & Management (FOM), Painting Subcontractor and Drywall Subcontractor.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review surface preparation technique for each surface type and each type of coating.
4. Review product selections.
5. Review application techniques.
6. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.
7. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.
8. Provide 7 business days minimum advance notice to participants prior to convening preinstallation conference.

F. Owner Inspection: Each coat of materials shall be inspected and approved by Owner prior to application of succeeding specified coat. The Applicator shall notify the Owner when each coat is ready for inspection. If Applicator fails to allow for Owner inspection, no credit will be given for the applied coat and the Applicator shall re-coat the surface at no additional cost to the Owner.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the Project Site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:
1. Product name or title of material.
2. Product description (generic classification or binder type).
3. Manufacturer's stock number and date of manufacture.
4. Contents by volume, for pigment and vehicle constituents.
5. Thinning instructions.
6. Application instructions.
7. Color name and number.
8. VOC content.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain containers used in storage in a clean condition, free of foreign materials and residue.
1. Protect from freezing. Keep storage area neat and orderly.
2. Remove oily rags and waste daily.
3. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.7 PROJECT CONDITIONS

A. Apply coatings only when temperatures of surfaces to be coated and ambient air temperatures are between 50 and 95 deg F. Relative humidity shall not be greater than 80 percent.
   1. At exterior applications, temperature shall be continuous for 48 hours prior to application, during application and for 48 hours after to application.

B. Exterior Finishes: Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 80 percent; or at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
   1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.
   2. Allow wet surfaces to dry thoroughly and attain temperature and conditions specified before proceeding with or continuing coating operation.

1.8 EXTRA MATERIALS

A. Furnish extra paint materials from the same production run as the materials applied and in the quantities described below. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner.
   1. Quantity: Furnish Owner with not less than 1 gal., of each material and color applied for Owner's use during move in.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

B. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
   1. Benjamin Moore & Company (Moore).
   2. Sherwin-Williams Co. (S-W).
   3. Flame Control Coatings, LLC (Flame Control); www.flamecontrol.com phone: (716) 282-1399; availablethrough Sherwin-Williams.

2.2 COATINGS MATERIALS, GENERAL

A. Material Compatibility: Provide block fillers, primers, undercoats, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Material Quality: Provide manufacturer's best quality coating material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

C. VOC Compliance for Exterior and Interior Paints and Coatings: Provide the manufacturer's formulation for the products specified below that are VOC compliant with the State of New Hampshire Administrative Code, Title Env – Department of Environmental Services; Subtitle Env A – Air Related Programs, Chapter Env-A 4200 – ARCHITECTURAL AND

INDUSTRIAL MAINTENANCE COATINGS Section Env-A 4203.01 – VOC Content Limits expressed in grams per liter:

1. Flat Paints and Coatings: VOC content of not more than 100 g/L.
2. Non-Flat Paints and Coatings: VOC content of not more than 150 g/L.
3. Non-Flat Paints and Coatings - High Gloss: VOC content of not more than 250 g/L.
4. Anticorrosive (Rust Preventative) Coatings: VOC content of not more than 400 g/L.
5. Clear Wood Coatings:
   a. Varnishes: VOC content of not more than 680 g/L.
6. Fire Retardant Coatings:
   a. Clear: VOC content of not more than 650 g/L.
   b. Opaque: VOC content of not more than 350 g/L.
7. Industrial Maintenance Coatings (IMC): VOC content of not more than 340 g/L.
8. Primers, Sealers, and Undercoaters: VOC content of not more than 200 g/L.
9. Quick-Dry Enamels: VOC content of not more than 250 g/L.
10. Quick-Dry Primers, Sealers, and Undercoaters: VOC content of not more than 200 g/L.
11. Specialty Primers, Sealers, and Undercoaters: VOC content of not more than 350 g/L.
12. Stains: VOC content of not more than 250 g/L.
13. Wood Preservatives: VOC content of not more than 350 g/L.

D. Colors: Provide colors as indicated in Materials Legend; if color is not indicated, color shall be as selected by the Architect from the manufacturer's full range of options.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Applicator and drywall subcontractor present, under which painting will be performed for compliance with paint application requirements.
   1. Inspect walls for dents and imperfections prior to painting. Inspect walls again after primer and first coat of paint applied, with Applicator and drywall subcontractor present. Drywall subcontractor shall touch-up as follows:
      a. Touch-up visible gypsum board imperfections before priming of walls.
      b. Touch-up imperfections found in field of boards and joints made visible from painting after first finish coat applied.
   2. If unacceptable conditions are encountered, prepare written report, endorsed by Applicator, listing conditions detrimental to performance of work.
   3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
   4. Application of coating indicates Applicator's acceptance of surfaces and conditions within a particular area.
   5. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of specified finish materials to ensure use of compatible primers.
   1. Notify Architect about anticipated problems when using the materials specified over substrates primed by others.

3.2 PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
   1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.
   1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
   1. Provide barrier coats over incompatible primers or remove and reprime.
   2. Existing Surfaces, Opaque Finishes: Prepare existing surfaces as follows:
      a. Thoroughly clean existing surfaces to be recoated to remove dust, dirt, grease, oils, and other surface contaminants that would affect the proper adhesion of the new coatings.
      b. Scrape loose paint from surfaces indicated to be recoated. Sand edges of remaining paint to smooth out surface.
      c. Existing painted surfaces shall be sanded to fully dull the surface.
      d. Provide barrier coats over all existing painted surfaces where indicated.
   3. Interior Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
      a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer.
      b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides of wood, including paneling.
      c. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
      d. If transparent finish is required, backprime with spar varnish.
   4. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's standards.
      a. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
      b. Touch up bare areas and shop-applied prime coats that have been damaged. Clean with solvents recommended by paint manufacturer and SSPC SP2; and touch up with same primer as the shop coat.
   5. Galvanized Surfaces: Uniformly abrade galvanized surfaces with a palm sander and 60 grit aluminum oxide so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
      a. Clean field welds with nonpetroleum-based solvents complying with SSPC's standards so surface is free of oil and surface contaminants.
      b. Coating shall be applied within 8 hours of sanding and wipe down.
   6. Metal Doors and Frames, New: Wipe down to remove oils and surface contaminates from shipping and installation.

a. Coating shall be applied within 8 hours of sanding and wipe down.

D. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
3. Use only thinners approved by paint manufacturer and only within recommended limits.
4. In areas where the formation of mildew is likely to occur, add a mildewcide to the paint to provide protection against mold and mildew growth.

3.3 APPLICATION

A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
1. Paint colors, surface treatments, and finishes are indicated in the paint schedules.
2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
3. Provide finish coats that are compatible with primers used.
4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, grilles, convector covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
6. Paint interior surfaces of ducts with a flat, non-specular black paint where visible through registers or grilles.
7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
8. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces, unless indicated otherwise.
9. Sand lightly between each succeeding enamel or varnish coat.

B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
2. Omit primer over metal surfaces that have been shop primed and touchup painted, unless otherwise indicated.
3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky

under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.

C. Paint all exposed surfaces, except where the paint schedules indicate that a surface or material is not to be painted or is to remain natural. If the paint schedules do not specifically mention an item or a surface, paint the item or surface the same as similar adjacent materials or surfaces whether or not schedules indicate colors. If the schedules do not indicate color or finish, the Architect will select from standard colors and finishes available.
   1. Painting includes field painting of exposed bare and covered pipes and ducts (including color-coding), hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment at all locations, except mechanical and electrical rooms.

D. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.
   1. Labels: Do not paint over Underwriters Laboratories (UL), Factory Mutual (FM), or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

E. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions. Walls shall have roller finish.
   1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
   2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
   3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.

F. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.

G. Mechanical and Electrical Work: Painting of mechanical, plumbing, fire protection, and electrical work is limited to items exposed in occupied spaces (outside mechanical and electrical rooms).

H. Mechanical, plumbing, and fire protection items to be painted include, but are not limited to, the following:
   1. Piping, pipe hangers and supports.
   2. Heat exchangers.
   3. Tanks.
   4. Ductwork, including interior of ductwork visible through air devices.
   5. Insulation.
   6. Accessory items.

I. Electrical items to be painted include, but are not limited to, the following:
   1. Conduit and fittings.
   2. Switchgear.
   3. Panelboards.

J. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

K. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

L. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

M. Exterior Ferrous Metal Items to Be Painted Include, but Are Not Limited To, the Following (New and Existing):
1. Exposed structural steel and lintel plates.
   a. Galvanized single angle lintels do not require painting.
2. Steel doors and frames.
3. Miscellaneous metal items, including galvanized steel.

N. Interior Ferrous Metal Items to Be Painted Include, but Are Not Limited To, the Following (New and Existing):
1. Steel doors and frames.
2. Lintel plates and angles.
3. Access panels (both sides).
4. Miscellaneous metal items.

3.4 CLEANING

A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from the Project site.
1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

3.5 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.

B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.
1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINT SCHEDULE

A. VOC Compliance, General: Provide the manufacturers' formulations for the products specified below that comply with the VOC requirements for the State of New Hampshire as defined in paragraph 2.2.C of this Section.

B. Exposed Structural Steel, Existing: Provide the following finish systems over existing exposed exterior structural steel.
   1. Semigloss, Waterborne Alkyd Finish: 2 finish coats over a bonding primer over a rust converter as needed at existing exposed exterior structural steel.
      a. Bonding Primer: Low-odor, low VOC, exterior barrier coat applied at spreading rate recommended by the manufacturer to achieve a dry film thickness of not less than indicated for product.
         1) PPG: Seal Grip Interior/Exterior Acrylic Universal Primer/Sealer 17-921 Series; 1.6 mils DFT.
      b. First and Second Coats: Semigloss, exterior, single component, waterborne alkyd applied at spreading rate recommended by the manufacturer to achieve a dry film thickness per coat of not less than indicated for product. Moore does not have exterior products meeting requirements; S-W ProMar 200 Interior Water-based Acrylic-Alkyd not approved for exterior use.
         1) PPG: Speedhide Interior/Exterior WB Alkyd Semi-Gloss 6-1510 Series; 1.5 mils DFT per coat.

C. Ferrous Metal, New and Existing: Provide the following finish systems over exterior ferrous metal. Primer is not required on shop-primed items, except steel doors and frames, which require a primer under this specification. Doors and frames shall be sprayed painted.

D. Ferrous and Zinc-Coated Metal, New and Existing: Provide the following finish systems over exterior zinc-coated (galvanized) metal surfaces. Primer is not required on shop-primed items, except zinc-coated (galvanized) steel doors and frames, which require a primer under this specification.
   1. Semigloss, Waterborne Alkyd Finish: 2 finish coats over a primer. Provide a bonding primer at existing metal.
      a. Primer, New and Touch-Up of Bare Spots on Existing Surfaces: Quick-drying, corrosion resistant, single component, acrylic-modified alkyd metal primer applied to galvanized metals not previously shop-primed applied at spreading rate recommended by the manufacturer to achieve a dry film thickness of not less than indicated for product. Moore and S-W do not have exterior products meeting requirements.
         1) PPG: Speedhide 6-209 Interior/Exterior Galvanized Steel Primer; 1.8 mils DFT.
      b. Bonding Primer on Existing Surfaces: Low-odor, low VOC, interior latex primer applied at spreading rate recommended by the manufacturer to achieve a dry film thickness of not less than indicated for product.
         1) PPG: Seal Grip Interior/Exterior Acrylic Universal Primer/Sealer 17-921 Series; 1.6 mils DFT.
      c. First and Second Coats: Semigloss, exterior, single component, waterborne alkyd applied at spreading rate recommended by the manufacturer to achieve a dry film thickness per coat of not less than indicated for product. Moore does not have exterior products meeting requirements; S-W ProMar 200 Interior Waterbased Acrylic-Alkyd not approved for exterior use.
         1) PPG: Speedhide Interior/Exterior WB Alkyd Semi-Gloss 6-1510 Series; 1.5 mils DFT per coat.

3.7 LOW VOC INTERIOR COATINGS

A. VOC Compliance, General: Provide the manufacturers' formulations for the products specified below that comply with the VOC requirements for the State of New Hampshire as defined in paragraph 2.2.C of this Section.

B. Gypsum Board: Provide the following finish systems over interior gypsum board surfaces:
1. Flat Acrylic Finish, GPDW Soffits and Ceilings, Except Where Indicated Otherwise: 2 finish coats over a primer.
a. Primer: Low-odor, zero VOC, latex-based, interior primer applied at spreading rate recommended by the manufacturer to achieve a dry film thickness of not less than indicated for product.
1) Moore: Eco Spec WB Interior Latex Primer No. N372; 1.2 mils DFT.
2) S-W: ProMar 200 Zero VOC Interior Latex Primer B28W02600 Series; 1.0 mils DFT.
b. First and Second Coats: Low-odor, zero VOC, flat, acrylic-latex-based, interior paint applied at spreading rate recommended by the manufacturer to achieve a dry film thickness per coat of not less than indicated for product.
1) Moore: Eco Spec WB Interior Flat Finish No. 219 (Dartmouth formulation); 1.5 mils DFT per coat.
2) S-W: ProMar 200 Zero VOC Interior Latex Flat, B30W2600 Series; 1.6 mils DFT per coat.
2. Low-Luster (Satin or Eggshell), Acrylic-Latex Finish; Walls, Except Where Indicated Otherwise, Bath and Toilet Room Ceilings: 2 finish coats over a primer.
a. Primer: Low odor, zero VOC, latex-based, interior primer applied at spreading rate recommended by the manufacturer to achieve a dry film thickness of not less than indicated for product.
1) Moore: Eco Spec WB Interior Latex Primer No. N372; 1.2 mils DFT.
2) S-W: ProMar 200 Zero VOC Interior Latex Primer, B28W02600 Series; 1.0 mils DFT.
b. First and Second Coats: Low odor, zero VOC, low-luster (eggshell), acrylic-latex, interior finish applied at spreading rate recommended by the manufacturer to achieve a dry film thickness per coat of not less than indicated for product.
1) Moore: Eco Spec WB Interior Latex Eggshell Finish No. N374; 1.4 mils DFT per coat.
2) S-W: ProMar 200 Zero VOC Interior Latex Eg-Shel, B20W2600 Series; 1.7 mils DFT per coat.
3. Semigloss, Acrylic-Latex Finish; Walls in Baths and Toilet Rooms: 2 finish coats over a primer.
a. Primer: Low odor, zero VOC, latex-based, interior primer applied at spreading rate recommended by the manufacturer to achieve a dry film thickness of not less than indicated for product.
1) Moore: Eco Spec WB Interior Latex Interior Latex Primer No. N372; 1.2 mils DFT per coat.
2) S-W: ProMar 200 Zero VOC Interior Latex Primer, B28W02600 Series; 1.0 mils DFT per coat.
b. First and Second Coats: Low odor, zero VOC, semigloss, interior acrylic-latex, interior finish applied at spreading rate recommended by the manufacturer to achieve a dry film thickness per coat of not less than indicated for product.
1) Moore: Eco Spec WB Interior Latex Semi-Gloss Finish No. N376; 1.5 mils DFT per coat.

2) S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss B31-2600 Series; 1.6 mils DFT per coat.

C. Ferrous Metal, New and Exisitng: Provide the following finish systems over ferrous metal. Primer is not required on shop-primed items, except steel doors and frames, which require a primer under this specification. Prime bare spots and cracks on other ferrous metals.

1. Semigloss, Acrylic-Modified Alkyd Finish or Pre-Catalyzed Waterborne Acrylic Epoxy Finish, All Surfaces except Handrails: 2 finish coats over a primer. Provide a bonding primer at existing metal.

a. Primer, New and Bare Spots of Exisitng: Quick-drying, corrosion resistant, single component, acrylic-modified alkyd primer or self cross-linking acrylic primer, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a dry film thickness of not less than indicated for product.

1) Moore: Advance Waterborne Interior Alkyd Primer No. 790; 1.6 mils DFT.

2) S-W: Pro Industrial Pro-Cryl Universal Primer B66-310 Series; 3.0 mils DFT.

b. Bonding Primer on Existing: Low-odor, low VOC, interior latex primer applied at spreading rate recommended by the manufacturer to achieve a dry film thickness of not less than indicated for product.

1) Moore: Stix Waterborne Bonding Primer, SXA-110; 1.9 mils DFT.

2) S-W: Extreme Bond Interior/Exterior Primer B51W00150 Series; 0.9 mils DFT.

c. First and Second Coats: Semigloss, single component, acrylic-modified alkyd interior enamel or single-component, pre-catalyzed waterborne acrylic epoxy applied at spreading rate recommended by the manufacturer to achieve a dry film thickness per coat of not less than indicated for product.

1) Moore: Advance Waterborne Interior Alkyd Semi-Gloss No. 793; 1.3 mils DFT per coat.

2) S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy K46-150 Series; 1.5 mils DFT per coat.

D. Zinc-Coated Metal, New and Exisitng: Provide the following finish systems over zinc-coated metal. Primer is not required on shop-primed items, except zinc-coated steel doors and frames, which require a primer under this specification. Prime bare spots and cracks on zinc-coated metals.

1. Semigloss, Acrylic-Modified Alkyd Finish or Pre-Catalyzed Waterborne Acrylic Epoxy Finish: 2 finish coats over a primer.

a. Primer, New and Bare Spots of Exisitng: Quick-drying, corrosion resistant, single component, acrylic-modified alkyd primer or self cross-linking acrylic primer, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a dry film thickness of not less than indicated for product.

1) Moore: Advance Waterborne Interior Alkyd Primer No. 790; 1.6 mils DFT.

2) PPG: Speedhide 6-209 Interior/Exterior Galvanized Steel Primer; 3.6 mils DFT.

3) S-W: Pro Industrial Pro-Cryl Universal Primer B66-310 Series; 3.0 mils DFT.

b. Bonding Primer on Existing: Low-odor, low VOC, interior latex primer applied at spreading rate recommended by the manufacturer to achieve a ry film thickness of not less than indicated for product.
   1) Moore: Stix Waterborne Bonding Primer, SXA-110; 1.9 mils DFT.
   2) S-W: Extreme Bond Interior/Exterior Primer B51W00150 Series; 0.9 mils DFT.

c. First and Second Coats: Low VOC, semigloss, single component, acrylic-modified alkyd interior enamel or single-component, pre-catalyzed waterborne acrylic epoxy applied at spreading rate recommended by the manufacturer to achieve a dry film thickness per coat of not less than indicated for product.
   1) Moore: Advance Waterborne Interior Alkyd Gloss No. 794; 1.6 mils DFT per coat.
   2) S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy K45-150 Series; 1.5 mils DFT per coat.

E. Telecommunication, Data and Electrical Backboards: Provide the following finish over plywood:
   1. Flat Intumescent Finish: Two finish coats over a primer.
      a. Primer: Latex-based, interior primer applied at spreading rate recommended by the manufacturer to achieve a dry film thickness of not less than indicated for product.
         1) Moore: Fresh Start High-Hiding All-Purpose Primer No. 056; 1.4 mils DFT.
         2) SW: Preprite Problock Interior/Exterior Latex Primer\Sealer; 1.4 mils DFT.
      b. First and Second Coats: Intumescent-type, fire-retardant paint applied at spreading rate recommended by manufacturer to achieve a total dry film thickness of not less than 4 mils; white color for telecommunication and black for electrical.
         1) Moore: Insl-X Fire-Retardant Paint Latex Intumescent Coating Flat Finish FR-110.
         2) FlameControl: 20-20A Flat Latex Intumescent Coating.

F. Smoke and Fire-Rated Partition Identification: Identify all smoke partitions and all fire-rated walls and partitions by stenciling "X-HOUR FIRE WALL", where "X" is the hourly rating; provide on each side of rated walls above ceiling line with 4-inch high letters in red or orange semigloss paint; each rated wall shall be identified with fire rating of wall at least once and at a spacing not greater than 12 feet o.c. and not more than 5 feet from each end of the wall. Identify all smoke barriers and partitions by stenciling "SMOKE" on each side of walls above ceiling line with 4-inch high letters in bright green semigloss paint; each rated wall shall be identified at least once and at a spacing not greater than 12 feet o.c. and not more than 5 feet from each end of wall.
   1. First Coat: Low odor, zero VOC, semigloss, acrylic-latex, interior enamel applied at spreading rate recommended by the manufacturer to achieve a dry film thickness of not less than indicated for product.
      a. Moore: Eco Spec WB Interior Latex Semi-Gloss No. N376; 1.5 mils DFT.
      b. S-W: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31-2600 Series; 1.6 mils DFT.

END OF SECTION 09 90 00

SECTION 21 10 00

WATER-BASED FIRE SUPPRESSION SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Reconfigured automatic suppression systems, wet and dry.

1.2 RELATED REQUIREMENTS

A. The general provisions of the Contract apply to this Section and to all Contractors, Subcontractors, or other persons supplying materials and/or labor, entering into the Project site and/or premises, directly or indirectly.

1.3 REFERENCE STANDARDS

A. ANSI A21.4	Standard for Cement-Mortar Lining For Ductile Iron Pipe And Fittings
B. ANSI A21.11	Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
C. ANSI A21.51	Ductile-Iron Pipe, Centrifugally Cast
D. ANSI B16.1	Cast Iron Pipe Flanges and Flanged Fittings
E. ANSI B16.3	Malleable and Ductile Iron Threaded Fittings
F. ANSI B16.4	Cast Iron Threaded Fittings
G. ANSI B16.5	Pipe Flanges and Flanged Fittings
H. ANSI B16.9	Factory Made Wrought Steel Buttweld Fittings
I. ANSI B16.11	Forged Steel Fittings, Socket Welded and Threaded
J. ANSI B16.18	Cast Bronze Solder Joint Pressure Fittings
K. ANSI B16.22	Wrought Copper and Wrought Copper Alloy Solder Joint Pressure Fittings
L. ANSI B16.29	Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings - DWV
M. ASTM A53	Pipe, Steel, Black and Hot-Dipped, Zinc Coated Welded and Seamless
N. ASTM A105	Forgings, Carbon Steel, for Piping Components
O. ASTM A126	Gray Cast Iron Castings for Valves, Flanges, and Pipe Fittings
P. ASTM A135	Electric Resistance Welded Steel Pipe
Q. ASTM A181	Forgings, Carbon Steel for General Purpose Piping
R. ASTM A234	Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures
S. ASTM A536	Ductile Iron Castings

T. ASTM A795	Black and Hot Dipped Zinc Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use
U. ASTM B88	Seamless Copper Water Tube
V. AWS A5.8	Brazing Filler Metal
W. AWS D10.9	Qualification of Welding Procedures and Welders for Piping and Tubing, Level AR3
X. NFPA 13	Installation of Sprinkler Systems.
Y. NFPA 14	Installation of Standpipe and Hose Systems.
Z. NFPA 20	Standard for the Installation of Private Fire Service Mains and Their Appurtenances
AA. NFPA 25	Inspection, Testing and Maintenance of Water-Based Fire Protection Systems
BB. NFPA 51B	Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
CC. NFPA 241	Standard for Safeguarding Construction, Alteration, and Demolition Operations
DD. UL	Underwriters' Laboratories Listing
EE.FM	Factory Mutual Approval

1.4 ADMINISTRATIVE REQUIREMENTS

A. SITE VERIFICATION: Prior to submitting a bid, the contractor must conduct a site visit and thoroughly inspect the project site to gain an understanding of all field conditions relevant to the fire protection work. Any inconsistencies or issues that may impact the work shall be promptly documented in writing before submitting the bid. If these concerns are not adequately resolved to the contractor's satisfaction, they shall be clearly stated as qualifications in the written bid submission. No considerations or adjustments will be granted for challenges arising from field conditions that were present up until the bid submission deadline. The contractor is expected to account for and accommodate any existing field conditions within their bid proposal.

B. CONTRACT DOCUMENTS: The contractor is responsible for thoroughly reviewing all drawings and specification sections to understand how the work in this section relates to the work performed by other trades and coordinating activities accordingly. Any alternates specified in the documents should be considered for addition or removal from the base bid, along with any associated tasks required to complete the installation in accordance with the indicated standards. The drawings provided are schematic and intended to offer approximate and relative locations of the fire protection work. They do not depict all necessary offsets. Scaling the drawings is not recommended. For accurate dimensions, refer to architectural or structural documents or take measurements on-site. Keep designated areas for future work clear and free from obstructions. Install all ceiling-mounted components precisely as indicated in the reflected ceiling plans. However, the contractor is still responsible for coordinating with any obstructions mounted on the

ceiling. In cases where there is a discrepancy between the specifications and drawings, and the issue has not been addressed prior to the bid, the more stringent requirement shall take precedence.

C. REQUESTE FOR INFORMATION (RFI): Prepare RFIs in compliance with industry standards and project specifications. When raising a concern, the RFIs should include proposed solutions.

D. TEMPORARY SERVICES: This contractor shall be responsible for temporary services in accordance with industry and standards and project requirements. Provide protection and covering of fire protection work and equipment until final installation and connection are made.

E. PERMITS AND FEES: The contractor is solely responsible for obtaining and paying for all necessary permits, inspections, and associated fees. This includes complying with all prerequisites and meeting any post-issuance requirements related to permits and inspection documentation. The contractor must promptly apply for and secure all required permits and schedule the necessary inspections in accordance with applicable regulations and codes. It is the contractor's obligation to fulfill any post-issuance obligations, such as providing requested documentation, addressing any deficiencies, and obtaining final approvals or certificates as necessary.

F. GUARANTEES: All equipment, materials, and workmanship are unconditionally guaranteed for one year from the date of final acceptance of the work. Final acceptance occurs when the fire protection work is taken over, accepted, and under the care, custody, and control of the owner. Any extensions to standard equipment warranty periods will be coordinated by the contractor to ensure the guarantee period begins upon the owner's beneficial usage.

1. The contractor is responsible for promptly replacing or repairing any defects that arise during the guarantee period, including associated expenses for workmanship, equipment, or materials. In cases where equipment or materials do not match the manufacturer's published data or information during performance testing, the contractor will promptly provide replacements.

2. Upon the appropriate timing or as directed by the owner, architect, or engineer, the contractor shall arrange for a manufacturer's representative to inspect, adjust, troubleshoot, and ensure proper operating condition of all relevant manufacturer's equipment. The contractor must also provide site visit reports and documentation regarding start-up activities.

G. DEMONSTATION: This contractor is responsible for demonstration of the proper operation of all major equipment, to the owner and the engineer, at the completion of installation.

1.5 CODES AND PERMITS

A. All work under this contract shall comply fully with requirements, rules and regulations of authorities having jurisdiction including but not limited to the local authorities having jurisdiction, state fire marshal, and owner's insurance carrier.

B. Sprinkler System must be compliant with all applicable condes and standards.

C. Any work that has to be changed to conform to the regulations and codes shall be made at this contractor's sole expense.

D. Any conditions noted in the specification that would be contrary to such regulations shall be brought to the attention of SFC Engineering Partnership, Inc. before work is started. Nothing in the Contract Documents is intended to allow a system that is not in accordance with applicable codes and standards to be installed.

1.6 PERFORMANCE REQUIREMENTS

A. DESIGN RESPONSIBILITY: The registered design professional (RDP) has provided partial design and specified the design criteria to be used by the Fire Protection Contractor for the fire protection system(s) that are to be installed. This contractor shall finalize the system layout, develop working plans, and provide calculations to confirm the specified design criteria. The RDP will review and approve the installing contractor's final layout and calculations. After RDP approval, this contractor shall submit their shop drawings for approval to all authorities having jurisdiction. Prior to changing design in response to AHJ comments, this contractor shall obtain approval from the RDP.

B. MAINS: This contractor shall not change the location of sprinkler mains, decrease the size of sprinkler mains, or change the system configuration (loop, main, tree) without written approval of the engineer.

C. BRANCH LINES: Sprinkler branch lines shall be sized by this contractor based on hydraulic calculations that are to be performed by this contractor.

D. SPRINKLER LOCATIONS: The Engineer's sprinkler layout, having been developed in conjunction with the architectural reflected ceiling plans, shall be utilized in areas with finished ceilings, unless written approval of the engineer is obtained. (Acceptance of a shop drawing is considered written approval). This does not relieve the contractor from coordinating with ceiling mounted obstructions. Additionally, this contractor shall ensure full sprinkler coverage under all obstructions, particularly in areas without finished ceilings.

E. HYDRAULIC CALCULATIONS: Calculations shall verify that a minimum margin of safety factor of the larger of 10 percent or 10 psi is maintained in the hydraulically most demanding area. Calculations are required to be submitted for engineering review prior to construction, unless specifically noted otherwise on the construction documents.

1.7 QUALIFICATIONS

A. INSTALLER: Installing sprinkler contractors shall meet all of the following criteria: installers shall be knowledgeable and experienced with the type and complexity of fire protection system(s) specified; installers shall be meet all local, state, and federal qualifications including current licensure as a sprinkler fitter (where applicable).

B. DESIGNER: Working plans, shop drawings, and hydraulic calculations should be prepared under the direct supervision of either a NICET Level III or IV fire protection engineering technician or a registered design professional (professional engineer). It is important to note that fulfilling this requirement does not solely involve the contractor developing plans and subsequently submitting them to an engineer for review and "stamping." The NICET technician or licensed engineer must have direct control over the drawings.

C. WELDING: Procedures and operators must be qualified in accordance with the following standards: AWS B2.1, Specification for Welding Procedure and Performance Qualification, and ASME Boiler and Pressure Vessel Code, Section IX, "Welding and Brazing Qualifications."

1.8 SUBMITTALS

A. Bids shall include all methods, materials, equipment, etc., as required to provide a complete installation.

B. For all submittals listed herein, the anticipated review time is 10 business days following the date of receipt, unless noted otherwise.

C. All submittals to be provided electronically in .pdf format and must be accessible via a link or email that does not require creation of a log-in.

D. Submit the following for review and approval to SFC Engineering Partnership, Inc., prior to installation:

1. PRODUCT DATA: Manufacturer's product data for each type of product specified, including details of construction relative to materials, dimensions of individual components, profiles, textures, and colors.

2. SHOP DRAWINGS: Prior to actual construction, submit shop drawings detailing the materials, fixtures and equipment to be incorporated in Shop drawings must contain all information required by NFPA 13 as working drawings. Shop drawings shall be developed under the responsible charge of and bear the NICET # of a NICET Level III or IV technician or the signature and seal of a registered professional engineer. Shop drawings shall bear the name, license number, and expiration date of the installing contractor. Shop drawings must be approved by the RDP prior to sending to the Authority Having Jurisdiction for approval. Anticipated review time is 10-15 business days following the day of receipt.

   a. Information shall contain specific reference to catalogue numbers and shall be qualified in writing as required. No consideration will be given to brochure or catalogue information not specifically designated or referenced to the Specification by an identifying number.

   b. All shop drawings shall be drawn at a 1/8-inch scale minimum. The Contractor shall electronically submit shop drawings and product submittals for approval.

   c. If seismic bracing is required, sway bracing calculations, bracing locations, and bracing type shall be submitted with the shop drawings. Seismic bracing calculations must be signed and sealed by a registered design professional.

   d. If welding is to be performed, welding certificates shall be submitted for review by the RDP.

3. QUALIFICATION DATA FOR FIRMS AND PERSONS: Documentation to verify the person(s) responsible for system design and installation has the required qualifications as stated in "Qualifications" section of this Specification.

E. Submit the following at project close-out:

1. RECORD DRAWINGS: Submit record drawings to indicate exact location of all piping, valves, drains, test fittings, switches, etc. Information shall contain specific reference to catalogue numbers, and shall be qualified in writing as well.

2. SEISMIC BRACING: If seismic bracing is required, record seismic bracing calculations, bracing locations, and bracing type shall be submitted with the record drawings. Seismic bracing calculations must be signed and sealed by a registered design professional.

3. CONTRACTOR CERTIFICATION OF COMPLIANCE: Upon project completion, it is the responsibility of this contractor to provide a certification of compliance with relevant codes and standards. The certification must be issued on the company's letterhead and signed by either this contractor or the General Contractor. Addressed to the Engineer, the certification should explicitly state that, to the best of the contractor's knowledge and belief, the construction work has been performed in substantial accordance with the applicable state building code, referenced standards, and the approved construction documents. Any deviations deemed pertinent shall be specifically noted in the certification. Anticipated review time is 5 business days following the day of receipt.

4. WRITTEN CONFIRMATION OF PUNCH LIST ITEMS: The Engineer will provide the General Contractor with a list of deviations from the applicable codes, standards, and approved construction documents. This contractor or the General Contractor must submit a written response to the list before the final signoff by the Responsible Design Professional (RDP). Anticipated review time is 5 business days following the day of receipt.

5. SYSTEM TEST REPORTS: All test reports required by applicable codes and standards shall be submitted to the engineer for review. Notify the Engineer, in writing, of date and time of test, so he or she (or a designee) may attend at their sole discretion. Notification should occur five (5) business days prior to test. If the engineer is not notified, the test may need to be reperformed at no additional cost. All test reports must contain the name, signature, and license number of the witnessing contractor.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Promptly inspect shipments to ensure that the material is undamaged and complies with specifications.

B. Cover pipe to prevent corrosion or deterioration while allowing sufficient ventilation to avoid condensation. Do not store materials directly on grade. Protect pipe, tube, and fitting ends so they are not damaged. Where end caps are provided or specified, take precautions so the caps remain in place. Protect fittings, flanges, and unions by storage inside or by durable, waterproof, above ground packaging.

C. Offsite storage agreements will not relieve the contractor from using proper storage techniques.

D. Storage and protection methods must allow inspection to verify products.

1.10 DESIGN CRITERIA

A. Use only new material, free of defects, rust and scale, and meeting the latest revision of ASTM specifications as listed in this specification.

B. Construct all piping systems for the highest pressures and temperatures in the respective system but not less than 175 psig.

C. Where weld fittings are used, use only long radius elbows having a centerline radius of 1.5 pipe diameters.

D. Where mechanical grooved fittings are used, use only ASTM standard radius fittings, short radius grooved fittings are not allowed.

PART 2 PRODUCTS

2.1 MATERIALS, GENERAL

A. Equipment shall be new and comply with referenced standards and other requirements specified in this Section applicable to each material indicated.

B. Sprinkler equipment shall be listed in "List of Inspected Fire Protection and Material", published annually by Underwriters Laboratories (UL) and shall bear UL approved stamp or label.

C. All equipment shall be Factory Mutual (FM) approved for the service intended.

D. All equipment utilized must adhere to UL Listing and FM Approval standards for their respective intended purposes, unless explicitly exempted by relevant codes and standards.

E. All electrical equipment shall be compatible with the fire alarm system and approved by SFC and Owner or Owner's Representative.

F. Trade names and specific manufacturer's model numbers, which define type and quality of materials and equipment, shall be required.

G. Unless otherwise specified, equipment or materials of the same type or classification used for the same purpose shall be the product of the same manufacturer.

H. Materials and/or products not approved may not be used in construction. No substitutions of materials and/or equipment shall be used without permission from SFC Engineering Partnership, Inc.. Any Work that has to be changed due to unapproved substitutions shall be made at the expense of this contractor.

I. EQUIPMENT SPECIFIED ON PLANS: It is important to note that the equipment and systems scheduled on the drawings may not contain additional specifications in this document. If this is the case, please provide the equipment as scheduled, referencing the manufacturer's specifications provided for any substitution requests or submittals. Any proposed equipment or systems submitted as "equivalent" will be reviewed by the engineer and accepted at his or her sole discretion.

J. Component Pressure Ratings: All components shall have pressure ratings that are equal to or greater than the minimum pressure rating indicated herein, unless a higher pressure is required due to elevated system pressure.

2.2 UNDERGROUND PIPING AND FITTINGS

A. All materials shall be UL Listed and FM Approved and installed in accordance with NFPA 13, NFPA 14, NFPA 20, NFPA 24, and applicable insurer guidelines. Coordinate with Site / Civil Drawings to confirm material and bury depth.

B. DUCTILE IRON PIPE AND FITTINGS: grooved-joint, ductile-iron pipe AWWA C151, with cut, rounded-grooved ends; mechanical-joint, ductile-iron pipe AWWA C151, with mechanical-joint bell and plain spigot end; grooved-end, ductile-iron fittings ASTM A 47/A 47M, malleable-iron castings or ASTM A 536, ductile-iron castings with dimensions matching pipe; grooved-end, ductile-iron-piping couplings AWWA C606, for ductile-iron-pipe dimensions. Include ferrous housing sections, gasket suitable for water, and bolts and nuts; mechanical-joint, ductile-iron fittings AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern; glands, gaskets, and bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and steel bolts; flanges ASME B16.1, Class 125, cast iron.

2.3 ABOVEGROUND PIPING AND FITTINGS

A. STEEL PIPE: Black steel pipe welded and seamless, Type F, Grade A, ASTM A53; black welded and seamless steel pipe for fire protection use, Type F, ASTM A795; electric resistance welded steel pipe, Grade A, ASTM A135.

1. Pipe wall and thickness:

   a. Threaded pipe shall have a minimum wall thickness of schedule 40.

   b. All piping, irrespective of size, shall be Schedule 40 in dry and preaction systems.

   c. All piping, irrespective of size, shall be Schedule 40 in drain piping and air-filled portions of FDC piping.

   d. All other pipe 2-½" and larger shall have a minimum wall thickness of schedule 10.

   e. Piping 2" and under shall be minimum schedule 40 unless stated otherwise herein.

   f. For dry system piping refer to Construction Documents.

B. STEEL FITTINGS:

1. Cast iron threaded fittings, Class 125 or 250, ASTM A126/ANSI B16.4. Malleable and ductile iron threaded fittings, Class 150 or 300, ASTM A197/ANSI B16.3. Standard weight seamless carbon steel weld fittings, ASTM A234 grade, ANSI B16.9.

2. Mechanical grooved fittings with EPDM gaskets, ASTM A536 ductile iron, ASTM A47 malleable iron or ASTM A53 fabricated steel. For wet pipe systems mechanical tee fittings with full iron back equal to Grinnell Figure 730 will be allowed only as needed for connection to existing systems. Outlets for drypipe and preaction systems shall be mechanical tees. Mechanical tees with U-bolt back or other fastening means are not allowed.

3. Welding Materials: Comply with Section II, Part C, ASME Boiler and Pressure Vessel Code for welding materials.

4. Finish: Hot dipped zinc coated (galvanized) finish on piping and fittings shall be used in piping exposed to weather and piping exposed to corrosive environments where indicated. Thread or grooved hot dipped zinc coated pipe ends for fitting connections.

C. UNIONS AND FLANGES

1. 2" AND SMALLER STEEL: ASTM A197/ANSI B16.3 malleable iron unions with brass seats. Use black malleable iron on black steel piping and galvanized malleable iron on galvanized steel piping. Grooved couplings may be used in lieu of unions.

2. 2½" AND LARGER: ASTM A181 or A105, Class 150, grade 1 hot forged steel flanges of threaded, welding neck, or slip-on pattern on black steel and threaded only on galvanized steel. ANSI B16.1 or ANSI B16.5, Class 150 cast iron threaded flanges. Use raised face flanges ANSI B16.5 for mating with other raised face flanges or equipment with flat ring or full-face gaskets. Use ANSI B16.1 flat face flanges with full face gaskets for mating with other flat face flanges on equipment.

3. MECHANICAL GROOVED PIPE CONNECTIONS

a. Mechanical grooved pipe couplings and fittings, ASTM F1476, as manufactured by Victaulic, Anvil, or Grinnell may be used with steel pipe. Mechanical grooved components and assemblies to be rated for minimum 175 psi working pressure unless noted otherwise.

b. All mechanical grooved pipe material including gaskets, couplings, fittings and flange adapters shall be from the same manufacturer.

c. Couplings and fittings to be malleable iron, ASTM A47, or ductile iron A536 with painted finish. Fittings used on galvanized steel pipe to have galvanized finish, ASTM A153.

d. Gaskets to be EPDM, ASTM D2000. Gaskets for dry systems to be flush seal design. Heat treated carbon steel oval neck track bolts and nuts, ASTM A-183, with zinc electroplated finish.

e. Flange adapters to be ductile iron, ASTM A536; except at lug type butterfly valves where standard threaded flanges shall be used.

f. Credit for the inherent flexibility of mechanical grooved pipe connections when used for expansion joints or flexible connectors may be allowed upon specific application by the Contractor. Three flexible couplings at first three connection points both upstream and downstream of pumps may be used in lieu of flexible connectors. Request for expansion joints shall be made in writing and shall include service, location, line size, proposed application and supporting calculations for the intended service.

2.4 SPRINKLERS

A. Manufacturers: Reliable, Tyco, Victaulic, Viking

B. Characteristics shall be equivalent to those scheduled on plans, unless applicable codes and standards require specific characteristics.

1. Temperature rating shall be as scheduled, unless conditions warrant higher temperature sprinklers in accordance with NFPA 13 or applicable FM datasheets to

accommodate in-field conditions. Change orders will not be accepted for incorrect temperature rated sprinklers being installed.

2. Quick response concealed sprinklers are UL Listed as Quick Response and FM Approved as standard response. These sprinklers meet NFPA 13 requirements for quick response.

C. Sprinklers shall be UL Listed as corrosion resistant when used in potentially corrosive areas, including bathrooms containing showers.

D. Sprinkler escutcheons and cover plates shall be installed on all sprinklers, other than fully exposed (i.e., upright) sprinklers.

E. Protective guards shall be installed on all exposed sprinklers installed at heights of less than 7'-6" or where potentially subjected to physical damage. Sprinkler guards shall be UL Listed and FM Approved for use with the provided sprinkler.

F. All sprinklers shall be new. Reuse of existing heads within the work area shall not be permitted. Any mention of "relocation of sprinklers" in contract documents is intended to mean demolish existing sprinkler and return bend piping and replace with new sprinkler.

2.5 HANGERS AND SUPPORTS

A. MANUFACTURERS: B-Line, Anvil, Erico, G-Strut, Tolco, Afcon, Roof Products & Systems or approved equal.

B. STRUCTURAL SUPPORTS: Provide all supporting steel required for the installation of mechanical equipment and materials, including angles, channels, beams, etc. to suspended or floor supported tanks and equipment. Note: this steel may not be specifically indicated on the drawings.

C. PIPE HANGERS AND SUPPORTS

1. HANGERS FOR PIPE SIZES 1" THROUGH 4": Carbon steel, adjustable swivel ring with 3/8" min. UL/FM approved hanger rods. B-Line B3170NF, Anvil 69 or 70.

2. HANGERS FOR PIPE SIZES 4" THROUGH 8": Carbon steel adjustable swivel ring with ½" min. UL/FM approved hanger rods. B-Line B3170NF, Anvil 69 or 70; Carbon steel, adjustable clevis, standard with UL/FM approved size hanger rods. B-Line B3100, Anvil 260.

3. HANGERS FOR PIPE SIZES 10" and UP: Carbon steel, adjustable clevis, standard with UL/FM approved size hanger rods. B-Line B3100, Anvil 260.

D. MULTIPLE OR TRAPEZE HANGERS:

1. Manufactured steel channel system with manufacturers slotted interlocking pipe clamps with screw/nut securing and threaded hanger rods or steel channels with welded spacers and threaded hanger rods. Must provide moment calculations in accordance with NFPA 13.

E. WALL SUPPORT:

1. Carbon steel welded bracket with hanger. B-Line 3060 Series, Anvil 190 Series.

2. Steel channels with pipe clamps.

F. VERTICAL SUPPORT: Carbon steel riser clamp. B-Line B3373, Anvil 261 for above floor use.

G. FLOOR SUPPORT: Carbon steel pipe saddle, stand and bolted floor flange. B-Line B3088T/B3093.

H. COPPER PIPE SUPPORTS: All supports, fasteners, clamps, etc. directly connected to copper piping shall be copper plated or polyvinylchloride coated. Where steel channels are used, provide flexible elastomeric/thermoplastic isolation cushion material to completely encircle the piping and avoid contact with the channel or clamp, equal to B-Line B1999 Vibra Cushion or provide manufacturers clamp and cushion assemblies, B-Line BVT series, Grinnell PS 1400 series.

I. PIPE HANGER RODS

1. STEEL HANGER RODS:

a. Threaded both ends, threaded one end, or continuous threaded, complete with adjusting and lock nuts.

b. Size rods for individual hangers and trapeze support as indicated in the following schedule: Pipe size up to and including 4": 3/8" (min); Pipe size 5" – 8": ½" (min); Pipe Size 10" or 12": 5/8" (min).

J. BEAM CLAMPS:

1. MSS SP-58 Types 19 & 23 malleable black iron clamp for attachment to beam flange to 0.62 inches thick with a retaining ring and threaded rod of 3/8, 1/2, and 5/8 inch diameter. Furnish with a hardened steel cup point set screw. B-Line B3036L/B3034, Anvil 86/92.

2. MSS SP-58 Type 28 or Type 29 forged steel jaw type clamp with a tie rod to lock clamp in place, suitable for rod sizes to 1-1/2 inch diameter. B-Line B3054, Anvil 228.

K. DRILLED FASTENERS:

1. CONCRETE CONSTRUCTION: Carbon steel expansion anchors, vibration resistant, with ASTM B633 zinc plating. Use drill bit of same manufacturer as anchor. Hilti, Rawl, Redhead.

2. WOOD CONSTRUCTION: Side or bottom mount lag thread by rod thread one piece hanger attachment installed per the Manufacturers standard and carrying capacity limit. Powers Fastener Vertigo, Erico Hangermate or equal.

L. CONTINUOUS CONCRETE INSERT CHANNELS: Steel inserts with an industry standard pre-galvanized finish, nominally 1-5/8 inch by 1-3/8 inch deep by length to suit the application, designed to be nailed to concrete forms and provide a linear slot for attaching other support devices. Installed channels to provide a load rating of 2000 pounds per foot in concrete. Manufacturer's standard brackets, inserts, and accessories designed to be used with channel inserts may be used. Select insert length to accommodate all pipe sizes in the area.

M. ANCHORS: Use welding steel shapes, plates, and bars to secure piping to the structure.

N. EQUIPMENT STANDS: Use structural steel members welded to and supported by pipe supports. Clean, prime and coat with three coat rust inhibiting alkyd paint or one coat epoxy mastic. Where exposed to weather, treat with corrosive atmosphere coatings.

O. CORROSIVE ATMOSPHERE COATINGS

P. Factory coat supports and anchors used in corrosive atmospheres with hot dip galvanizing after fabrication, ASTM A123, 1.5 ounces/square foot of surface each side. Mechanical galvanize threaded products, ASTM B695 Class 50, 2.0 mil coating. Field cuts and damaged finishes to be field covered with zinc rich paint of comparable thickness to factory coating. Corrosive atmospheres include, but are not limited to, the following locations.

2.6 HANGERS AND SUPPORTS:

A. INSTALLATION:

1. Size, apply and install supports and anchors in compliance with manufacturers recommendations and applicable codes and standards.
2. Install supports to provide for free expansion of the piping system. Support all piping from the structure using concrete inserts, beam clamps, ceiling plates, wall brackets, or floor stands. Fasten ceiling plates and wall brackets securely to the structure and test to demonstrate the adequacy of the fastening.
3. Coordinate hanger and support installation to properly group piping of all trades.
4. Trim steel hanger rods to within one inch of the final lock nut position. Hanger and support cutoff burrs shall be removed and sharp edges ground smooth.
5. Shared supports must be provided with calculations signed and sealed by a registered professional engineer.

B. HANGER AND SUPPORT SPACING

1. Use hangers with minimum vertical adjustment.
2. Support riser piping independently of connected horizontal piping.
3. Adjust hangers to obtain the slope specified in the piping section of these specifications.
4. Space hangers for pipe as follows:

Pipe Material	Pipe Size	Max. Horiz. Spacing	Max. Vert. Spacing
Steel	1" – 1¼"	12'-0"	15'-0"
Steel	1½" – 8"	15'-0"	15'-0"
Steel	8" – 12"	15'-0"	20'-0"

C. Hangers, supports and hanger spacing for CPVC plastic piping systems shall conform to the requirements of NFPA 13 and the manufacturer's requirements. Contractor shall provide details on the installation drawings for all proposed means of support.

D. Restraint hangers shall be installed at all sprinkler head location within 1'-0" for a single restraint and within 5'-0" for two points of restraint. The requirements for hanger restraint for systems in excess of 100 PSI pressure shall be followed.

E. Hangers for CPVC systems shall not compress, distort, cut or abrade the piping and shall allow free movement of the pipe to permit thermal expansion and contraction.

F. Unsupported length from the last hanger and an end sprinkler for steel piping systems shall be as follows:

1" piping	Not greater than 36"
1¼" piping	Not greater than 48"
1½" or larger piping	Not greater than 60"

*If static pressure exceeds 100psi, unsupported length cannot exceed 12"

G. RISER CLAMPS: Support vertical piping with clamps secured to the piping and resting on the building structure or secured to the building structure below at each floor. Use method of securing the vertical risers to the building structure below in stairwell locations.

H. ANCHORS: Install where indicated on the drawings and details. Where not specifically indicated, install anchors at ends of principal pipe runs and at intermediate points in pipe runs. Make provisions for preset of anchors as required to accommodate both expansion and contraction of piping.

2.7 SPRINKLER SPECIALTIES

A. FLEXIBLE SPRINKLER FITTINGS:

1. Manufacturers: FlexHead Industries, Victaulic or Viking.

2. Corrugated Type 304 stainless steel hose with braided Type 304 stainless steel exterior cover, welded stainless steel or zinc plated steel inlet and outlet threaded fittings with EPDM seals. 175 PSI pressure rating. 225 °F temperature rating, 1" minimum internal hose diameter. 48" maximum hose length, straight or angle outlet configuration. Galvanized steel ceiling support bar and brackets selected to match project ceiling support system requirements. UL Listed and FM approved.

3. Unless noted otherwise, the engineer's hydraulic analysis assumes the use of hard piped drops. If flexible drops are to be used, the contractor shall fully adhere to the most stringent conditions of the FM Approval and the following conditions: 4" maximum length, 3 bends maximum, minimum bend radius not less than 7".

4. Hydraulic calculations: The contractor shall submit hydraulic calculations justifying the use of flexible drops. A maximum length, number of bends, and bend radius shall be documented on the shop drawings and accounted for in hydraulic calculations. These conditions shall be applied uniformly to all hydraulic calculations. Hydraulic equivalent length shall be in accordance with the more stringent requirements of the UL Listing and FM Approval.

B. AUXILIARY DRAINS

1. General: an "accessible location" is defined as a point that is reliably maintained above 40°F and is located not more than 7'-6" above finished floor to which a 75'-0" hose could be connected to discharge the water in an acceptable manner.
2. Wet Systems and Preaction Systems Not Subject to Freezing:
   a. For isolated trapped sections of pipe with a trapped volume of 50 gal or more, utilize a 1" valve piped to an accessible location.
   b. For isolated trapped sections of pipe with more than 5 gal and less than 50 gal are trapped utilize a ¾" or larger valve and a plug or a nipple and cap.
   c. When less than 5 gal of water are trapped, provide an auxiliary drain consisting of a nipple and cap or plug not less than ½" in size, unless the piping can be drained by removing a single pendent sprinkler.
3. Dry Systems and Preaction Systems Subject to Freezing:
   a. Auxiliary drains shall be in an accessible and reliably heated location. A permanent sign shall be provided at the riser that indicates the location of all auxiliary drains.
   b. For isolated trapped systems less than 5 gal, the drain shall consist of an AGF Model 5900FE flood eliminator device, a valve not smaller than ½", and a plug or nipple and cap.
   c. For trapped systems in excess of 5 gal, the drain shall consist of an AGF Nidek 5900FE floor eliminator device and an AGF Model 5100A COLLECTanDRAIN device which incorporates two (2) 1" valves with a 2" x 12" long pipe nipple, an anti-trip plate, and water detection alarm powered by 24VDC OR 9V batteries. Alarm contacts shall be monitored by the fire alarm system as a supervisory signal.
   d. For trapped systems in excess of 5 gal, the drain shall consist of an AGF Model 5900FE flood eliminator device, two (2) 1" valves with a NPS 2 x 12" long pipe nipple between.

2.8 SPARE SPRINKLER CABINET

A. Cabinet shall be fabricated of steel with a hinged door and stay. Enclosure shall be painted red and shall be located in a location such that sprinklers will not be subject to corrosive atmospheres or temperatures in excess of 100°F.

B. Cabinet shall contain a spare stock of each type of sprinkler, and one of each type of head wrench in accordance with NFPA 13-2013. Minimum quantities shall be based upon NFPA 13 requirements.

2.9 PIPE SLEEVES, ESCUTCHEONS

A. Escutcheons: chromium plated brass escutcheons (split ring)

B. Cast-Iron Pipe Sleeves: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop.

C. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, anticorrosion coated or galvanized, with plain ends and integral welded waterstop collar.

D. Galvanized-Steel Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.

E. Penetrations through fire-rated assemblies shall be properly protected by listed fire stop system.

2.10 SEISMIC RESTRAINTS

A. Where the applicable building code, fire code, insurance underwriter, or referenced standard requires protection against damage from earthquake the following the prescriptive requirements of NFPA 13 (Section 9.3) and insurer regulations.

PART 3 EXECUTION

3.1 RESPONSIBILITY TO INFORM ENGINEER AND ARCHITECT OF CONCERNS

A. As the contractor is most intimately aware of the building and the site, they shall report to the engineer promptly and in writing if any code-related issues are observed at the site. Potential issues include but are not limited to areas where there is a potential freeze concern; areas above a suspended ceiling with substantial combustible loading; and changes from design documents that affect compliance with applicable codes and standards.

3.2 PREPARATION

A. The Contractor shall obtain manufacturer information concerning their apparatus, and then provide the proper methods of installation. Contractor shall obtain all information from the Owner or Owner's Representative and the other Subcontractors, which may be necessary to facilitate the Contractor's work and the completion of the whole project.

3.3 PIPING INSTALLATION:

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping. Install piping as indicated on approved working plans. Deviations from approved working plans for piping require written approval from authorities having jurisdiction. File for written approval with engineer before deviating from approved working plans.

B. Install all piping parallel to building walls and ceilings and at heights which do not obstruct any portion of a window, doorway, stairway, or passageway. Where interferences develop in the field, offset or reroute piping as required to clear such interferences. Coordinate locations of fire protection piping with piping, ductwork, conduit and equipment of other trades to allow sufficient clearances.

C. Piping shall be arranged for flushing in accordance with NFPA 13 requirements.

D. Piping Standard: Comply with applicable NFPA 13 requirements for installation of sprinkler e piping.

E. Install seismic restraints on piping as required. Comply with NFPA 13 requirements for seismic-restraint device materials and installation.

F. Use listed fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.

G. Install unions adjacent to each valve in pipes NPS 2 and smaller.

H. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2½ and larger end connections.

I. Install sprinkler piping with drains for complete system drainage. Drain risers and main drains shall terminate to the exterior.

J. Install automatic (ball drip) drain valve at low points on fire department connection to drain piping between fire-department connection and check valve. Install drain piping to and spill over floor drain or to outside building.

K. Install hangers and supports for sprinkler system piping according to NFPA 13 and NFPA 14 as applicable. Comply with requirements for hanger materials. In seismic-rated areas, provide restraint in accordance with NFPA 13 requirements.

L. Install sleeves for piping penetrations of walls, ceilings, and floors. Install sleeve seals for piping penetrations of concrete walls and slabs. Extend sleeves 1½ inch above finished floor and pack space between pipe and sleeve as recommended in NFPA 13.

M. Install escutcheons for piping penetrations of walls, ceilings, and floors.

N. Keep the interior of piping clean during installation at all times. All open ends of pipe shall be properly capped or plugged during the construction period to prevent entrance of foreign matter.

O. Piping within the building shall run concealed wherever possible and shall be installed as close to the structure as possible, unless noted otherwise. Where piping and or fittings are exposed, they shall be painted to match the surface they are secured to. Under no circumstances may sprinklers or cover plates be painted. Any sprinklers found to be painted shall be replaced at no additional cost to the owner.

P. All piping, in general, shall be run as straight and direct as possible forming right angles or parallel lines with the building walls and other pipes, and be neatly spaced. Check closely with other trades to prevent interference. No claims will be allowed for extra work caused by failure to coordinate with others.

Q. During the installation of the system, coordinate the final location of all the piping and appurtenances to permit the proper installation and operation of other trades and of all systems.

R. Provide proper fire stopping at all penetrations through fire-rated partitions, ceilings, and floors.

S. Escutcheons shall be provided for all exposed piping passing through finished rooms.

T. No pipe shall be installed outside of the thermal envelope or in an exterior wall unless adequate provision is made to protect such pipe from freezing.

U. Where copper or steel piping is embedded in masonry or concrete, provide protective sleeve covering of elastomeric pipe insulation.

V. Provide 3/32" min. thickness steel nailing plates behind or on either side of piping where the possibility of penetration from nails or drywall screws exists.

W. Provide anchors, expansion joints, swing joints and/or expansion loops so that piping may expand and contract without damage to itself, equipment, or building.

3.4 SPRINKLER INSTALLATION:

A. Install sprinkler heads located as specified in this Specification. Locations other than those specified must be confirmed by the Engineer in writing.

B. Install sprinklers in suspended ceilings in center of the acoustical ceiling panels (for 24" x 48" panels", install in the center of one half of the panel). Use return bend, flexible connection, or swing joint to ensure sprinkler is in center of tile, unless specifically noted otherwise.

C. Install upright sprinklers on 1" sprig from pipe with reducer, unless specifically noted otherwise.

D. When flexible sprinkler hose fittings are installed, utilize bracket on ceiling grid. Ensure hydraulic performance and installation (bend radius, number of bends) is within manufacturer installation manual / listing and requirements of this specification.

E. For dry sprinkler installations, ensure the requirements of NFPA 13 (2016) §7.2.2 are met.

F. For preaction sprinkler installations, ensure the requirements of NFPA 13 (2016) §7.2.3.5 are met.

G. Sprinklers installed in potentially corrosive environments (including rooms containing showers) shall be listed as corrosion resistant.

H. Ensure all sprinklers are adequately protected from paint overspray for the duration of the project. After completion of painting, remove all protective caps. Only sprinklers with their original factory finish are acceptable. Remove and replace any sprinklers that are painted or have any other finish than their original factory finish.

3.5 VALVE AND SPECIALTIES INSTALLATION

A. Install listed fire-protection valves, trim and drain valves, specialty valves and trim, controls, and specialties according to applicable NFPA standards, manufacturer instructions, insurance regulations, and authorities having jurisdiction.

B. Install listed fire protection shutoff valves supervised open, located to control sources of water supply except from fire-department connections. Install permanent identification signs indicating portion of system controlled by each valve.

C. Furnish and install a minimum of 1 air release valve per sprinkler system zone. Install at the high point on the fire sprinkler system piping to assure evacuation of air from the system during and after filling.

D. All alarm valves or switches shall be wired to the fire alarm panel. The Electrical Contractor shall be responsible for all wiring.

3.6 COMPRESSORS / NITROGEN GENERATORS:

A. Air Compressor / Nitrogen Generator: Install on concrete housekeeping pad, leveled and bolted in place. Pipe automatic drain discharge piping to floor drain. Install line size ball valve and check valve in discharge line. Install pressure gauge upstream of ball valve.

3.7 SYSTEM DRAINAGE

A. Piping shall be arranged for proper drainage. Pipe layout shall be such that areas of trapped water are avoided where practical. Where necessary, the amount of auxiliary drains shall be minimized to the maximum extent possible.

B. For dry and preaction systems, branch line piping shall be pitched a minimum of ½" per 10 feet and main piping shall be pitched a minimum of ¼" per 10 feet.

3.8 VALVE-TAG INSTALLATION

A. Install tags on valves and control devices in fire-suppression piping systems. List tagged valves in a valve-tag schedule.

3.9 SIGNAGE & LABELING

A. Provide durable, permanently installed, readily visible from 10' away containing at minimum the following information:

1. Provide design hydraulics summary on each system control riser and auxiliary system control valve, in accordance with NFPA 13 (2016), §25.6:

   a. Occupancy classification, density and area

   b. Hydraulic demand at base of riser

   c. Storage information [commodity classification; presence of high-piled and/or rack storage; maximum height of storage planned; aisle width planned; encapsulation of pallet loads; presence of solid shelving; presence of flammable/combustible liquids; presence of hazardous materials; presence of other special storage]

   d. Location of auxiliary drains and low point drains on dry pipe and preaction systems

   e. Original results of main drain flow test

   f. Name of installing contractor or designer

   g. Indication of presence and location of antifreeze or other auxiliary systems

   h. Where injection systems are installed to treat MIC or corrosion, the type of chemical, concentration of the chemical, and where information can be found as to the proper disposal of the chemical

2. Provide signage with 1" minimum letters on each control valve and test / drain assembly indicating the system served.

3.10 WORKMANSHIP

A. All Work shall be executed in a workmanship-like manner and shall present a neat, mechanical appearance when completed. Work not approved by the Owner and/or SFC Engineering Partnership, Inc., shall be replaced by the Sprinkler Contractor without any additional charge.

3.11 FLUSHING

A. The System shall be thoroughly flushed before sprinklers are in place in order to free the system from any stones or other obstructing material that might clog the sprinkler orifices.

B. Where evidence of stoppage appears in piping or equipment, disconnect, clean, repair, and reconnect obstructed parts. The Contractor shall bear the cost of cutting, patching and joining work necessitated by such cleaning and repairing.

3.12 FIELD QUALITY CONTROL

A. Prior to any concealing of sprinkler equipment, the Engineer shall visually verify that the installation is in accordance with approved shop drawings. Inspection shall verify pipe sizes and lengths, pipe supports and fitting locations.

B. The contractor shall request field changes in writing to the engineer. Any field changes to be made to the approved shop drawings shall be approved by the Engineer prior to the change being made in the field.

3.13 ACCEPTANCE TESTING

A. Contractor shall furnish all instruments, ladders, test equipment, and personnel required for the testing of systems and shall dispose of all test water and wastewater. Appropriate staffing levels and protections shall be put in place to avoid water damage. Pressure testing should be performed prior to high-value equipment being installed, whenever possible.

B. Field tests to determine the conformance with the specified requirements shall be performed. System shall be hydrostatically tested at 200 psig for a period of two (2) hours.

1. When existing systems are modified such that the work affects fewer than 20 sprinklers, the system only requires testing at the system working pressure.

2. Where the modification affects more than 20 sprinklers, that portion of the system must be isolated and tested at 200 psi for two hours.

Where system design is in excess of 150 psig, test at a pressure 50 psig above system design pressure., unless a higher pressure is required by NFPA 13. Alarms and other devices shall be tested by flowing water through the inspector's test connection.

3. If the new work cannot be isolated, the testing can be done at system working pressure.

4. An NFPA 13 above ground inspection / test form is required for each system (i.e., wet riser, floor / zone control assembly, dry system, preaction system, etc.).

5. After satisfactory final inspection and test by the approving authority, a copy of the material and test certificate for aboveground piping shall be filed with the Owner and SFC Engineering Partnership, Inc.

C. When hydrostatic and alarm tests have been completed and all necessary corrections made, the Contractor shall submit a signed and dated certificate, as required by NFPA 13-, with a request for an inspection by the Engineer. At this inspection, any or all of the required tests shall be repeated as directed by the Engineer.

1. The request for formal inspection shall be submitted at least five (5) working days prior to the date the inspection is to take place.

D. A competent representative of the sprinkler installer shall be present during the field tests and inspection.

E. All defects or deficiencies shall be corrected by the Contractor at the Contractor's own expense, and additional tests shall be made until it has been demonstrated that the Systems comply with all contract requirements. All appliances and equipment necessary for additional testing shall be furnished by the Contractor, and all expenses in connection with these tests shall be defrayed by the Contractor.

3.14 CUTTING AND PATCHING

A. All cutting and patching is the responsibility of the Sprinkler Contractor. The contractor shall utilize best trade practices in cutting and patching.

B. It shall be the responsibility of the contractor to dismantle and reinstall all ceilings as needed for pipe concealment. This contractor shall be responsible for replacing any materials damaged during the sprinkler installation.

3.15 SEISMIC BRACING

A. Provide seismic bracing on all new and existing main sprinkler piping within scope of work as required by applicable codes and standards. Where existing main sprinkler piping is installed without seismic restraints, seismic restraints shall be installed in compliance with current NFPA 13 requirements for new sprinkler piping.

3.16 DEMONSTRATION

A. After completion of assembly and installation of all systems and equipment and piping required under this section of the specifications, the owner's supervisory and operating personnel shall be instructed regarding the operation and maintenance of the systems. The instructions shall be given by this contractor and other qualified personnel who are thoroughly familiar with all systems and shall be furnished for a time period as directed by the architect or engineer.

END OF SECTION

SECTION 260519

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

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.

1.2 SUMMARY

A. Section Includes:

1. Aluminum and Copper building wire rated 600 V or less.
2. Metal-clad cable, Type MC, rated 600 V or less.
3. Connectors, splices, and terminations rated 600 V and less.

1.3 DEFINITIONS

A. RoHS: Restriction of Hazardous Substances.

B. VFC: Variable-frequency controller.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Product Schedule: Indicate type, use, location, and termination locations.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Field quality-control reports.

PART 2 - PRODUCTS

2.1 ALUMINUM AND COPPER BUILDING WIRE

A. Description: Flexible, insulated and uninsulated, drawn aluminum and copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.

B. 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. Encore Wire Corporation.
2. General Cable Technologies Corporation.
3. Okonite Company (The).
4. Southwire Company.
5. Or equal.

C. Standards:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
2. RoHS compliant.
3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

D. Conductors: Aluminum, complying with ASTM B800 and ASTM B801. Copper, complying with ASTM B3 for bare annealed copper and with ASTM B8 for stranded conductors.

E. Conductor Insulation:
1. Type THHN and Type THWN-2: Comply with UL 83.
2. Type XHHW-2: Comply with UL 44.

2.2 METAL-CLAD CABLE, TYPE MC

A. Description: A factory assembly of one or more current-carrying insulated conductors in an overall metallic sheath.

B. 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. Encore Wire Corporation.
2. General Cable Technologies Corporation.
3. Southwire Company.
4. Or equal.

C. Standards:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

2. Comply with UL 1569.
3. RoHS compliant.
4. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

D. Circuits:

1. Single circuit.

E. Conductors: Copper, complying with ASTM B3 for bare annealed copper and with ASTM B8 for stranded conductors or Aluminum, complying with ASTM B800 and ASTM B801.

F. Ground Conductor: Insulated.

G. Conductor Insulation:

1. Type TFN/THHN/THWN-2: Comply with UL 83.
2. Type XHHW-2: Comply with UL 44.

H. Armor: Aluminum, interlocked.

I. Jacket: Where indicated PVC applied over armor.

2.3 CONNECTORS AND SPLICES

A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

B. 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. 3M Electrical Products.
2. AFC Cable Systems; a part of Atkore International.
3. Ideal Industries, Inc.
4. ILSCO.
5. O-Z/Gedney; a brand of Emerson Industrial Automation.
6. Thomas & Betts Corporation; A Member of the ABB Group.

C. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.

1. Material: Copper or Aluminum, rated for use with the conductor material being terminated.
2. Type: Two hole with long barrels.
3. Termination: Compression.

D. Pigtail Adapters: One piece, seamless, designed to terminate conductors specified in this Section.

1. Material: Copper or Aluminum, rated for use with the conductor material being terminated.
2. Type: Chamfered barrel with insulating cover.
3. Termination: Compression with knurled pin.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper or Aluminum; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Branch Circuits: Copper; Solid for No. 14 AWG and smaller; stranded for No. 12 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway.

B. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces: Type THHN/THWN-2, single conductors in raceway.

C. Feeders and Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.

D. Exposed Branch Circuits, Including in Crawlspaces: Type THHN/THWN-2 single conductors in raceway.

E. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway or Metal-clad cable, Type MC.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.

B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.

C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

F. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.

C. All aluminum conductors used for feeder circuits shall be terminated with compression pigtail adapters with insulating cover.

D. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches (150 mm) of slack.

3.5 IDENTIFICATION

A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."

B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.7 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 078413 "Penetration Firestopping."

3.8 FIELD QUALITY CONTROL

A. Perform tests and inspections.

1. After installing conductors and cables and before electrical circuitry has been energized, test feeder conductors for compliance with requirements.

2. Perform each of the following visual and electrical tests:

a. Inspect exposed sections of conductor and cable for physical damage and correct connection according to the single-line diagram.
b. Test bolted connections for high resistance using one of the following:

1) A low-resistance ohmmeter.

2) Calibrated torque wrench.

c. Inspect compression-applied connectors for correct cable match and indentation.
d. Inspect for correct identification.
e. Inspect cable jacket and condition.
f. Insulation-resistance test on each conductor for ground and adjacent conductors. Apply a potential of 500-V dc for 300-V rated cable and 1000-V dc for 600-V rated cable for a one-minute duration.
g. Continuity test on each conductor and cable.
h. Uniform resistance of parallel conductors.

B. Cables will be considered defective if they do not pass tests and inspections.

C. Prepare test and inspection reports to record the following:

1. Procedures used.
2. Results that comply with requirements.
3. Results that do not comply with requirements, and corrective action taken to achieve compliance with requirements.

END OF SECTION 260519

SECTION 260526

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes grounding and bonding systems and equipment.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. 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.

B. Comply with UL 467 for grounding and bonding materials and equipment.

2.2 MANUFACTURERS

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. Erico by nVent.
2. Harger Lightning and Grounding.
3. Or equal.

2.3 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:

1. Solid Conductors: ASTM B3.

2. Stranded Conductors: ASTM B8.
3. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.

2.4 CONNECTORS

A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

B. Mechanical-Type Bus-Bar Connectors: Cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

C. Cable-to-Cable Connectors: Compression type, copper or copper alloy.

D. Conduit Hubs: Mechanical type, terminal with threaded hub.

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

B. Grounding Conductors: Green-colored insulation with continuous yellow stripe.

C. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Connections to Structural Steel: Welded connectors.

3.2 GROUNDING AT SEPARATIVELY DERVIVED SERVICES

A. Equipment grounding conductors and grounding electrode conductors must be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

3.3 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:

1. Feeders and branch circuits.
2. Lighting circuits.
3. Receptacle circuits.
4. Single-phase motor and appliance branch circuits.
5. Three-phase motor and appliance branch circuits.

6. Flexible raceway runs.
7. Metal-clad cable runs.

3.4 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.

C. Grounding and Bonding for Piping:

1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

D. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install bonding jumper to bond across flexible duct connections to achieve continuity.

E. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 ft. (18 m) apart.

F. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact are galvanically compatible.

1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in order of galvanic series.
2. Make connections with clean, bare metal at points of contact.
3. Make aluminum-to-steel connections with stainless steel separators and mechanical clamps.
4. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.

5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

3.5 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.

B. Grounding system will be considered defective if it does not pass tests and inspections.

C. Prepare inspection reports.

D. Report measured ground resistances that exceed the following values:

1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
2. Pad-Mounted Equipment: 5 ohms.

E. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Engineer promptly and include recommendations to reduce ground resistance.

END OF SECTION 260526

SECTION 260529

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Support, anchorage, and attachment components.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:

a. Slotted support systems, hardware, and accessories.
b. Clamps.
c. Hangers.
d. Sockets.
e. Eye nuts.
f. Fasteners.
g. Anchors.
h. Saddles.
i. Brackets.

2. Include rated capacities and furnished specialties and accessories.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32 inch (10 mm) diameter holes at a maximum of 8 inch (200 mm) on center in at least one surface.

1. 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:

a. CADDY; a brand of nVent.
b. Flex-Strut Inc.
c. Unistrut; Part of Atkore International.

d. Or equal.

2. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
3. Material for Channel, Fittings, and Accessories: Galvanized steel.
4. Channel Width: 1-5/8 inch (41.25 mm).
5. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
6. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
7. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Conduit and Cable Support Devices: Steel and malleable-iron or Stainless steel, as indicated hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

C. Structural Steel for Fabricated Supports and Restraints: ASTM A36/A36M steel plates, shapes, and bars; black and galvanized.

D. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated or stainless steel as indicated, for use in hardened portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.

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) Hilti, Inc.
2) ITW Ramset/Red Head; Illinois Tool Works, Inc.
3) Or equal.

2. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
3. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
4. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM F3125/F3125M, Grade A325 (Grade A325M).
5. Toggle Bolts: All steel or stainless steel, as indicated, springhead type.
6. Hanger Rods: Threaded steel.

PART 3 - EXECUTION

3.1 SELECTION

A. Comply with the following standards for selection and installation of hangers and supports, except where requirements on Drawings or in this Section are stricter:

1. NECA NEIS 1

2. NECA NEIS 101
3. NECA NEIS 102.
4. NECA NEIS 105.
5. NECA NEIS 111.

B. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping materials and installation for penetrations through fire-rated walls, ceilings, and assemblies.

C. Comply with requirements for raceways and boxes specified in Section 260533 "Raceway and Boxes for Electrical Systems."

D. Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for EMT and GRC as required by NFPA 70. Minimum rod size must be 1/4 inch (6 mm) in diameter.

E. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 20 percent in future without exceeding specified design load limits.

1. Secure raceways and cables to these supports with two-bolt conduit clamps.

F. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2 inch (38 mm) and smaller raceways serving branch circuits and communication systems above suspended ceilings, and for fastening raceways to trapeze supports.

3.2 INSTALLATION OF SUPPORTS

A. Comply with NECA NEIS 1 and NECA NEIS 101 for installation requirements except as specified in this article.

B. Raceway Support Methods: In addition to methods described in NECA NEIS 1, EMT and GRC may be supported by openings through structure members, in accordance with NFPA 70.

C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination must be weight of supported components plus 200 lb (90 kg).

D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:

1. To Wood: Fasten with lag screws or through bolts.
2. To New Concrete: Bolt to concrete inserts.
3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
4. To Existing Concrete: Expansion anchor fasteners.
5. To Steel: Beam clamps (MSS SP-58, Type 19, 21, 23, 25, or 27), complying with MSS SP-69.
6. To Light Steel: Sheet metal screws.

7. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.

E. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

3.3 PAINTING

A. Touchup:

1. Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

a. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils (0.05 mm).

B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A780.

END OF SECTION 260529

SECTION 260533

RACEWAYS AND BOXES FOR ELECTRICAL 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.

1.2 SUMMARY

A. Section Includes:

1. Metal conduits and fittings.
2. Nonmetallic conduits and fittings.
3. Metal wireways and auxiliary gutters.
4. Surface raceways.
5. Boxes, enclosures, and cabinets.

B. Related Requirements:

1. Section 078413 "Penetration Firestopping" for firestopping at conduit and box entrances.

1.3 DEFINITIONS

A. GRC: Galvanized rigid steel conduit.

1.4 ACTION SUBMITTALS

A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

1.5 INFORMATIONAL SUBMITTALS

A. Source quality-control reports.

PART 2 - PRODUCTS

2.1 METAL CONDUITS AND FITTINGS

A. Metal Conduit:

1. 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:

   a. AFC Cable Systems; a part of Atkore International.
   b. Allied Tube & Conduit; a part of Atkore International.
   c. Calconduit.
   d. Western Tube and Conduit Corporation.
   e. Wheatland Tube Company.
   f. Or equal.

2. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. GRC: Comply with ANSI C80.1 and UL 6.
4. EMT: Comply with ANSI C80.3 and UL 797.
5. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

B. Metal Fittings:

1. 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:

   a. AFC Cable Systems; a part of Atkore International.
   b. Allied Tube & Conduit; a part of Atkore International
   c. Or equal.

2. Comply with NEMA FB 1 and UL 514B.
3. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
4. Fittings, General: Listed and labeled for type of conduit, location, and use.
5. Fittings for EMT:

   a. Material: Steel.
   b. Type: Compression.

6. Expansion Fittings: GRC, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.

C. Joint Compound for GRC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS AND FITTINGS

A. Nonmetallic Conduit:

1. 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:

   a. CANTEX INC.
   b. Condux International, Inc.
   c. JM Eagle, Inc.
   d. Or equal.

2. Listing and Labeling: Nonmetallic conduit shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
4. LFNC: Comply with UL 1660.

B. Nonmetallic Fittings:

1. 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:

   a. CANTEX INC.
   b. Condux International, Inc.
   c. JM Eagle, Inc.
   d. Or equal.

2. Fittings, General: Listed and labeled for type of conduit, location, and use.
3. Fittings for ENT and RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.

   a. Fittings for LFNC: Comply with UL 514B.

4. Solvents and Adhesives: As recommended by conduit manufacturer.

2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

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. B-line, an Eaton business.
2. Hoffman; a brand of nVent.
3. Or equal.

B. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 12 unless otherwise indicated, and sized according to NFPA 70.

1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

D. Wireway Covers: Screw-cover type unless otherwise indicated.

E. Finish: Manufacturer's standard enamel finish.

2.4 BOXES, ENCLOSURES, AND CABINETS

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. Crouse-Hinds, an Eaton business.
2. EGS/Appleton Electric.
3. O-Z/Gedney; a brand of Emerson Industrial Automation.
4. RACO; Hubbell.
5. Or equal.

B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.

C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.

E. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

F. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum with gasketed cover.

G. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

H. Device Box Dimensions: 4 inches square by 2-1/8 inches deep (100 mm square by 60 mm deep).

I. Gangable boxes are prohibited.

J. Cabinets:

1. NEMA 250, Type 12 galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
2. Hinged door in front cover with flush latch and concealed hinge.
3. Key latch to match panelboards.
4. Metal barriers to separate wiring of different systems and voltage.
5. Accessory feet where required for freestanding equipment.

6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed Conduit: GRC.
2. Concealed Conduit, Aboveground: GRC.
3. Underground Conduit: RNC, Type EPC-40-PVC, direct buried.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.

B. Indoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed, Not Subject to Physical Damage: EMT.
2. Exposed, Not Subject to Severe Physical Damage: EMT.
3. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:
    a. Loading docks.
    b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
    c. Mechanical rooms.
4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
6. Damp or Wet Locations: GRC.
7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in damp or wet locations.

C. Minimum Raceway Size: 3/4-inch (21-mm) trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
2. EMT: Use compression, steel fittings. Comply with NEMA FB 2.10.
3. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

E. Install surface raceways only where indicated on Drawings.

F. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F (49 deg C).

3.2 INSTALLATION

A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.

B. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.

C. Do not install raceways or electrical items on any "explosion-relief" walls or rotating equipment.

D. Do not fasten conduits onto the bottom side of a metal deck roof.

E. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

F. Complete raceway installation before starting conductor installation.

G. Arrange stub-ups so curved portions of bends are not visible above finished slab.

H. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches (300 mm) of changes in direction.

I. Make bends in raceway using large-radius preformed ells. Field bending shall be according to NFPA 70 minimum radii requirements. Use only equipment specifically designed for material and size involved.

J. Conceal conduit within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

K. Support conduit within 12 inches (300 mm) of enclosures to which attached.

L. Stub-Ups to Above Recessed Ceilings:

1. Use EMT or RMC for raceways.
2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

M. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

N. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.

O. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch (35mm) trade size and insulated throat metal

bushings on 1-1/2-inch (41-mm) trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.

P. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

Q. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.

R. Cut conduit perpendicular to the length. For conduits 2-inch (53-mm) trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.

S. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

T. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.

U. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where an underground service raceway enters a building or structure.
3. Conduit extending from interior to exterior of building.
4. Conduit extending into pressurized duct and equipment.
5. Conduit extending into pressurized zones that are automatically controlled to maintain different pressure set points.
6. Where otherwise required by NFPA 70.

V. Comply with manufacturer's written instructions for solvent welding RNC and fittings.

W. Expansion-Joint Fittings:

1. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F (17 deg C) and that has straight-run length that exceeds 25 feet (7.6 m). Install in each run of aboveground RMC and EMT conduit that is located where environmental temperature change may exceed 100 deg F (55 deg C) and that has straight-run length that exceeds 100 feet (30 m).
2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:

   a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F (70 deg C)] temperature change.
   b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F (86 deg C)] temperature change.

c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F (70 deg C) temperature change.
d. Attics: 135 deg F (75 deg C) temperature change.

3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F (0.06 mm per meter of length of straight run per deg C) of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F (0.0115 mm per meter of length of straight run per deg C) of temperature change for metal conduits.
4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

X. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 36 inches (915 mm) of flexible conduit for equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

1. Use LFMC in damp or wet locations subject to severe physical damage.
2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.

Y. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.

Z. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.

AA. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.

BB. Locate boxes so that cover or plate will not span different building finishes.

CC. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

DD. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit.
2. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide

maximum supporting strength. After placing controlled backfill to within 12 inches (300 mm) of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction.

3. Underground Warning Tape: Comply with requirements in Section 260553 "Identification for Electrical Systems."

3.4 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.5 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

END OF SECTION 260533

SECTION 260553

IDENTIFICATION FOR ELECTRICAL 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.

1.2 SUMMARY

A. Section Includes:

1. Color and legend requirements for raceways, conductors, and warning labels and signs.
2. Labels.
3. Bands and tubes.
4. Tape.
5. Tags.
6. Signs.
7. Cable ties.
8. Paint for identification.
9. Fasteners for labels and signs.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for electrical identification products.

B. Identification Schedule: For each piece of electrical equipment and electrical system components to be an index of nomenclature for electrical equipment and system components used in identification signs and labels. Use same designations indicated on Drawings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with ASME A13.1.

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.

D. Comply with ANSI Z535.4 for safety signs and labels.

E. Comply with NFPA 70E requirements for arc-flash warning labels.

F. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

G. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 COLOR AND LEGEND REQUIREMENTS

A. Raceways and Cables Carrying Circuits at 600 V or Less:

1. Black letters on an orange field.
2. Legend: Indicate voltage and system or service type.

B. Color-Coding for Phase- and Voltage-Level Identification, 600 V or Less: Use colors listed below for ungrounded branch-circuit conductors.

1. Color shall be factory applied or field applied for sizes larger than No. 8 AWG if authorities having jurisdiction permit.
2. Colors for 208/120-V Circuits:

a. Phase A: Black.
b. Phase B: Red.
c. Phase C: Blue.
d. Neutral: White.

3. Colors for 480/277-V Circuits:

a. Phase A: Brown.
b. Phase B: Orange.
c. Phase C: Yellow.
d. Neutral: Gray.

4. Color for Equipment Grounds: Green.

C. Warning Label Colors:

1. Identify system voltage with black letters on an orange background.

D. Warning labels and signs shall include, but are not limited to, the following legends:

1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."

2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES (915 MM)."

E. Equipment Identification Labels:

1. Black letters on a white field.

2.3 LABELS

A. Vinyl Wraparound Labels: Preprinted, flexible labels laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing label ends.
1. 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:

a. Brady Corporation.
b. Panduit Corp.
c. Or equal.

B. Snap-around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeves, with diameters sized to suit diameters and that stay in place by gripping action.
1. 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:

a. Brady Corporation.
b. Panduit Corp.
c. Or equal.

C. Self-Adhesive Labels: Vinyl, thermal, transfer-printed, 3-mil- (0.08-mm-) thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for intended use and location.
1. 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:

a. Brady Corporation.
b. Brother International Corporation.
c. Panduit Corp.
d. Or equal.

2. Minimum Nominal Size:

a. 1-1/2 by 6 inches (37 by 150 mm) for raceway and conductors.
b. 3-1/2 by 5 inches (76 by 127 mm) for equipment.
c. As required by authorities having jurisdiction.

2.4 BANDS AND TUBES

A. Snap-around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2 inches (50 mm) long, with diameters sized to suit diameters and that stay in place by gripping action.

1. 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:

   a. Brady Corporation.
   b. Or equal.

2.5 TAPES AND STENCILS

A. Underground-Line Warning Tape:

1. 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:

   a. Brady Corporation.
   b. Ideal Industries, Inc.
   c. Seton Identification Products; a Brady Corporation company.
   d. Or equal.

2. Tape:

   a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical utility lines.
   b. Printing on tape shall be permanent and shall not be damaged by burial operations.
   c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.

3. Color and Printing:

   a. Comply with ANSI Z535.1, ANSI Z535.2, ANSI Z535.3, ANSI Z535.4, and ANSI Z535.5.
   b. Inscriptions for Red-Colored Tapes: "ELECTRIC LINE, HIGH VOLTAGE".

4. Tag: Typical for all locations:

   a. Detectable three-layer laminate, consisting of a printed pigmented polyolefin film, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core; bright colored, compounded for direct-burial service.
   b. Width: 3 inches (75 mm).
   c. Overall Thickness: 5 mils (0.125 mm).
   d. Foil Core Thickness: 0.35 mil (0.00889 mm).
   e. Weight: 28 lb/1000 sq. ft. (13.7 kg/100 sq. m).
   f. Tensile according to ASTM D882: 70 lbf (311.3 N) and 4600 psi (31.7 MPa).

2.6 TAGS

A. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch (50 by 50 by 1.3 mm), with stamped legend, punched for use with self-locking cable tie fastener.

1. 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:

   a. Brady Corporation.
   b. Marking Services, Inc.
   c. Or equal.

B. Nonmetallic Preprinted Tags: Polyethylene tags, 0.023 inch (0.58 mm) thick, color-coded for phase and voltage level, with factory printed permanent designations; punched for use with self-locking cable tie fastener.

1. 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:

   a. Brady Corporation.
   b. Panduit Corp.
   c. Or equal.

2.7 SIGNS

A. Baked-Enamel Signs:

1. 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:

   a. Carlton Industries, LP.
   b. Or equal.

2. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
3. 1/4-inch (6.4-mm) grommets in corners for mounting.
4. Nominal Size: 7 by 10 inches (180 by 250 mm).

B. Laminated Acrylic Signs:

1. 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:

   a. Brady Corporation.
   b. Or equal.

2. Engraved legend.
3. Thickness:

   a. For signs up to 20 sq. in. (129 sq. cm), minimum 1/16 inch (1.6 mm) thick.
   b. For signs larger than 20 sq. in. (129 sq. cm), 1/8 inch (3.2 mm) thick.
   c. Engraved legend with black letters on white face.
   d. Punched or drilled for mechanical fasteners with 1/4-inch (6.4-mm) grommets in corners for mounting.

e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.8 CABLE TIES

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. HellermannTyton.
2. Ideal Industries, Inc.
3. Or equal.

B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.

1. Minimum Width: 3/16 inch (5 mm).
2. Tensile Strength at 73 Deg F (23 Deg C) according to ASTM D638: 12,000 psi (82.7 MPa).
3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
4. Color: Black.

2.9 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).

B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 PREPARATION

A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

3.2 INSTALLATION

A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.

B. Install identifying devices before installing acoustical ceilings and similar concealment.

C. Verify identity of each item before installing identification products.

D. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.

E. Apply identification devices to surfaces that require finish after completing finish work.

F. Install signs with approved legend to facilitate proper identification, operation, and maintenance of electrical systems and connected items.

G. System Identification for Raceways and Cables under 600 V: Identification shall completely encircle cable or conduit. Place identification of two-color markings in contact, side by side.

1. Secure tight to surface of conductor, cable, or raceway.

H. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.

I. Elevated Components: Increase sizes of labels, signs, and letters to those appropriate for viewing from the floor.

J. Accessible Fittings for Raceways: Identify the covers of each junction and pull box of the following systems with the wiring system legend and system voltage. System legends shall be as follows:

1. "EMERGENCY POWER."
2. "POWER."
3. "UPS."

K. Vinyl Wraparound Labels:

1. Secure tight to surface of raceway or cable at a location with high visibility and accessibility.
2. Attach labels that are not self-adhesive type with clear vinyl tape, with adhesive appropriate to the location and substrate.

L. Snap-around Labels: Secure tight to surface at a location with high visibility and accessibility.

M. Self-Adhesive Wraparound Labels: Secure tight to surface at a location with high visibility and accessibility.

N. Self-Adhesive Labels:

1. On each item, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on 1-1/2-inch- (38-mm-) high label; where two lines of text are required, use labels 2 inches (50 mm) high.

O. Snap-around Color-Coding Bands: Secure tight to surface at a location with high visibility and accessibility.

P. Heat-Shrink, Preprinted Tubes: Secure tight to surface at a location with high visibility and accessibility.

Q. Marker Tapes: Secure tight to surface at a location with high visibility and accessibility.

R. Self-Adhesive Vinyl Tape: Secure tight to surface at a location with high visibility and accessibility.

1. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches (150 mm) where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding.

S. Metal Tags:

1. Place in a location with high visibility and accessibility.
2. Secure using general-purpose cable ties.

T. Nonmetallic Preprinted Tags:

1. Place in a location with high visibility and accessibility.
2. Secure using general-purpose cable ties.

U. Laminated Acrylic Signs:

1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on 1-1/2-inch- (38-mm-) high sign; where two lines of text are required, use labels 2 inches (50 mm) high.

3.3 IDENTIFICATION SCHEDULE

A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.

B. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.

C. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits, More Than 30 A and 120 V to Ground: Identify with self-adhesive raceway labels.

1. Locate identification at changes in direction, at penetrations of walls and floors, at 50-foot (15-m) maximum intervals in straight runs, and at 25-foot (7.6-m) maximum intervals in congested areas.

D. Accessible Fittings for Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive labels containing the wiring system legend and system voltage. System legends shall be as follows:

1. "EMERGENCY POWER."
2. "POWER."
3. "UPS."

E. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use vinyl wraparound labels to identify the phase.

1. Locate identification at changes in direction, at penetrations of walls and floors, at 50-foot (15-m) maximum intervals in straight runs, and at 25-foot (7.6-m) maximum intervals in congested areas.

F. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use self-adhesive labels with the conductor or cable designation, origin, and destination.

G. Control-Circuit Conductor Termination Identification: For identification at terminations, provide self-adhesive labels with the conductor designation.

H. Auxiliary Electrical Systems Conductor Identification: Self-adhesive vinyl tape that is uniform and consistent with system used by manufacturer for factory-installed connections.

1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.

I. Instructional Signs: Self-adhesive labels, including the color code for grounded and ungrounded conductors.

J. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Baked-enamel warning signs.

1. Apply to exterior of door, cover, or other access.
2. For equipment with multiple power or control sources, apply to door or cover of equipment, including, but not limited to, the following:

a. Power-transfer switches.
b. Controls with external control power connections.

K. Operating Instruction Signs: Self-adhesive labels.

L. Equipment Identification Labels:
1. Indoor and Outdoor Equipment: Laminated acrylic sign.
2. Equipment to Be Labeled:

a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be in the form of a self-adhesive, engraved, laminated acrylic sign.
b. Enclosures and electrical cabinets.
c. Access doors and panels for concealed electrical items.
d. Enclosed switches.
e. Enclosed circuit breakers.

END OF SECTION 260553

SECTION 262416

PANELBOARDS

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.

1.2 SUMMARY

A. Section Includes:

1. Distribution panelboards.
2. Lighting and appliance branch-circuit panelboards.

1.3 DEFINITIONS

A. ATS: Acceptance testing specification.

B. GFCI: Ground-fault circuit interrupter.

C. GFEP: Ground-fault equipment protection.

D. HID: High-intensity discharge.

E. MCCB: Molded-case circuit breaker.

F. SPD: Surge protective device.

G. VPR: Voltage protection rating.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of panelboard.

1. Include materials, switching and overcurrent protective devices, SPDs, accessories, and components indicated.
2. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For each panelboard and related equipment.

1. Include dimensioned plans, elevations, sections, and details.
2. Show tabulations of installed devices with nameplates, conductor termination sizes, equipment features, and ratings.
3. Detail enclosure types including mounting and anchorage, environmental protection, knockouts, corner treatments, covers and doors, gaskets, hinges, and locks.
4. Detail bus configuration, current, and voltage ratings.
5. Short-circuit current rating of panelboards and overcurrent protective devices.
6. Include evidence of NRTL listing for series rating of installed devices.
7. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
8. Include wiring diagrams for power, signal, and control wiring.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Panelboard Schedules: For installation in panelboards.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
2. Time-current curves, including selectable ranges for each type of overcurrent protective device that allows adjustments.

1.7 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. Keys: Two spares for each type of panelboard cabinet lock.
2. Circuit Breakers Spares for each panelboard as indicated within panelboard schedules.

1.8 QUALITY ASSURANCE

A. Manufacturer Qualifications: ISO 9001 or ISO 9002 certified.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Remove loose packing and flammable materials from inside panelboards; install temporary electric heating (250 W per panelboard) to prevent condensation.

B. Handle and prepare panelboards for installation according to NEMA PB 1.

1.10 FIELD CONDITIONS

A. Environmental Limitations:

1. Do not deliver or install panelboards until any wet work in spaces is complete and dry and work above panelboards is complete.
2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:

    a. Ambient Temperature: Not exceeding 23 deg F (minus 5 deg C) to plus 104 deg F (plus 40 deg C).
    b. Altitude: Not exceeding 6600 feet (2000 m).

B. Service Conditions: NEMA PB 1, usual service conditions, as follows:

1. Ambient temperatures within limits specified.
2. Altitude not exceeding 6600 feet (2000 m).

C. Interruption of Existing Electric Service: Do not interrupt any electric service within the facilities occupied by Owner or others unless permitted under the following conditions:

1. Notify Owner no fewer than 14 days in advance of proposed interruption of electric service.
2. Do not proceed with interruption of electric service without Owner's written permission.
3. Comply with NFPA 70E.

1.11 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace panelboards that fail in materials or workmanship within specified warranty period.

1. Panelboard Warranty Period: 12 months from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PANELBOARDS COMMON REQUIREMENTS

A. Product Selection for All Spaces: Drawings indicate maximum dimensions for panelboards including height, width, and clearances between panelboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.

B. 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.

C. Comply with NEMA PB 1.

D. Comply with NFPA 70.

E. Enclosures: Surface-mounted, dead-front cabinets.

1. Rated for environmental conditions at installed location.

   a. Indoor Dry and Clean Locations: NEMA 250, Type 1.
   b. Outdoor Locations: NEMA 250, Type 3R or 4X as indicated.
   c. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.

2. Height: 84 inches (2.13 m) maximum.
3. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box. Trims shall cover all live parts and shall have no exposed hardware.
4. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover. Trims shall cover all live parts and shall have no exposed hardware.
5. Skirt for Surface-Mounted Panelboards: Same gage and finish as panelboard front with flanges for attachment to panelboard, wall, and ceiling or floor.
6. Gutter Extension and Barrier: Same gage and finish as panelboard enclosure; integral with enclosure body. Arrange to isolate individual panel sections.
7. Finishes:

   a. Panels and Trim: Galvanized steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
   b. Back Boxes: Same finish as panels and trim.
   c. Fungus Proofing: Permanent fungicidal treatment for overcurrent protective devices and other components.

F. Incoming Mains:

1. Location: Convertible between top and bottom.
2. Main Breaker: Main lug interiors up to 400 amperes shall be field convertible to main breaker.

G. Phase, Neutral, and Ground Buses:

1. Material: Hard-drawn copper, 98 percent conductivity.

   a. Plating shall run entire length of bus.
   b. Bus shall be fully rated the entire length.

2. Interiors shall be factory assembled into a unit. Replacing switching and protective devices shall not disturb adjacent units or require removing the main bus connectors.
3. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.
4. Full-Sized Neutral: Equipped with full-capacity bonding strap for service entrance applications. Mount electrically isolated from enclosure. Do not mount neutral bus in gutter.

H. Conductor Connectors: Suitable for use with conductor material and sizes.

1. Material: Tin-plated aluminum or hard-drawn copper, 98 percent conductivity.
2. Terminations shall allow use of 75 deg C rated conductors without derating.
3. Size: Lugs suitable for indicated conductor sizes, with additional gutter space, if required, for larger conductors.
4. Main and Neutral Lugs: Mechanical type, with a lug on the neutral bar for each pole in the panelboard.
5. Ground Lugs and Bus-Configured Terminators: Mechanical type, with a lug on the bar for each pole in the panelboard.
6. Feed-Through Lugs: Mechanical type, suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
7. Subfeed (Double) Lugs: Mechanical type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.

I. Future Devices: Panelboards or load centers shall have mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.

1. Percentage of Future Space Capacity: As indicated on the panelboard schedule.

J. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals. Assembly listed by an NRTL for 100 percent interrupting capacity.

1. Panelboards and overcurrent protective devices rated 240 V or less shall have short-circuit ratings as shown on Drawings, but not less than 10,000 A rms symmetrical.
2. Panelboards and overcurrent protective devices rated above 240 V and less than 600 V shall have short-circuit ratings as shown on Drawings, but not less than 14,000 A rms symmetrical.

2.2 POWER PANELBOARDS

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. Eaton.
2. Square D; Schneider Electric USA.

3. Siemens Industry, Inc., Energy Management Division.
4. Or equal.

B. Panelboards: NEMA PB 1, distribution type.

C. Doors: Secured with vault-type latch with tumbler lock; keyed alike.

1. For doors more than 36 inches (914 mm) high, provide two latches, keyed alike.

D. Mains: Circuit breaker or lugs only, as indicated.

E. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes 125 A and Smaller: Bolt-on circuit breakers.

F. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers.

2.3 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

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. Eaton.
2. Square D; Schneider Electric USA.
3. Siemens Industry, Inc., Energy Management Division.
4. Or equal.

B. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.

C. Mains: Circuit breaker or lugs only, as indicated.

D. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

E. Doors: Door-in-door construction with concealed hinges; secured with multipoint latch with tumbler lock; keyed alike. Outer door shall permit full access to the panel interior. Inner door shall permit access to breaker operating handles and labeling, but current carrying terminals and bus shall remain concealed.

2.4 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

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. Eaton.
2. Square D; Schneider Electric USA.
3. Siemens Industry, Inc., Energy Management Division.
4. Or equal.

B. MCCB: Comply with UL 489, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers:

   a. Inverse time-current element for low-level overloads.
   b. Instantaneous magnetic trip element for short circuits.
   c. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
3. GFCI Circuit Breakers: Single- and double-pole configurations with Class A ground-fault protection (6-mA trip).
4. GFEP Circuit Breakers: Class B ground-fault protection (30-mA trip).
5. Subfeed Circuit Breakers: Vertically mounted.
6. MCCB Features and Accessories:

   a. Standard frame sizes, trip ratings, and number of poles.
   b. Breaker handle indicates tripped status.
   c. UL listed for reverse connection without restrictive line or load ratings.
   d. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.
   e. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
   f. Rating Plugs: Three-pole breakers with ampere ratings greater than 150 amperes shall have interchangeable rating plugs or electronic adjustable trip units.
   g. Multipole units enclosed in a single housing with a single handle or factory assembled to operate as a single unit.
   h. Handle Padlocking Device: Fixed attachment, for locking circuit-breaker handle in on or off position.

2.5 IDENTIFICATION

A. Panelboard Label: Manufacturer's name and trademark, voltage, amperage, number of phases, and number of poles shall be located on the interior of the panelboard door.

B. Breaker Labels: Faceplate shall list current rating, UL and IEC certification standards, and AIC rating.

C. Circuit Directory: Computer-generated circuit directory mounted inside panelboard door with transparent plastic protective cover.

1. Circuit directory shall identify specific purpose with detail sufficient to distinguish it from all other circuits.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify actual conditions with field measurements prior to ordering panelboards to verify that equipment fits in allocated space in, and comply with, minimum required clearances specified in NFPA 70.

B. Receive, inspect, handle, and store panelboards according to NEMA PB 1.1.

C. Examine panelboards before installation. Reject panelboards that are damaged, rusted, or have been subjected to water saturation.

D. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.

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

3.2 INSTALLATION

A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Comply with NECA 1.

C. Install panelboards and accessories according to NEMA PB 1.1.

D. Equipment Mounting:
1. Attach panelboard to the vertical finished or structural surface behind the panelboard.

E. Mount panelboard cabinet plumb and rigid without distortion of box.

F. Install overcurrent protective devices and controllers not already factory installed.

1. Set field-adjustable, circuit-breaker trip ranges.
2. Tighten bolted connections and circuit breaker connections using calibrated torque wrench or torque screwdriver per manufacturer's written instructions.

G. Make grounding connections and bond neutral for services and separately derived systems to ground. Make connections to grounding electrodes, separate grounds for isolated ground bars, and connections to separate ground bars.

H. Install filler plates in unused spaces.

I. Arrange conductors in gutters into groups and bundle and wrap with wire ties.

3.3 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; install warning signs complying with requirements in Section 260553 "Identification for Electrical Systems."

B. Create a directory to indicate installed circuit loads. Obtain approval before installing. Handwritten directories are not acceptable. Install directory inside panelboard door.

C. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

D. Device Nameplates: Label each branch circuit device in power panelboards with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

E. Install warning signs complying with requirements in Section 260553 "Identification for Electrical Systems" identifying source of remote circuit.

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections.

1. Inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Acceptance Testing Preparation:

1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.

C. Panelboards will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.5 ADJUSTING

A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

B. Load Balancing: After Substantial Completion, but not more than 60 days after Final Acceptance, measure load balancing and make circuit changes. Prior to making circuit changes to achieve load balancing, inform Engineer of effect on phase color coding.

1. Measure loads during period of normal facility operations.

2. Perform circuit changes to achieve load balancing outside normal facility operation schedule or at times directed by the Architect. Avoid disrupting services such as fax machines and on-line data processing, computing, transmitting, and receiving equipment.
3. After changing circuits to achieve load balancing, recheck loads during normal facility operations. Record load readings before and after changing circuits to achieve load balancing.
4. Tolerance: Maximum difference between phase loads, within a panelboard, shall not exceed 20 percent.

END OF SECTION 262416

SECTION 262816

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Fusible switches.
2. Nonfusible switches.
3. Molded-case circuit breakers (MCCBs).
4. Enclosures.

1.3 DEFINITIONS

A. NC: Normally closed.

B. NO: Normally open.

C. SPDT: Single pole, double throw.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include nameplate ratings, dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.

1. Enclosure types and details for types other than NEMA 250, Type 1.
2. Current and voltage ratings.
3. Short-circuit current ratings (interrupting and withstand, as appropriate).
4. Include evidence of a nationally recognized testing laboratory (NRTL) listing for series rating of installed devices.
5. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.

B. Shop Drawings: For enclosed switches and circuit breakers.

1. Include plans, elevations, sections, details, and attachments to other work.

2. Include wiring diagrams for power, signal, and control wiring.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For enclosed switches and circuit breakers to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

   a. Manufacturer's written instructions for testing and adjusting enclosed switches and circuit breakers.
   b. Time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device. Provide in PDF electronic format.

1.7 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. Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than 3 of each size and type.
2. Fuse Pullers: Two for each size and type.

1.8 QUALITY ASSURANCE

A. Testing Agency Qualifications: Accredited by NETA.

1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:

1. Ambient Temperature: Not less than minus 22 deg F (minus 30 deg C) and not exceeding 104 deg F (40 deg C).
2. Altitude: Not exceeding 6600 feet (2010 m).

1.10 WARRANTY

A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace components that fail in materials or workmanship within specified warranty period.

1. Warranty Period: One year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single manufacturer.

B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and application.

D. Comply with NFPA 70.

2.2 FUSIBLE SWITCHES

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. Eaton.
2. Siemens Industry, Inc., Energy Management Division.
3. Square D; Schneider Electric USA.
4. Or equal.

B. Type HD, Heavy Duty:

1. Single throw.
2. Three pole.
3. 240 or 600-V ac as indicated.
4. 200 A and smaller.
5. UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate indicated fuses.
6. Lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

C. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.

2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
3. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
4. Lugs: Compression type, suitable for number, size, and conductor material.

2.3 NONFUSIBLE SWITCHES

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. Eaton.
2. Siemens Industry, Inc., Energy Management Division.
3. Square D; Schneider Electric USA.
4. Or equal.

B. Type GD, General Duty, Three Pole, Single Throw, 240-V ac, 600 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.

C. Type HD, Heavy Duty, Three Pole, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

D. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
3. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
4. Lugs: Compression type, suitable for number, size, and conductor material.

2.4 MOLDED-CASE CIRCUIT BREAKERS

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. Eaton.
2. Siemens Industry, Inc., Energy Management Division.
3. Square D; Schneider Electric USA.
4. Or equal.

B. Circuit breakers shall be constructed using glass-reinforced insulating material. Current carrying components shall be completely isolated from the handle and the accessory mounting area.

C. Circuit breakers shall have a toggle operating mechanism with common tripping of all poles, which provides quick-make, quick-break contact action. The circuit-breaker handle shall be over center, be trip free, and reside in a tripped position between on and off to provide local trip indication. Circuit-

breaker escutcheon shall be clearly marked on and off in addition to providing international I/O markings. Equip circuit breaker with a push-to-trip button, located on the face of the circuit breaker to mechanically operate the circuit-breaker tripping mechanism for maintenance and testing purposes.

D. The maximum ampere rating and UL, IEC, or other certification standards with applicable voltage systems and corresponding interrupting ratings shall be clearly marked on face of circuit breaker. Circuit breakers shall be 100 percent rated or series rated as indicated on the Drawings. Fuse/circuit breaker combinations for series connected interrupting ratings shall be listed by UL as recognized component combinations. Any series rated combination used shall be marked on the end-use equipment along with the statement "Caution - Series Rated System. _____ Amps Available. Identical Replacement Component Required."

E. MCCBs shall be equipped with a device for locking in the isolated position.

F. Lugs shall be suitable for 167 deg F (75 deg C) rated wire or 194 deg F (90 deg C) rated wire, sized according to the 167 deg F (75 deg C) temperature rating in NFPA 70, as required.

G. Standard: Comply with UL 489 with interrupting capacity to comply with available fault currents.

H. Thermal-Magnetic Circuit Breakers: Inverse time-current thermal element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

I. Features and Accessories:

1. Standard frame sizes, trip ratings, and number of poles.
2. Lugs: Compression type, suitable for number, size, trip ratings, and conductor material.
3. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge lighting circuits.

2.5 ENCLOSURES

A. Enclosed Switches and Circuit Breakers: UL 489, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.

B. Enclosure Finish: The enclosure shall be finished with gray baked enamel paint, electrodeposited on cleaned, phosphatized galvannealed steel (NEMA 250 Types 3R, 12).

C. Conduit Entry: NEMA 250 Types 4, 4X, and 12 enclosures shall contain no knockouts.

D. Operating Mechanism: The circuit-breaker operating handle shall be. The cover interlock mechanism shall have an externally operated override. The override shall not permanently disable the interlock mechanism, which shall return to the locked position once the override is released. The tool used to override the cover interlock mechanism shall not be required to enter the enclosure in order to override the interlock.

E. Enclosures designated as NEMA 250 Type 4, 4X stainless steel, 12, or 12K shall have a dual cover interlock mechanism to prevent unintentional opening of the enclosure cover when the circuit breaker is ON and to prevent turning the circuit breaker ON when the enclosure cover is open.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.

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

1. Commencement of work shall indicate Installer's acceptance of the areas and conditions as satisfactory.

3.2 PREPARATION

A. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions:

1. Notify Owner no fewer than 14 days in advance of proposed interruption of electric service.
2. Do not proceed with interruption of electric service without Owner's written permission.
3. Comply with NFPA 70E.

3.3 ENCLOSURE ENVIRONMENTAL RATING APPLICATIONS

A. Enclosed Switches and Circuit Breakers: Provide enclosures at installed locations with the following environmental ratings.

1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
2. Outdoor Locations: NEMA 250, Type 3R.
3. Other Wet or Damp, Indoor Locations: NEMA 250, Type 4.
4. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.

3.4 INSTALLATION

A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.

C. Install fuses in fusible devices.

D. Comply with NFPA 70 and NECA 1.

3.5 IDENTIFICATION

A. Comply with requirements in Section 260553 "Identification for Electrical Systems."

1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.6 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections for Switches:

1. Visual and Mechanical Inspection:

a. Inspect physical and mechanical condition.
b. Inspect anchorage, alignment, grounding, and clearances.
c. Verify that the unit is clean.
d. Verify blade alignment, blade penetration, travel stops, and mechanical operation.
e. Verify that fuse sizes and types match the Specifications and Drawings.
f. Verify that each fuse has adequate mechanical support and contact integrity.
g. Inspect bolted electrical connections for high resistance using one of the two following methods:

1) Use a low-resistance ohmmeter.

a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.

2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.

a) Bolt-torque levels shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.

h. Verify that operation and sequencing of interlocking systems is as described in the Specifications and shown on the Drawings.
i. Verify correct phase barrier installation.
j. Verify lubrication of moving current-carrying parts and moving and sliding surfaces.

2. Electrical Tests:

a. Perform resistance measurements through bolted connections with a low-resistance ohmmeter. Compare bolted connection resistance values to values of similar

connections. Investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.

b. Measure contact resistance across each switchblade fuseholder. Drop values shall not exceed the high level of the manufacturer's published data. If manufacturer's published data are not available, investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.

c. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with switch closed, and across each open pole. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1 from the NETA ATS. Investigate values of insulation resistance less than those published in Table 100.1 or as recommended in manufacturer's published data.

d. Measure fuse resistance. Investigate fuse-resistance values that deviate from each other by more than 15 percent.

C. Tests and Inspections for Molded Case Circuit Breakers:

1. Visual and Mechanical Inspection:

a. Verify that equipment nameplate data are as described in the Specifications and shown on the Drawings.
b. Inspect physical and mechanical condition.
c. Inspect anchorage, alignment, grounding, and clearances.
d. Verify that the unit is clean.
e. Operate the circuit breaker to ensure smooth operation.
f. Inspect bolted electrical connections for high resistance using one of the two following methods:

1) Use a low-resistance ohmmeter.

a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.

2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.

a) Bolt-torque levels shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.

g. Inspect operating mechanism, contacts, and chutes in unsealed units.
h. Perform adjustments for final protective device settings in accordance with the coordination study.

2. Electrical Tests:

a. Perform resistance measurements through bolted connections with a low-resistance ohmmeter. Compare bolted connection resistance values to values of similar

connections. Investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.

b. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with circuit breaker closed, and across each open pole. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1 from the NETA ATS. Investigate values of insulation resistance less than those published in Table 100.1 or as recommended in manufacturer's published data.

c. Perform a contact/pole resistance test. Drop values shall not exceed the high level of the manufacturer's published data. If manufacturer's published data are not available, investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.

d. Perform insulation resistance tests on all control wiring with respect to ground. Applied potential shall be 500-V dc for 300-V rated cable and 1000-V dc for 600-V rated cable. Test duration shall be one minute. For units with solid state components, follow manufacturer's recommendation. Insulation resistance values shall be no less than two megohms.

3. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

4. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

D. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports.

1. Test procedures used.
2. Include identification of each enclosed switch and circuit breaker tested and describe test results.
3. List deficiencies detected, remedial action taken, and observations after remedial action.

3.7 ADJUSTING

A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

END OF SECTION 262816

STATE OF NEW HAMPSHIRE

Department of Administrative Services

DIVISION OF PUBLIC WORKS DESIGN & CONSTRUCTION

MAIN BUILDING REWIRING PHASE 1

OFFICE PARK SOUTH

106 PLEASANT STREET

CONCORD, NEW HAMPSHIRE

DIVISION OF PUBLIC WORKS PROJECT NUMBER 81230

Contract B

DPW DIVISION OF PUBLIC WORKS Design & Construction
building New Hampshire

7 Hazen Drive PO Box 483 Room 250
Concord, New Hampshire 03301
p 603-271-3516 f 603-271-3515

DIRECTOR - DIVISION OF PUBLIC WORKS DESIGN & CONSTRUCTION

SIGNATURE 06062025 DATE

PROJECT MANAGER - DIVISION OF PUBLIC WORKS DESIGN & CONSTRUCTION

SIGNATURE 6/6/25 DATE

LOCUS MAP



REVISIONS

DATE	SYMBOL	DESCRIPTION

PROJECT NAME
Office Park South
Main Building Rewiring Phase 1

PROJECT NUMBER
81230-B

ISSUE DATE
05/30/2025

SHEET NUMBER
T-1
SHEET: 1 OF 24

ELECTRICAL
Richardson Engineering
South Berwick, Maine
p. 207-384-1055
e. info@richardson-eng.com

ARCHITECTURAL
Studio E
Westbrook, Maine
p. 860-874-1033
e. studio@architect.com

FIRE PROTECTION
SFC Engineering
Windham, New Hampshire
p. 603-647-8700
e. info@sfceng.com

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
A/C	AIR CONDITIONING
BLD.	BUILDING
BSMT	BASEMENT
CFM	CUBIC FEET PER MINUTE
CL	CENTERLINE
CLG	CEILING
CMU	CONCRETE MASONRY UNIT
CONC	CONCRETE
DN	DOWN
EL	ELEVATION
EXT	EXISTING
FDN	FOUNDATION
FF	FINISHED FLOOR
FL	FLOOR
FRG	FOOTING
GC	GENERAL CONTRACTOR
GYP	GYPSUM WALL BOARD
HVAC	HEATING, VENTILATING, AND AIR-CONDITIONING
INT	INTERIOR
MR	MOISTURE RESISTANT
MTL	METAL
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OC	ON CENTER
PE	PRE-ENGINEERED
PLAM	PLASTIC LAMINATE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TREATED
R	RISER/ RADIUS
RO	ROUGH OPENING
SC	SOLID CORE
SF	SQUARE FOOT
SQ	SQUARE
SS	STAINLESS STEEL
T	TREAD
TBD	TO BE DETERMINED
THK	THICK/ THICKNESS
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VIF	VERIFY IN FIELD
WC	WATER CLOSET
WD	WOOD

CODE ANALYSIS IEBC AND NFPA 101

	IEBC 2021			NFPA 101 - 2021	
CATEGORY	REFERENCE	CODE REQUIREMENT	REFERENCE	CODE REQUIREMENT	
USE GROUP	304.1, 308.3	"B" BUSINESS (OFFICE, ASSESSMENT, TRAINING)	6.1.1	ASSEMBLY, EDUCATIONAL, DAY CARE, INDUSTRIAL, RESIDENTIAL, MERCANTILE, OCCUPANCIES	
ALTERATION LEVEL	603	LEVEL 2 - ADDITION OR ELIMINATION OF DOORS OR WINDOWS; REDUCTION OR REARRANGEMENT OF TENANT SPACE; ALTERATION OF ANY SYSTEM			
BUILDING CONSTRUCTION	TABLE 601 (IBC 2018)	TYPE IIB*	NFPA 220 TABLE 4.3.1	TYPE II (111)	
		FOUNDATION - EXCAVATIONS AND CONCRETE			
		SUPERSTRUCTURE - STEEL, MISC.			
		INTERIOR WALLS - STEEL, WOOD STUD WALLS, PARTITIONS			
		FLOOR CONSTRUCTION - STEEL, CONCRETE DECK			
		ROOF - STEEL, HEAVY TIMBER			
		ROOF - STEEL, LIGHT WEIGHT			
FIRE RATINGS	602.3	EXISTING WALLS AND CEILING OF ROOMS, ENCLOSING THE ELECTRICAL EQUIPMENT, SHALL BE REMOVED AND REPLACED WITH NEW FIRE RATED CONSTRUCTION AS REQUIRED BY THE CURRENT BUILDING CODE. ALL NEW WALLS AND CEILINGS SHALL BE 1 HOUR FIRE RATED CONSTRUCTION. ALL NEW DOORS SHALL BE 1 HOUR FIRE RATED. ALL NEW PENETRATIONS THROUGH FIRE RATED WALLS AND CEILINGS SHALL BE FIRE STOPPED WITH A UL APPROVED SYSTEM.			
	TABLE 601 (IBC 2018)	FOUNDATION - CONCRETE AND CMU WALLS			
	TABLE 601 (IBC 2018)	EXTERIOR WALLS - NON-BEARING			
	TABLE 601 (IBC 2018)	INTERIOR WALLS - STEEL, WOOD STUD WALLS, PLASTER			
	TABLE 601 (IBC 2018)	FLOOR CONSTRUCTION - STEEL, CONCRETE DECK			
	TABLE 601 (IBC 2018)	ROOF - STEEL, HEAVY TIMBER			
MEANS OF EGRESS	806.2	EXISTING EGRESS SYSTEM TO REMAIN. NEW EGRESS SYSTEM TO BE PROVIDED AS REQUIRED BY THE CURRENT BUILDING CODE. ALL NEW EGRESS SYSTEMS SHALL BE IN COMPLIANCE WITH THE CURRENT BUILDING CODE.			
REDESIGNED DOOR HARDWARE	304.3.3	DOUBLE CYLINDER DEADBOLTS OR DOORS CONTAINING GLASS WITHIN 40" OF THE DOOR LOCK SHALL NOT BE PERMITTED			
DOOR SWING	304.3.3	DOORS EXISTING ON THE DIRECTION OF TRAVEL OF OCCUPANTS EXPECTED TO EGRESS SHALL BE PERMITTED TO BE HUNG TO SWING IN EITHER DIRECTION	7.2.1.2.3	DOORS SHALL BE HUNG TO SWING IN THE DIRECTION OF EGRESS TRAVEL WHERE SERVING A HAZARD OF OCCUPANCY OR A ROOM WITH AN OCCUPANT LOAD OF 50 OR MORE	
DOOR CLOSING	304.3.1	ALL DOORS OPENING ONTO AN EXIT ENCLOSURE AT GRADE OR ONTO A PUBLIC WAY SHALL BE EQUIPPED WITH SELF-CLOSING, SELF-LATCHING DEVICES. DOORS IN EXIT ENCLOSURES SHALL NOT BE EQUIPPED WITH DOOR HOLD-OPEN DEVICES.	7.2.1.3.1	EXISTING DOORS SHALL BE PERMITTED TO BE HELD OPEN BY AUTOMATIC DOOR HOLD-OPEN DEVICES THAT RELEASE ON ACTIVATION OF THE FIRE ALARM SYSTEM OR ON LOSS OF POWER TO THE DEVICE.	
CORRIDOR DOORS	304.6.6	NOT TO BE LESS THAN 32" CLEAR WIDTH	7.2.1.3.2	CORRIDOR DOORS SHALL NOT BE LESS THAN 32" CLEAR WIDTH WHEN IN A FULLY OPEN POSITION	
TRANSOMS	804.6.3	NO REQUIREMENTS FOR TRANSOMS	4.2.1.1.1(B)(1)(A)	EXISTING TRANSOMS MAY REMAIN FOR ALL USE GROUPS. NEW TRANSOMS SHALL COMPLY WITH THE APPLICABLE NFPA BASE MANUFACTURER'S REQUIREMENTS.	
DEAD-END CORRIDORS	804.7	SHALL NOT EXCEED 35 FEET		SHALL BE NOT LESS THAN 50'	
ANTI-NUISANCE GLAZING REQUIRED	304.6.1	PROVIDE MINIMUM GLASS THICKNESS IN ACCORDANCE WITH IBC	7.2.1.5.1.(3)	MINIMUM THICKNESS OF ANY GLASS IS 1/4" (6.35mm)	
	304.6.1	WHERE ARE THE NEW DOOR GLASS IN EXISTING DOORS SHALL BE PROVIDED WITH SAFETY GLAZING IN ACCORDANCE WITH THE REQUIREMENTS OF THE IBC			
FIRE SUPPRESSION SYSTEMS	605.2.2	EXEMPTED			
STAIRWAYS	605.3	NOT REQUIRED	38.5.6.2.(2)	NOT REQUIRED	
FIRE ALARM SYSTEM	803.4	WHERE APPLIED TO FIRE ALARM SYSTEMS, MINIMUM DETECTION IS REQUIRED	39.3.4.1	REQUIRED	
OCCUPANCY REQUIREMENTS	602.4.1	FIRE ALARM SYSTEM SHALL BE REQUIRED IF ALTERATIONS AFFECT EXISTING DEVICES			
SMOKE ALARMS	309	NO USER INSTALLED FOR BUSINESS OCCUPANCIES	39.3.4	NEED TO PROVIDE	
CARBON MONOXIDE DETECTION	306	NO REQUIREMENTS FOR BUSINESS OCCUPANCIES			

ELECTRICAL CODE ANALYSIS NFPA 70

	NATIONAL ELECTRICAL CODE 2020 EDITION - NFPA 70	
WORKSPACE	REFERENCE	CODE REQUIREMENT
EXISTING BASEMENT DEPTH OF WORKING SPACE	110.26(A)(1)(a)	EXISTING PANELBOARDS IN EXISTING ROOMS TO REMAIN. EQUIPMENT IS BEING INSTALLED IN CONDITION 2 WORKING SPACE AS COMPLIANCE IS MET. THEREFORE FURTHER EVALUATION CANNOT WARRANT ANY CHANGES. EXISTING CONDITIONS TO REMAIN.
WIDTH OF WORKING SPACE	110.26(A)(2)	WIDTH SHALL BE THE WIDTH OF THE EQUIPMENT OR 30" WHICHEVER IS GREATER
HEIGHT OF WORKING SPACE	110.26(A)(3)	6'-6" CLEAR 6 FEET 6 INCHES NEC, WHAT EVER PIPING FOR EXPLOSION
CLEAR SPACES	110.26(C)	CANNOT BE USED FOR STORAGE
ENTRANCE AND EGRESS FROM WORKING SPACE	110.26(C)(3)	NEW RULE AS CLASS ONE ENTRANCE NEED
PERSONNEL DOORS	110.26(F)(2)	FOR EQUIPMENT REQUIRING DOORS, DOORS SHALL OPEN IN DIRECTION OF EGRESS AND BE EQUIPPED WITH PANIC HARDWARE OR LISTED TYPE OF LATCHING
ILLUMINATION	110.26(D)	ALL EQUIPMENT SHALL BE PROVIDED WITH ILLUMINATION
DEDICATED EQUIPMENT SPACE	110.26(E)	ALL NEW ELECTRICAL PANELBOARDS, SWITCHGEAR, DISCONNECTS, AND MOTOR CONTROLLERS SHALL BE LOCATED IN DEDICATED ELECTRICAL SPACE. NO PIPING, DUCTS, OR EQUIPMENT FOREIGN TO THE ELECTRICAL INSTALLATION SHALL BE LOCATED IN THE ZONE.
OUTDOOR	110.26(E)(3)(a)	OUTDOOR DEDICATED ELECTRICAL SPACE - NO PIPING, DUCTS, OR APPARATUS OR OTHER EQUIPMENT FOREIGN TO THE ELECTRICAL INSTALLATION SHALL BE LOCATED IN THE ZONE - OTHER THAN EQUIPMENT ASSOCIATED WITH THE ELECTRICAL INSTALLATION. PIPES LIABLE TO CAUSE DAMAGE TO ELECTRICAL EQUIPMENT BY CONDENSATION, LEAKAGE, OR ACCIDENTAL OPERATION OF SPRINKLER SYSTEMS SHALL NOT BE INSTALLED IN THE ZONE. PROTECTION SHALL BE PROVIDED TO AVOID DAMAGE TO ELECTRICAL EQUIPMENT BY SPRINKLER DISCHARGE WHEN SUCH SPRINKLERS ARE INSTALLED ABOVE THE ZONE.
WARNING SIGNS	110.21(B)	ELECTRICAL EQUIPMENT SHALL BE MARKED WITH MANUFACTURER'S NAME OR TRADEMARK, VOLTAGE, CURRENT, AND OTHER OPERATING LIMITS.
	110.16	FLASH PROTECTION REQUIRED WHERE WORK IS PERFORMED ON EQUIPMENT ENERGIZED OR WHERE ENERGIZED PARTS ARE EXPOSED.

CODE OVERVIEW

CITY OF CONCORD	
SPRINKLERED	
IEBC 2021	
USE GROUP:	B
ALTERATION LEVEL	LEVEL 2: ADDITION OR ELIMINATION OF DOORS OR WINDOWS; REDUCTION OR REARRANGEMENT OF TENANT SPACE; ALTERATION OF ANY SYSTEMS
MEANS OF EGRESS	EXCEPTION 2: MEANS OF EGRESS COMPLYING WITH THE REQUIREMENTS OF THE BUILDING CODE UNDER WHICH THE BUILDING WAS CONSTRUCTED SHALL BE CONSIDERED TO BE ACCEPTABLE MEANS OF EGRESS IF, IN THE OPINION OF THE CODE OFFICIAL, THEY DO NOT CONSTITUTE A DISTINCT HAZARD TO LIFE
NFPA 70 NATIONAL ELECTRICAL CODE, 2020 ED.	
	KEY ELECTRICAL REQUIREMENTS ANALYSIS
ACCESSIBILITY	
11.3.3 MACHINERY SPACES	DETAILED REQUIREMENTS UNDER DIFFERENT PARAGRAPHS... SPACE NOT BE REQUIRED TO COMPLY WITH ACCESSIBILITY REQUIREMENTS EXCEPT IN LOCATION ACCESSIBLE ONLY TO... EQUIPMENT ROOMS
NFPA 101, 2021	EXISTING BUSINESS
DOOR REQUIREMENTS	
7.2.1.4.3.1 (2) & 3.3.19	ADMINISTERED BY EGRESS MEANS OF EGRESS NOT LESS THAN 28" OR LIMITING OUT OF USE
A 7.2.1.2.3 & 7.2.1.6	EXCEPTION WHEN NOT REQUIRED TO BE ACCESSIBLE BY NFPA 5000 MAINTAINED SIGNAGE WITH EXISTING BUILDINGS. THE EXISTING DOOR LEAF WIDTH SHALL BE NOT LESS THAN 28"

WALL TYPES

MARK	DESCRIPTION	WALL
A	1 HOUR RATED WALL SYSTEM TO MATCH EXISTING WALL SYSTEM AT THE BASEMENT LEVEL • 5/8 GYP. BOARD • 3 5/8" METAL STUDS @ 16" O.C. WITH R-13 BATT INSULATION • 5/8 GYP. BOARD EXTEND THROUGH SUSPENDED CEILING TO STRUCTURE	
B	EXISTING PARTITION TO BE REMOVED TO ACCOMMODATE NEW ELECTRICAL EQUIPMENT • DEMOLISH ALL • DISPOSE OF ALL DEMOLISHED MATERIALS IN ACCORDANCE WITH ALL APPLICABLE LAWS AND CODES IN EFFECT IN THE PLACE OF WORK DEMOLISH EXISTING SUSPENDED CEILING AS NEEDED	
C	NEW 1 HOUR RATED WALL SYSTEM TO MATCH EXISTING WALL SYSTEM AT THE BASEMENT LEVEL • 5/8" GYP. BOARD • 3 5/8" METAL STUDS @ 16" O.C. WITH R-13 BATT INSULATION • 5/8" GYP. BOARD • 3 5/8" METAL STUDS @ 16" O.C. WITH R-13 BATT INSULATION • 5/8" GYP. BOARD EXTEND THROUGH SUSPENDED CEILING TO STRUCTURE	

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Filing Period No. 2021

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NUMBER 13135
CERTIFICATE OF AUTHORIZATION
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DEPARTMENT OF ADMINISTRATIVE SERVICES
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DESIGNED/DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE OF ISSUE:

REVISIONS		
DATE	DESCRIPTION	BY
09/24/2024	ISSUED FOR CONSTRUCTION	

OFFICE PARK SOUTH – MAIN BUILDING
MAIN BLDG. REWIRING PHASE 1
108 PLEASANT ST. CONCORD, NH 03301
DEPARTMENT OF ADMINISTRATIVE SERVICES

BASEMENT ELECTRICAL ROOMS PLANS AND ELEVATIONS

DRAWN BY:	SCALE:	DATE:	PROJECT No. 8130 CONTRACT: 3
MDI	AS NOTED	09/24/2024	A0-00 SHEET: 3 OF 28

FINISH SCHEDULE

ROOM NAME	FLOOR	BASE/CHAIR RAIL/ALL TRIM WORK	WALL SURFACE				CEILING	NOTES
			NORTH	EAST	SOUTH	WEST		
ELECTRICAL CLOSET 400 AMP	NO WORK	PAINT EXISTING & NEW	PAINT EXISTING GWB	GWB PAINTED	GWB PAINTED	PAINT EXISTING GWB	PAINT EXISTING GWB	NOTE 1-3, 4
1005	PAINT EXISTING WOOD FLOOR	PAINT EXISTING	PAINT EXISTING GWB	PAINT EXISTING GWB	PAINT EXISTING GWB	PAINT EXISTING GWB	PAINT EXISTING GWB	NOTE 1-2
ELECTRICAL CLOSET A2052	PAINT EXISTING WOOD FLOOR	PAINT EXISTING & NEW	GWB PAINTED	GWB PAINTED	GWB PAINTED	PAINT EXISTING GWB	PAINT EXISTING GWB	NOTE 1-4
B2486	PAINT EXISTING WOOD FLOOR	PAINT EXISTING	PAINT EXISTING GWB	PAINT EXISTING GWB	PAINT EXISTING GWB	PAINT EXISTING GWB	PAINT EXISTING GWB	NOTES 1-2
T1425	NO WORK	PAINT EXISTING	PAINT EXISTING GWB	PAINT EXISTING GWB	PAINT EXISTING GWB	PAINT EXISTING GWB	PAINT EXISTING GWB	NOTES 1-2
T2439	PAINT EXISTING WOOD FLOOR	PAINT EXISTING	PAINT EXISTING GWB	PAINT EXISTING GWB	PAINT EXISTING GWB	PAINT EXISTING GWB	PAINT EXISTING GWB	NOTES 1-2

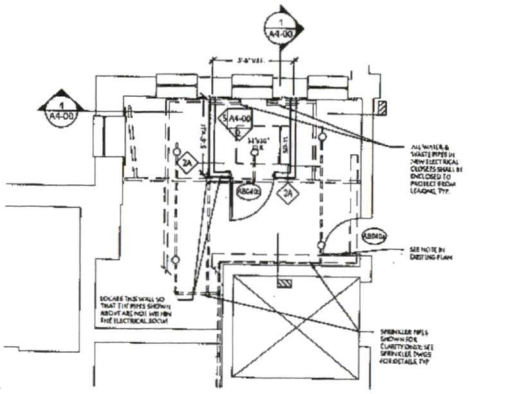
NOTES:
1) ALL EXPOSED TO BE SMOOTH WITH LEVEL 4 FINISH MIN. PRIOR TO PAINT. ONE COAT PRIMER (SELF-PRIMING PAINT), 1 COAT OF PAINT
2) ALL DOORS & TRIM TO BE PAINTED WITH BENJAMIN MOORE REGAL SELECT WHITE, SHEEN 50, ACRYLIC SEMI-GLOSS
3) REMOVE EXISTING CARPET TILING AS REQUIRED TO CONSTRUCT NEW WALLS. ASSESS THE EXISTING FLOORING BELOW TO DETERMINE IF IT CAN BE REFINISHED. CONSULT WITH ARCHITECT.
4) PAINT BOTH SIDES OF NEW PARTITIONS OF ELEC. CLOSET, REPAINTING EXISTING CONTAINING CLOSET

DOOR SCHEDULE

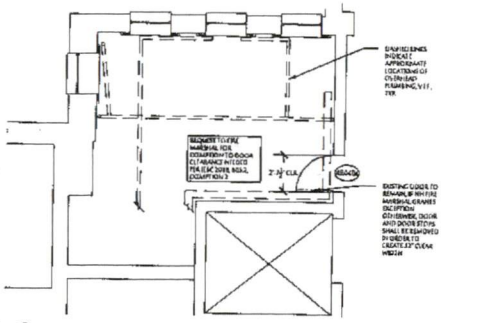
NO.	LOCATION	MANUFACTURER	MODEL NO	DOOR TYPE	FRAME TYPE	DOOR FINISH	RATING	ROUGH OPENING		DOOR SIZE			CLOSER	HARDWARE SET	ELECTRIC FUNCTION	NOTES
								WIDTH	HEIGHT	WIDTH	HEIGHT	THICKNESS				
A0400A	BASEMENT	EXISTING	EXISTING	WD	WD	EXISTING	-	-	-	3'-1 1/2"	6'-8"	1 3/4"	-	GROUP #1	N/A	
A0040B	ELEC. CLOSET	CURRIES	70A	FLUSH TYP.	TBD	FACTORY	-	38.5"	82.25"	36"	80"	1 3/4"	-	GROUP #1	N/A	
E1005	ROOF HOOD	EXISTING	EXISTING	WD	WD	EXISTING	-	-	-	2'-10 3/4"	7'-0"	1 3/8"	-	GROUP #1	N/A	
B2496	ROOF HOOD	EXISTING	EXISTING	WD	WD	EXISTING	-	-	-	2'-10 3/4"	7'-0"	1 3/8"	-	GROUP #1	N/A	
B2496	ELEC. CLOSET	CURRIES	70A	ALUMINUM	MTL	FACTORY	-	38.5"	82.25"	35 1/2"	96"	1 3/4"	-	GROUP #1	N/A	
B2405	BASEMENT	EXISTING	EXISTING	WD	WD	EXISTING	-	-	-	2'-11"	6'-2 1/2"	1 3/4"	-	GROUP #1	N/A	
T1425	BASEMENT	EXISTING	EXISTING	WD	WD	EXISTING	-	-	-	2'-9"	7'-1"	1 3/4"	-	GROUP #1	N/A	
T2439	BASEMENT	EXISTING	EXISTING	WD	WD	EXISTING	-	-	-	2'-9"	7'-1"	1 3/4"	-	GROUP #1	N/A	

NOTES FOR DOOR HEADING SCHEDULE:

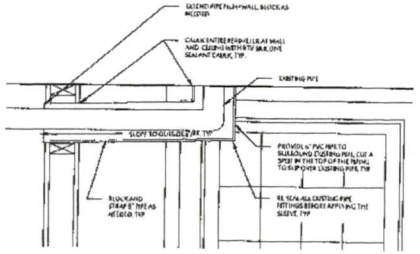
GROUP #1	
HINGES	4.5 INCH, FULL MORTISE, BALL BEARING, PROVIDE 2 HINGES STANDARD FOR DOORS UP TO 7'-0" HT., 3 HINGES FOR DOORS OVER 7'-0" HT.
SCREWS AND FASTENERS	PER MANUFACTURER RECOMMENDATION, PROVIDE SELF-TAPPING SCREWS FOR PLATES AND ESCUTCHEONS WHERE APPLICABLE. USE FLUSH-TYPE FOR TAPERED SCREW HEADS
LOCKSET	STEEL BRUSH FINISH LOCKSET WITH LEVER HANDLES, HEAVY DUTY, SERIES, FINISH #626
WIRES & TUBES	PROVIDE FLEXIBLE METAL CONDUIT FOR PREWIRING DOOR CONTAINING WIRES FOR POWER, DOOR CONTROL, SIGNALING, TELEPHONE, WATCHMAN'S CLOCK, MAGNETIC LOCK, ELECTRIC STRIKE, AND/OR OTHER SIMILAR ITEMS
PROTECTION PLATES	STAINLESS STEEL, 10" HEIGHT, 1" FROM DOOR BOTTOM, BEVELED EDGES, FINISH #630
THRESHOLDS	AS INDICATED, CLEARED THRESHOLD STYLE
SUBSTITUTION NOTE	ANY SUBSTITUTIONS MUST BE APPROVED BY ARCHITECT
GENERAL DOOR NOTES	
1)	ALL NEW DOORS SHALL BE PROVIDED WITH THRESHOLDS
2)	SEE FLOOR PLANS FOR HANDING
3)	CONFIRM ALL HARDWARE SPECS TO MATCH EXISTING DOOR PHOTOS
4)	PROVIDE ALL DOORS WITH A SMALL GAP AT THE WATER SHEDDING OUTSIDE EDGE, OR FLOOR IN INNER STORE. A WHERE THERE IS NOT POSSIBLE, PROVIDE IN WALL FLOOR GAP BEHIND ALL DOOR SILL MEMBERS



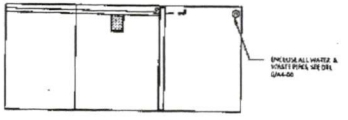
7 PROPOSED FLOOR PLAN ROOM AB040C; PANEL SD-11
1/4" = 1'-0"



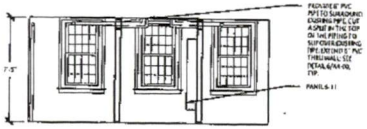
3 EXISTING/DEMO FLOOR PLAN ROOM AB040C; PANEL SD-11
1/4" = 1'-0"



6 LEAK-PROOFING DETAIL
1 1/2" = 1'-0"



5 PROPOSED SOUTH ELEVATION ROOM AB040C; PANEL SD-11
1/4" = 1'-0"



4 PROPOSED WEST ELEVATION ROOM AB040C; PANEL SD-11
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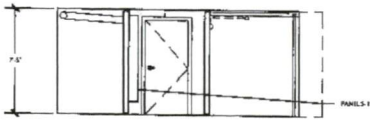
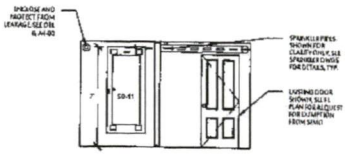
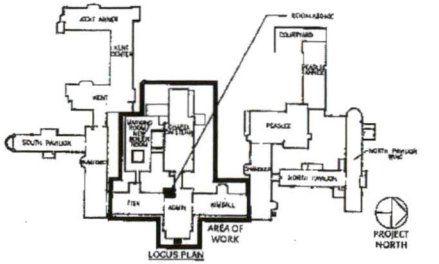


2 PROPOSED EAST ELEVATION ROOM AB040C; PANEL SD-11
1/4" = 1'-0"



1 PROPOSED NORTH ELEVATION ROOM AB040C; PANEL SD-11
1/4" = 1'-0"



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RICHARDSON ENGINEERING, ELECTRICAL ENGINEERS & CONSULTANTS, Plymouth, New Hampshire, 603 536 1355

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
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7 HAZEN DRIVE PO BOX 483 CONCORD, NEW HAMPSHIRE 03302-0483
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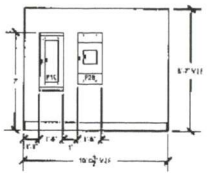
REVISIONS		
DATE	DESCRIPTION	BY
09/24/2024	ISSUED FOR CONSTRUCTION	

OFFICE PARK SOUTH - MAIN BUILDING
MAIN BLDG. REWIRING PHASE I
106 PLEASANT ST. CONCORD, NH 03301
DEPARTMENT OF ADMINISTRATIVE SERVICES

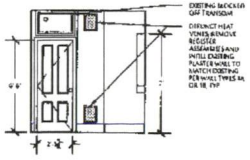
BASEMENT ELECTRICAL ROOMS PLANS AND ELEVATIONS

PROJECT NO. 24020 CONTRACT: 3

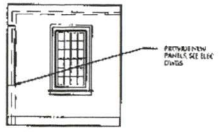
DRAWN BY: MDI | SCALE: AS NOTED | DATE: 09/24/2024 | SHEET: A4-00



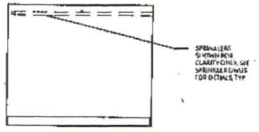
12 PROPOSED SOUTH ELEVATION ROOM F109S; PANEL P1C & P2B
3/4" = 1'-0"



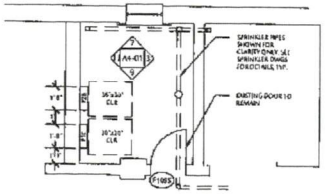
9 PROPOSED EAST ELEVATION ROOM F109S; PANEL P1C & P2B
3/4" = 1'-0"



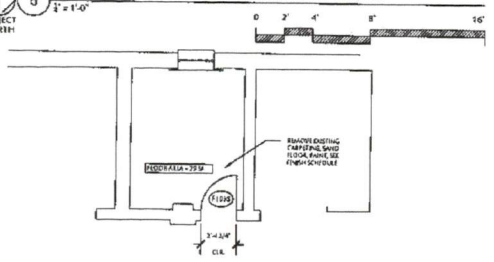
7 PROPOSED WEST ELEVATION ROOM F109S; PANEL P1C & P2B
3/4" = 1'-0"



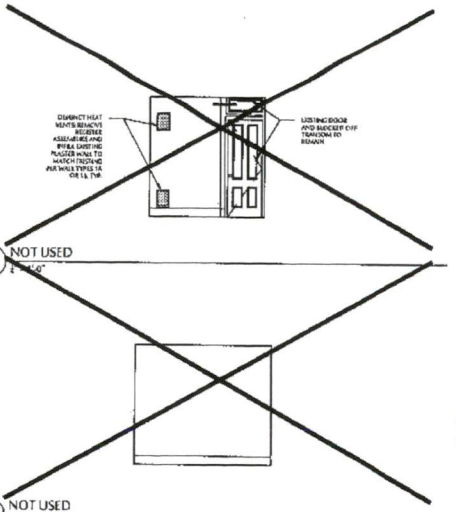
3 PROPOSED NORTH ELEVATION ROOM F109S; PANEL P1C & P2B
3/4" = 1'-0"



6 PROPOSED FLOOR PLAN ROOM F109S; PANEL P1C & P2B
3/4" = 1'-0"
PROJECT NORTH

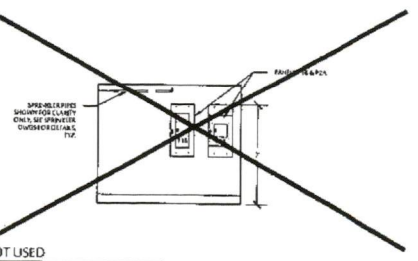


2 EXISTING/DEMO FLOOR PLAN ROOM F109S; PANEL P1C & P2B
3/4" = 1'-0"
PROJECT NORTH

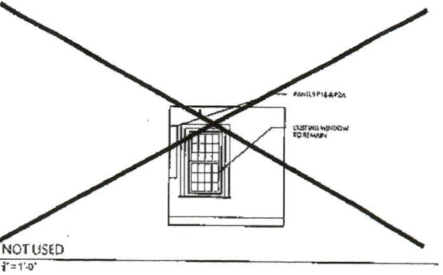


11 NOT USED
3/4" = 1'-0"

8 NOT USED
3/4" = 1'-0"



5 NOT USED
3/4" = 1'-0"



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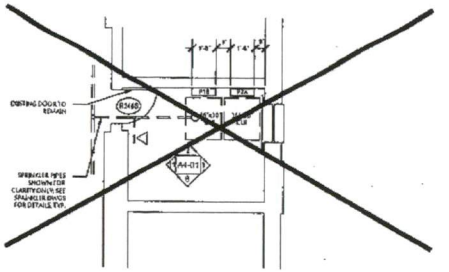

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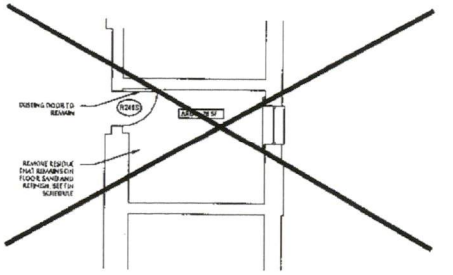
PROJECT NORTH



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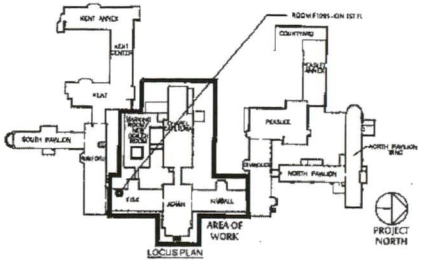
PROJECT NORTH



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STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
DIVISION OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 200
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

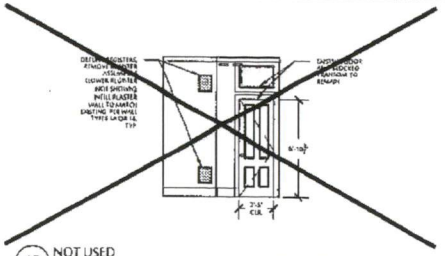
REVISIONS

DATE	DESCRIPTION	BY
	ISSUED FOR CONSTRUCTION	

OFFICE PARK SOUTH – MAIN BUILDING
MAIN BLDG. REWIRING PHASE 1
106 PLEASANT ST, CONCORD, NH 03301
DEPARTMENT OF ADMINISTRATIVE SERVICES

1ST & 2ND FLOOR ELECTRICAL ROOMS
PLANS AND ELEVATIONS

DRAWN BY: MDI
SCALE: AS NOTED
DATE: 09/24/2024
A4-01
SHEET 2 OF 10



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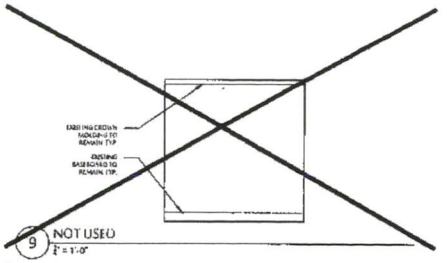

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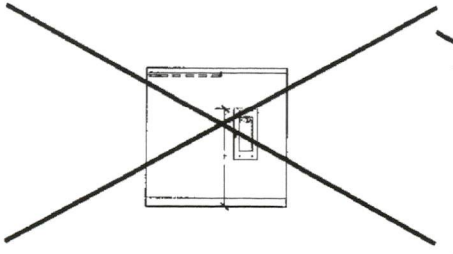

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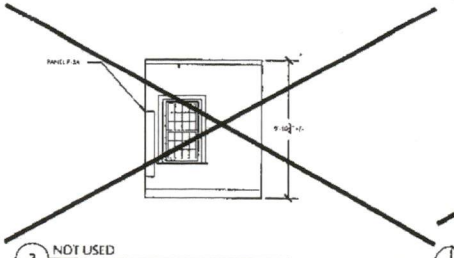

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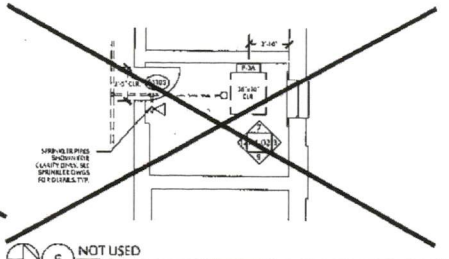

6 NOT USED
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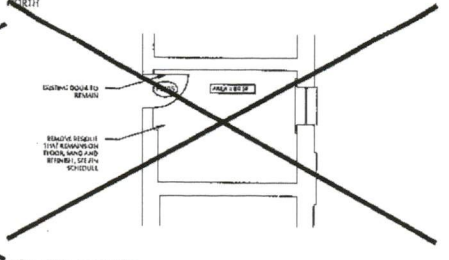
PROJECT NORTH



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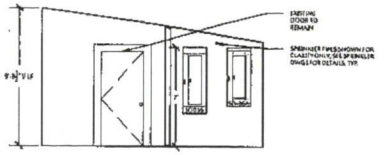
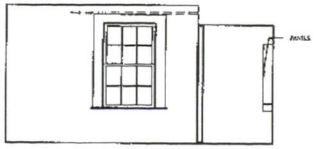
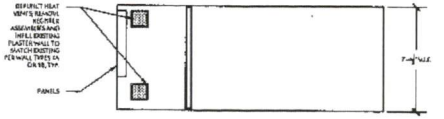
¼" = 1'-0"
PROJECT NORTH



11 PROPOSED SOUTH ELEVATION ROOM A206C; PANEL SD36-A
¼" = 1'-0"



8 PROPOSED EAST ELEVATION ROOM A206C; PANEL SD36-A
¼" = 1'-0"



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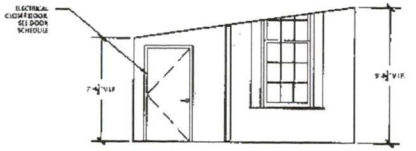
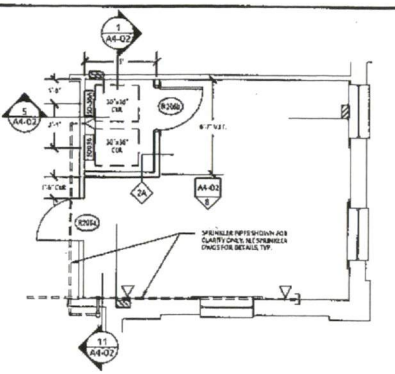
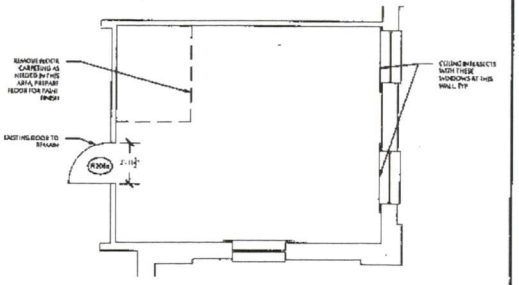
¼" = 1'-0"



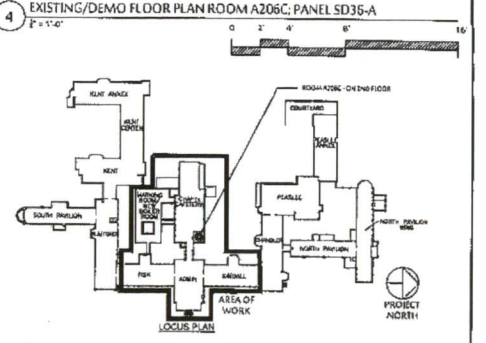
1 PROPOSED NORTH ELEVATION ROOM A206C; PANEL SD36-A
¼" = 1'-0"



10 PROPOSED FLOOR PLAN ROOM A206C; PANEL SD36-A
¼" = 1'-0"
PROJECT NORTH



4 EXISTING/DEMO FLOOR PLAN ROOM A206C; PANEL SD36-A
¼" = 1'-0"
PROJECT NORTH



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DIVISION OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BUF 450 ROOM 850
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

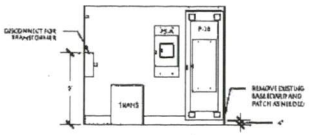
REVISIONS

DATE	DESCRIPTION	BY
09/24/2024	ISSUED FOR CONSTRUCTION	

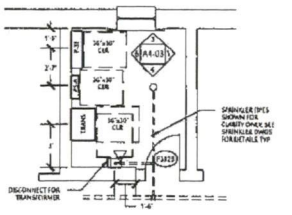
OFFICE PARK SOUTH – MAIN BUILDING
MAIN BLDG. REWIRING PHASE 1
106 PLEASANT ST, CONCORD, NH 03301
DEPARTMENT OF ADMINISTRATIVE SERVICES

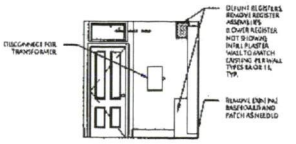
2ND & 3RD FLOOR ELECTRICAL ROOMS: PLANS AND ELEVATIONS

DRAWN BY: MDI | SCALE: AS NOTED | DATE: 09/24/2024 | A4-02 | SHEET: 6 OF 26

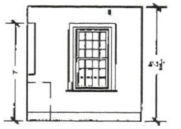


6 PROPOSED SOUTH ELEVATION ROOM F312S; PANEL P3B
1/4" = 1'-0"

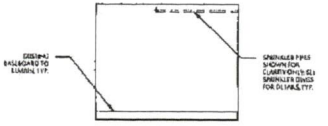




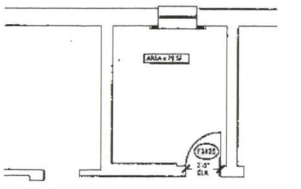
4 PROPOSED EAST ELEVATION ROOM F312S; PANEL P3B
1/4" = 1'-0"



3 PROPOSED WEST ELEVATION ROOM F312S; PANEL P3B
1/4" = 1'-0"

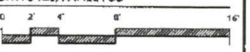


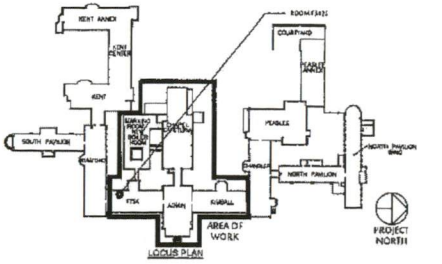
1 PROPOSED NORTH ELEVATION ROOM F312S; PANEL P3B
1/4" = 1'-0"



PROJECT NORTH 5 PROPOSED FLOOR PLAN ROOM F312S; PANEL P3B
1/4" = 1'-0"

PROJECT NORTH 2 EXISTING/DEMO FLOOR PLAN ROOM F312S; PANEL P3B
1/4" = 1'-0"





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JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 256
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-2516 FAX (603) 271-2915

REVISIONS		
DATE	DESCRIPTION	BY
2024-12-05	ISSUED FOR CONSTRUCTION	

OFFICE PARK SOUTH – MAIN BUILDING
MAIN BLDG. REWIRING PHASE 1
108 PLEASANT ST, CONCORD, NH 03301
DEPARTMENT OF ADMINISTRATIVE SERVICES

3RD FLOOR ELECTRICAL ROOMS PLANS AND ELEVATIONS

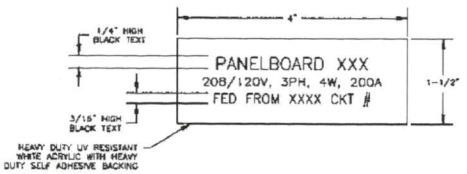
PROJECT No. 8130
CONTRACT #

DRAWN BY	SCALE	DATE
MDI	AS NOTED	09/24/2024

A4-03
SHEET 5 OF 28

DRAWING LIST:

E000 ELECTRICAL LEGEND
E101 SUB-BASEMENT ELECTRICAL DEMO PLAN
E102 BASEMENT ELECTRICAL DEMO PLAN
E103 FIRST FLOOR ELECTRICAL DEMO PLAN
E104 SECOND FLOOR ELECTRICAL DEMO PLAN
E105 THIRD FLOOR ELECTRICAL DEMO PLAN
E106 FOURTH FLOOR/ATTIC ELECTRICAL DEMO PLAN
E107 SUB-BASEMENT ELECTRICAL NEW WORK PLAN
E108 BASEMENT ELECTRICAL NEW WORK PLAN
E109 FIRST FLOOR ELECTRICAL NEW WORK PLAN
E110 SECOND FLOOR ELECTRICAL NEW WORK PLAN
E111 THIRD FLOOR ELECTRICAL NEW WORK PLAN
E112 FOURTH FLOOR/ATTIC ELECTRICAL NEW WORK PLAN
E501 PANELBOARD SCHEDULES SHEET 1 OF 3
E502 PANELBOARD SCHEDULES SHEET 2 OF 3
E503 PANELBOARD SCHEDULES SHEET 3 OF 3
E801 EXISTING AND NEW WORK ONELINE DIAGRAMS



TYPICAL PANELBOARD NAMEPLATES

POWER SYMBOLS:

- JUNCTION BOX
- NEW LIGHTING OR POWER PANELBOARD AS INDICATED
- EXISTING LIGHTING OR POWER PANELBOARD AS INDICATED
- EQUIPMENT OR ITEM TO BE DEMOLISHED AS INDICATED
- EQUIPMENT ENCLOSURE OR WIREWAY; TYPE AND CONTENTS AS INDICATED
- UNDERGROUND CONDUIT; CONTENTS AS INDICATED
- ABOVE GRADE CONDUIT; CONTENTS AS INDICATED
- EXISTING CONDUIT; CONTENTS AS INDICATED
- MOTOR
- TRANSFORMER
- METER
- SIMPLEX RECEPTACLE, NEMA 5-20R
- SIMPLEX STANDBY RECEPTACLE, NEMA 5-20R
- DUPLEX RECEPTACLE, NEMA 5-20R
- DUPLEX STANDBY RECEPTACLE, NEMA 5-20R
- DUPLEX GFCI RECEPTACLE, NEMA 5-20R
- QUAD RECEPTACLE, NEMA 5-20R
- QUAD STANDBY RECEPTACLE, NEMA 5-20R
- SPECIALTY RECEPTACLE; AS INDICATED
- VFD — VARIABLE FREQUENCY DRIVE
- $\$_M$ — MANUAL MOTOR STARTER WITH INTEGRAL THERMAL PROTECTION
- FUSED DISCONNECT SWITCH
- DISCONNECT SWITCH OR ENCLOSED CIRCUIT BREAKER
- COMBIGATION MOTOR STARTER DISCONNECT SWITCH
- MOTOR STARTER
- #16 / P-12 — HOME RUN; P DENOTES PANEL OR MCC DESIGNATION, 12 DENOTES CIRCUIT, #16 INDICATES CONDUIT TYPE

ONELINE SYMBOLS:

- TRANSFORMER; RATINGS AND SIZE AS INDICATES
- UTILITY METER SOCKET
- GROUND CONNECTION
- DISCONNECT SWITCH
- CIRCUIT BREAKER

ABBREVIATIONS:

A	AMPERE(S)
AFF	ABOVE FINISHED FLOOR
AIM	ADDRESSABLE INPUT MODULE
AL	ALUMINUM
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
B. BLDG	BUILDING
BATT	BATTERY
C	CONDUIT
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CKT	CIRCUIT
CP	CONTROL PANEL
CU	COPPER
D	DEPTH
DC	DIRECT CURRENT
DIN	DEUTSCHES INSTITUTE FUR NORMUNG
DS	DISCONNECT SWITCH
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EMT	ELECTRICAL METALLIC TUBING
EOL	END OF LINE RESISTOR
EUH	ELECTRIC UNIT HEATER
EXIST	EXISTING
FA	FIRE ALARM
FC	FOOT CANDLES
G, GND	GROUND
GC	GENERAL CONTRACTOR
GEC	GROUNDING ELECTRODE CONDUCTOR
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GRS	HOT DIPPED GALVANIZED RIGID STEEL
H	HORN
H/S, HS	HORN/STROBE
HP	HORSEPOWER
HZ	HERTZ
J. J.BOX	JUNCTION BOX
KA	KILO AMPS
KAIC	KILO AMPERE INTERRUPTING CAPACITY
KV	KILO VOLTS
KVA	KILO VOLT-AMPERES
KW	KILO WATTS
L	LOAD OR LENGTH
LP	LIQUID PROPANE
LTG	LIGHTING
MAX	MAXIMUM
MBJ	MAIN BONDING JUMPER
MC	METAL CLAD
MCB	MAIN CIRCUIT BREAKER
MDP	MAIN DISTRIBUTION PANEL
MLO	MAIN LUGS ONLY
MIN	MINIMUM
MTS	MANUAL TRANSFER SWITCH
NC, N.C.	NORMALLY CLOSED
NEC	NFPA 70; NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NF	NONFUSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NO, N.O.	NORMALLY OPEN
NTS	NOT TO SCALE
OC	ON CENTER
OH	OVERHEAD
OIT	OPERATOR INTERFACE TERMINAL
P	POLE
PH, ϕ	PHASE
POE	POWER OVER ETHERNET
PRI	PRIMARY
PT	POINT
PVC	POLYVINYL CHLORIDE
R, REC	RECEPTACLE
RGS	RIGID GALVANIZED STEEL
S	SOURCE
SS	STAINLESS STEEL
SCH	SCHEDULE
SEC	SECONDARY
SP	SPARE
SPD	SURGE PROTECTIVE DEVICE
SPST	SINGLE POLE SINGLE THROW
TB	TERMINAL
TELEM	TELEMETRY
TP	TWISTED PAIR
TS	THIS SHEET
TSP	TWISTED SHIELDED PAIR
UFC	UNIFIED FACILITIES CRITERIA
UG	UNDERGROUND
UPS	UNINTERRUPTIBLE POWER SUPPLY
V, VOLT	VOLTAGE
VA	VOLT-AMPERE
VAC	VOLTAGE, ALTERNATING CURRENT
VDC	VOLTAGE, DIRECT CURRENT
VGA	VIDEO GRAPHICS ARRAY CONNECTOR
W	WIDTH, WATT OR WIRES
WP	WEATHERPROOF OR WEATHER RATED
XP	EXPLOSION PROOF
XFMR	TRANSFORMER

NOTES:

1. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH STATE OF NEW HAMPSHIRE BUILDING CODES, NH DAS REQUIREMENTS, NFPA 70, AND THE AUTHORITY HAVING JURISDICTION.
2. ALL MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS AND RECOMMENDATIONS.
3. COORDINATE THE INSTALLATION OF NEW UNDERGROUND CONDUIT PRIOR TO STARTING CONSTRUCTION. CALL DIGSAFE (888) 344-7233 TO DETERMINE THE ACTUAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES AND CONDUITS IN THE AREA PRIOR TO EXCAVATION.
4. ALL WIRING HAS BEEN SIZED ASSUMING COPPER CONDUCTORS WITH <1% VOLTAGE DROP IN FEEDER CIRCUITS AND <2% VOLTAGE DROP IN BRANCH CIRCUITS, AS DETAILED IN THE SPECIFICATION. ALUMINUM IS AN ACCEPTABLE ALTERNATE FOR FEEDER CIRCUITS. CONTRACTOR SHALL BE RESPONSIBLE FOR FINAL SIZING OF CONDUCTORS BASED ON ACTUAL ROUTING OF CONDUITS, CONDUCTOR MATERIAL, AND DE-RATION FOR MULTIPLE CURRENT CARRYING CONDUCTORS IN A SINGLE RACEWAY.
5. IF THE LENGTH OF CONDUIT BETWEEN THE JUNCTION BOX/WIREWAY REPLACING PSB-1 AND PANEL SD-10 EXCEEDS 24', THE CABLE SIZES AND CONDUITS SHALL BE INCREASED AS REQUIRED TO ACCOUNT FOR CONDUIT FILL LIMITATIONS AND NUMBER OF CURRENT CARRYING CONDUCTORS IN A SINGLE RACEWAY AS REQUIRED BY THE NEC.

CONSTRUCTION GENERAL REQUIREMENTS:

1. CONTRACTOR SHALL VISIT THE SITE PRIOR TO BID TO FAMILIARIZE THEMSELVES WITH THE EXISTING INSTALLATION AND CONDITIONS AT THE SITE. NO ALLOWANCES WILL BE MADE FOR OBSERVABLE CONDITIONS.
2. ALL OUTAGES SHALL BE COORDINATED, A MINIMUM OF TWO (2) WEEKS IN ADVANCE, AT THE OWNER'S CONVENIENCE AND OCCUR DURING OFF HOURS; NO OUTAGES SHALL OCCUR MONDAY THROUGH FRIDAY BETWEEN THE HOURS OF 6:00AM AND 5:00PM. THE CONTRACTOR SHALL INCLUDE TEMPORARY POWER FOR BUILDING HEATING SYSTEMS DURING OUTAGES AS REQUIRED.
3. ALL EXISTING WIRING TO BE REUSED IS FUNCTIONAL AND CURRENTLY IN USE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETE REPLACEMENT OF ANY EXISTING WIRING DAMAGED DURING CONSTRUCTION. WHERE EXISTING WIRING IS TO BE REROUTED, SPLICED, AND EXTENDED, COMPLETE WIRING ASSEMBLY SHALL BE TESTED, TO INCLUDED CONTINUITY AND INSULATION RESISTANCE, TO VERIFY FULL FUNCTIONALITY OF ASSEMBLY PRIOR TO MAKING FINAL CONNECTIONS AND TERMINATIONS.
4. ONLY CIRCUITS SERVING THE STAIRWELL MAY BE RUN OR REMAIN IN THE STAIRWELL. CIRCUITS INCLUDING STAIRWELL LIGHTING, STAIRWELL RECEPTACLES, STAIRWELL HVAC EQUIPMENT, ETC. ALL NEW PANEL FEEDER CIRCUITS AND EXISTING BRANCH CIRCUITS TO REMAIN SERVING OTHER AREAS ARE TO BE ROUTED THROUGH OTHER AREAS AND/OR DEMOLISHED AND REMOVED IN THEIR ENTIRETY. REFER TO NEW WORK PLANS FOR ADDITIONAL REQUIREMENTS.
5. ALL FEEDER AND BRANCH CIRCUITS NOT TO BE REUSED SHALL BE DEMOLISHED TO THE MAXIMUM EXTENT POSSIBLE. ALL CONDUCTORS/WIRING SHALL BE REMOVED FROM LOAD TO SOURCE. ALL EXPOSED CONDUITS AND RACEWAYS SHALL BE REMOVED. CONDUITS AND RACEWAYS THAT ENTER MASONRY WALLS OR FLOORS SHALL BE CUT FLUSH AT THE SURFACE WITH WALLS PATCHED AND PAINTED TO MATCH EXISTING WALL FINISH UPON COMPLETION.
6. THE DIMENSIONS OF EQUIPMENT DETAILED ON THE ELECTRICAL DRAWINGS AND WITHIN THE ARCHITECTURAL ELEVATIONS INDICATE THE MAXIMUM DIMENSIONS OF EQUIPMENT ALLOWED. NO ALTERNATES WILL BE REVIEWED WITHOUT VERIFICATION BY THE CONTRACTOR THAT THE ALTERNATE MANUFACTURER OR MODEL WILL FIT IN THE LOCATION INDICATED AND PROVIDE ALL REQUIRED WORKING SPACE CLEARANCES REQUIRED BY THE NEC.
7. CLOTH COVERED FEEDER AND BRANCH CIRCUITS, STILL IN USE, WERE IDENTIFIED WITHIN PANELS P1C, P2B, P-3D, P-4B, P2D, P-5A, SD-10, SD-11, SD-4, SD-3B, AND SD-36A. IN ADDITION TO WORK DETAILED WITHIN THE DRAWINGS, PRICING AND UNIT PRICING FOR THE FOLLOWING BID ITEMS SHALL BE INCLUDED:
   - 7.1. BID ITEM 2 – 100 HOURS OF INVESTIGATION FOR FIELD VERIFICATION OF EXISTING BRANCH CIRCUITS AND THE LOAD(S) SUPPLIED.
   - 7.2. BID ITEM 3 – EXISTING SURFACE BRANCH CIRCUIT REPLACEMENT AND DEMOLITION OF EXISTING; 75 CIRCUITS TO INCLUDE 2500' OF 3/4" EMT WITH 4#12 CU & 1#12G CU, 75 – 4"SQUARE BOXES AND COVERS, WITH TERMINATIONS, MOUNTING HARDWARE, AND FITTINGS REQUIRED.
   - 7.3. UNIT PRICE 3 – PER FOOT COST FOR ADDITIONAL 3/4" EMT WITH 4#12 CU & 1#12G CU REQUIRED.
   - 7.4. BID ITEM 4 – EXISTING CONCEALED BRANCH CIRCUIT REPLACEMENT AND DEMOLITION OF EXISTING; 50 CIRCUITS TO INCLUDE 1500' OF MC CABLE WITH 4#12 CU & 1#12G CU WITH TERMINATIONS, MOUNTING HARDWARE, AND FITTINGS REQUIRED.
   - 7.5. UNIT PRICE 4 – PER FOOT COST FOR ADDITIONAL MC CABLE WITH 4#12 CU & 1#12G CU REQUIRED.

#	CONTENTS: CONDUIT	CONTENTS: WIRING	TYPE	DESIGNATION
1	3"C	4#350KCMIL CU & 1#600 CU	FEEDER	LDP-2 TO SD-10
2	3/4"C	3#6 CU & 1#10G CU	BRANCH	SD-10 EXISTING BRANCH CIRCUITS
	3/4"C	3#8 CU & 1#10G CU		
	3/4"C	3#12 CU & 1#12G CU		
	3/4"C	2#8 CU & 1#10G CU		
3	1"C	2#2 CU & 1#6 CU	BRANCH	PSB-1 BRANCH CIRCUITS (NOTE 8)
4	3"C	4#1 CU & 1#6 CU	BRANCH	SD-10 TO SD-36A
5	2"C	3#2/0 CU & 1#4G CU	FEEDER	LDP-1A TO SD-4
6	2"C	4#4/0 CU & 1#4G CU	FEEDER & BRANCH	SD-4 EXISTING FEEDER & BRANCH CIRCUITS
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	3#8 CU & 1#10G CU		
	1"C	4#6 CU & 1#6G CU		
	3/4"C	3#8 CU & 1#10G CU		
	3/4"C	3#8 CU & 1#10G CU		
	3/4"C	2#8 CU & 1#10G CU		
7	3-1/2"C	4#500KCMIL CU & 1#1/2G CU	FEEDER	SD-4 TO P1C
8	3-1/2"C	4#500KCMIL CU & 1#1/0G CU	FEEDER	LDP-2 TO SD-11
9	1-1/4"C	3#3 CU & 1#6G CU	FEEDER & BRANCH	SD-11 EXISTING FEEDER & BRANCH CIRCUITS
	3/4"C	3#8 CU & 1#10G CU		
	1"C	3#4 CU & 1#6G CU		
	1-1/4"C	3#3 CU & 1#6G CU		
	1-1/4"C	3#3 CU & 1#6G CU		
	3/4"C	3#12 CU & 1#12G CU		
	2"C	3#2/0 CU & 1#6G CU		
	3/4"C	3#8 CU & 1#10G CU		
	1-1/4"C	3#3 CU & 1#6G CU		
	3/4"C	3#8 CU & 1#10G CU		
10	1-1/4"C	4#4 CU & 1#6G CU	FEEDER	P1C TO P2B
11	3/4"C	4#12 CU & 1#12G CU	BRANCH	P1C EXISTING BRANCH CIRCUITS
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
12	3/4"C	4#12 CU & 1#12G CU	BRANCH	P2B EXISTING BRANCH CIRCUITS
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
13	2"C	4#2/0 & 1#1/0 CU	FEEDER	LDP-1A TO P1B
14	2"C	4#250 & 1#2/0 CU	FEEDER	LDP-1A TO P2A
15	3/4"C	4#12 CU & 1#12G CU	BRANCH	P1B EXISTING BRANCH CIRCUITS
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	2#10 CU & 1#10G CU		
16	3/4"C	4#12 CU & 1#12G CU	BRANCH	P2A EXISTING BRANCH CIRCUITS
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
17	3/4"C	3#8 CU & 1#10G CU	FEEDER	SD-36A TO P2D
18	3/4"C	4#12 CU & 1#12G CU	BRANCH	SD-36A EXISTING BRANCH CIRCUITS
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
19	3"C	4#350KCMIL CU & 1#6G CU	FEEDER	LDP-2 TO SD-36
20	3/4"C	4#12 CU & 1#12G CU	BRANCH	SD-7S EXISTING BRANCH CIRCUITS
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
21	1-1/2"C	4#1 CU & 1#6G CU	FEEDER	LDP-1A TO P-3A
22	3/4"C	4#12 CU & 1#12G CU	BRANCH	P-3A EXISTING BRANCH CIRCUITS
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
23	1-1/2"C	3#1/0 CU & 1#1/0 CU	FEEDER	HDP-1 TO XFMR DISCONNECT TO XFMR
24	3"C	4#4/0 CU & 1#2/0 CU	FEEDER	XFMR TO P-3B
25	1-1/4"C	4#3 CU & 1#6G CU	FEEDER	P-3B TO P-3C
26	3/4"C	4#12 CU & 1#12G CU	BRANCH	P-3B EXISTING BRANCH CIRCUITS
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
	3/4"C	4#12 CU & 1#12G CU		
27	1"C	4#3 CU & 1#6G CU	FEEDER	SD-4 TO P3-A
28	1"C	4#2 CU & 1#6G CU	FEEDER	SD-3B TO P4-B
29	3/4"C	1#2AWG CU	GROUND	T1 A TO EXISTING WATER MAIN
30	3/4"C	4#12 CU & 1#12G CU	BRANCH	P5-A EXISTING BRANCH CIRCUITS
	3/4"C	4#12 CU & 1#12G CU		
31	1-1/4"C	4#2 CU & 1#6G CU	SERVICE	XFMR TO FIRE PUMP DS

NOTE 4

CONDUIT & WIRING LEGEND

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DRAWN BY	DESIGNED BY	CHECKED BY	CHECKED BY
RICHARDSON ENG	SVR	SVR	KAT

REVISIONS		
DATE	DESCRIPTION	BY
30MAY25	ISSUED FOR CONSTRUCTION	SVR

OFFICE PARK SOUTH – MAIN BUILDING
MAIN BLDG. REWIRING PHASE 1
106 PLEASANT ST, CONCORD, NH 03301
DEPARTMENT OF ADMINISTRATIVE SERVICES

ELECTRICAL LEGEND

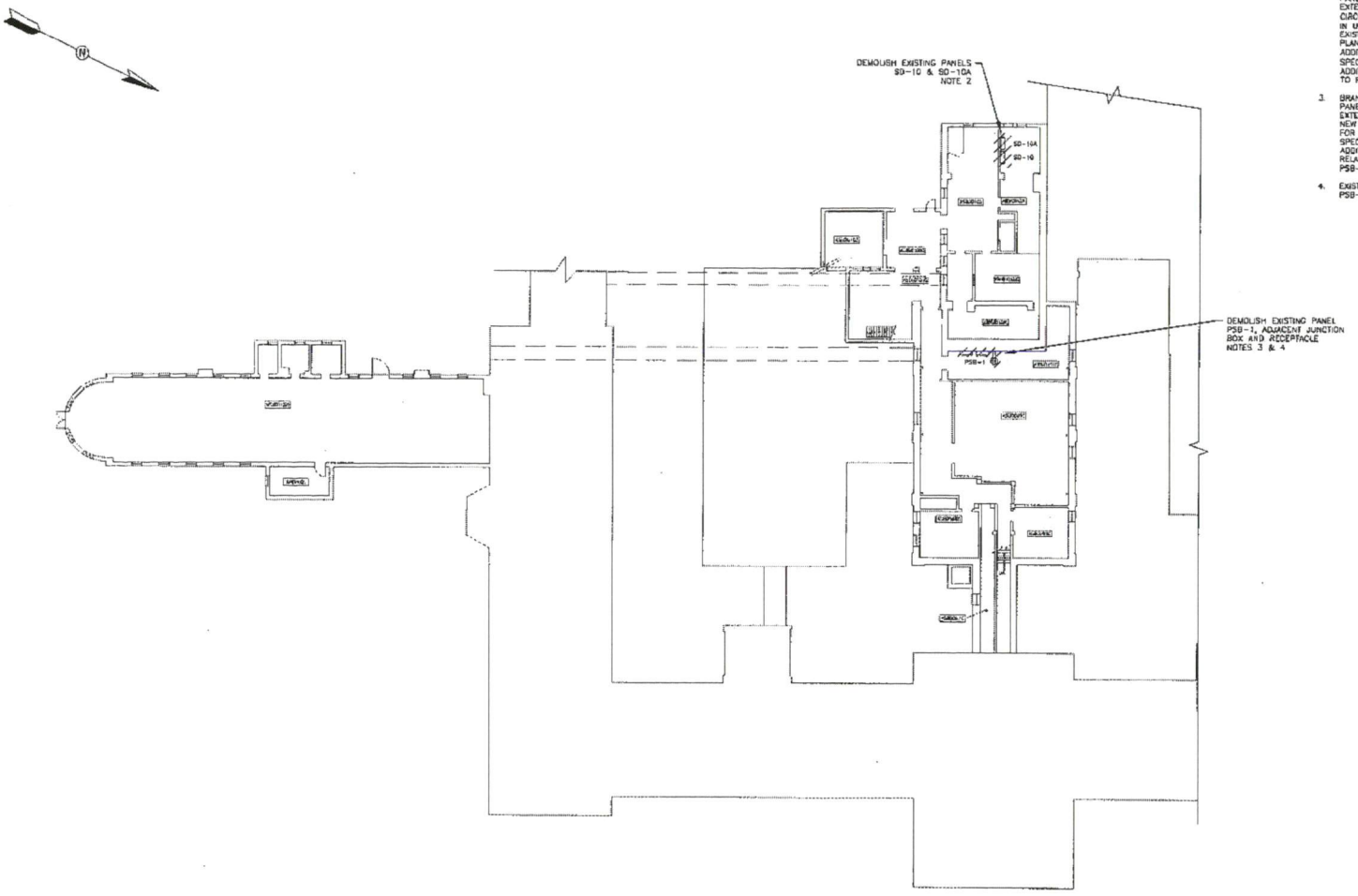
PROJECT No. 27.220 CONTRACT 3

DRAWN BY	SCALE	DATE
SVR	NONE	05/24/2024

E000 SHEET 1 OF 38

NOTES:

1. REFER TO E000 FOR ELECTRICAL LEGEND AND ABBREVIATIONS.
2. BRANCH CIRCUITS STILL IN USE, FED FROM PANEL SD-10 ARE TO REMAIN AND BE EXTENDED TO NEW PANEL SD-10. BRANCH CIRCUITS FROM PANEL SD-10A ARE NO LONGER IN USE AND SHALL BE DEMOLISHED, ALONG WITH EXISTING PANEL SD-10A. REFER TO NEW WORK PLANS AND SD-10 PANEL SCHEDULE FOR ADDITIONAL REQUIREMENTS. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO PANEL SD-10 BRANCH CIRCUITS.
3. BRANCH CIRCUITS STILL IN USE, FED FROM PANEL PSB-1 ARE TO REMAIN AND BE EXTENDED TO NEW PANEL SD-10. REFER TO NEW WORK PLANS AND SD-10 PANEL SCHEDULE FOR ADDITIONAL REQUIREMENTS. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO BRANCH CIRCUITS FED FROM PANEL PSB-1.
4. EXISTING DUPLEX RECEPTACLE NEXT TO PANEL PSB-1 SHALL BE DEMOLISHED.



SUB-BASEMENT ELECTRICAL DEMO PLAN

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DATE	DESCRIPTION	BY
30MAY25	ISSUED FOR CONSTRUCTION	SVR

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108 PLEASANT ST, CONCORD, NH 03301
DEPARTMENT OF ADMINISTRATIVE SERVICES

SUB-BASEMENT ELECTRICAL DEMO PLAN

PROJECT No. 8330
CONTRACT: 8

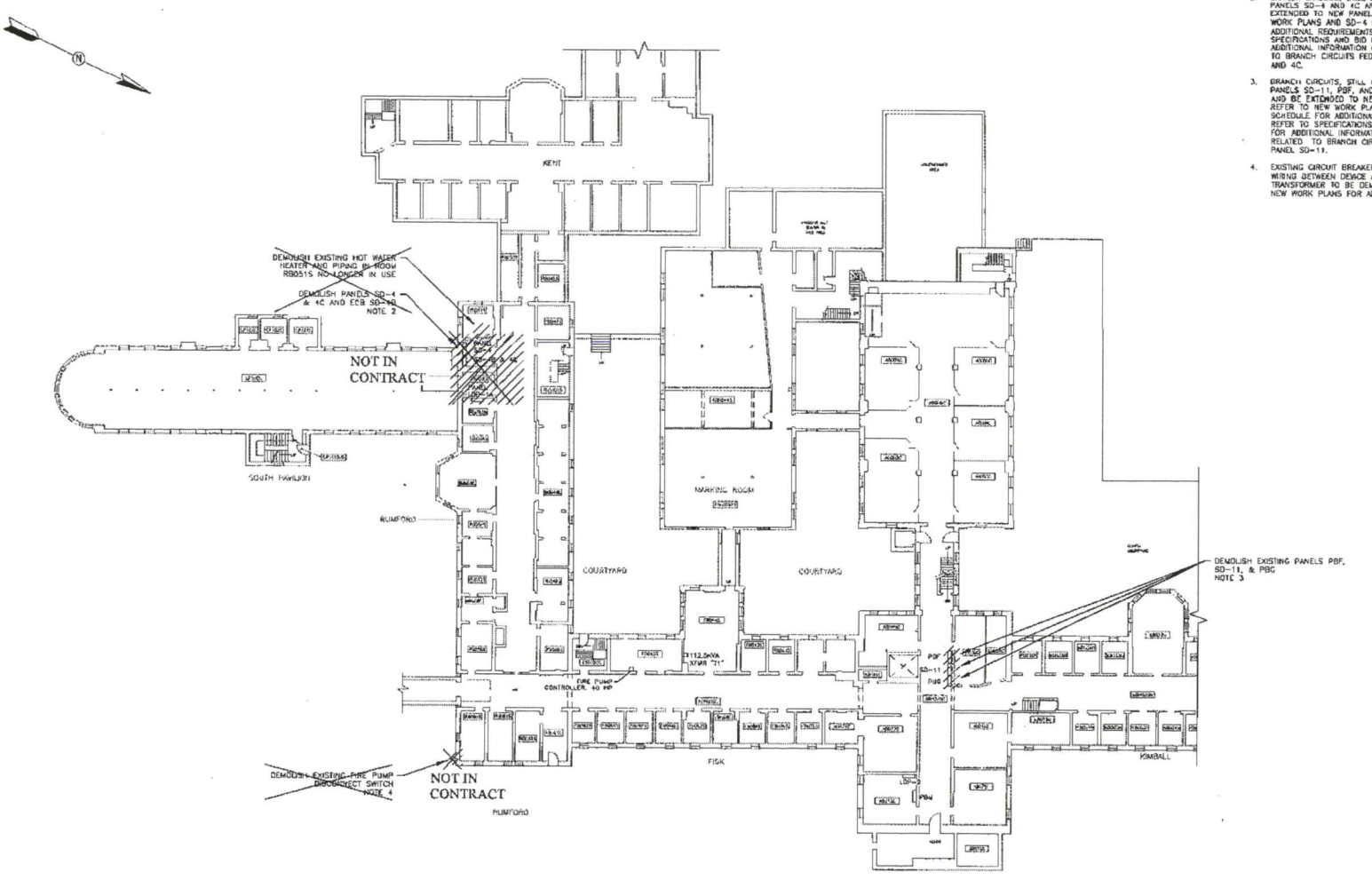
DRAWN BY: SVR | SCALE: 1/16" = 1'-0" | DATE: 06/24/2024

E101

SHEET: 8 OF 33

NOTES:

1. REFER TO E003 FOR ELECTRICAL LEGEND AND ABBREVIATIONS.
2. BRANCH CIRCUITS, STILL IN USE, FED FROM PANELS SD-4 AND 4C ARE TO REMAIN AND BE EXTENDED TO NEW PANEL SD-4. REFER TO NEW WORK PLANS AND SD-4 PANEL SCHEDULE FOR ADDITIONAL REQUIREMENTS. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO BRANCH CIRCUITS FED FROM PANELS SD-4 AND 4C.
3. BRANCH CIRCUITS, STILL IN USE, FED FROM PANELS SD-11, PBF, AND PBG ARE TO REMAIN AND BE EXTENDED TO NEW PANEL SD-11. REFER TO NEW WORK PLANS AND SD-11 PANEL SCHEDULE FOR ADDITIONAL REQUIREMENTS. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO BRANCH CIRCUITS FED FROM PANEL SD-11.
4. EXISTING CIRCUIT BREAKER/DISCONNECT AND WIRING BETWEEN DEVICE AND PAD MOUNTED TRANSFORMER TO BE DEMOLISHED REFER TO NEW WORK PLANS FOR ADDITIONAL INFORMATION.



BASEMENT ELECTRICAL DEMO PLAN

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DRAWN BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:
RICHARDSON ENG	SVR	SVR	KAT

REVISIONS		
DATE	DESCRIPTION	BY
30MAY25	ISSUED FOR CONSTRUCTION	SVR

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DEPARTMENT OF ADMINISTRATIVE SERVICES

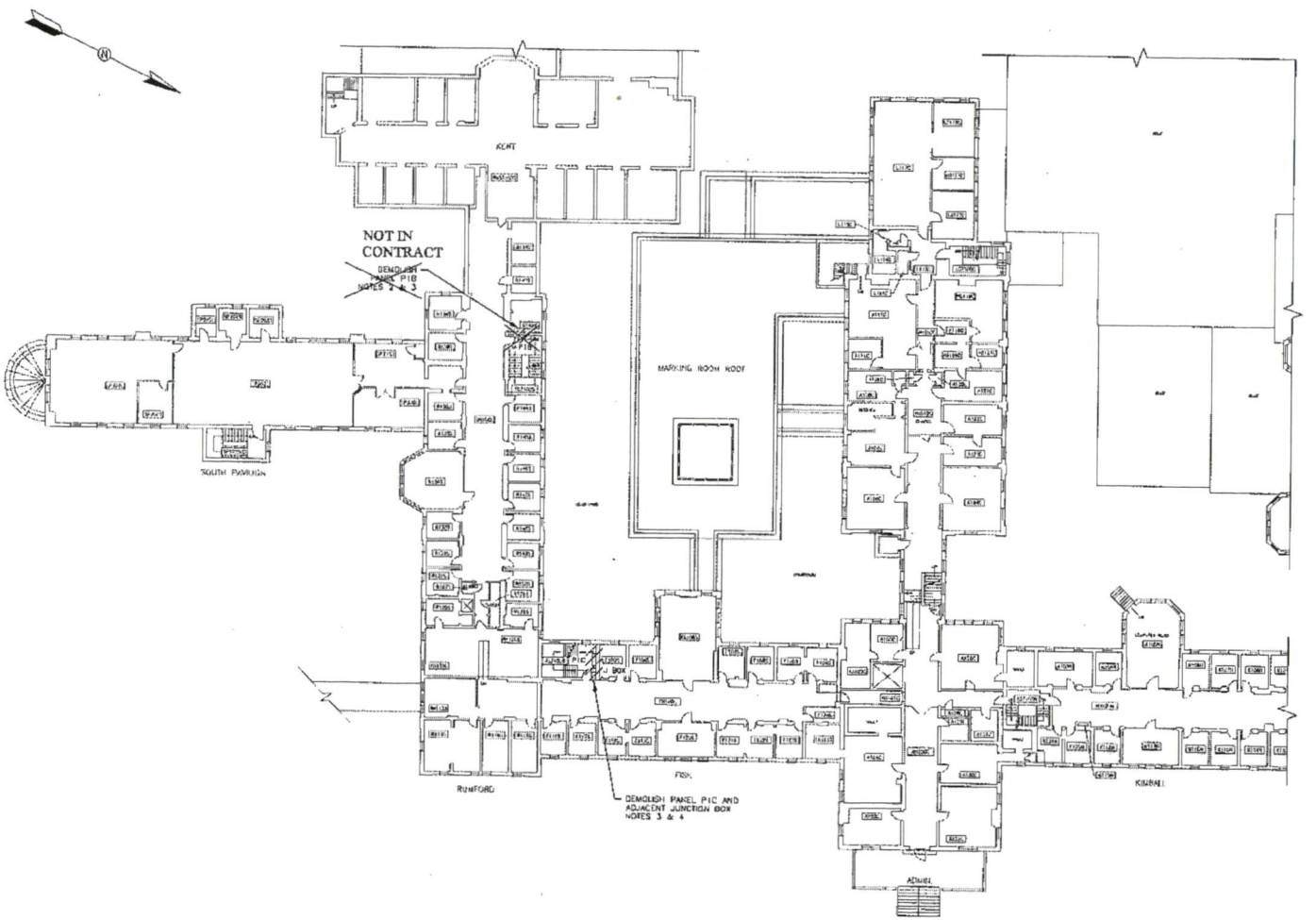
BASEMENT ELECTRICAL DEMO PLAN

PROJECT NO. 01760 CONTRACT: 3

DRAWN BY:	SCALE:	DATE:	SHEET
SVR	1/16" = 1'-0"	09/24/2024	E102

NOTES:

1. REFER TO E000 FOR ELECTRICAL LEGEND AND ABBREVIATIONS.
2. EXISTING BRANCH CIRCUITS, STILL IN USE, FED FROM PANEL P1B ARE TO REMAIN. CONTRACTOR SHALL LOCATE CIRCUITS ABOVE CEILING IN HALLWAY AND PULL BACK TO HALLWAY FOR EXTENSION TO NEW LOCATION OF PANEL OF PANEL P1B. REFER TO NEW WORK PLANS FOR ADDITIONAL REQUIREMENTS.
3. AFTER DEMOLITION OF PANEL AND ANY JUNCTION BOXES WITHIN STAIRWELL, WALL SHALL BE PATCHED AND PAINTED TO MATCH EXISTING WALL FINISHES.
4. EXISTING BRANCH CIRCUITS, STILL IN USE, FED FROM PANEL P1C ARE TO REMAIN. CONTRACTOR SHALL LOCATE CIRCUITS ABOVE CEILING IN HALLWAY AND EXTEND FROM HALLWAY TO NEW LOCATION OF PANEL P1C. REFER TO NEW WORK PLANS FOR ADDITIONAL REQUIREMENTS. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO BRANCH CIRCUITS FED FROM PANEL P1C.



FIRST FLOOR ELECTRICAL DEMO PLAN

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DESIGNED BY	DRAWN BY	CHECKED BY	PROJECT NO.
RICHARDSON ENG	SVR	SVR	KAT

REVISIONS			
DATE	DESCRIPTION	BY	
30MAY25	ISSUED FOR CONSTRUCTION	SVR	

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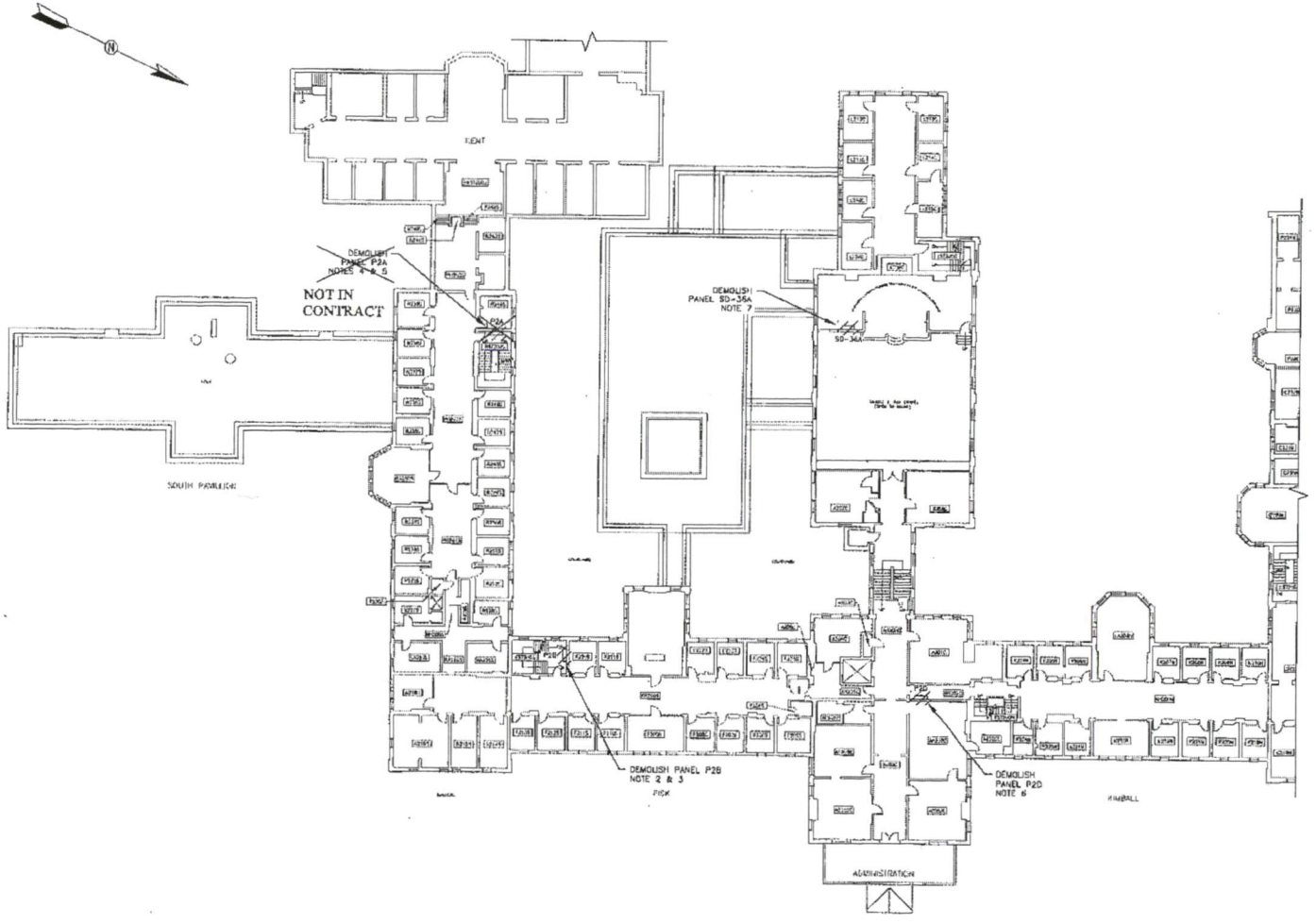
FIRST FLOOR ELECTRICAL DEMO PLAN

DRAWN BY	SCALE	DATE	PROJECT NO. BLDG CONTRACT X
SVR	1/16" = 1'-0"	09/24/2024	E103

SHEET 15 OF 28



SECOND FLOOR ELECTRICAL DEMO PLAN

NOTES:

1. REFER TO E000 FOR ELECTRICAL LEGEND AND ABBREVIATIONS.
2. EXISTING BRANCH CIRCUITS, STILL IN USE, FED FROM PANEL P2B ARE TO REMAIN. CONTRACTOR SHALL LOCATE CIRCUITS ABOVE CEILING IN HALLWAY AND PULL BACK TO HALLWAY FOR EXTENSION TO NEW LOCATION OF PANEL P2B. REFER TO NEW WORK PLANS FOR ADDITIONAL REQUIREMENTS. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO BRANCH CIRCUITS FED FROM PANEL P2B.
3. AFTER DEMOLITION OF PANEL P2B AND JUNCTION BOX WITHIN STAIRWELL, WALL SHALL BE PATCHED AND PAINTED TO MATCH EXISTING WALL FINISHES.
4. EXISTING BRANCH CIRCUITS, STILL IN USE, FED FROM PANEL P2A ARE TO REMAIN. CONTRACTOR SHALL LOCATE CIRCUITS ABOVE CEILING IN HALLWAY AND PULL BACK TO HALLWAY FOR EXTENSION FROM HALLWAY TO NEW LOCATION OF PANEL P2A. REFER TO NEW WORK PLANS FOR ADDITIONAL REQUIREMENTS.
5. AFTER DEMOLITION OF PANEL P2A WITHIN STAIRWELL, WALL SHALL BE PATCHED AND PAINTED TO MATCH EXISTING WALL FINISHES.
6. EXISTING BRANCH CIRCUITS, STILL IN USE, FED FROM PANEL P2D ARE TO REMAIN AND BE REFED FROM NEW PANEL P2D. REFER TO NEW WORK PLANS FOR ADDITIONAL REQUIREMENTS. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO BRANCH CIRCUITS FED FROM PANEL P2D.
7. EXISTING BRANCH CIRCUITS, STILL IN USE, FED FROM PANEL SD-36A ARE TO REMAIN AND BE REFED FROM NEW PANEL SD-36A. REFER TO NEW WORK PLANS FOR ADDITIONAL REQUIREMENTS. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO BRANCH CIRCUITS FED FROM PANEL SD-36A.

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PROJECT/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
RICHARDSON ENG	SVR	SVR	KAT

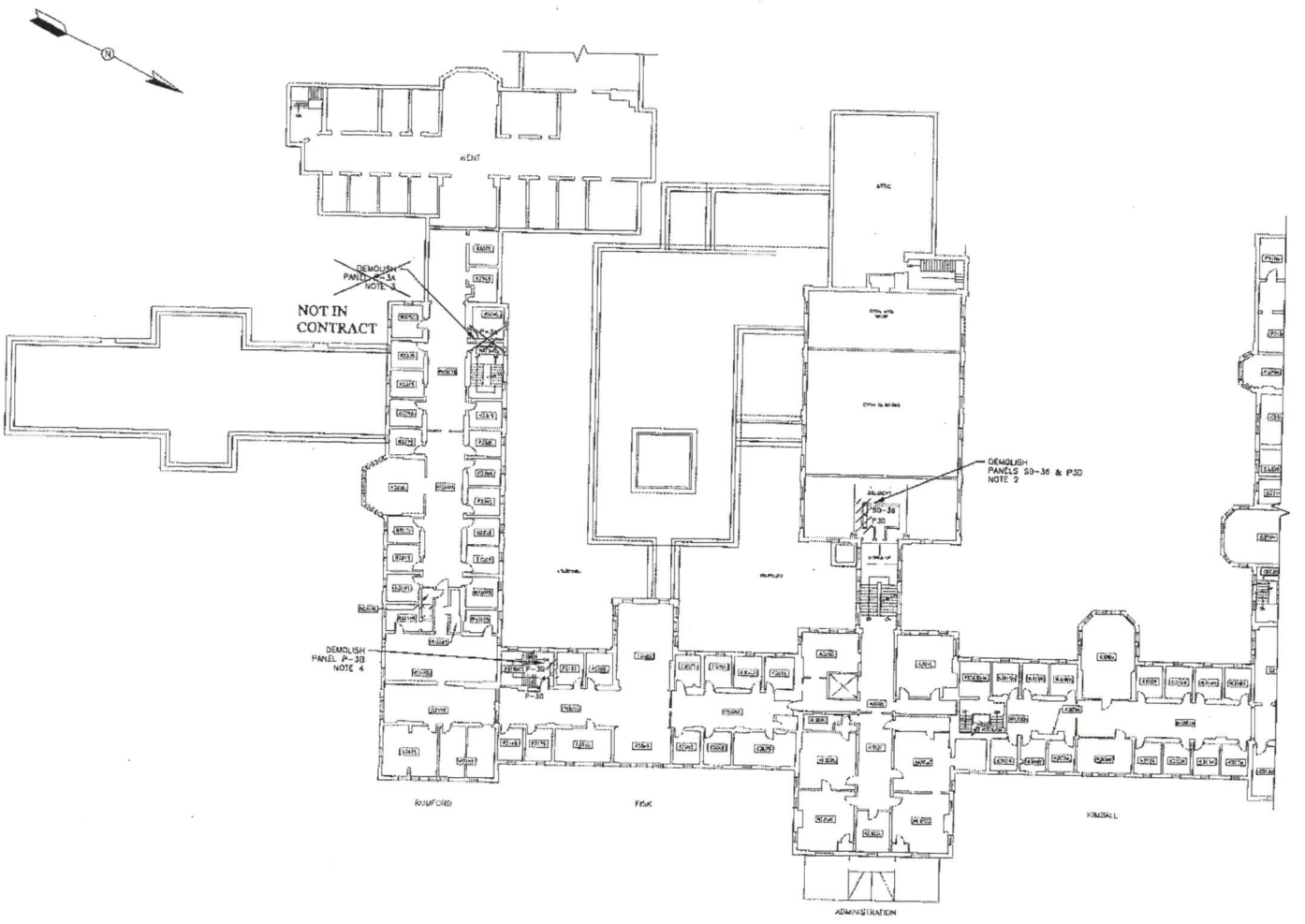
REVISIONS

DATE	DESCRIPTION	BY
30MAY25	ISSUED FOR CONSTRUCTION	SVR

OFFICE PARK SOUTH – MAIN BUILDING
MAIN BLDG. REWIRING PHASE 1
108 PLEASANT ST. CONCORD, NH 03301
DEPARTMENT OF ADMINISTRATIVE SERVICES

SECOND FLOOR ELECTRICAL DEMO PLAN

DRAWN BY:	SCALE:	DATE:	PROJECT No.
SVR	1/16" = 1'-0"	09/24/2024	E104



THIRD FLOOR ELECTRICAL DEMO PLAN

NOTES:

1. REFER TO EQOD FOR ELECTRICAL LEGEND AND ABBREVIATIONS.
2. EXISTING BRANCH CIRCUITS, STILL IN USE, FED FROM PANELS SD-36 AND P3D ARE TO REMAIN AND BE REFED FROM NEW PANEL SD-36. REFER TO NEW WORK PLANS FOR ADDITIONAL REQUIREMENTS. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO BRANCH CIRCUITS FED FROM PANELS SD-36.
3. EXISTING BRANCH CIRCUITS, STILL IN USE, FED FROM PANEL P-3A ARE TO REMAIN. CONTRACTOR SHALL LOCATE CIRCUITS ABOVE CEILING IN HALLWAY AND PULL BACK TO HALLWAY FOR EXTENSION TO NEW LOCATION OF PANEL P-3A. REFER TO NEW WORK PLANS FOR ADDITIONAL REQUIREMENTS.
4. EXISTING BRANCH CIRCUITS, STILL IN USE, FED FROM PANEL P-3B ARE TO REMAIN. CONTRACTOR SHALL LOCATE CIRCUITS ABOVE CEILING IN HALLWAY AND PULL BACK TO HALLWAY FOR EXTENSION TO NEW LOCATION OF PANEL P-3B. REFER TO NEW WORK PLANS FOR ADDITIONAL REQUIREMENTS. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO BRANCH CIRCUITS FED FROM PANEL P-3B.

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(603) 271-3515 FAX(603) 271-3515

DESIGNED/ARCHITECT	DESIGNED BY	DRAWN BY	CHECKED BY
RICHARDSON ENG	SVR	SVR	KAT

REVISIONS

DATE	DESCRIPTION	BY
30MAY25	ISSUED FOR CONSTRUCTION	SVR

OFFICE PARK SOUTH – MAIN BUILDING
MAIN BLDG. REWIRING PHASE 1
106 PLEASANT ST. CONCORD, NH 03301
DEPARTMENT OF ADMINISTRATIVE SERVICES

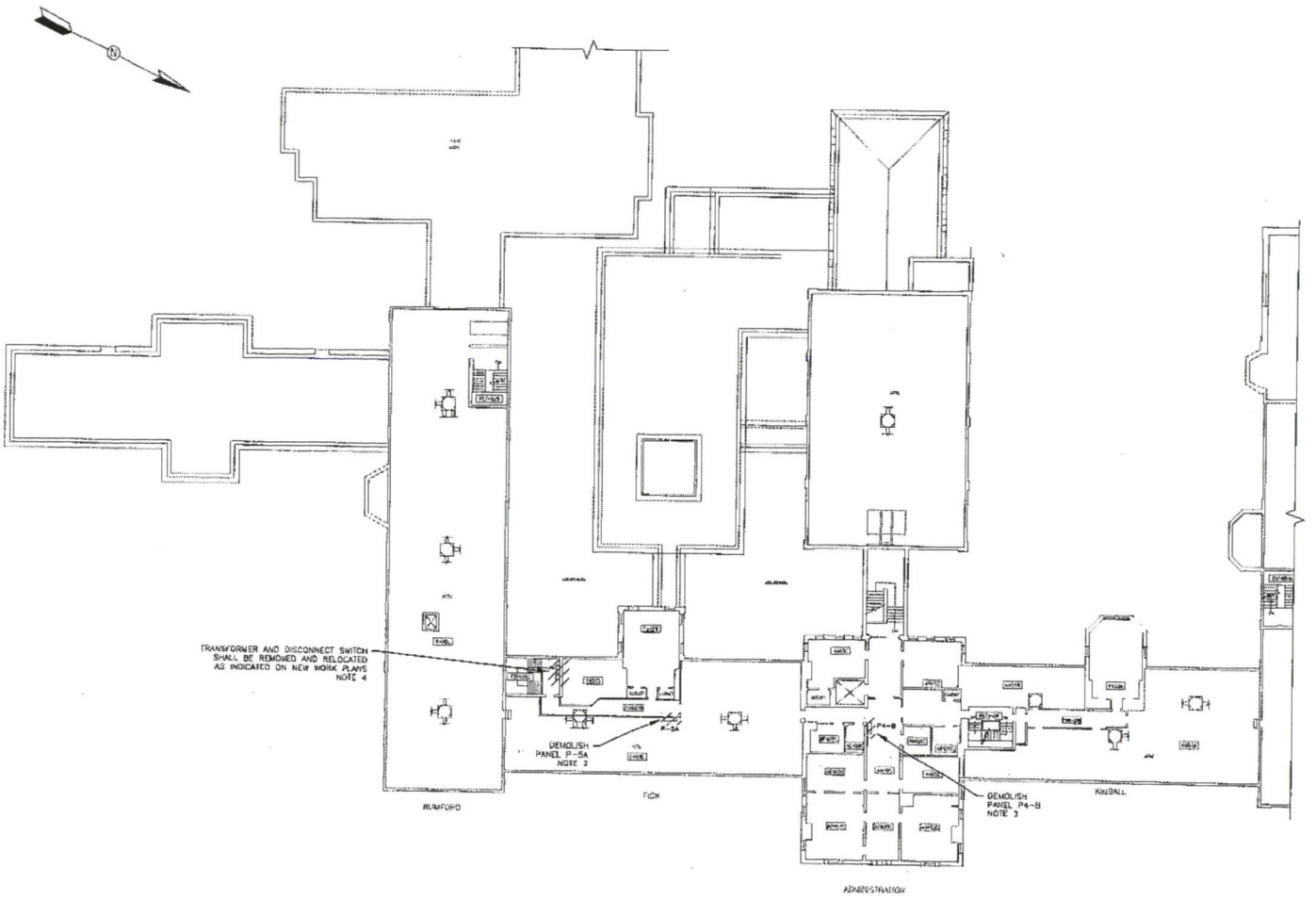
THIRD FLOOR ELECTRICAL DEMO PLAN

PROJECT No. 8150 CONTRACT: 9

DRAWN BY	SCALE	DATE	SHEET
SVR	1/16" = 1'-0"	09/24/2024	E105 SHEET 12 OF 28

NOTES:

1. REFER TO E000 FOR ELECTRICAL LEGEND AND ABBREVIATIONS.
2. EXISTING BRANCH CIRCUITS, STILL IN USE, FED FROM PANEL P-5A ARE TO REMAIN AND BE REFED FROM NEW PANEL P-5A IN NEW LOCATION. REFER TO NEW WORK PLANS FOR ADDITIONAL REQUIREMENTS. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO BRANCH CIRCUITS FED FROM PANEL P-5A.
3. EXISTING BRANCH CIRCUITS, STILL IN USE, FED FROM PANEL P4-B ARE TO REMAIN AND BE REFED FROM NEW PANEL P4-B. REFER TO NEW WORK PLANS FOR ADDITIONAL REQUIREMENTS. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO BRANCH CIRCUITS FED FROM PANEL P4-B.
4. ALL CONDUITS AND WIRING ASSOCIATED WITH THE TRANSFORMER AND DISCONNECT SHALL BE DEMOLISHED FROM LOAD TO SOURCE.



FOURTH FLOOR & ATTIC ELECTRICAL DEMO PLAN

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CONSULTANT/SUB	DESIGNED BY	DRAWN BY	CHECKED BY
RICHARDSON ENG	SVR	SVR	KAT

REVISIONS

DATE	DESCRIPTION	BY
30MAY25	ISSUED FOR CONSTRUCTION	SVR

OFFICE PARK SOUTH - MAIN BUILDING
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DEPARTMENT OF ADMINISTRATIVE SERVICES

FOURTH FLOOR & ATTIC ELECTRICAL DEMO PLAN

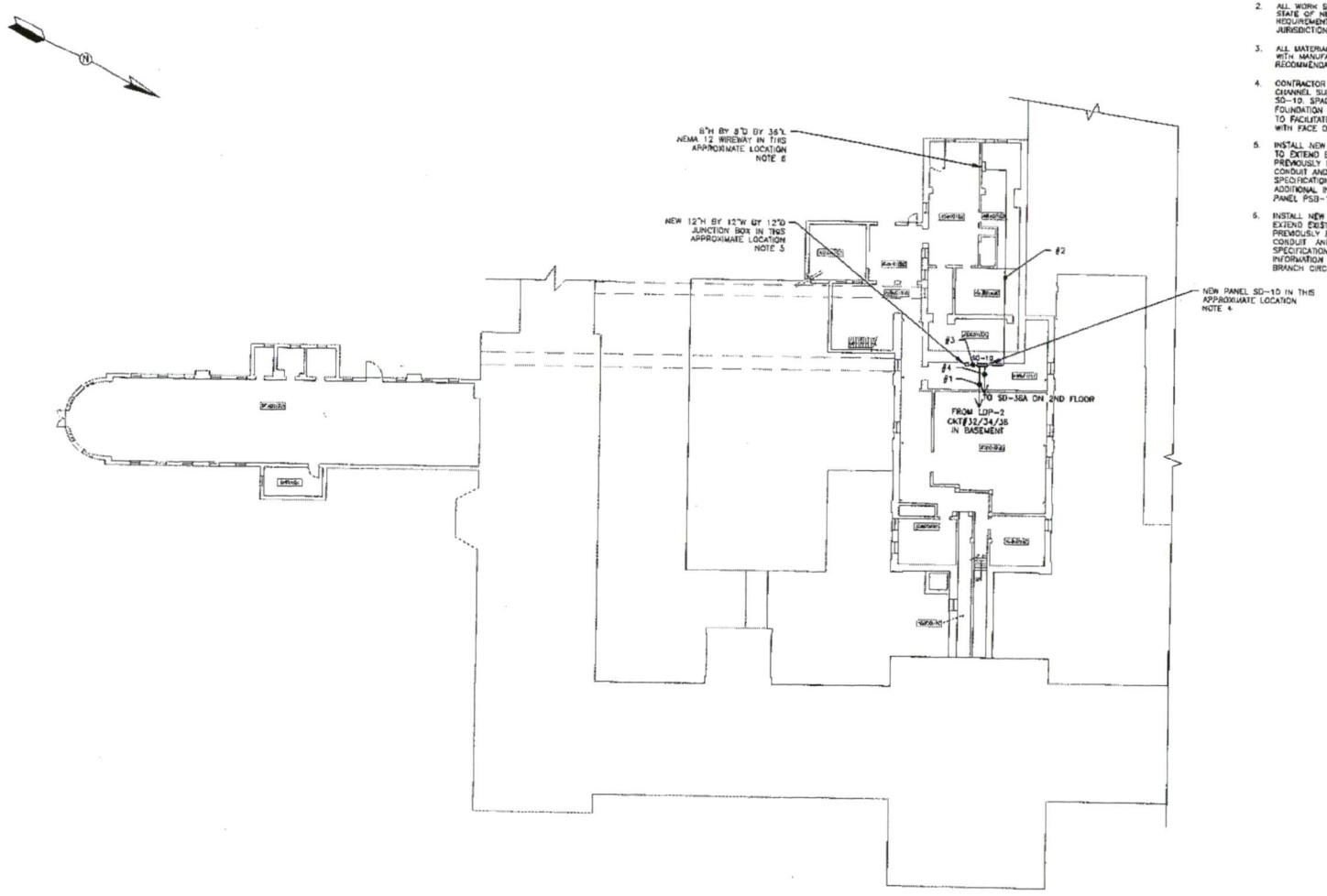
PROJECT No. 21270 CONTRACT: 3

DRAWN BY	SCALE	DATE
SVR	1/16" = 1'-0"	05/24/2024

E106
SHEET: 13 OF 38

NOTES:

1. REFER TO E000 FOR ELECTRICAL LEGEND, ABBREVIATIONS, AND CONDUIT & WIRING LEGEND. REFER TO E501, E502, & E503 FOR PANELBOARD SCHEDULES.
2. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH STATE OF NEW HAMPSHIRE BUILDING CODES, NH DAS REQUIREMENTS, NFPA 70, AND THE AUTHORITY HAVING JURISDICTION.
3. ALL MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS AND RECOMMENDATIONS.
4. CONTRACTOR SHALL INSTALL WALL MOUNTED STRUT CHANNEL SUPPORT SPACER FOR MOUNTING OF PANEL SD-10. SPACER SHALL EXTEND FROM EXISTING BRICK FOUNDATION WALL APPROXIMATELY 6" TO 10" OFF WALL TO FACILITATE MOUNTING OF NEW PANEL SD-10 EVEN WITH FACE OF EXISTING STONE FOUNDATION.
5. INSTALL NEW JUNCTION BOX WITH TERMINAL BLOCKS, TO EXTEND EXISTING FEEDER AND BRANCH CIRCUITS, PREVIOUSLY FED FROM PANEL PSB-1, WITH NEW CONDUIT AND WIRING AS INDICATED. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO PANEL PSB-1 BRANCH CIRCUITS.
6. INSTALL NEW WIREWAY WITH TERMINAL BLOCKS, TO EXTEND EXISTING FEEDER AND BRANCH CIRCUITS, PREVIOUSLY FED FROM PANEL SD-10, WITH NEW CONDUIT AND WIRING AS INDICATED. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO PANEL SD-10 BRANCH CIRCUITS.



SUB-BASEMENT ELECTRICAL NEW WORK PLAN

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ENGINEER/ARCHITECT	DESIGNED BY	APPROVED BY	CHECKED BY
RICHARDSON ENG	SVR	SVR	KAT

REVISIONS

DATE	DESCRIPTION	BY
30MAY25	ISSUED FOR CONSTRUCTION	SVR

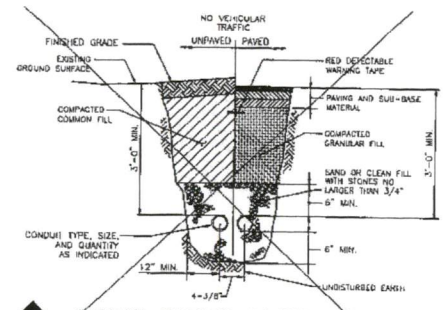
OFFICE PARK SOUTH - MAIN BUILDING
MAIN BLDG. REWIRING PHASE 1
106 PLEASANT ST. CONCORD, NH 03301
DEPARTMENT OF ADMINISTRATIVE SERVICES

SUB-BASEMENT ELECTRICAL NEW WORK PLAN

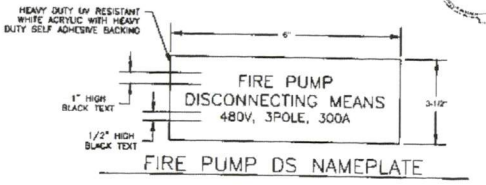
PROJECT No. 81330 CONTRACT: 1

DRAWN BY:	SCALE:	DATE:	SHEET:
SVR	1/16" = 1'-0"	09/24/2024	E107

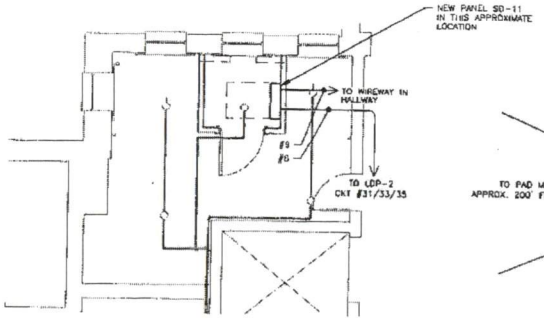
NOT USED



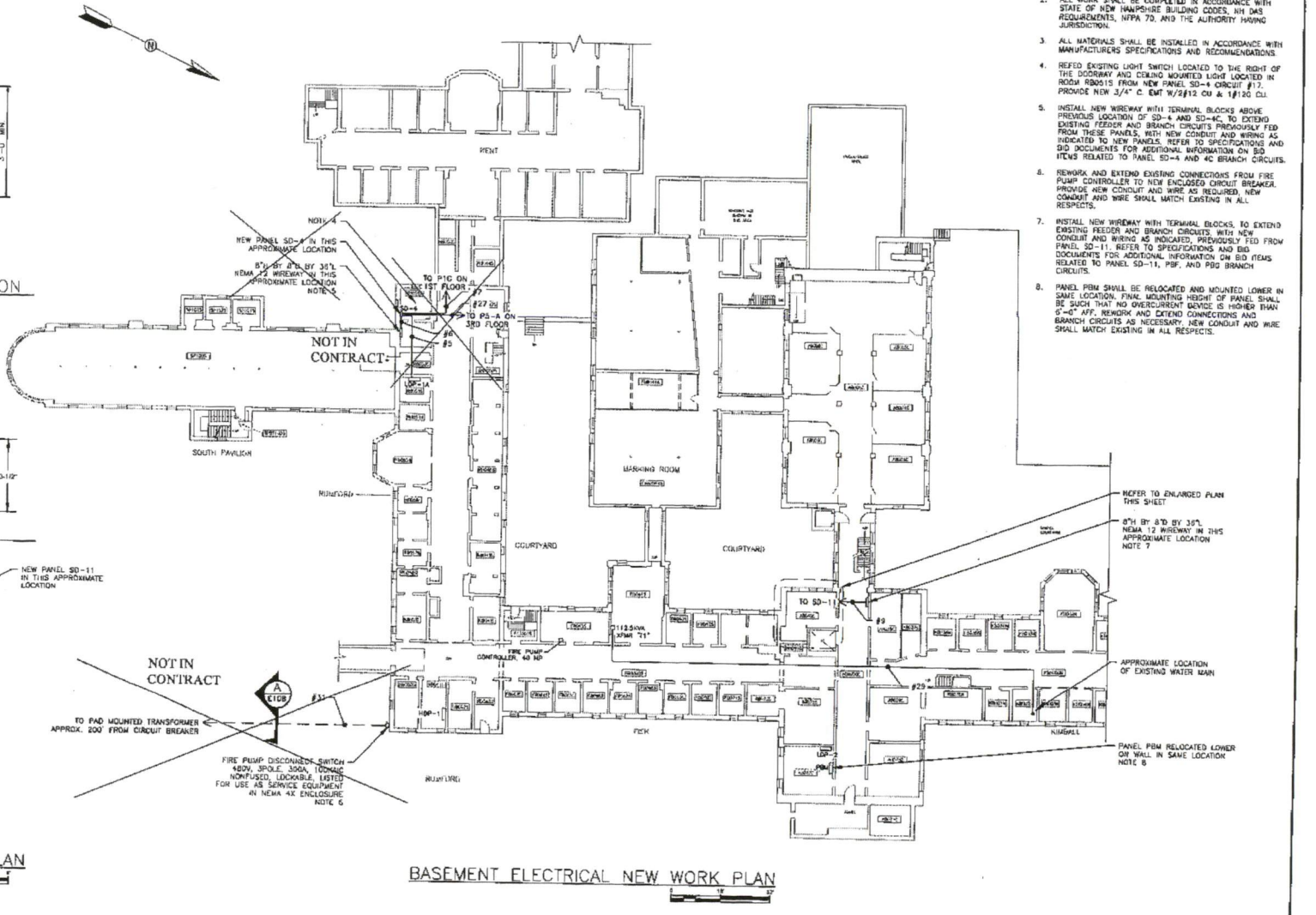
A E108 DIRECT BURIED DUCTBANK SECTION
NTS



FIRE PUMP DS NAMEPLATE



ROOM AB040C ENLARGED NEW WORK PLAN



BASEMENT ELECTRICAL NEW WORK PLAN

NOTES:

1. REFER TO E000 FOR ELECTRICAL LEGEND, ABBREVIATIONS, AND CONDUIT & WIRING SCHEDULE. REFER TO E501, E502, & E503 FOR PANELBOARD SCHEDULES.
2. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH STATE OF NEW HAMPSHIRE BUILDING CODES, NH DAS REQUIREMENTS, NFPA 70, AND THE AUTHORITY HAVING JURISDICTION.
3. ALL MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS AND RECOMMENDATIONS.
4. REFED EXISTING LIGHT SWITCH LOCATED TO THE RIGHT OF THE DOORWAY AND CEILING MOUNTED LIGHT LOCATED IN ROOM RB0515 FROM NEW PANEL SD-4 CIRCUIT #12. PROVIDE NEW 3/4" C. EMT W/2#12 CU & 1#12G CU.
5. INSTALL NEW WIREWAY WITH TERMINAL BLOCKS ABOVE PREVIOUS LOCATION OF SD-4 AND SD-4C. TO EXTEND EXISTING FEEDER AND BRANCH CIRCUITS PREVIOUSLY FED FROM THESE PANELS, WITH NEW CONDUIT AND WIRING AS INDICATED TO NEW PANELS. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO PANEL SD-4 AND 4C BRANCH CIRCUITS.
6. REWORK AND EXTEND EXISTING CONNECTIONS FROM FIRE PUMP CONTROLLER TO NEW ENCLOSED CIRCUIT BREAKER. PROVIDE NEW CONDUIT AND WIRE AS REQUIRED. NEW CONDUIT AND WIRE SHALL MATCH EXISTING IN ALL RESPECTS.
7. INSTALL NEW WIREWAY WITH TERMINAL BLOCKS, TO EXTEND EXISTING FEEDER AND BRANCH CIRCUITS, WITH NEW CONDUIT AND WIRING AS INDICATED, PREVIOUSLY FED FROM PANEL SD-11. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO PANEL SD-11, PBF, AND PBG BRANCH CIRCUITS.
8. PANEL PBM SHALL BE RELOCATED AND MOUNTED LOWER IN SAME LOCATION. FINAL MOUNTING HEIGHT OF PANEL SHALL BE SUCH THAT NO OVERCURRENT DEVICE IS HIGHER THAN 6'-6" AFF. REWORK AND EXTEND CONNECTIONS AND BRANCH CIRCUITS AS NECESSARY. NEW CONDUIT AND WIRE SHALL MATCH EXISTING IN ALL RESPECTS.

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RICHARDSON ENG	SVR	SVR	KAT

REVISIONS

DATE	DESCRIPTION	BY
30MAY25	ISSUED FOR CONSTRUCTION	SVR

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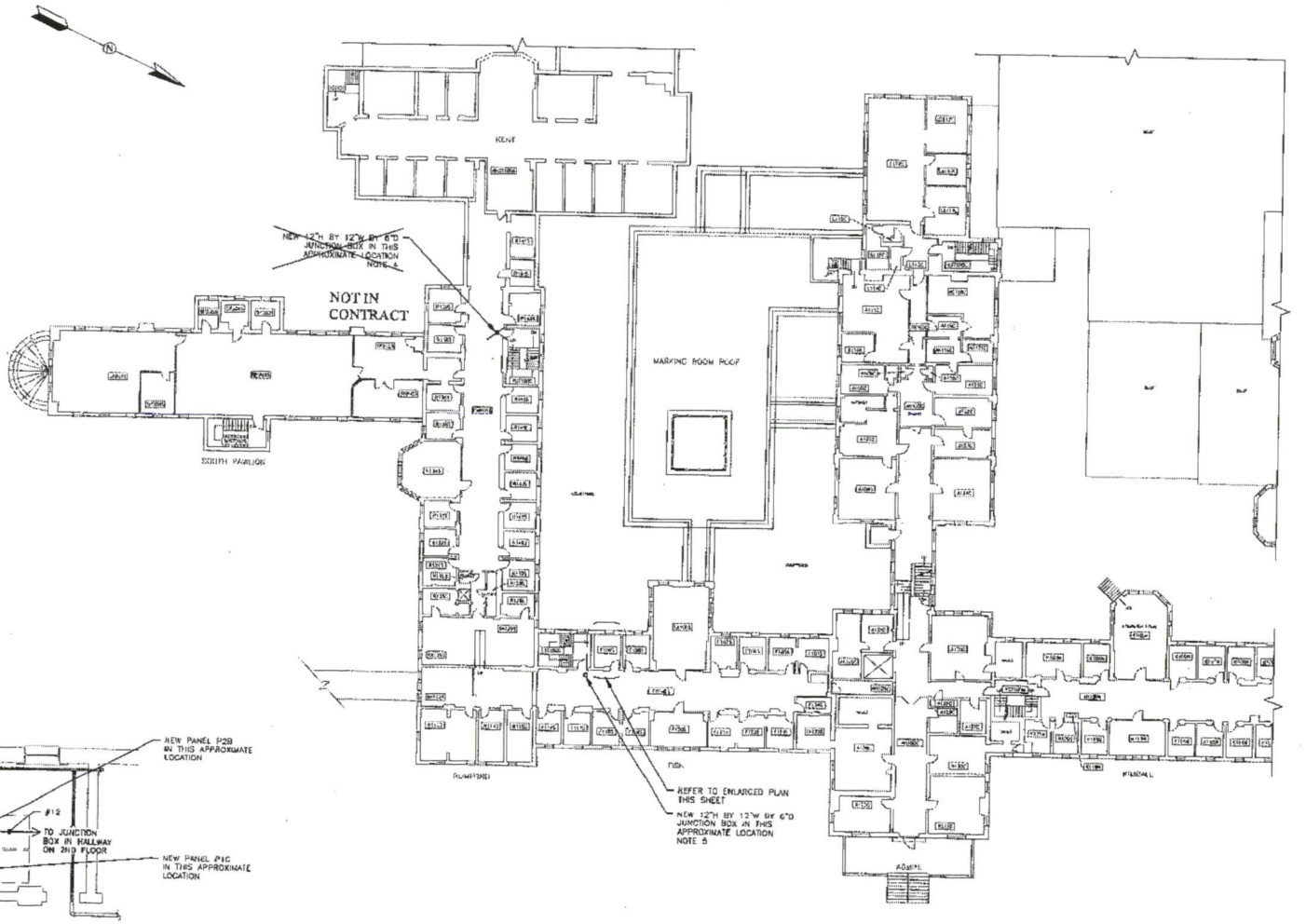
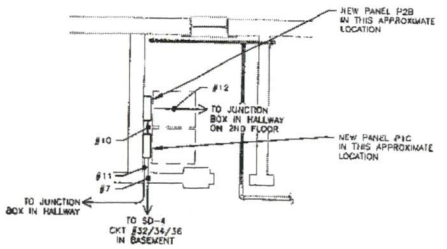
BASEMENT ELECTRICAL NEW WORK PLAN

PROJECT No. 8130 CONTRACT: 8

DRAWN BY	SCALE	DATE	SHEET
SVR	AS INDICATED	08/24/2024	E106 SHEET: 15 of 28



FIRST FLOOR ELECTRICAL NEW WORK PLAN



ROOM F109S ENLARGED NEW WORK PLAN

NOTES:

1. REFER TO E000 FOR ELECTRICAL LEGEND, ABBREVIATIONS, AND CONDUIT & WIRE SCHEDULE. REFER TO E501, E502, AND E503 FOR PANELBOARD SCHEDULES.
2. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH STATE OF NEW HAMPSHIRE BUILDING CODES, NH DAS REQUIREMENTS, NFPA 70, AND THE AUTHORITY HAVING JURISDICTION.
3. ALL MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS AND RECOMMENDATIONS.
4. NEW JUNCTION BOX WITH TERMINAL BLOCKS SHALL BE CEILING MOUNTED OVER EXPOSED EXISTING BRANCH CIRCUITS. CIRCUITS SHALL BE EXTENDED WITH NEW WIRING, AS INDICATED, FROM NEW JUNCTION BOX TO NEW LOCATION OF PANEL P1B ON 2ND FLOOR ABOVE.
5. NEW JUNCTION BOX WITH TERMINAL BLOCKS SHALL BE CEILING MOUNTED OVER EXPOSED EXISTING BRANCH CIRCUITS. CIRCUITS SHALL BE EXTENDED WITH NEW WIRING, AS INDICATED, FROM NEW JUNCTION BOX TO NEW LOCATION OF PANEL P1C. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO BRANCH CIRCUITS FED FROM PANEL P1C.

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ENGINEER/ARCHITECT	DESIGNED BY	DRAWN BY	CHECKED BY
RICHARDSON ENG	SVR	SVR	KAT

REVISIONS

DATE	DESCRIPTION	BY
30MAY25	ISSUED FOR CONSTRUCTION	SVR

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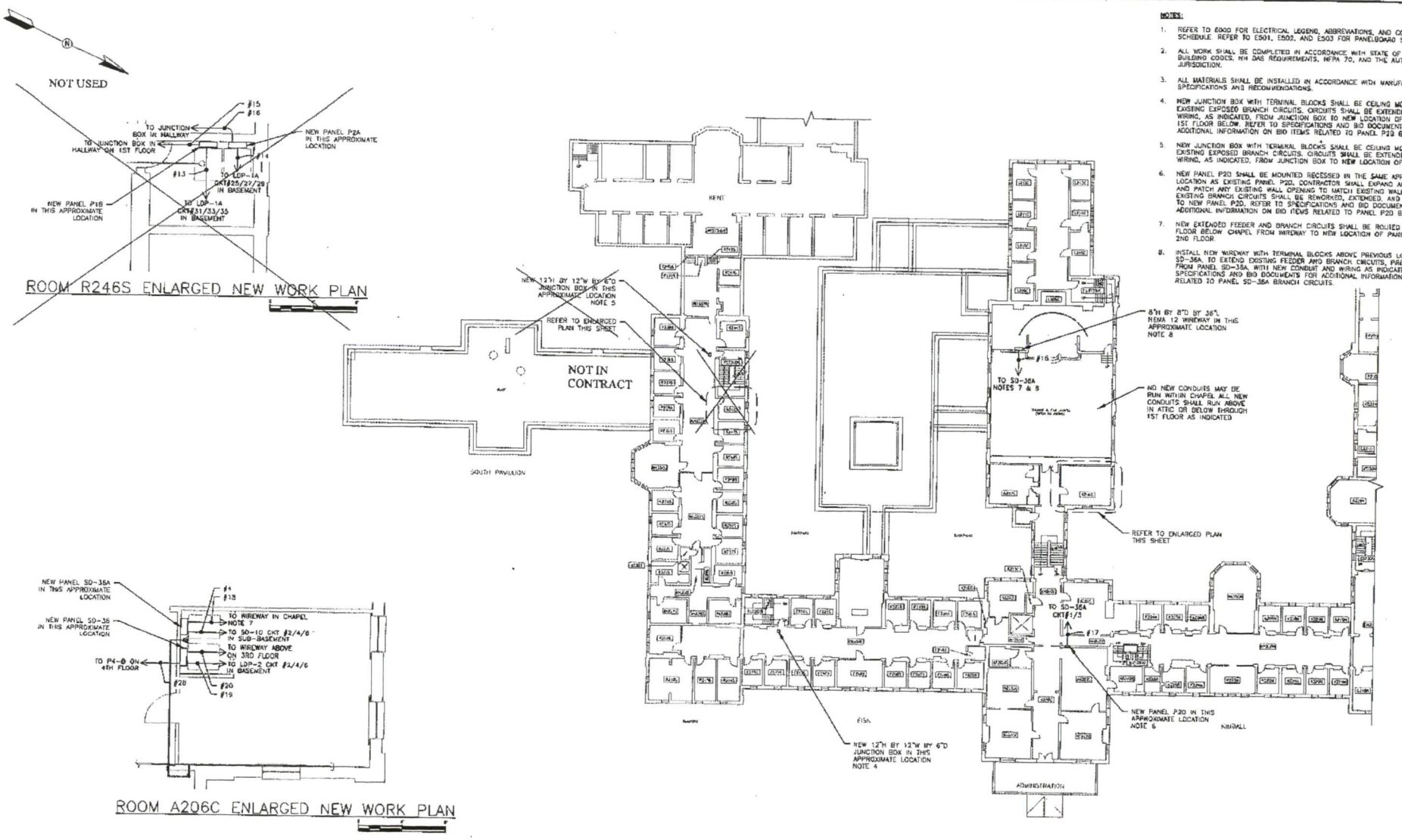
106 PLEASANT ST, CONCORD, NH 03301
DEPARTMENT OF ADMINISTRATIVE SERVICES

FIRST FLOOR ELECTRICAL NEW WORK PLAN

PROJECT No. E1200 CONTRACT: 2

DRAWN BY:	SCALE:	DATE:	SHEET:
SVR	AS INDICATED	09/24/2024	E109



NOTES:

1. REFER TO E000 FOR ELECTRICAL LEGEND, ABBREVIATIONS, AND CONDUIT & WIRE SCHEDULE. REFER TO E501, E502, AND E503 FOR PANELBOARD SCHEDULES.
2. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH STATE OF NEW HAMPSHIRE BUILDING CODES, NH DAS REQUIREMENTS, NFPA 70, AND THE AUTHORITY HAVING JURISDICTION.
3. ALL MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS AND RECOMMENDATIONS.
4. NEW JUNCTION BOX WITH TERMINAL BLOCKS SHALL BE CEILING MOUNTED OVER EXISTING EXPOSED BRANCH CIRCUITS. CIRCUITS SHALL BE EXTENDED WITH NEW WIRING, AS INDICATED, FROM JUNCTION BOX TO NEW LOCATION OF PANEL P2B ON 1ST FLOOR BELOW. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO PANEL P2B BRANCH CIRCUITS.
5. NEW JUNCTION BOX WITH TERMINAL BLOCKS SHALL BE CEILING MOUNTED OVER EXISTING EXPOSED BRANCH CIRCUITS. CIRCUITS SHALL BE EXTENDED WITH NEW WIRING, AS INDICATED, FROM JUNCTION BOX TO NEW LOCATION OF PANEL P2A.
6. NEW PANEL P2D SHALL BE MOUNTED RECESSED IN THE SAME APPROXIMATE LOCATION AS EXISTING PANEL P2D. CONTRACTOR SHALL EXPAND AND/OR PAINT AND PATCH ANY EXISTING WALL OPENING TO MATCH EXISTING WALL FINISH. ALL EXISTING BRANCH CIRCUITS SHALL BE REWORKED, EXTENDED, AND CONNECTED TO NEW PANEL P2D. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO PANEL P2D BRANCH CIRCUITS.
7. NEW EXTENDED FEEDER AND BRANCH CIRCUITS SHALL BE ROUTED THROUGH 1ST FLOOR BELOW CHAPEL FROM WIREWAY TO NEW LOCATION OF PANEL SD-35A ON 2ND FLOOR.
8. INSTALL NEW WIREWAY WITH TERMINAL BLOCKS ABOVE PREVIOUS LOCATION OF SD-36A, TO EXTEND EXISTING FEEDER AND BRANCH CIRCUITS, PREVIOUSLY FED FROM PANEL SD-35A, WITH NEW CONDUIT AND WIRING AS INDICATED. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO PANEL SD-35A BRANCH CIRCUITS.

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DESIGNED BY:	DRAWN BY:	CHECKED BY:	CHECKED BY:
RICHARDSON ENG	SVR	SVR	KAE

REVISIONS		
DATE	DESCRIPTION	BY
30MAY25	ISSUED FOR CONSTRUCTION	SVR

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DEPARTMENT OF ADMINISTRATIVE SERVICES

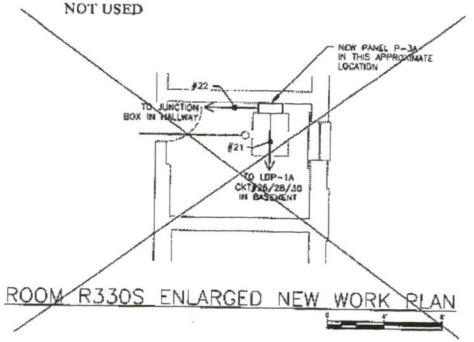
SECOND FLOOR ELECTRICAL NEW WORK PLAN

DRAWN BY:	SCALE:	DATE:	PROJECT No. P-931 CONTRACT: 2
SVR	AS INDICATED	09/24/2024	E110

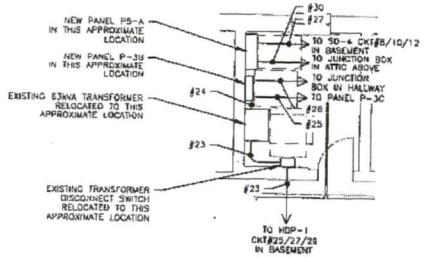
SHEET: 17 OF 38

NOTES:

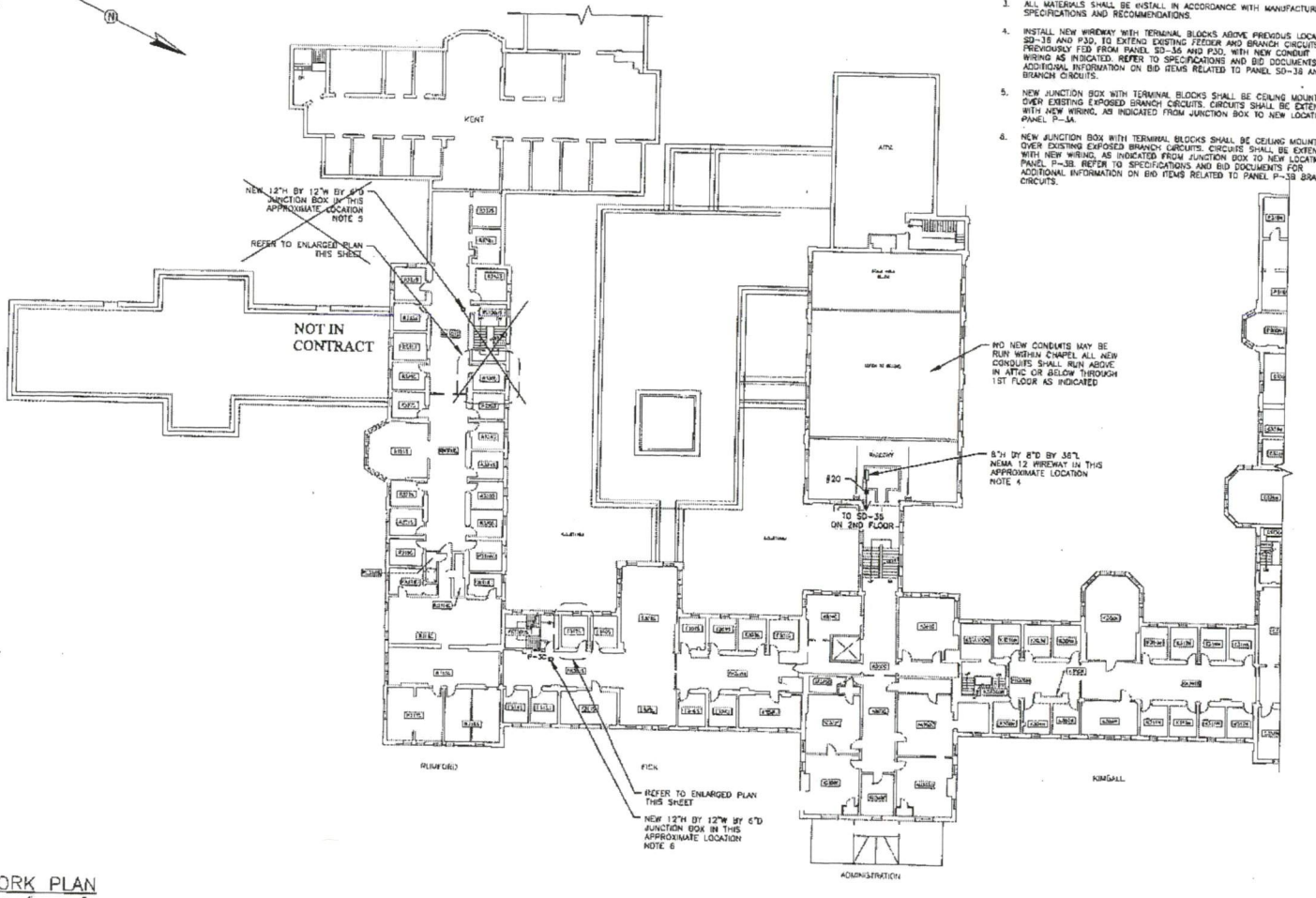
1. REFER TO E000 FOR ELECTRICAL LEGEND, ABBREVIATIONS, AND CONDUIT & WIRE SCHEDULE. REFER TO E501, E502, AND E503 FOR PANELBOARD SCHEDULES.
2. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH STATE OF NEW HAMPSHIRE BUILDING CODES, NH DAS REQUIREMENTS, NFPA 70, AND THE AUTHORITY HAVING JURISDICTION.
3. ALL MATERIALS SHALL BE INSTALL IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS AND RECOMMENDATIONS.
4. INSTALL NEW WIREWAY WITH TERMINAL BLOCKS ABOVE PREVIOUS LOCATION OF SD-3B AND P3D. TO EXTEND EXISTING FEEDER AND BRANCH CIRCUITS, PREVIOUSLY FED FROM PANEL SD-3B AND P3D, WITH NEW CONDUIT AND WIRING AS INDICATED. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO PANEL SD-3B AND P3D BRANCH CIRCUITS.
5. NEW JUNCTION BOX WITH TERMINAL BLOCKS SHALL BE CEILING MOUNTED OVER EXISTING EXPOSED BRANCH CIRCUITS. CIRCUITS SHALL BE EXTENDED WITH NEW WIRING, AS INDICATED FROM JUNCTION BOX TO NEW LOCATION OF PANEL P-3A.
6. NEW JUNCTION BOX WITH TERMINAL BLOCKS SHALL BE CEILING MOUNTED OVER EXISTING EXPOSED BRANCH CIRCUITS. CIRCUITS SHALL BE EXTENDED WITH NEW WIRING, AS INDICATED FROM JUNCTION BOX TO NEW LOCATION OF PANEL P-3B. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO PANEL P-3B BRANCH CIRCUITS.



ROOM R330S ENLARGED NEW WORK PLAN



ROOM R312S ENLARGED NEW WORK PLAN



THIRD FLOOR ELECTRICAL NEW WORK PLAN

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DESIGNATION	DESIGNED BY	DRAWN BY	CHECKED BY
RICHARDSON ENG	SVR	SVR	KAT

REVISIONS		
DATE	DESCRIPTION	BY
30MAY25	ISSUED FOR CONSTRUCTION	SVR

OFFICE PARK SOUTH – MAIN BUILDING
MAIN BLDG. REWIRING PHASE 1
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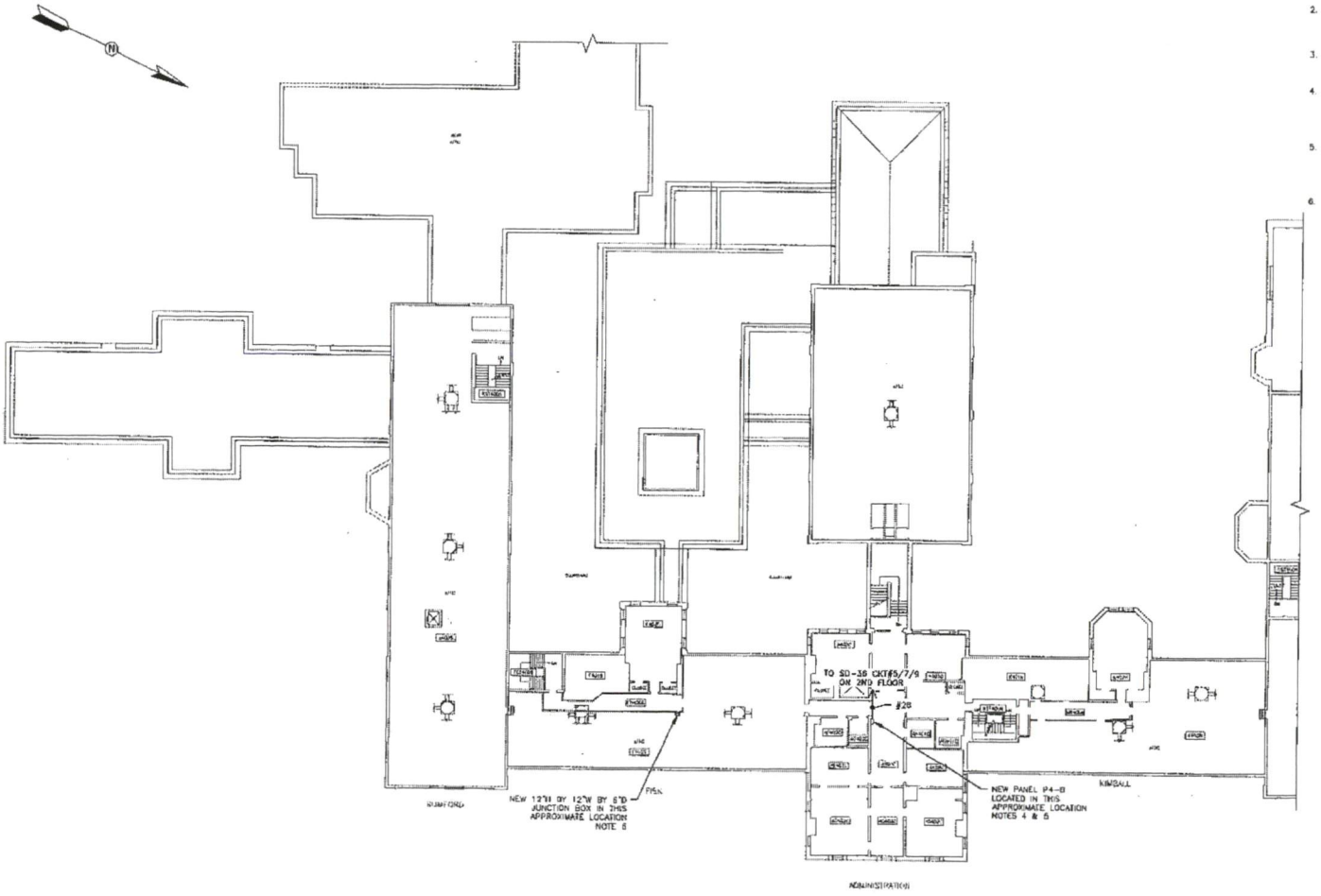
THIRD FLOOR ELECTRICAL NEW WORK PLAN

PROJECT No. P-330 CONTRACT: 8

DRAWN BY:	SCALE:	DATE:	E111
SVR	AS INDICATED	06/24/2024	

SHEET 16 OF 38



NOTES:

1. REFER TO E000 FOR ELECTRICAL LEGEND, ABBREVIATIONS, AND CONDUIT & WIRE SCHEDULE. REFER TO E501, E502, AND E503 FOR PANELBOARD SCHEDULES.
2. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH STATE OF NEW HAMPSHIRE BUILDING CODES, NH DAS REQUIREMENTS, NFPA 70, AND THE AUTHORITY HAVING JURISDICTION.
3. ALL MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS AND RECOMMENDATIONS.
4. NEW PANEL P-4B SHALL BE MOUNTED RECESSED IN THE SAME APPROXIMATE LOCATION AS EXISTING PANEL P4-B. CONTRACTOR SHALL EXPAND AND/OR PAINT AND PATCH ANY EXISTING WALL OPENING TO MATCH EXISTING WALL FINISH.
5. EXISTING BRANCH CIRCUITS SHALL BE REWORKED AND EXTENDED FOR RECONNECTION TO NEW PANEL P-4B. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO PANEL P-4B BRANCH CIRCUITS.
6. NEW JUNCTION BOX WITH TERMINAL BLOCKS SHALL BE WALL MOUNTED OVER EXISTING EXPOSED BRANCH CIRCUITS. CIRCUITS SHALL BE EXTENDED WITH NEW WIRING, AS INDICATED FROM JUNCTION BOX TO NEW LOCATION OF PANEL P-5A. REFER TO SPECIFICATIONS AND BID DOCUMENTS FOR ADDITIONAL INFORMATION ON BID ITEMS RELATED TO PANEL P-5A BRANCH CIRCUITS.

FOURTH FLOOR/ATTIC ELECTRICAL NEW WORK PLAN

SFC ENGINEERING
Wiesbaum, New Hampshire
Portland, Maine
(603) 647-5700
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RICHARDSON ENGINEERING
ELECTRICAL ENGINEERS & CONSULTANTS

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
DIVISION OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 350
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

CHECKED/ADJUSTED:	ACCOUNT NO.	APPROVED BY:	CHECKED BY:
RICHARDSON ENG	SVR	SVR	KAT

REVISIONS

DATE	DESCRIPTION	BY
30MAY25	ISSUED FOR CONSTRUCTION	SVR

OFFICE PARK SOUTH - MAIN BUILDING
MAIN BLDG. REWIRING PHASE 1
106 PLEASANT ST, CONCORD, NH 03301
DEPARTMENT OF ADMINISTRATIVE SERVICES

FOURTH FLOOR/ATTIC ELECTRICAL NEW WORK PLAN

DRAWN BY:	SCALE:	DATE:	PROJECT No.
SVR	1/16" = 1'-0"	01/24/2024	E112

NOT USED

PANELBOARD SD-10

200 AMP MAIN BREAKER; 225 AMP BUS RATING; 42 POLES; 208/120 VOLTS; 3 PHASE 4 WIRE 60 Hz.
22 KA SHORT CIRCUIT RATING; ELECTRONIC GRADE: NO
LOCATION: SUB-BASEMENT - RM AB60102; ENCLOSURE RATING: NEMA 12; MOUNTING: SURFACE

CIRCUIT NO	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
1	FIRE ALARM (NOTE 4)				50 /3	2
3						
5						
7	BASEMENT				60 /3	2
9						
11						
13						
15	WELDER MECH. COW				20 /3	2
17						
19	SPARE				20 /3	
21						
23	SPARE				20 /3	
25	SPARE				20 /1	
27	SPARE				20 /1	
29	SPARE				20 /1	
31	MOTORIZED STEAM VALVE				20 /3	
33	ROOM 106 C				15 /1	2
35	SUB BASEMENT EAST				15 /1	2
37	OLD HEAT ROOMS				15 /1	2
39	OUTLET IN TUNNEL & 1120 NTH KITCHEN				20 /1	2
41	LIGHTING - RM AB60105				15 /1	2
	TOTAL PHASE KVA THIS SIDE	0	0	0		

CIRCUIT NO	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
2						
4	PANEL SD-36A				125 /3	
6						
8						
10	SEWING ROOM				50 /3	3
12						
14						
16	SPARE				50 /3	
18						
20						
22	SPARE				20 /3	
24						
26	SPARE				20 /1	
28	SPARE				20 /1	
30	SPARE				20 /1	
32	LIGHTING - SUB BASEMENT				20 /1	2
34	CLOCK CIRCUIT				15 /1	2
36	SPRINGE VALVE & SUB BASE LTG (NEST				15 /1	2
38	MOTORIZED STEAM VALVE - RM AB60102				15 /1	2
40	SPARE				15 /1	2
42	LIGHTING - SUB BASEMENT				15 /1	2
	TOTAL PHASE KVA THIS SIDE	0	0	0		
	TOTAL KVA PER PHASE	0	0	0		
	TOTAL THREE PHASE KVA		0			

NOTES:
1) PROVIDE NEW BRANCH CIRCUIT WIRING (3#12 & #12 GND) TO VALVE

NOTES CONT.:
2) EXTEND EXISTING BRANCH CIRCUIT WIRING AS INDICATED ON NEW WORK PLANS.

PANELBOARD SCHEDULE – PANEL SD-10

PANELBOARD SD-4

200 AMP MAIN BREAKER; 225 AMP BUS RATING; 42 POLES; 208/120 VOLTS; 3 PHASE 4 WIRE 60 Hz.
22 KA SHORT CIRCUIT RATING; ELECTRONIC GRADE: NO
LOCATION: BASEMENT - RM RB0518; ENCLOSURE RATING: NEMA 12; MOUNTING: SURFACE

CIRCUIT NO	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
1						
3	REFRIGERATORS				25 /3	1
5						
7						
9	RUMFORD SOUTH LL - TUNNEL LTG				30 /3	1
11						
13	SOUTH PAVILION				50 /2	1
15						
17	LIGHTING - RM RB0518				20 /1	
19	EXISTING LOAD				50 /3	1
21						
23	SPARE				20 /1	
25						
27	SPARE				50 /3	
29						
31	EM & EXIT LTS - BOX 5				20 /1	1
33	EM & EXIT LTS - BOX 6				20 /1	1
35	SPARE				20 /1	
37						
39	SPACE				/3	
41						
	TOTAL PHASE KVA THIS SIDE	0	0	0		

CIRCUIT NO	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
2						
4	SPARE				35 /3	
6						
8						
10	PANELBOARD P-5A				70 /3	
12						
14						
16	LIGHTS P&R 5A				50 /3	1
18						
20						
22	SPARE				50 /3	
24						
26						
28	SPARE				100 /3	
30						
32						
34	PANELBOARD P1C				125 /3	
36						
38						
40	PNL SP-2 LVL 2				150 /3	1
42						
	TOTAL PHASE KVA THIS SIDE	0	0	0		
	TOTAL KVA PER PHASE	0	0	0		
	TOTAL THREE PHASE KVA		0			

NOTES:
1) EXTEND EXISTING BRANCH CIRCUIT WIRING AS INDICATED ON NEW WORK PLANS.

NOTES CONT.:
2)

PANELBOARD SCHEDULE – PANEL SD-4

PANELBOARD SD-11

300 AMP MAIN BREAKER; 400 AMP BUS RATING; 42 POLES; 208/120 VOLTS; 3 PHASE 4 WIRE 60 Hz.
22 KA SHORT CIRCUIT RATING; ELECTRONIC GRADE: NO
LOCATION: BASEMENT - RM AB0400; ENCLOSURE RATING: NEMA 12; MOUNTING: SURFACE

CIRCUIT NO	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
1						
3	SPARE				35 /3	
5						
7						
9	RM 94 TRANSPONDER PANEL (FA)				90 /3	1
11						
13						
15	EXISTING LOAD				35 /3	1
17						
19						
21	EXISTING LOAD				70 /3	1
23						
25						
27	SPARE				70 /3	
29						
31						
33	NEW 42 CIRCUIT PANEL				100 /3	1
35						
37						
39	PANEL SUPERS OFFICE				100 /3	1
41						
	TOTAL PHASE KVA THIS SIDE	0	0	0		

CIRCUIT NO	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
2						
4	EXISTING LOAD				20 /3	1
6						
8						
10	EXISTING LOAD				90 /3	1
12						
14						
16	HALLS A, D, & E				200 /3	1
18						
20						
22	LIGHT PANEL 4TH & 5TH SPACE				56 /3	1
24						
26						
28	SPARE				60 /3	
30						
32						
34	CENTER HALL OFFICES SD-11G				100 /3	1
36						
38						
40	P2C & BASEMENT LIGHTING				50 /3	1
42						
	TOTAL PHASE KVA THIS SIDE	0	0	0		
	TOTAL KVA PER PHASE	0	0	0		
	TOTAL THREE PHASE KVA		0			

NOTES:
1) EXTEND EXISTING BRANCH CIRCUIT WIRING AS INDICATED ON NEW WORK PLANS.

NOTES CONT.:
2)

PANELBOARD SCHEDULE – PANEL SD-11

PANELBOARD P1C

125 AMP MAIN BREAKER; 125 AMP BUS RATING; 42 POLES; 208/120 VOLTS; 3 PHASE 4 WIRE 60 Hz.
22 KA SHORT CIRCUIT RATING; ELECTRONIC GRADE: NO
LOCATION: 1ST FLOOR - RM F1095; ENCLOSURE RATING: NEMA 12; MOUNTING: SURFACE

CIRCUIT NO	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
1						
3	PANELBOARD P2B				70 /3	
5						
7	LTG - RM 1063 & 132				15 /1	1
9	LTG - RM 108				15 /1	1
11	OUTLETS - RM 112 & BATHROOM				15 /1	1
13	A/C				20 /1	1
15	OUTLETS - RM 113A, SD HALL, & RM 116				20 /1	1
17	OUTLETS - RM 118A				20 /1	1
19	OUTLETS - RM 120B & RM 126				20 /1	1
21	OUTLETS - HALL				20 /1	1
23	OUTLETS - STAIRWELL & RM 1205				20 /1	1
25	OUTLETS - RM 1165				20 /1	1
27	OUTLETS - RM 1173 (?)				20 /1	1
29	OUTLETS - RM 1168 (G)				20 /1	1
31	OUTLETS - RM 1165 (G)				20 /1	1
33	SPARE				15 /1	
35	SPARE				15 /1	
37	SPARE				20 /1	
39	SPARE				20 /1	
41	SPARE				20 /1	
	TOTAL PHASE KVA THIS SIDE	0	0	0		

CIRCUIT NO	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
2	LTG - HALL AND CORNER				20 /1	1
4	LTG - STAIR AND BASEMENT				15 /1	1
6	LTG - HALLWAY				20 /1	1
8	OUTLETS - RM 108 SD WALL & RM 1108				20 /1	1
10	AC - RM 1123				20 /1	1
12	AC				30 /2	1
14						
16	OUTLETS - RM 1115, 1125, & 1135				20 /1	1
18	OUTLETS - RM 116 F AC (P)				20 /1	1
20	OUTLETS - RM 1175 AC (G)				20 /1	1
22	OUTLETS - RM 1125 AC (G)				20 /1	1
24	DOOR OPENER				20 /1	1
26	EXISTING LOAD				20 /2	1
28						
30	SPARE				15 /1	
32	SPARE				15 /1	
34	SPARE				20 /1	
36	SPARE				20 /1	
38	SPARE				20 /1	
40	SPARE				20 /1	
42	SPARE				20 /1	
	TOTAL PHASE KVA THIS SIDE	0	0	0		
	TOTAL KVA PER PHASE	0	0	0		
	TOTAL THREE PHASE KVA		0			

NOTES:
1) EXTEND EXISTING BRANCH CIRCUIT WIRING AS INDICATED ON NEW WORK PLANS.

NOTES CONT.:
2)

PANELBOARD SCHEDULE – PANEL P1C

PANELBOARD P2B

70 AMP MAIN LUG ONLY; 100 AMP BUS RATING; 30 POLES; 208/120 VOLTS; 3 PHASE 4 WIRE 60 Hz.
22 KA SHORT CIRCUIT RATING; ELECTRONIC GRADE: NO
LOCATION: 1ST FLOOR - RM F1085; ENCLOSURE RATING: NEMA 12; MOUNTING: SURFACE

CIRCUIT NO	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
1	LTG				15 /1	1
3	LTG - CORRIDOR				15 /1	1
5	LTG - RM 2218				15 /1	1
7	OUTLETS - RM 144				20 /1	1
9	AC - RM 245, 247, 248, & 249				20 /1	1
11	LTG & OUTLET - END OF HALL				20 /1	1
13	RM 2222 AC				20 /1	1
15	OUTLETS - RM 2236, 247, & 249				20 /1	1
17	OUTLETS - RM 2220, 247, & 249				20 /1	1
19	RM 206 COFFEE & MICROWAVE				20 /1	1
21	EXISTING LOAD				20 /1	1
23	LTG - STAIRS				20 /1	1
25	AC OUTLET RM 2205				20 /1	1
27	OUTLET - RM 2205				20 /1	1
29	AC OUTLET RM 2225				20 /1	1
	TOTAL PHASE KVA THIS SIDE	0	0	0		

CIRCUIT NO	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
2	EXISTING LOADS				15 /1	1
4	LTG - RM 2133				15 /1	1
6	EXISTING LOADS				15 /1	1
8	OUTLETS - RM 220				20 /1	1
10	OUTLETS - RM 220				20 /1	1
12	AC RM 221 OUTLET				20 /1	1
14	RM 208 - 2SK - 2				20 /1	1
16	OUTLETS - RM 206, 207, 208, 212, 213, 215 & 216				20 /1	1
18	OUTLETS - RM 202, 203, 204, 208, 211, 212, & 213				20 /1	1
20	EXISTING LOAD				20 /1	1
22	RM 214				20 /1	1
24	AC RM 216B				20 /1	1
26	EXISTING LOAD				20 /1	1
28	EXISTING LOAD				20 /1	1
30	AC RM 215 & 216				20 /1	1
	TOTAL PHASE KVA THIS SIDE	0	0	0		
	TOTAL KVA PER PHASE	0	0	0		
	TOTAL THREE PHASE KVA		0			

NOTES:
1) EXTEND EXISTING BRANCH CIRCUIT WIRING AS INDICATED ON NEW WORK PLANS.

NOTES CONT.:
2)

PANELBOARD SCHEDULE – PANEL P2B

NOTES:
1. REFER TO E000 FOR ELECTRICAL LEGEND AND ABBREVIATIONS.
2. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH STATE OF NEW HAMPSHIRE BUILDING CODES, NH DES REQUIREMENTS, NFPA 70, AND THE AUTHORITY HAVING JURISDICTION.
3. ALL MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS AND RECOMMENDATIONS.
4. CONTRACTOR SHALL FIELD VERIFY THE RATING OF THE BRANCH CIRCUIT WIRING CURRENTLY SUPPLYING THIS LOAD. FINAL RATING OF OVERCURRENT PROTECTIVE DEVICE SHALL BE COORDINATED WITH THE ACTUAL RATING OF CONDUCTORS IN THE FIELD IN PANEL SD-10.

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SARA VIRGINIA RICHARDSON No. 14483 PROFESSIONAL ENGINEER

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
DIVISION OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN D. MORTON BUILDING
7 HAZEN DRIVE PO BOX 483 CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX (603) 271-3515

DRAWING MASTER	DESIGNED BY	DRAWN BY	CHECKED BY
RICHARDSON ENG	SVR	SVR	KAT

REVISIONS		
DATE	DESCRIPTION	BY
30MAY25	ISSUED FOR CONSTRUCTION	SVR

OFFICE PARK SOUTH – MAIN BUILDING
MAIN BLDG. REWIRING PHASE 1
106 PLEASANT ST, CONCORD, NH 03301
DEPARTMENT OF ADMINISTRATIVE SERVICES

PANELBOARD SCHEDULES
SHEET 1 OF 3

DRAWN BY	SCALE	DATE
SVR	NONE	06/24/2024

PROJECT No. (FISCAL CONTRACT) E501
SHEET 39 OF 66

NOT USED

100 AMP MAIN BREAKER / 100 AMP BUS RATING / 208/120 VOLTS	30 POLES / 3 PHASE 4 WIRE 60 Hz.	PANELBOARD P1B / 22 KA SHORT CIRCUIT RATING / ELECTRONIC GRADE: NO	LOCATION: 2ND FLOOR - RM B246S / ENCLOSURE RATING: NEMA 12 / MOUNTING: SURFACE

CIRCUIT NO	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
1	LTG - OFFICE				15 /1	1
3	LTG				15 /1	1
5	LTG - CONFERENCE ROOM				15 /1	1
7	OUTLETS - HALL & RM 134				15 /1	1
9	OUTLETS - RM 149				15 /1	1
11	LTG				15 /1	1
13	OUTLETS - RM 147, 125, 145, 148, & 150				15 /1	1
15	OUTLETS - LTG, RM 141.5, & BATT.				20 /1	1
17	OUTLETS - RM 132				15 /1	1
19	OUTLETS - RM 130				20 /1	1
21	OUTLETS - RM 146				20 /1	1
23	AC - RM 149 & 150				20 /1	1
25	OUTLETS - RM 149				20 /2	1
27	AC - HALLWAY WEST				20 /1	1
29	EXISTING LOAD				20 /1	1
	TOTAL PHASE KVA THIS SIDE	0	0	0		

CIRCUIT NO	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
2	LTG - STAIRWAY				15 /1	1
4	OUTLETS - BETWEEN 141 & 143				20 /1	1
6	OUTLETS - BETWEEN 139 & WINDOW				20 /1	1
8	LTG - SOUTH OFFICES				15 /1	1
10	LTG - HALL & NORTH OFFICES				15 /1	1
12	HEATER				15 /3	1
14					50 /2	1
16	FLOOR RM BELOW				15 /1	1
18	EXISTING LOAD				15 /1	1
20	EXISTING LOAD				20 /1	1
22	EXISTING LOAD				20 /1	1
24	EXISTING LOAD				20 /2	1
26						
28	EXISTING LOAD				20 /1	1
30	EXISTING LOAD				20 /1	1
	TOTAL PHASE KVA THIS SIDE	0	0	0		
	TOTAL KVA PER PHASE	0	0	0		
	TOTAL THREE PHASE KVA		0			

NOTES:
1 EXTEND EXISTING BRANCH CIRCUIT WIRING AS INDICATED ON NEW WORK PLANS.

NOTES CONT:
2

PANELBOARD SCHEDULE – PANEL P1B

NOT USED

150 AMP MAIN BREAKER / 100 AMP BUS RATING / 208/120 VOLTS	42 POLES / 3 PHASE 4 WIRE 60 Hz.	PANELBOARD P2A / 22 KA SHORT CIRCUIT RATING / ELECTRONIC GRADE: NO	LOCATION: 2ND FLOOR - RM B246S / ENCLOSURE RATING: NEMA 12 / MOUNTING: SURFACE

CIRCUIT NO	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
1	LTG & OUTLET - RM 247				15 /1	1
3	LTG - RM 246				15 /1	1
5	RM 329 & 248				15 /1	1
7	OUTLETS - PRINTER WEST HALLWAY				20 /1	1
9	EXISTING LOAD				15 /1	1
11	AC OUTLET - CONF RM & RM 229				20 /1	1
13	OUTLETS - COPIER HALLWAY				20 /1	1
15	OUTLETS - COPIER HALLWAY				20 /1	1
17	AC OUTLET - RM 228S				20 /1	1
19	SPARE IN AC OUTLET BOX RM 228				20 /1	1
21	SPARE IN GE WIRE / BOX OUTSIDE RM 227				20 /1	1
23	SPARE IN CONFD / PUX OUTSIDE RM 227				20 /1	1
25	AC OUTLET - RM 227S				20 /1	1
27	OUTLETS - BREAK ROOM & JAN CLOSETS				20 /1	1
29	OUTLET - BREAK ROOM / FRIDGE				20 /1	1
31	SPARE				20 /1	1
33	SPARE				20 /1	1
35	SPARE				20 /1	1
37	SPACE				20 /1	1
39	SPACE				20 /1	1
41	SPACE				20 /1	1
	TOTAL PHASE KVA THIS SIDE	0	0	0		

CIRCUIT NO	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
2	OUTLET - HALL RER & RM 235				15 /1	1
4	LTG - OFFICE NORTH & HALLWAY				15 /1	1
6	LTG - OFFICE SOUTH				15 /1	1
8	RM 230 BY WINDOW				20 /1	1
10	LTG - HALLWAY				20 /1	1
12	NO OUTLET - RM 232				20 /1	1
14	OUTLET - HALL COFFEE & FRIDGE				20 /1	1
16	QUIZZER - RM 236S				20 /1	1
18	AC OUTLET - RM 236S				20 /1	1
20	AC OUTLET - RM 251 SOUTH				20 /1	1
22	SPARE				20 /2	
24						
26	SPARE				20 /1	
28	1ST FL BATH WATER HEATER				20 /1	1
30	2ND FL BATH WATER HEATER				20 /1	1
32	3RD FL BATH WATER HEATER				20 /1	1
34	OUTLETS - BATH				20 /1	1
36	BATHS FAN				20 /1	1
38	OUTLET - ATTIC & LIGHT				20 /1	1
40	SPARE				20 /1	
42	SPARE				20 /1	
	TOTAL PHASE KVA THIS SIDE	0	0	0		
	TOTAL KVA PER PHASE	0	0	0		
	TOTAL THREE PHASE KVA		0			

NOTES:
1 EXTEND EXISTING BRANCH CIRCUIT WIRING AS INDICATED ON NEW WORK PLANS.

NOTES CONT:
2

PANELBOARD SCHEDULE – PANEL P2A

125 AMP MAIN BREAKER / 100 AMP BUS RATING / 208/120 VOLTS	42 POLES / 3 PHASE 4 WIRE 60 Hz.	PANELBOARD SD-36A / 22 KA SHORT CIRCUIT RATING / ELECTRONIC GRADE: NO	LOCATION: 2ND FLOOR - RM A206C / ENCLOSURE RATING: NEMA 12 / MOUNTING: SURFACE

CIRCUIT NO	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
1	PANELBOARD P2D				60 /3	
3						
5	CHAPEL KANS				15 /1	1
7	EXISTING LOAD				15 /1	1
9	EXISTING LOAD				15 /1	1
11	EXISTING LOAD				15 /1	1
13	LTG - OVER BALCONY				15 /1	1
15	LTG - LEFT BACK CHAPEL				15 /1	1
17	LTG - RIGHT BACK CHAPEL				15 /1	1
19	LTG - LEFT FRONT CHAPEL				15 /1	1
21	LTG - RIGHT FRONT CHAPEL				15 /1	1
23	SPARE				15 /1	
25	SPARE				15 /1	
27	SPARE				15 /1	
29	SPARE				15 /1	
31	SPARE				15 /1	
33	SPARE				15 /1	
35	SPACE				/1	
37	SPACE				/1	
39	SPACE				/1	
41	SPACE				/1	
	TOTAL PHASE KVA THIS SIDE	0	0	0		

CIRCUIT NO	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
2	LTG - OUTSIDE HALL				15 /1	1
4	LTG - STAGE				15 /1	1
6	EXISTING LOAD				15 /1	1
8	LTG - OUTSIDE HALL				15 /1	1
10	EXISTING LOAD				15 /1	1
12	EXISTING LOAD				15 /1	1
14	EXISTING LOAD				15 /1	1
16	EXISTING LOAD				15 /1	1
18	PA SYSTEM				15 /1	1
20	EXISTING LOAD				15 /1	1
22	EXISTING LOAD				15 /1	1
24	EXISTING LOAD				15 /1	1
26	EXISTING LOAD				15 /1	1
28	EXISTING LOAD				15 /1	1
30	LTG - UNDER BALCONY				15 /1	1
32	SPARE				15 /1	
34	SPARE				15 /1	
36	SPARE				/1	
38	SPACE				/1	
40	SPACE				/1	
42	SPACE				/1	
	TOTAL PHASE KVA THIS SIDE	0	0	0		
	TOTAL KVA PER PHASE	0	0	0		
	TOTAL THREE PHASE KVA		0			

NOTES:
1 EXTEND EXISTING BRANCH CIRCUIT WIRING AS INDICATED ON NEW WORK PLANS.

NOTES CONT:
2

PANELBOARD SCHEDULE – PANEL SD-36A

90 AMP MAIN BREAKER / 100 AMP BUS RATING / 208/120 VOLTS	9 POLES / 3 PHASE 4 WIRE 60 Hz.	PANELBOARD P2D / 10 KA SHORT CIRCUIT RATING / ELECTRONIC GRADE: NO	LOCATION: 2ND FLOOR - CORRIDOR / ENCLOSURE RATING: NEMA 1 / MOUNTING: RECESS

CIRCUIT NO	DESCRIPTION	LOAD KVA LINE 1	LOAD KVA LINE 2	BREAKER AMPS/ POLES	NOTES
1	3RD FLOOR CENTER KITCHEN			15 /1	1
3	SERVER			15 /1	1
5	UNKNOWN			15 /1	1
7	SPARE			15 /1	
	TOTAL LINE KVA THIS SIDE	0	0		

CIRCUIT NO	DESCRIPTION	LOAD KVA LINE 1	LOAD KVA LINE 2	BREAKER AMPS/ POLES	NOTES
2	OUTLETS - PAYROLL OFFICE			15 /1	1
4	UNKNOWN			15 /1	1
6	UNKNOWN			15 /1	1
8	UNKNOWN			15 /1	1
10	SPARE			15 /1	1
	TOTAL LINE KVA THIS SIDE	0	0		
	TOTAL KVA PER LINE	0	0		
	TOTAL KVA		0		

NOTES:
1 EXTEND EXISTING BRANCH CIRCUIT WIRING AS INDICATED ON NEW WORK PLANS.

NOTES CONT:

PANELBOARD SCHEDULE – PANEL P2D

200 AMP MAIN BREAKER / 225 AMP BUS RATING / 208/120 VOLTS	84 POLES / 3 PHASE 4 WIRE 60 Hz.	PANELBOARD SD-36 / 22 KA SHORT CIRCUIT RATING / ELECTRONIC GRADE: NO	LOCATION: 2ND FLOOR - RM A206C / ENCLOSURE RATING: NEMA 12 / MOUNTING: SURFACE

CIRCUIT NO	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
1						
3	SOUTH LIGHT & PLUG				15 /3	1
5						
7						
9	OUTLETS - SMALL CHAPEL				20 /3	1
11						
13						
15	CEILING FAN				20 /3	1
17						
19						
21	EXISTING LOAD				35 /3	1
23						
25	PANELBOARD P4S				150 /3	
27						
29						
31	LTG - LEFT ROW CHAPEL				20 /1	1
33	LTG - LEFT ROW CHAPEL				20 /1	1
35	LTG - LEFT ROW OLD CHAPEL				20 /1	1
37	LTG - LEFT ROW OLD CHAPEL				20 /1	1
39	LTG - NEAVE ROOM				20 /1	1
41	LTG - WOMBSE ROOM				20 /1	1
43						
45	EXHAUST FANS ATTIC				15 /3	1
47						
49						
51	SPACE				/3	
53						
	TOTAL PHASE KVA THIS SIDE	0	0	0		

CIRCUIT NO	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
2						
4	EXISTING LOAD				15 /3	1
6						
8						
10	OUTLET - SMALL CHAPEL				20 /3	1
12						
14						
16	SPARE				20 /3	
18						
20						
22	LTG - RIGHT ROW OLD CHAPEL				20 /1	1
24	LTG - RIGHT ROW OLD CHAPEL				20 /1	1
26	LTG - RIGHT ROW OLD CHAPEL				20 /1	1
28	OUTLET - OPEI ATTIC				20 /1	1
30	AC - CHAPEL SOUTH				30 /2	1
32						
34	AC - CHAPEL NORTH				30 /2	1
36	SPARE				20 /1	
38	SPARE				20 /1	
40	SPARE				20 /1	
42	SPARE				20 /1	
44						
46	SPARE				20 /3	
48						
50	SPACE				/3	
52						
	TOTAL PHASE KVA THIS SIDE	0	0	0		
	TOTAL KVA PER PHASE	0	0	0		
	TOTAL THREE PHASE KVA		0			

NOTES:
1 EXTEND EXISTING BRANCH CIRCUIT WIRING AS INDICATED ON NEW WORK PLANS.

NOTES CONT:
2

PANELBOARD SCHEDULE – PANEL SD-36

NOT USED

100 AMP MAIN BREAKER / 100 AMP BUS RATING / 208/120 VOLTS	30 POLES / 3 PHASE 4 WIRE 60 Hz.	PANELBOARD P-3A / 22 KA SHORT CIRCUIT RATING / ELECTRONIC GRADE: NO	LOCATION: 3RD FLOOR - RM R330S / ENCLOSURE RATING: NEMA 12 / MOUNTING: SURFACE

CIRCUIT NO	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
1	OUTLETS - RM 330S SOUTH				20 /1	1
3	SPARE J. BOX RM 334				20 /2	1
5						
7	OUTLETS - OFFICE				15 /1	1
9	OUTLETS - OLD				15 /1	1
11	OUTLETS - RM 331				15 /1	1
13	OUTLETS - RM'S 28,22,21,20 COMPUTERS				20 /1	1
15	OUTLETS - RM'S 31,23,25,29 COMPUTERS				20 /1	1
17	RM 329				20 /1	1
19	EXISTING LOAD				20 /1	1
21	OUTLETS - RM 378				20 /1	1
23	OUTLETS - RM 332				20 /1	1
25	OUTLETS - RM 333				20 /1	1
27	OUTLETS - RM 333S DESK				20 /1	1
29	AC OUTLET				20 /1	1
	TOTAL PHASE KVA THIS SIDE	0	0	0		

CIRCUIT NO	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
2	OUTLETS - RM 376				15 /1	1
4	LTG & OUTLETS - CORRIDOR & OFFICE				15 /1	1
6	LTG - CORRIDOR				15 /1	1
8	RMS AIR PUMP				20 /1	1
10	AC - COPY ROOM				20 /1	1
12	RC - CONFERENCE ROOM				20 /1	1
14	EXISTING LOAD				20 /1	1
16	OUTLETS - RM 337				20 /1	1
18	EXISTING LOAD				20 /1	1
20	OUTLETS - RM 393				20 /1	1
22	OUTLETS - RM 394				20 /1	1
24	OUTLETS - RM 376				20 /1	1
26	EXISTING LOAD				20 /1	1
28	OUTLETS - SMALL RM 331/332 OPEN AREA				20 /1	1
30	SPARE				20 /1	
	TOTAL PHASE KVA THIS SIDE	0	0	0		
	TOTAL KVA PER PHASE	0	0	0		
	TOTAL THREE PHASE KVA		0			

NOTES:
1 EXTEND EXISTING BRANCH CIRCUIT WIRING AS INDICATED ON NEW WORK PLANS.

NOTES CONT:
2

PANELBOARD SCHEDULE – PANEL P-3A

NOTES:

1. REFER TO E000 FOR ELECTRICAL LEGEND AND ABBREVIATIONS.
2. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH STATE OF NEW HAMPSHIRE BUILDING CODES, NH DHS REQUIREMENTS, NFPA 70, AND THE AUTHORITY HAVING JURISDICTION.
3. ALL MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS AND RECOMMENDATIONS.

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Richardson Engineering Project No. 1924

SARA VIRGINIA RICHARDSON No. 14483 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
PLOT DATE: 9/24/2024

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
DIVISION OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3519 FAX(603) 271-3915

DRAWING BY:	DESIGNED BY:	CHECKED BY:	CHARGED BY:
RICHARDSON ENG	SVR	SVR	SVR

REVISIONS		
DATE	DESCRIPTION	BY
30MAY25	ISSUED FOR CONSTRUCTION	SVR

OFFICE PARK SOUTH – MAIN BUILDING
MAIN BLDG. REWIRING PHASE 1
106 PLEASANT ST, CONCORD, NH 03301
DEPARTMENT OF ADMINISTRATIVE SERVICES

PANELBOARD SCHEDULES
SHEET 2 OF 3

PROJECT NO. 9150
CONTRACT: 3

DRAWN BY:	SCALE:	DATE:	SHEET:
SVR	NONE	09/24/2024	E501

NOTES:

1. REFER TO E000 FOR ELECTRICAL LEGEND AND ABBREVIATIONS.
2. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH STATE OF NEW HAMPSHIRE BUILDING CODES, NH GAS REQUIREMENTS, NFPA 70, AND THE AUTHORITY HAVING JURISDICTION.
3. ALL MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS AND RECOMMENDATIONS.

PANELBOARD P-3B

225 AMP MAIN BREAKER
225 AMP BUS RATING 42 POLES
208/120 VOLTS 3 PHASE 4 WIRE 60 Hz.

22 KA SHORT CIRCUIT RATING
ELECTRONIC GRADE: NO

LOCATION: 3RD FLOOR - RM P2125
ENCLOSURE RATING: NEMA 12 ,
MOUNTING: SURFACE

CIRCUIT NO.	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
1	LTG - CORRIDOR & OFFICE				15 /1	1
3	OUTLETS - OFFICE				15 /1	1
5	OUTLETS - OFFICE				15 /1	1
7	AC				20 /2	1
9						
11	ROOM 309				20 /1	1
13	ROOM 309				15 /1	1
15	EXISTING LOAD				20 /1	1
17	OUTLETS - COMPUTER ROOM				20 /1	1
19						
21	PANELBOARD P3C				100 /3	
23						
25	DECK IN HALL POWER				20 /1	1
27	FENCE OF OUTSIDE RM 3012				20 /1	1
29	DECK IN HALL POWER 2 LIGHTS				20 /1	1
31	SPARE				20 /1	
33	SPARE				20 /1	
35	SPARE				20 /1	
37	SPACE				/1	
39	SPACE				/1	
41	SPACE				/1	
	TOTAL PHASE KVA THIS SIDE	0	0	0		

CIRCUIT NO.	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
2	OUTLETS - HALL				15 /1	1
4	OUTLETS - RM 3015 FRIDGE & MICRO.				15 /1	1
6	LTG - OFFICE				15 /1	1
8	COPIER 25				20 /1	1
10	COPIER 23				20 /1	1
12	MICROWAVE 25				20 /1	1
14	ROOM 323				20 /1	1
16	ROOMS 319 & 313				20 /1	1
18	ROOM 312				20 /1	1
20	OUTLETS - AC 2ND FLOOR RM 2125				15 /1	1
22	LTG - STAIRWELL				20 /1	1
24	EXISTING LOAD				20 /2	1
26						
28	EXISTING LOAD				30 /2	1
30						
32	SPARE				20 /1	
34	SPARE				20 /1	
36	SPARE				20 /1	
38	SPACE				/1	
40	SPACE				/1	
42	SPACE				/1	
	TOTAL PHASE KVA THIS SIDE	0	0	0		
	TOTAL KVA PER PHASE	0	0	0		
	TOTAL THREE PHASE KVA		0			

NOTES:
1. EXTEND EXISTING BRANCH CIRCUIT WIRING AS INDICATED ON NEW WORK PLANS

NOTES CONT':
2.
3.

PANELBOARD SCHEDULE - PANEL P-3B

PANELBOARD P4-B

100 AMP MAIN BREAKER
125 AMP BUS RATING 42 POLES
208/120 VOLTS 3 PHASE 4 WIRE 60 Hz.

22 KA SHORT CIRCUIT RATING
ELECTRONIC GRADE: NO

LOCATION: 4TH FLOOR - CORRIDOR
ENCLOSURE RATING: NEMA 12 ,
MOUNTING: SURFACE

CIRCUIT NO.	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
1	LTG - NO W				15 /1	1
3	LTG - 2ND, 3RD, 4TH & 5TH				15 /1	1
5	LTG - SHEDU				15 /1	1
7	EXISTING LOAD				15 /1	1
9	LTG - CENTER				20 /1	1
11	LTG - RECEPTION				20 /1	1
13	LTG - COMP. ROOM & SIDE				20 /1	1
15	EXISTING LOAD				20 /1	1
17	AC - NORTH WALL RM 404C				20 /1	1
19	OUTLETS - COMPUTER COMM OFFICE				20 /1	1
21	OUTLETS - BILLING OFFICE				20 /1	1
23	EXISTING LOAD				40 /2	1
25						
27	SPRINKLER AIR COMPRESSOR				30 /2	1
29						
31	COPY MACHINE GBS GUY				20 /2	1
33						
35	CORRIDOR RS OFFICE				20 /1	1
37	EXISTING LOAD				20 /1	1
39	AC - RM 391 RB				20 /1	1
41	LTG & OUTLETS - RM 39160				20 /1	1
	TOTAL PHASE KVA THIS SIDE	0	0	0		

CIRCUIT NO.	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
2	LTG				15 /1	1
4	EXISTING LOAD				15 /1	1
6	EXISTING LOAD				15 /1	1
8	EXISTING LOAD				15 /1	1
10	EXISTING LOAD				20 /1	1
12	EXISTING LOAD				20 /1	1
14	OUTLETS - BILLING OFFICE FLOOR				20 /1	1
16	OUTLETS - BILLING OFFICE FLOOR				20 /1	1
18	EXISTING LOAD				20 /1	1
20	EXISTING LOAD				20 /1	1
22	OUTLETS - CORP MOON RIGHT HALF				20 /1	1
24	OUTLETS - ACROSS FROM ELEV & PHANTOLOGIC				20 /1	1
26	EXISTING LOAD				20 /1	1
28	OUTLETS - COPY & UNDER PANEL				20 /1	1
30	OUTLETS - KITCHEN COUNTER QUAD				20 /1	1
32	KITCH				20 /1	1
34	EXISTING LOAD				20 /1	1
36	HUMAN RES 3RD FLOOR				20 /1	1
38	PAYROLL 3RD FLOOR				20 /1	1
40	LTG - OFFICE BELOW				20 /1	1
42	PAYROLL CORNER 2123				20 /1	1
	TOTAL PHASE KVA THIS SIDE	0	0	0		
	TOTAL KVA PER PHASE	0	0	0		
	TOTAL THREE PHASE KVA		0			

NOTES:
1. EXTEND EXISTING BRANCH CIRCUIT WIRING TO NEW PANEL

NOTES CONT':
2.
3.

PANELBOARD SCHEDULE - PANEL P4-B

PANELBOARD P-5A

70 AMP MAIN LUG ONLY
100 AMP BUS RATING 12 POLES
208/120 VOLTS 3 PHASE 4 WIRE 60 Hz.

22 KA SHORT CIRCUIT RATING
ELECTRONIC GRADE: NO

LOCATION: 3RD FLOOR - RM P2125
ENCLOSURE RATING: NEMA 12 ,
MOUNTING: SURFACE

CIRCUIT NO.	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
1	COPY ROOM 301				20 /1	1
3	BATH FANS				20 /1	1
5	EXISTING LOAD				20 /1	1
7	SPACE				/1	
9	SPACE				/1	
11	SPACE				/1	
	TOTAL PHASE KVA THIS SIDE	0	0	0		

CIRCUIT NO.	DESCRIPTION	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/ POLES	NOTES
2	CIRCULATION FAN				20 /1	1
4	EXISTING LOAD				20 /1	1
6	EXISTING LOAD				20 /1	1
8	SPACE				/1	
10	SPACE				/1	
12	SPACE				/1	
	TOTAL PHASE KVA THIS SIDE	0	0	0		
	TOTAL KVA PER PHASE	0	0	0		
	TOTAL THREE PHASE KVA		0			

NOTES:
1. EXTEND EXISTING BRANCH CIRCUIT WIRING TO NEW PANEL

NOTES CONT':
2.
3.

PANELBOARD SCHEDULE - PANEL P-5A

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STATE OF NEW HAMPSHIRE
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CONSULTANT	DRAWN BY	CHECKED BY	CHANGE BY
RICHARDSON ENG	SVR	SVR	SVR

REVISIONS

DATE	DESCRIPTION	BY
2024/09/25	ISSUED FOR CONSTRUCTION	SVR

OFFICE PARK SOUTH - MAIN BUILDING
MAIN BLDG. REWIRING PHASE 1
105 PLEASANT ST, CONCORD, NH 03301
DEPARTMENT OF ADMINISTRATIVE SERVICES

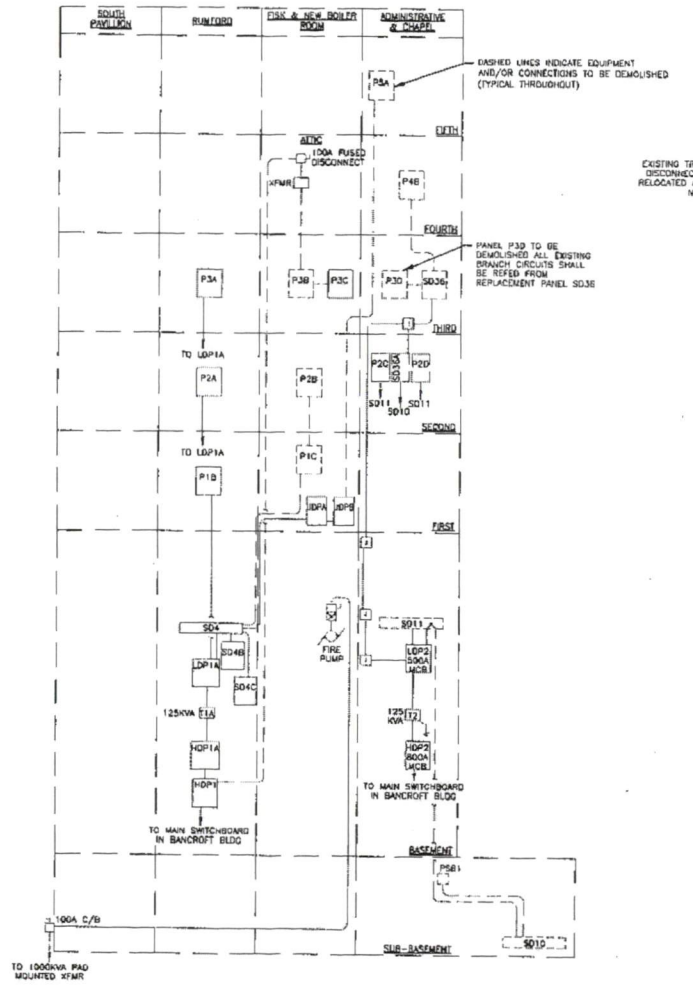
PANELBOARD SCHEDULES
SHEET 3 OF 3

PROJECT No. 8150
CONTRACT: 1

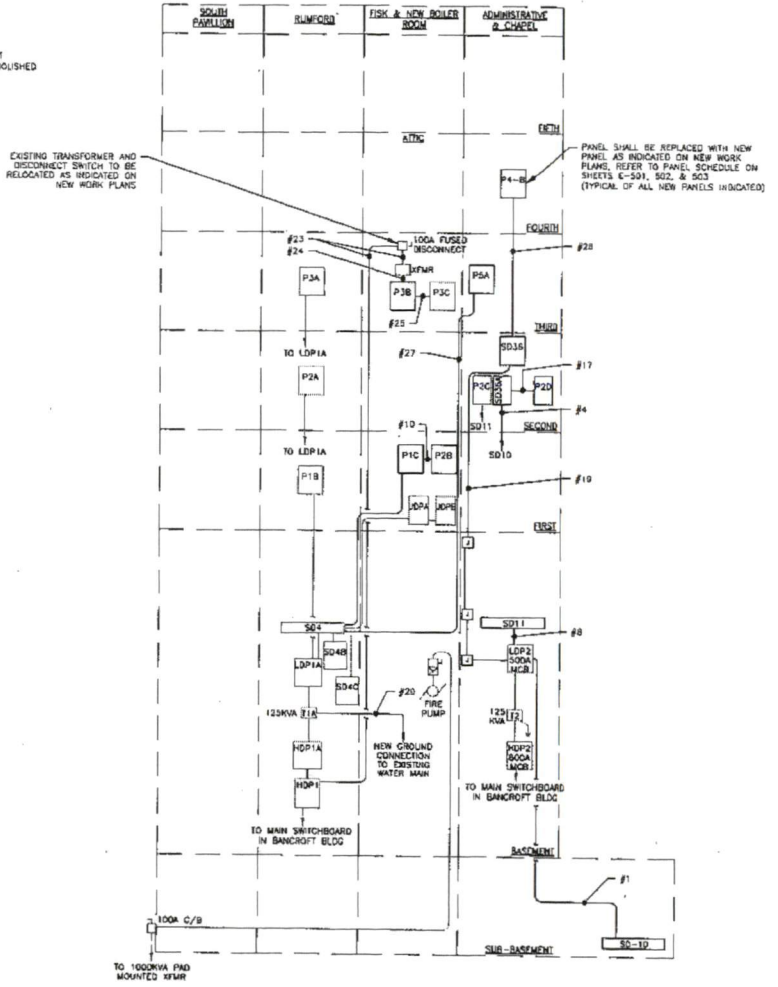
DRAWN BY:	SCALE:	DATE:	E503
SVR	NONE	09/24/2024	SHEET 22 OF 38

NOTES:

1. REFER TO E000 FOR ELECTRICAL LEGEND, ABBREVIATIONS, AND CONDUIT & WIRING LEGEND.
2. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH STATE OF NEW HAMPSHIRE BUILDING CODES, NH GAS REQUIREMENTS, NFPA 70, AND THE AUTHORITY HAVING JURISDICTION.
3. ALL MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS AND RECOMMENDATIONS.
4. EXISTING AND NEW WORK ONELINE DIAGRAMS ARE PARTIAL FACILITY DIAGRAMS. EXISTING PANELS TO REMAIN WITH NO CONNECTIONS TO OR FROM PANELS TO BE REPLACED/RELOCATED HAVE NOT BEEN SHOWN FOR CLARITY. EXISTING FEEDER AND BRANCH CIRCUITS TO BE EXTENDED AND/OR REWORKED FOR CONNECTION TO NEW PANELS HAVE NOT BEEN SHOWN FOR CLARITY. REFER TO NEW WORK PLANS FOR THESE ITEMS.



PARTIAL FACILITY ONELINE DIAGRAM - EXISTING



PARTIAL FACILITY ONELINE DIAGRAM - NEW WORK

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CHANGED/UPDATED:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
RICHARDSON ENG	KAT	SVR	SVR

REVISIONS

DATE	DESCRIPTION	BY
30MAY25	ISSUED FOR CONSTRUCTION	SVR

OFFICE PARK SOUTH - MAIN BUILDING
MAIN BLDG. REWIRING PHASE 1
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DEPARTMENT OF ADMINISTRATIVE SERVICES

EXISTING & NEW WORK ONELINE DIAGRAMS

DRAWN BY:	SCALE:	DATE:	PROJECT No. B-530 CONTRACT: 8
SVR	NONE	09/24/2024	E601 SHEET: 33 OF 38

SPRINKLER SCHEDULE

SPRINKLER SCHEDULE						
SYMBOL	DESCRIPTION	S.I.N.	K-FACTOR	TEMP.	RESPONSE	FINISH
◀	RECESSED SIDEWALL	VK305	5.6	200 °F	Quick	CHROME
○	<varies>	VK300	5.6	200 °F	Quick	BRASS

PIPING & DEMOLITION LEGEND

- EXISTING PIPING, EXISTING SPRINKLER
- EXISTING PIPING, NEW SPRINKLER
- EXISTING PIPING, DEMOLISHED SPRINKLER
- NEW PIPING, NEW SPRINKLER
- DEMOLISHED PIPING, DEMOLISHED SPRINKLER
- CONNECT TO EXISTING
- LIMIT OF DEMOLITION

NOTE: CONTRACTOR TO CAP ALL OPEN OUTLETS.

SUBMITTALS / CLOSEOUT

1. [redacted]
2. [redacted]
3. [redacted]

SHEET LIST

FIRE PROTECTION SHEET LIST	
NUMBER	NAME
FP000	FIRE PROTECTION LEGEND AND NOTES
FP001	FIRE PROTECTION DETAILS
FP100	FIRE PROTECTION ENLARGED PLANS

SCOPE OF WORK

1. RECONFIGURATION OF EXISTING WET AND DRY SPRINKLER SYSTEMS AT THE FACILITY TO SUPPORT THE PROPOSED RECONFIGURATION RELATED TO INSTALLATION OF ELECTRICAL EQUIPMENT. SYSTEMS SERVING THE ASSOCIATED ROOMS ARE AS FOLLOWS. CONTRACTOR TO FIELD VERIFY.
   A. WET SYSTEM 102:
      a. A004C
      b. F106S
      c. F310S
   B. WET SYSTEM 106:
      a. R245S
      b. R330S
   C. DRY SYSTEM 107:
      a. A206C

GENERAL NOTES

1. THE CONTRACTOR SHALL PROVIDE LABOR, MATERIALS, TOOLS, AND EQUIPMENT FOR THE INSTALLATION OF THE SPECIFIED FIRE PROTECTION SYSTEMS, ENSURING COMPLIANCE WITH UL LISTED/FM APPROVED MATERIALS. WORK SHALL CONFORM TO APPLICABLE NFPA STANDARDS AND FEDERAL, STATE, AND LOCAL CODES. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING PERMITS AND SUBMITTING CERTIFICATES AND PERMITS TO THE ARCHITECT.
2. WORK SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL CODES AND REGULATIONS. IN CASE OF CONFLICTING REQUIREMENTS, THE MORE STRINGENT REQUIREMENTS SHALL PREVAIL.
3. THE FIRE PROTECTION CONTRACTOR SHALL DEVELOP WORKING PLANS (SHOP DRAWINGS) FOR THE SPECIFIED SYSTEMS IN ACCORDANCE WITH NFPA 13 AND RELEVANT INSURANCE REQUIREMENTS. THE ENGINEER MUST APPROVE THE WORKING PLANS BEFORE SUBMISSION TO THE AUTHORITY HAVING JURISDICTION. THE PLANS MUST BE DEVELOPED BY A REGISTERED PROFESSIONAL ENGINEER OR A NICET LEVEL III OR IV FIRE PROTECTION TECHNICIAN. IF REQUIRED BY THE LOCAL JURISDICTION, A LICENSED ENGINEER SHALL STAMP THE PLANS AT NO ADDITIONAL COST.
4. WORKING PLANS SHALL INCLUDE THE NAME, LICENSE NUMBER, AND EXPIRATION DATE OF THE SPRINKLER FITTER LICENSE (WHERE APPLICABLE).
5. THE DESIGN AIMS TO PROVIDE FULL NFPA 13 SPRINKLER COVERAGE IN ALL AREAS, FOLLOWING THE ROUTING AND SIZING INDICATED ON THE CONTRACT DRAWINGS.
6. SPRINKLERS SHALL CONFORM TO THE SCHEDULE OR BE APPROVED EQUIVALENTS. THE TEMPERATURE RATING SHALL MATCH THE SCHEDULE UNLESS NFPA 13 REQUIRES A HIGHER RATING. NOTIFY THE ENGINEER PROMPTLY AND IN WRITING IF HIGHER TEMPERATURE RATED SPRINKLERS ARE NEEDED DUE TO FIELD CONDITIONS.
7. SPRINKLERS IN AREAS WITH FINISHED CEILINGS SHALL BE INSTALLED ACCORDING TO THE CONTRACT DOCUMENTS. DEVIATIONS MUST BE INDICATED ON THE SHOP DRAWINGS.
8. SPRINKLER LOCATIONS IN AREAS WITHOUT FINISHED CEILINGS ARE APPROXIMATE AND SHOW THE QUANTITY OF CEILING-LEVEL SPRINKLERS REQUIRED. THE CONTRACTOR MUST REVIEW EXISTING CONDITIONS AND COORDINATE WITH STRUCTURAL, MECHANICAL, AND ARCHITECTURAL DRAWINGS TO ENSURE PROPER COVERAGE PER NFPA 13.
9. THE SPRINKLER CONTRACTOR SHALL PROVIDE UNIT PRICES FOR ADDITIONAL SPRINKLERS THAT MAY BE REQUIRED DUE TO DESIGN CHANGES (INCLUDING ALL LABOR AND MATERIALS FOR INSTALLATION, TAPPING BRANCH PIPING, ARMOVER/RUNOUT PIPING, DRAINDOWN, ETC.
10. PIPING INSTALLED ABOVE SENSITIVE AREAS (ELECTRICAL ROOMS, DATA ROOMS, ETC.) SHALL BE LIMITED TO THE NECESSARY PIPING FOR THE SPACE, WITH NO OTHER FIRE PROTECTION PIPING ALLOWED WITHIN THOSE AREAS. PIPING SERVING SENSITIVE AREAS SHOULD BE FED FROM ABOVE THE DOOR TO AVOID ROUTING OVER EQUIPMENT.
11. FIRE PROTECTION SYSTEM PIPE ROUTING SHOWN ON THE DRAWINGS IS DIAGRAMMATIC AND FOR REFERENCE ONLY. THE FIRE PROTECTION CONTRACTOR MAY ADVISE THE ROUTING WITH WRITTEN APPROVAL FROM THE ENGINEER TO ACCOUNT FOR ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL CLEARANCES, LIMITATIONS, AND EQUIPMENT SELECTION. ALL REQUIRED ELEMENTS FOR THE INTENDED PIPING SYSTEMS MUST BE FURNISHED AND INSTALLED, EVEN IF NOT SPECIFICALLY SHOWN ON THE DRAWINGS OR IN THE SPECIFICATIONS, PARTICULARLY IN FINISHED AREAS OR AS REQUIRED BY ARCHITECTURAL DRAWINGS.
12. EXPOSED PIPING SHALL BE PAINTED IN COORDINATION WITH THE ARCHITECT'S SPECIFICATIONS.
13. DRAWINGS DO NOT DEPICT ALL REQUIRED TAKEOFFS/TAPS FROM EXISTING PIPING. THE FIRE PROTECTION CONTRACTOR SHALL INSTALL NEW PIPING TAKEOFFS AS NECESSARY FOR ADEQUATE COVERAGE, AVOIDING SUSPENDED CEILING FRAMING OR COORDINATING WITH OTHER TRADES.
14. REVIEW ALL DRAWINGS, NOTE ARCHITECTURAL DETAILS, AND CONSIDER ALL CONDITIONS THAT MAY IMPACT THE WORK.

ABBREVIATIONS

Alarm Valve (AV)
Automatic Air Vent (AVA)
Automatic Ball Drip Drain (ABD)
Backflow Preventer Assembly (BP)
Backflow Test Header (BTH)
Butterfly Valve, Normally Closed (BFVnc)
Butterfly Valve, Normally Open (BFV)
Check Valve (CV)
Chlorinated Polyvinyl Chloride (CPVC)
Compressor (CP)
Contractor (CONTR)
Drawing (DWG)
Drain Outlet (DO)
Drain Riser (DR)
Drain Valve (DV)
Dry System Riser (DSR)
Dry System Valve (DSV)
Chlorinated Polyvinyl Chloride (CPVC)
Each (EA)
Fire Department Connection (FDC)
Fire Department Valve Cabinet (FDVC)
Fire Department Valve (FDV)
Fire Pump Test Header (FTH)
Flow Meter (FM)
Flow Switch (FSW)
Furnished by Other Contractor (FBCO)
Gate Valve, Normally Closed (GVnc)
Gate Valve, Normally Open (GV)
Inspector's Test Connection (ITC)
Manual Air Vent (MAV)
Nitrogen Generator (NG)
Nitrogen Purge Valve (NGP)
Not In Contract (NIC)
Not to Scale (NTS)
OS&Y Gate Valve (OSGV)
Post Indicator Valve (PIV)
Pressure Reducing Valve (PRV)
Pressure Gauge (PG)
Pressure Switch (PS)
Registered Design Professional (RDP)
Riser Check Valve (RCV)
Riser Nipple (RN)
Room (RM)
Response Time Index (RTI)
Riser (RSR)
Sidewall Sprinkler (SW)
Sprinkler Identification Number (SIN)
Splash Block (SB)
Thrust Block (TB)
Tamper Switch (TS)
Typical (TYP)
Upright Sprinkler (UPR)
Unlined Ductile Iron (DI)
Underground (UG)
Wet System Riser (WSR)
Wall Post Indicator Valve (WPIV)
Zone Control Valve Assembly (ZCV)

DESIGN CRITERIA

THE SPRINKLER SYSTEM SHALL DELIVER THE MINIMUM REQUIRED DISCHARGE DENSITIES AS REQUIRED BY NFPA 13 AND AS SPECIFIED BELOW:

1. MAXIMUM SPRINKLER COVERAGE AREA LISTED IS FOR STANDARD COVERAGE SPRINKLERS UNDER SMOOTH FLAT CEILINGS. THIS SHALL BE ADJUSTED AS REQUIRED BY CODE FOR OTHER SITUATIONS.
2. MAXIMUM SPRINKLER COVERAGE AREA IS PERMITTED TO BE REDUCED WHERE ALLOWED BY THE §11.2.3.2.3.1 OF NFPA 13.
3. ROOM DESIGN METHOD OF §11.2.3.2 OF NFPA 13 IS PERMITTED, WHERE ALL APPLICABLE REQUIREMENTS ARE MET.

ORDINARY HAZARD (GROUP 1) (ALL AREAS EXCEPT A206C ELECTRICAL ROOM)

1. SYSTEM TYPE: DRY PIPE
2. DISCHARGE DENSITY: 0.15GPM / SF
3. MAXIMUM SPRINKLER COVERAGE AREA: 130SF (UPRIGHT), 100SF (SW)
4. AREA OF APPLICATION: 1,500SF
5. HOSE ALLOWANCE: 250GPM

ORDINARY HAZARD (GROUP 1) (A206C ELECTRICAL ROOM)

1. SYSTEM TYPE: DRY PIPE
2. DISCHARGE DENSITY: 0.15GPM / SF
3. MAXIMUM SPRINKLER COVERAGE AREA: 130SF (UPRIGHT), 100SF (SW)
4. AREA OF APPLICATION: 1,500SF * (1.3) = 1,950SF (DRY SYSTEM INCREASE
5. HOSE ALLOWANCE: 250GPM

HYDRAULIC CALCULATIONS ARE NOT REQUIRED. PROPOSED RENOVATION DOES NOT MAKE ANY OF THE IMPACTED ROOMS THE HYDRAULICALLY MOST DEMANDING AREA.

PIPING SCHEDULE

1. 2" AND SMALLER:
   A. SCHEDULE 40 BLACK STEEL (THREADED, WELDED, OR GROOVED)
2. 2-1/2" AND LARGER:
   A. WET SYSTEM ONLY: SCHEDULE 10 (GROOVED OR WELDED)
   B. DRY SYSTEM: SCHEDULE 40 (GROOVED OR WELDED)

SFC ENGINEERING
Windham, New Hampshire
Portland, Maine
(603) 647-5790
www.sfceng.com

STUDIO E
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RICHARDSON ARCHITECTURE
LIGHTING DESIGNERS & CONSULTANTS

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
DIVISION OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE, PO BOX 483, CONCORD, NH 03302-0483
(603) 271-3446 FAX (603) 271-3445

REVISIONS		
DATE	DESCRIPTION	BY
30 MAY 25	ISSUED FOR CONSTRUCTION	AJS

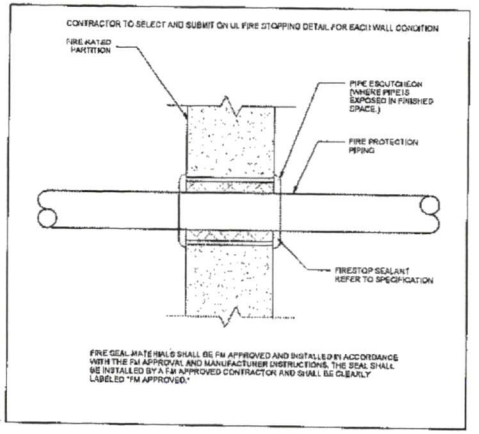
DESIGN ENGINEER: SFC | DRAWN BY: TJB | CHECKED BY: SFE | APPROVED BY: SJS

OFFICE PARK SOUTH – MAIN BUILDING
MAIN BLDG. REWIRING PHASE 1
100 PLEASANT STREET, CONCORD, NH
DEPARTMENT OF ADMINISTRATIVE SERVICES

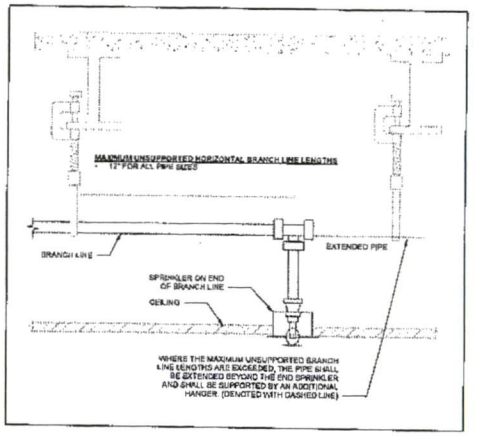
FIRE PROTECTION LEGEND AND NOTES

PROJECT NO.: CONTRACT 8

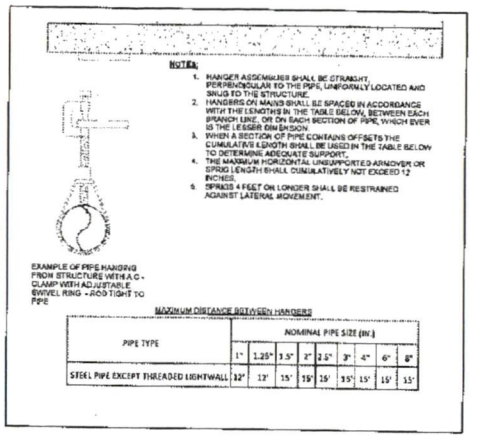
DATE: 10/24/2024 | SCALE: NTS | SHEET: FP000 | SHEET 24 OF 29



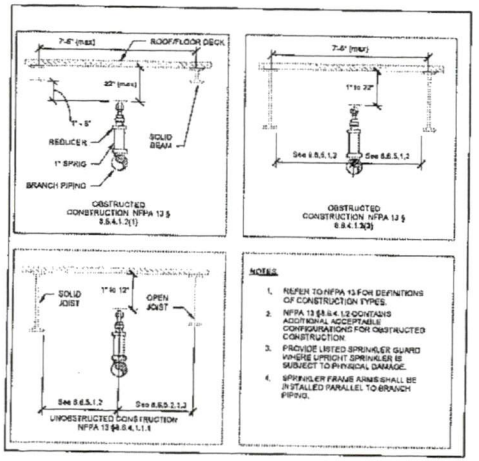
1 PENETRATION THRU RATED WALL
NTS



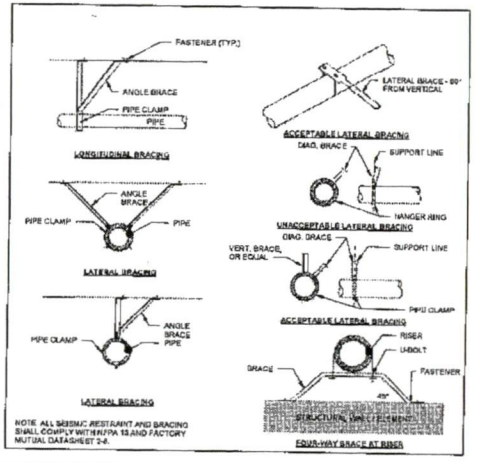
2 TYPICAL METHODS OF SECURING HANGER RODS TO STRUCTURE STEEL
NTS



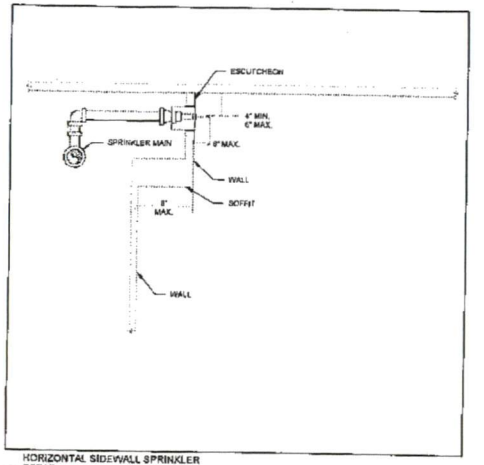
3 TYPICAL METHODS OF SECURING HANGER RODS TO STRUCTURE STEEL
NTS



4 UPRIGHT SPRINKLER PIPING DETAIL
NTS



5 SEISMIC BRACING
NTS



6 HORIZONTAL SIDEWALL SPRINKLER DETAIL
NTS

SFC ENGINEERING
Wareham, New Hampshire
Portland, Maine
(603) 617-5700
www.sfceng.com
NFPA Certified

STUDIO E ARCHITECTURE + DESIGN
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RICHARDSON ENGINEERING
ELECTRICAL ENGINEERS + CONSULTANTS

STEVEN SOUTHARD No. 13604 — LICENSED PROFESSIONAL ENGINEER

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
DIVISION OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE — PO BOX 483 — CONCORD, NH 03302-0483
(603) 271-3516 — FAX (603) 27--3515

REVISIONS		
DATE	DESCRIPTION	BY
30 MAY 25	ISSUED FOR CONSTRUCTION	SJS

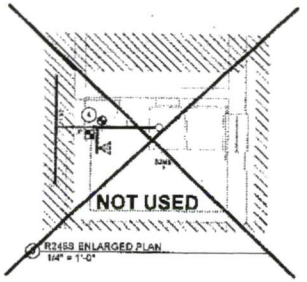
DESIGNED/DRAWN BY: MFD | CHECKED BY: 725 | APPROVED BY: SJS | DATE: 05/30/25

OFFICE PARK SOUTH - MAIN BUILDING
MAIN BLDG. REWIRING PHASE 1
106 PLEASANT STREET, CONCORD, NH
DEPARTMENT OF ADMINISTRATIVE SERVICES

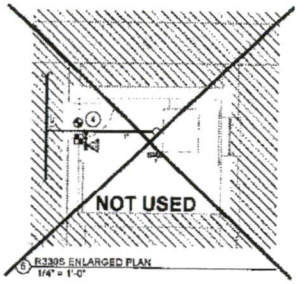
FIRE PROTECTION DETAILS

PROJECT NO.: CONTRACT #:
DRAWN BY: 725 | SCALE: NTS | DATE: 06/24/2025
PROJECT NO. 25-01 SHEET 22 OF 25

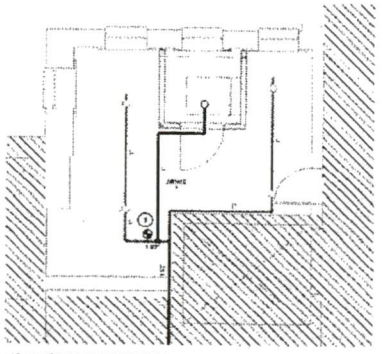
KEYNOTES	
1	ROUTE NEW 1" BRANCHLINE AS INDICATED.
2	EXISTING SPRINKLER AND PIPING TO REMAIN.
3	ROUTE NEW 1" DRY BRANCHLINE BACK TO VERTICAL RISER. NO ENT IS TO EXTEND, NO NEW LOW POINTS ON THE EXISTING DRY SYSTEM ARE CREATED.
4	DEMOLISH VERTICAL SIDEWALL, EXTEND 1" PIPE TO NEW UPRIGHT SPRINKLER.



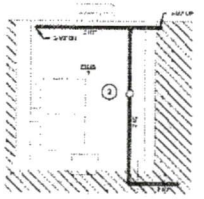
R248S ENLARGED PLAN
1/4" = 1'-0"



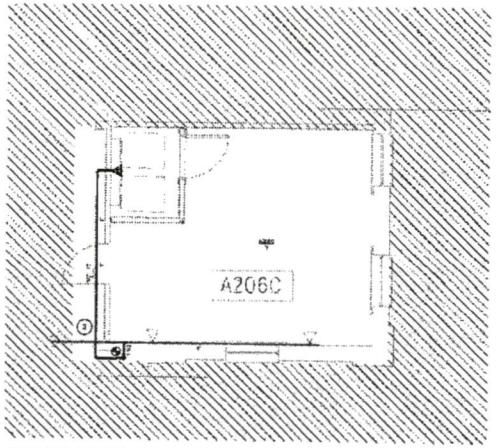
R330S ENLARGED PLAN
1/4" = 1'-0"



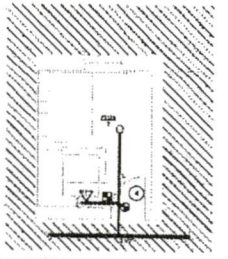
A804W ENLARGED FLOOR PLAN
1/4" = 1'-0"



F109S ENLARGED PLAN
1/4" = 1'-0"



A206C ENLARGED PLAN
1/4" = 1'-0"



F312S ENLARGED PLAN
1/4" = 1'-0"

SFC ENGINEERING
Wingham, New Hampshire
Portland, Maine
(603) 641-5709
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STEVEN J. SOUTHARD
No 13004
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW HAMPSHIRE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
DIVISION OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 260
CONCORD, NH 03302-0483
(603) 271-3516 FAX(603) 271-3515

DESIGNED/ENGINEER	DRAWN BY	CHECKED BY
SFC	TSB	SJS

REVISIONS		
DATE	DESCRIPTION	BY
28 MAY 25	ISSUED FOR CONSTRUCTION	SJS

OFFICE PARK SOUTH - MAIN BUILDING
MAIN BLDG. REWIRING PHASE I
106 PLEASANT STREET, CONCORD, NH
DEPARTMENT OF ADMINISTRATIVE SERVICES

FIRE PROTECTION ENLARGED PLANS

DRAWN BY	SCALE	DATE
TSB	1/4" = 1'-0"	05/24/2024

PROJECT NO. 23-1423

FP100
SHEET 25 OF 28

Bond Number: UCSX333X6190

AIA® Document A312™ – 2010

Payment Bond

CONTRACTOR:
(Name, legal status and address)
CDS Unlimited, LLC
279 Bible Hill Road
Bennington, NH 03442

SURETY:
(Name, legal status and principal place of business)
United Casualty and Surety Insurance Company
303 Congress Street, Suite 502
Boston, MA 02210

OWNER:
(Name, legal status and address)
State of New Hampshire, Department of Administrative Services
25 Capitol Street
Concord, NH 03301

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

AIA Document A312–2010 combines two separate bonds, a Performance Bond and a Payment Bond, into one form. This is not a single combined Performance and Payment Bond.

CONSTRUCTION CONTRACT
Date: , 2025

Amount: Four Hundred Seventeen Thousand Nine Hundred Eighty and 00/100 Dollars ($417,980.00)

Description:
(Name and location)
81230, Main Building Rewiring Services at the Concord Main Building, 105 Pleasant Street, Concord, NH 03301

BOND
Date: , 2025
(Not earlier than Construction Contract Date)

Amount: Four Hundred Seventeen Thousand Nine Hundred Eighty and 00/100 Dollars ($417,980.00)

Modifications to this Bond: ☑ None ☐ See Section 18

CONTRACTOR AS PRINCIPAL		SURETY	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
CDS Unlimited, LLC		United Casualty and Surety Insurance Company	
Signature:		Signature:	
Name and Title:	Jordan Widger, Owner	Name and Title:	Mark D. Leskanic, Attorney-in-Fact

(Any additional signatures appear on the last page of this Payment Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:
Surety Bond Professionals, Inc.
1661 Worcester Road, Suite 207
Framingham, MA 01701

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)
Richardson Engineering
15 Sewall Rd
South Berwick, ME 03908

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

§ 2 If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.

§ 4 When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.

§ 5 The Surety's obligations to a Claimant under this Bond shall arise after the following:

§ 5.1 Claimants, who do not have a direct contract with the Contractor,

.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

.2 have sent a Claim to the Surety (at the address described in Section 13).

§ 5.2 Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).

§ 6 If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.

§ 7 When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

§ 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

§ 7.2 Pay or arrange for payment of any undisputed amounts.

§ 7.3 The Surety's failure to discharge its obligations under Section 7.1 or Section 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Section 7.1 or Section 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

§ 8 The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

§ 9 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

§ 10 The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.

§ 11 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 12 No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Section 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 13 Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

§ 14 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 15 Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

§ 16 Definitions

§ 16.1 Claim. A written statement by the Claimant including at a minimum:

.1 the name of the Claimant;
.2 the name of the person for whom the labor was done, or materials or equipment furnished;
.3 a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
.4 a brief description of the labor, materials or equipment furnished;
.5 the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
.6 the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the Claim;
.7 the total amount of previous payments received by the Claimant; and
.8 the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.

§ 16.2 Claimant. An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

§ 16.3 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

§ 16.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 16.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 17 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 18 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	
Address		Address	

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

UCS

POWER OF ATTORNEY

171333

KNOW ALL MEN BY THESE PRESENTS: That United Casualty and Surety Insurance Company, a corporation of the State of Nebraska, and US Casualty and Surety Insurance Company and United Surety Insurance Company, assumed names of United Casualty and Surety Insurance Company (collectively, the Companies), do by these presents make, constitute and appoint:

Mark D. Leskanic, Matthew Leskanic, Greg Angel, Colin Warner, Lauren Leskanic

its true and lawful Attorney(s)-in-Fact, each in their separate capacity if more than one is named above, with full power and authority hereby conferred in its name, place and stead, to execute, acknowledge and deliver **any and all bonds, recognizances, undertakings or other instruments or contracts of suretyship to include riders, amendments, and consents of surety, providing the bond penalty does not exceed Five Million & 00/100 Dollars** (**$5,000,000.00**). This Power of Attorney shall expire without further action on December 31st, 2026.

This Power of Attorney is granted under and by authority of the following resolutions adopted by the Board of Directors of the Companies at a meeting duly called and held on the 1st day of July, 1993:

Resolved that the President, Treasurer, or Secretary be and they are hereby authorized and empowered to appoint Attorneys-in-Fact of the Company, in its name and as its acts to execute and acknowledge for and on its behalf as Surety any and all bonds, recognizances, contracts of indemnity, waivers of citation and all other writings obligatory in the nature thereof, with power to attach thereto the seal of the Company. Any such writings so executed by such Attorneys-in-Fact shall be binding upon the Company as if they had been duly executed and acknowledged by the regularly elected Officers of the Company in their own proper persons.

That the signature of any officer authorized by Resolutions of this Board and the Company seal may be affixed by facsimile to any power of attorney or special power of attorney or certification of either given for the execution of any bond, undertaking, recognizance or other written obligation in the nature thereof; such signature and seal, when so used being hereby adopted by the Company as the original signature of such officer and the original seal of the Company, to be valid and binding upon the Company with the same force and effect as though manually affixed.

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed and their corporate seals to be hereunto affixed, this 14th day of January, 2025

UNITED CASUALTY AND SURETY INSURANCE COMPANY
US Casualty and Surety Insurance Company
United Surety Insurance Company

Corporate Seals

R. Kyle Fowler
R. Kyle Fowler, Treasurer

Commonwealth of Massachusetts
County of Suffolk ss:

On this 14th day of January, 2025, before me, Colleen A. Cochrane, a notary public, personally appeared, R. Kyle Fowler, Treasurer of United Casualty and Surety Insurance Company, US Casualty and Surety Insurance Company and United Surety Insurance Company, who proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument the person(s), or the entity on behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the Commonwealth of Massachusetts that the foregoing paragraph is true and correct.
WITNESS my hand and seal.

Colleen A. Cochrane (Seal)
Notary Public Commission Expires: 10/27/2028

COLLEEN A. COCHRANE
Notary Public, Commonwealth of Massachusetts
My Commission Expires 10/27/2028

I, Robert F. Thomas, President of United Casualty and Surety Insurance Company, US Casualty and Surety Insurance Company and United Surety Insurance Company do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney, executed by said Companies, which is still in full force and effect; furthermore, the resolutions of the Board of Directors, set out in the Power of Attorney are in full force and effect.

In Witness Whereof, I have hereunto set my hand and affixed the seals of said Companies at Boston, Massachusetts this _____ day of _____, 2025

Corporate Seals

Robert F. Thomas
Robert F. Thomas, President

TO CONFIRM AUTHENTICITY OF THIS BOND OR DOCUMENT EMAIL: CONFIRMBOND@UNITEDCASUALTY.COM

Bond Number: UCSX333X6190

AIA® Document A312™ – 2010

Performance Bond

CONTRACTOR:
(Name, legal status and address)
CDS Unlimited, LLC
279 Bible Hill Road
Bennington, NH 03442

SURETY:
(Name, legal status and principal place of business)
United Casualty and Surety Insurance Company
303 Congress Street, Suite 502
Boston, MA 02210

OWNER:
(Name, legal status and address)
State of New Hampshire, Department of Administrative Services
25 Capitol Street
Concord, NH 03301

CONSTRUCTION CONTRACT
Date: , 2025

Amount: Four Hundred Seventeen Thousand Nine Hundred Eighty and 00/100 Dollars ($417,980.00)

Description:
(Name and location)
81230, Main Building Rewiring Services at the Concord Main Building, 105 Pleasant Street, Concord, NH 03301

BOND
Date: , 2025
(Not earlier than Construction Contract Date)

Amount: Four Hundred Seventeen Thousand Nine Hundred Eighty and 00/100 Dollars ($417,980.00)

Modifications to this Bond: ☑ None ☐ See Section 16

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

AIA Document A312–2010 combines two separate bonds, a Performance Bond and a Payment Bond, into one form. This is not a single combined Performance and Payment Bond.

CONTRACTOR AS PRINCIPAL
Company: *(Corporate Seal)*
CDS Unlimited, LLC

Signature:
Name and Title: Jordan Widger, Owner

SURETY
Company: *(Corporate Seal)*
United Casualty and Surety Insurance Company

Signature:
Name and Title: Mark D. Leskanic, Attorney-in-Fact

(Any additional signatures appear on the last page of this Performance Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:
Surety Bond Professionals, Inc.
1661 Worcester Road, Suite 207
Framingham, MA 01701

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party.)
Richardson Engineering
15 Sewall Rd
South Berwick, ME 03908

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

.1 the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

.2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

.3 the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

§ 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

§ 5 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

§ 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

§ 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

§ 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

§ 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

§ 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

§ 7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

.2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and

.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

§ 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

§ 9 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.

§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 14 Definitions

§ 14.1 Balance of the Contract Price. The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 14.2 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

§ 14.3 Contractor Default. Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

§ 14.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 14.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 16 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		SURETY	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	
Address		Address	

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

UCS

POWER OF ATTORNEY

171333

KNOW ALL MEN BY THESE PRESENTS: That United Casualty and Surety Insurance Company, a corporation of the State of Nebraska, and US Casualty and Surety Insurance Company and United Surety Insurance Company, assumed names of United Casualty and Surety Insurance Company (collectively, the Companies), do by these presents make, constitute and appoint:

Mark D. Leskanic, Matthew Leskanic, Greg Angel, Colin Warner, Lauren Leskanic

its true and lawful Attorney(s)-in-Fact, each in their separate capacity if more than one is named above, with full power and authority hereby conferred in its name, place and stead, to execute, acknowledge and deliver **any and all bonds, recognizances, undertakings or other instruments or contracts of suretyship to include riders, amendments, and consents of surety, providing the bond penalty does not exceed Five Million & 00/100 Dollars** ($5,000,000.00). This Power of Attorney shall expire without further action on December 31st, 2026.

This Power of Attorney is granted under and by authority of the following resolutions adopted by the Board of Directors of the Companies at a meeting duly called and held on the 1st day of July, 1993:

Resolved that the President, Treasurer, or Secretary be and they are hereby authorized and empowered to appoint Attorneys-in-Fact of the Company, in its name and as its acts to execute and acknowledge for and on its behalf as Surety any and all bonds, recognizances, contracts of indemnity, waivers of citation and all other writings obligatory in the nature thereof, with power to attach thereto the seal of the Company. Any such writings so executed by such Attorneys-in-Fact shall be binding upon the Company as if they had been duly executed and acknowledged by the regularly elected Officers of the Company in their own proper persons.

That the signature of any officer authorized by Resolutions of this Board and the Company seal may be affixed by facsimile to any power of attorney or special power of attorney or certification of either given for the execution of any bond, undertaking, recognizance or other written obligation in the nature thereof; such signature and seal, when so used being hereby adopted by the Company as the original signature of such officer and the original seal of the Company, to be valid and binding upon the Company with the same force and effect as though manually affixed.

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed and their corporate seals to be hereunto affixed, this 14th day of January, 2025

UNITED CASUALTY AND SURETY INSURANCE COMPANY
US Casualty and Surety Insurance Company
United Surety Insurance Company

Corporate Seals

R. Kyle Fowler
R. Kyle Fowler, Treasurer

Commonwealth of Massachusetts
County of Suffolk ss:

On this 14th day of January, 2025, before me, Colleen A. Cochrane, a notary public, personally appeared, R. Kyle Fowler, Treasurer of United Casualty and Surety Insurance Company, US Casualty and Surety Insurance Company and United Surety Insurance Company, who proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument the person(s), or the entity on behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the Commonwealth of Massachusetts that the foregoing paragraph is true and correct.
WITNESS my hand and seal.

Colleen A. Cochrane (Seal)
Notary Public Commission Expires: 10/27/2028

COLLEEN A. COCHRANE
Notary Public, Commonwealth of Massachusetts
My Commission Expires 10/27/2028

I, Robert F. Thomas, President of United Casualty and Surety Insurance Company, US Casualty and Surety Insurance Company and United Surety Insurance Company do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney, executed by said Companies, which is still in full force and effect; furthermore, the resolutions of the Board of Directors, set out in the Power of Attorney are in full force and effect.

In Witness Whereof, I have hereunto set my hand and affixed the seals of said Companies at Boston, Massachusetts this _____ day of _____, 2025

Corporate Seals

Robert F. Thomas
Robert F. Thomas, President

TO CONFIRM AUTHENTICITY OF THIS BOND OR DOCUMENT EMAIL: CONFIRMBOND@UNITEDCASUALTY.COM

State of New Hampshire
Department of State

CERTIFICATE

I, David M. Scanlan, Secretary of State of the State of New Hampshire, do hereby certify that CDS UNLIMITED LLC is a New Hampshire Limited Liability Company registered to transact business in New Hampshire on April 03, 2020. I further certify that all fees and documents required by the Secretary of State's office have been received and is in good standing as far as this office is concerned.

Business ID: **839674**

Certificate Number: **0007238691**

IN TESTIMONY WHEREOF,
I hereto set my hand and cause to be affixed
the Seal of the State of New Hampshire,
this 16th day of July A.D. 2025.

David M. Scanlan
Secretary of State

Certificate of Authority # 3

(Limited partnership, Limited liability professional partnership or LLC)

Limited Partnership or LLC Certification of Authority

I, Jordan Widger **, hereby certify** that I am the sole Partner, Member or
(Name)

Manager and the sole officer of CDS Unlimited LLC a limited liability partnership
(Name of Partnership or LLC)

under RSA 304-B, a limited liability professional partnership under RSA 304-D, or a limited liability company under RSA 304-C.

I certify that I am authorized to bind the partnership or LLC. I further certify that it is understood that the State of New Hampshire will rely on this certificate as evidence that the person listed above currently occupies the position indicated and that they have full authority to bind the partnership or LLC and that this authorization **shall remain valid for thirty (30)** days from the date of this Corporate Resolution.

DATED: 07-16-2025

Jordan Widger Digitally signed by Jordan Widger Date: 2025.07.16 09:44:20 -04'00'

ATTEST: Vanessa Dupuis Digitally signed by Vanessa Dupuis Date: 2025.07.16 09:44:38 -04'00'

(Name & Title) Vanessa Dupuis, Operations Manager

ACORD

CDSUNLI-01

BMERRITT

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)
7/16/2025

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:	
Knapton Reade & Woods Agency, Inc. 22 School Street Hillsboro, NH 03244	PHONE (A/C, No, Ext): (603) 464-3422	FAX (A/C, No): (603) 464-4066
	E-MAIL ADDRESS:	

INSURED	INSURER(S) AFFORDING COVERAGE	NAIC #
CDS Unlimited LLC 279 Bible Hill Road Bennington, NH 03442	INSURER A : Acuity Insurance	14184
	INSURER B : Benchmark Insurance Company	
	INSURER C :	
	INSURER D :	
	INSURER E :	
	INSURER F :	

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY			ZN1237	6/4/2025	6/4/2026	EACH OCCURRENCE	$ 1,000,000
	CLAIMS-MADE X OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 250,000
							MED EXP (Any one person)	$ 10,000
							PERSONAL & ADV INJURY	$ 1,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$ 3,000,000
	POLICY PRO-JECT LOC						PRODUCTS - COMP/OP AGG	$ 3,000,000
	OTHER:							$
	AUTOMOBILE LIABILITY						COMBINED SINGLE LIMIT (Ea accident)	$
	ANY AUTO						BODILY INJURY (Per person)	$
	OWNED AUTOS ONLY / SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	HIRED AUTOS ONLY / NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per accident)	$
								$
A	UMBRELLA LIAB X OCCUR							$
	X EXCESS LIAB CLAIMS-MADE			ZN1237	6/4/2025	6/4/2026	EACH OCCURRENCE	$ 5,000,000
	DED RETENTION $						AGGREGATE	$ 5,000,000
								$
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY						PER STATUTE / OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y / N: Y	N / A		XWC40001302	6/11/2025	6/11/2026	E.L. EACH ACCIDENT	$ 1,000,000
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$ 1,000,000
							E.L. DISEASE - POLICY LIMIT	$ 1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
Workers Comp Info: Excluded Member - Jordan Widger. States Included NH, MA

CERTIFICATE HOLDER

State of New Hampshire
25 Capitol Street
Concord, NH 03301

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Elizabeth Merritt

ACORD 25 (2016/03)

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