

Northfield Town Hall

Northfield, Massachusetts



INVITATION FOR BIDS

FOR

ELECTRICAL UPGRADES PHASE III IFB 20190906

CONTACT INFORMATION:

**ANDREA WOODS, MCPPO
CHIEF PROCUREMENT OFFICER
FRANKLIN REGIONAL COUNCIL OF GOVERNMENTS**

12 Olive Street, Suite 2
Greenfield, MA 01301

email: bids@frcog.org bid docs available at <https://frcog.org/bids>

**413-774-3167 X104
FAX: 413-774-3169**

Engineering Plans and Specifications by:

OWL Engineers
105 Abbot Street
Andover, MA 01810

INVITATION FOR BIDS
Northfield Town Hall Electrical Upgrades – Phase III
Northfield, MA
IFB 20190906

The Franklin Regional Council of Governments will accept sealed bids on behalf of the Town of Northfield for PHASE III ELECTRICAL SYSTEM UPGRADES at the Town Hall located at 69 Main Street in Northfield, MA per the specifications. OWL Engineers is the Designer.

Bids should be marked “**Bid for Northfield Town Hall Electrical Upgrades-Phase 3**” and will be received by the Franklin Regional Council of Governments, 12 Olive Street, Suite 2, Greenfield, MA 01301, until **SEPTEMBER 6, 2019 at 2pm at which time they will be publicly opened**. Emailed or faxed bids will not be accepted. The original and one copy must be submitted.

A bid deposit, payable to the TOWN OF NORTHFIELD, in the amount of 5% of the bid amount is required with the bid submittal and may be in the form of a Treasurer’s/bank check or drawn on a MA licensed surety. The awarded contractor will be expected to provide a Labor and Materials Payment bond in the amount of 50% of the contract price.

A **mandatory** pre-bid briefing/walk through will be held on site on **AUGUST 20, 2019 at 10:00am**. **In case the Town Hall must be closed for any reason, planholders will be notified via email and the walk-through will be held the next business day at 10:00am.**

Wage rates for this bid are subject to prevailing wage rates as per MGL Chapter 149, Section 26 - 27f inclusive and are included in the bid package.

Bid specifications must be requested from <https://frcog.org/bids> in order to receive addenda and/or meeting notifications. Bidders should check for addenda before submitting their bid.

The awarding authority is the Town of Northfield Selectboard. The Franklin Regional Council of Governments and the Town reserve the right to accept or reject any or all bids in total or in part as they may deem to be in the best public interest.

FRANKLIN REGIONAL
COUNCIL OF GOVERNMENTS

Andrea Woods, Chief Procurement Officer

AUGUST 7, 2019

Date

The Franklin Regional Council of Governments (FRCOG) and the Town do not discriminate on the basis of race, color, national origin, sex, age, disability, or gender with respect to admission to, access to, or operation of its programs, services or activities. If you would like accessibility or language accommodation, please contact the Title VI Coordinator at 413-774-3167 (voice) (MA Relay System: 800-439-2370), 413-774-3169 (fax), or civilrights@frcog.org (e-mail).

Advertisement for Construction Services (MGL c. 149)

| | |
|--|----------|
| ☐ Greenfield Recorder Newspaper Legal Ad – | 8/7/2019 |
| ☐ Bids posted to FRCOG Webpage http://frcog.org/bids – | 8/7/2019 |
| ☐ IFB posted at Northfield Town Hall – | 8/7/2019 |
| ☐ Central Register Publication– | 8/7/2019 |

CRITICAL DATES

| | |
|-----------|--|
| 8/20/2019 | Mandatory On-Site Briefing Meeting 10:00am |
| 8/26/2019 | Deadline for Written Questions 2pm |
| 8/29/2019 | Addenda sent to Planholders |
| 9/6/2019 | BID OPENING 2pm (at Franklin Regional Council of Govts office) Submit 1 original and 1 copy. |

ESTIMATED DATES

| | |
|------------|---|
| 9/11/2019: | Bids evaluated |
| 9/13/2019: | Board of Selectmen Authorize Contract |
| 9/16/2019: | Work Begins |
| 90 DAYS | Work Completed (90 DAYS FROM NOTICE TO PROCEED) |

Bid Package Table of Contents

- General Conditions and Specifications
- Bid Instructions and General Contract Terms
- BID FORMS (all to be submitted to FRCOG)
- Sample Contract
- EXHIBIT 1
 - MA Prevailing Wage Reporting and Schedule
- EXHIBIT 2
 - Engineers Plans
 - Sheets T-0 and E-0 through E-4

INVITATION FOR BIDS

NORTHFIELD TOWN HALL ELECTRICAL UPGRADES-PHASE 3

SUMMARY OF THE WORK

(provided to give a general understanding and is not intended to be a complete description of the Work in the attached Specifications and Plans)

Relocate the existing PV system raceway system underground; provide new addressable fire alarm system and associated devices; provide battery calculations and provide new batteries, amplifiers and all other system components; provide a complete and UL Listed fire alarm system; install the existing PV array feeder and circuitry underground; and provide all required trenching and backfilling including patching the existing landscape.

I. GENERAL CONDITIONS

DEFINITIONS: Where “Owner”, “Awarding Authority” or “Town” is used, it shall mean the Northfield Board of Selectmen or their designee. Where “Engineer” is used, it shall mean Judith O’Brien, PE or her designee. Where “Contractor” is used, it shall mean the Firm hired by the Town of Northfield to perform the Work or the Contractor’s authorized Project Manager or designee. The Project Orientation meeting shall identify all authorized individuals.

SUMMARY: The work consists primarily of PV System and Fire Alarm System work at Northfield Town Hall, constructed in 1927 located at 69 Main Street, Northfield, MA. The Town engaged OWL Engineers, Judith O’Brien, PE, to design upgrades to the building’s systems. This is Phase 3 of the upgrades.

The Work of the contract shall consist of all construction materials, labor, equipment and services required by the drawings, specifications and other documentation, or as reasonably inferable from any or all of the Construction Documents. The Work shall be for the whole or part of the project as described in the Construction Agreement.

The Work of the project shall comply in all respects with applicable federal, state, county and/or city/town regulations, laws and codes. All required building and other permits shall be obtained before beginning construction.

All materials and workmanship shall be equal to the highest standard and shall be to the satisfaction of the Owner. Substitution of items will not be permitted unless specifically approved by the Engineer in writing.

EXAMINATION OF DOCUMENTS AND SITE: Before submitting a bid, each bidder shall examine the building carefully, shall read the Specifications and all other Bidding Documents. Each bidder shall fully inform himself/herself prior to bidding as to existing conditions and limitations under which the Work is to be performed, and shall include in his bid a sum to cover the cost of items necessary to perform the Work as set forth in the proposed Contract Documents. No allowance will be made

to a bidder because of lack of such examination or knowledge. The submission of a bid will be considered as conclusive evidence that the bidder has made such examination. A MANDATORY ON SITE PREBID MEETING will be held and only bidders who have sent a representative to this meeting will be allowed to bid.

HAZARDOUS MATERIALS/ STOP WORK: If hazardous-containing materials are encountered during the course of this work the Contractor shall cease removal work and immediately notify the owner. Town-approved Work Stoppages will not apply to the liquidated damages deadline.

PROJECT MEETINGS: Unless otherwise directed by the Town, weekly project meetings will be held to review project progress. Present at these meetings shall be a representative authorized to make commitments for action on behalf of the Engineer, the Contractor and the Town. The Engineer shall write minutes of all meetings and distribute them within 72 hours of the meeting to all parties present and to those on the distribution list given out at the orientation meeting. The EC shall revise the schedule weekly and shall bring the revised schedule with a detailed week look ahead to each project meeting

CONSTRUCTION TIME: The Agreement includes a stipulation that the Work be substantially completed within 90 days from the Notice to Proceed.

LIQUIDATED DAMAGES: Liquidated damages apply for each day beyond the contract completion date until the work is substantially complete.

A. As actual damages for any delay in completion are impossible to determine, the Contractor and his/her sureties shall be liable for and shall pay five hundred dollars (\$500.00) as fixed, and agreed liquidated damages for each calendar day of delay beyond the contract completion date until the work is substantially complete.

B. For purposes of liquidated damages, Substantial Completion means that the value of the work remaining to be done is, in the estimate of the Engineer, and approved by the Owner, less than one percent of the original contract price. When the Contractor considers the work to be complete, s/he shall request, in writing, to the Engineer, an inspection to be conducted by the Owner, the Contractor, and the Engineer. Any deficiencies in the work shall be noted in a monetized "Punch List" prepared by the Engineer. If the monetized punch list amounts to less than 1% of the original contract price, the work shall be considered to be substantially complete as of the date of the written request for a final inspection. If the monetized punch list amounts to more than 1% of the original contract price, the work shall be considered not substantially complete.

BUILDING PERMIT: It is the responsibility of the Contractor to apply for and secure a building permit for the Work. The Contractor is responsible for contacting the Engineer and the Town of Northfield's Building Inspector for timely and required inspections of the Work.

ACCESS TO BUILDING: Contractor shall be allowed access to the building during hours that the Town Hall is closed and there will be no requirement for a town representative to be on site. The Contractor shall assure that the building is secured and will use utmost care in protecting Town-owned property at all times.

ELECTRICAL SERVICE INTERRUPTION: Contractor may interrupt electrical service during normal Town Hall hours for brief periods and with planned notice to given to the Town representative.

MODIFICATIONS: All requests to modify the project scope, specifications or drawings shall be submitted to the Town in writing and must be approved by the Town in writing.

2. GENERAL SPECIFICATIONS

CONTRACT DOCUMENTS AND RELATED REQUIREMENTS:

The following specifications are considered minimum requirements for proper completion of the Work as described by the Documents. Provide all necessary permits, labor, materials, equipment, debris and demolition removal, safety procedures and supervision and all Project and Contract Closeout requirements and procedures.

Drawings, general provisions of the contract, including any supplementary conditions and other included specifications shall apply to the work of this project. The Documents show the work to be done under the contract and related requirements and conditions impacting the project. Related requirements and conditions include applicable codes and regulations, notices and permits, existing building conditions and restrictions on use of the building/site, requirements for Owner occupancy during the work, coordination with other work and the phasing of the work. In the event the Contractor discovers a conflict in the contract documents and/or requirements or codes, the conflict must be brought to the immediate attention of the Engineer for resolution. Whenever there is a conflict or overlap in the requirements, the most stringent shall apply. Any actions taken by the Contractor without obtaining guidance from the Engineer shall become the sole risk and responsibility of the Contractor. All cost incurred due to such action are also the responsibility of the Contractor.

CONTRACTOR(S):

The Contractor shall be solely responsible for the Work described in the contract agreement. S/he shall have complete control over construction methods, techniques and procedures and shall supervise such work with her/his best skill and attention. The Contractor shall pay for all labor, equipment, materials and services required to complete the Work as described in the Contract Agreement as well as building permits and other governmental fees, licenses and inspections necessary for the proper completion of the Work.

The Contractor warrants to the Owner that all materials and equipment required to complete the Work on the project will be of good quality and new, unless otherwise specified.

The Contractor shall take care in working near existing areas to protect them from damage. The Contractor shall be responsible for any damage to existing areas and will repair such damage, at his expense, to the Owner's satisfaction.

The Contractor shall keep the project site and surrounding area free from waste materials and rubbish which results from his work on the project. Providing a dumpster in the Town Hall parking

lot area, removal, hauling and disposal of rubbish and waste materials shall be the responsibility of the Contractor. Costs for dumpster and hauling shall be included in the lump sum fee.

The Contractor shall be held responsible for all damages resulting from his, or his subcontractors, errors, omissions or negligence in the performance of the Work of the Construction Agreement.

The Contractor shall hold harmless the Town and Engineer from and against all claims, damages, losses, expenses, legal fees or other costs resulting from the Contractor's performance of the Work of the Construction Agreement.

The Contractor shall provide the Town and Engineer access to the Work for review.

SUBCONTRACTORS:

The Contractor shall select the subcontractors, except that he shall not use subcontractors to whom the Owner has a reasonable objection. The Contractor shall not be required to use a subcontractor to whom he has a reasonable objection.

OSHA:

The work area shall be made OSHA safe by this Contractor. All workers must be OSHA trained and carry their OSHA cards.

JURISDICTION:

This agreement shall be governed by the laws of the Commonwealth of Massachusetts.

CONTRACTOR USE OF PREMISES:

The Contractor and Contractor's personnel, subcontractors and others providing portions of the Work of the project shall cooperate fully with the Owner regarding the use of the building to facilitate the Work.

PROJECT CHANGES:

Changes, modifications, additions and/or deletions to the Work under this agreement will only be made by written order signed by the Owner and the Contractor. Any such changes will not invalidate this Agreement. The time for project completion and the project cost will be adjusted accordingly.

PERSONNEL PROTECTION:

The Contractor is responsible for all safety and protection of all persons at the site of the Work.

3. PROJECT WORK SPECIFICATIONS

CONTRACTOR NOTE: THE SPECIFICATIONS MAY USE SOME PROPRIETARY MATERIALS AND CONSTRUCTION METHODS. THE SPECIFICATIONS, AS WRITTEN, ARE INTENDED TO SET A LEVEL OF QUALITY FOR THIS PROJECT. CONTRACTOR MAY USE ALTERNATE MATERIALS OF AN EQUAL OR GREATER QUALITY, BUT ONLY AS APPROVED IN WRITING BY THE ENGINEER. THE ENGINEER IS THE SOLE ARBITER OF THE QUALITY OF THE MATERIALS AND METHODS. Submit suggested alternatives to: bids@frcog.org before the due date for written questions..

CONTRACT CLOSEOUT:

PART 1 – GENERAL SUMMARY

This Section describes an orderly and efficient transfer of the completed Work to the Owner.

QUALITY ASSURANCE: Prior to requesting inspection by the Engineer, use adequate means to assure that the Work is completed in accordance with the specified requirements and is ready for the requested inspection.

PROCEDURES:

Substantial Completion:

The Engineer will inspect to determine status of completion.

Should the Engineer determine that the Work is not substantially complete:

- a. The Engineer promptly will so notify the Contractor, in writing, giving the reasons therefore.
- b. Remedy the deficiencies and notify the Engineer when ready for re-inspection.
- c. The Engineer will re-inspect the Work.

When the Engineer concurs that the Work is substantially complete:

- a. The Engineer will prepare a “Certificate of Substantial Completion”, accompanied by the Contractor’s list of items to be completed or corrected, as verified by the Engineer.
- b. The Engineer will submit the Certificate to the Owner and to the Contractor for their written acceptance of the responsibilities assigned to them in the Certificate.

Final Completion:

Verify that the Work is complete including, but not necessarily limited to any “punch list” items.

Certify that:

- a. Contract Documents have been reviewed.
- b. Work has been inspected for compliance with the Contract Documents.
- c. Work has been completed in accordance with the Contract Documents.
- d. Equipment and systems have been tested as required, and are operational.
- e. Work is completed and ready for final inspection.

The Engineer will make an inspection to verify status of completion.

Should the Engineer determine that the Work is incomplete or defective:

- a. The Engineer promptly will so notify the Contractor, in writing, listing the incomplete or defective work.
- b. Remedy the deficiencies promptly, and notify the Engineer when ready for re-inspection.

When the Engineer determines that the Work is acceptable under the Contract Documents, he will request the Contractor to make closeout submittals.

Closeout submittals include, but are not necessarily limited to:

- a. Operation and maintenance data for items for other Sections of these Specifications, and for other items when so directed by the Engineer.
- b. Warranties and bonds.

Evidence of compliance with requirements of governmental agencies having jurisdiction including, but not necessarily limited to:

- a. Certificates of Inspection.
- b. Certificates of Insurance for products and completed operations.
- c. Evidence of payment and release of liens.
- d. Final adjustment of accounts:
- e. Submit a final statement of accounting to the Engineer, showing all adjustments to the Contract Sum.

If so required, the Engineer will prepare a final Change Order showing adjustments to the Contract Sum which were not made previously by Change Orders.

INSTRUCTION: Instruct the Owner's personnel in proper operation and maintenance of systems, equipment, and similar items which were provided as part of the Work.

CLEANING

PART 1 – GENERAL SUMMARY

Throughout the construction period, maintain the building and site in a standard of cleanliness as described in this Section.

QUALITY ASSURANCE

Conduct daily inspections, and more often if necessary, to verify that requirements for cleanliness are being met.

PART 2 – PRODUCTS CLEANING MATERIALS AND EQUIPMENT:

Provide required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.

COMPATIBILITY:

Use only the cleaning materials and equipment which are compatible with the surface being cleaned, safe for personnel in the areas, and as recommended by the manufacturer of the material.

PART 3 – EXECUTION PROGRESS CLEANING:

General: Retain stored items in an orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing required protection of materials.

Do not allow accumulation of scrap, debris, waste material, and other items not required for construction of this work.

Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the ecology.

Site: Daily, and more often if necessary, inspect the site and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.

Weekly, and more often if necessary, inspect all arrangements of materials stored on the site by re-stacking and organizing.

Maintain the site in a neat and orderly condition at all times.

'Clean' for the purpose of this paragraph shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort and a hand-held broom.

FINAL CLEANING:

'Clean' for the purpose of this Article, except as may be specifically provided otherwise, shall be interpreted as meaning the level of cleanliness generally provided by skilled cleaners using commercial quality building maintenance equipment and materials.

Prior to completion of the work, remove from the job site all tools, surplus materials, equipment, scrap debris, and waste. Conduct final progress cleaning as described above.

DELIVERY STORAGE HANDLING

Delivery and Acceptance Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

Storage and Handling Requirements:

1. Store and handle materials in accordance with manufacturer's instructions.

2. Keep materials in manufacturer's original, unopened containers and packaging until installation.
3. Do not store materials directly on ground.
4. Store materials on flat, level surface, raised above ground, with adequate support to prevent sagging.
5. Protect materials and finish during storage, handling, and installation to prevent damage.

WARRANTY

In addition to other guarantees or warranties required under law or other sections of the specification, the Contractor warrants all materials furnished and labor performed under this Contract to be free from defects or errors in workmanship or installation for a period of one year from the date of Substantial Completion of work, as certified by the Engineer, except that for items of work not completed at the time of Substantial Completion, the warranty period shall be for one year from completion of those items of work. The Contractor shall indemnify the Authority for the full cost of any damage to the property that may result by reason of such defects or errors and shall indemnify the Authority from and against any and all claims, demands, losses, costs, expenses, liabilities, and damages, including reasonable attorney's fees and expenses, arising out of or on account of this Contract, including but not limited to claims brought against the Authority for alleged infringement of patents based upon any methods of construction of application or upon materials furnished under the Contract.



**PROJECT MANUAL AND INVITATION TO BID
NORTHFIELD TOWN HALL
ELECTRICAL ENGINEERING – PHASE 3
at
NORTHFIELD TOWN HALL
69 MAIN STREET
NORTHFIELD, MA 01360**

**Volume 1 of 1
Chapter 149
Bid Documents
July 25, 2019**

**PREPARED BY
OWL ENGINEERS
Judith O'Brien, PE
978.621.2391
jobrien@owlengineers.com**

SECTION 01010

SCOPE OF THE WORK

PART 1 - GENERAL

1.01 LOCATION OF WORK

- A. The work of this Contract shall be performed at the Northfield Town Hall 69 Main Street Northfield MA 01360

1.02 GENERAL SCOPE OF WORK

- A. The work to be done under this contract consists of the following:
1. Contractor shall provide all labor, materials and appurtenances in accordance, but not limited to, this Summary of Work, the remainder of this specification and the work shown on the plans.
 2. Contractor shall visit the site prior to commencement of work to coordinate work with The Town of Northfield and engineer to completely review any areas of concern and develop a schedule for approval.
 3. If the contractor uncovers any obstacles or issues during construction, the contractor shall contact the owner and engineer immediately. Change orders will not be approved if issues are not properly conveyed to the owner and engineer in a timely manner. At no time shall the contractor leave a hazardous condition unresolved for the purposes of documentation.
 4. The Contractor shall leave the area of work clean of all materials and debris at the end of each day and shall at all times keep the work area safe for contractor personnel, the building occupants and the general public. The building shall remain open and operational throughout this project.
 5. The contractor is responsible to leave all areas which required demolition completely patched to match surrounding areas and paint ready. The owner shall provide all painting.
 6. Contractor shall final clean each work area upon completion and acceptance to the standards and specifications of the Town of Northfield.
 7. All work shall be in strict conformance with all applicable code requirements.
 8. Proposals shall be inclusive of all work for complete installation and operation of equipment herein before described.
- B. The Contractor shall furnish and do everything, except as otherwise provided by specific notations herein or on the drawings, necessary to complete the work in accordance with the Plans and Project Manual. The contractor shall furnish all labor, materials, supplies, tools, water, machinery, implements, light, power, transportation, and other facilities required, and do all work necessary for the complete execution and completion of the Contract.
- C. All work and materials furnished and installed shall be of the best quality and workmanship, and to the satisfaction of the Engineer. There shall be no defect in the work or the operation thereof due to inferior materials or the workman like placing of any part. The work under this contract shall be performed at such times as may be necessary to facilitate the orderly progress of the work. It is the intention of these Specifications and Plans to cover all work necessary and incidental to the completion of this project, including all trades, as shown on the drawings or specified.
- D. Contractor shall do all necessary cutting and patching of structural and finish work as necessary to provide the finished results shown on the Contract Drawings and as herein specified.
- E. Work shall include all items included on the plans and specification this is a general description of work, this description is for general understanding and is not intended to exclude any work otherwise noted. The contractor shall relocate the existing PV system raceway system underground including but not limited to field coordination, conduit, grounding, building penetrations, and connection to existing and new equipment. The contractor shall provide new addressable fire alarm system and associated devices where shown on plans. All conduit and wiring

shall be run concealed and shall be the requirement of state building code, local code and NFPA. The EC shall provide battery calculations and provide new batteries, amplifiers and all other system components provide a complete and UL Listed fire alarm system. The EC shall install the existing PV array feeder and circuitry underground. The EC shall provide all required trenching and backfilling. The EC shall patch the existing landscape to match existing.

1.03 LIST OF DRAWINGS dated July 25th, 2019

Plan No. Description

T0.1 Title Sheet

Electrical

E-0 Legend and Notes
E-1 Electrical Details and Schedules
E-2 Electrical Basement New Work and Demo.
E-3 Electrical First Floor New Work and Demo.
E-4 Electrical Second Floor New Work and Demo.

END OF SECTION

SECTION 01330

SUBMITTALS

PART 1 - GENERAL

1.1 PROVISIONS INCLUDED

- A. The conditions of the Contract and other Sections of Division 1, GENERAL REQUIREMENTS, apply to the work under this Section..

1.2 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

A. Related Documents

1. This Article supplements the General Conditions.
2. Consult the individual Sections of the Specifications for the specific submittals required under those Sections and for further details and descriptions of the requirements.

B. General Procedures for Submittal

1. Within ten (10) days after the date set forth in the Notice to Proceed, hand deliver samples and shop drawings to the Engineer. Email of PDF shall be allowed.
2. Submit shop drawings for all material to be furnished giving detailed dimension, capacities, construction, size, arrangement, etc. Secure approval from the Engineer before fabricating, purchasing, releasing or installing such material.
3. Submit each submittal to the Engineer sufficiently in advance of performing the related work or other applicable activities, so that the installation will not be delayed by processing times, including disapproval with re-submittal (if required), coordination and other submittals, testing, purchasing, fabrications, delivery and similar sequenced activities. No extension of time will be authorized because of the Contractor's failure to transmit submittals to the Engineer sufficiently in advance of the work.
4. Transmit each submittal in a sequence which will not result in the approval having to be later modified or rescinded by reason of a subsequent submittal which should have been processed earlier or concurrently for coordination.
5. Only submittals received from and bearing the stamp of approval by the Contractor will be considered for review by the Engineer. Submittals shall be accompanied by a transmittal notice stating the name of the Project, date of submittal, "To", "From", (Contractor, Subcontractor, Installer, Manufacturer, Supplier), Specification Section or Drawing No. to which the submittal refers, purpose (first submittal, re-submittal), description, remarks, distribution record, signature or transmitter.
6. On the transmittal, or on a separate sheet attached to the transmittal, direct attention to any deviations, including minor limitations and variations, from the requirements of the Contract Documents. Submittals shall be marked to highlight the deviations.
7. All costs for printing, preparing, packaging, submitting, resubmitting, and mailing or delivering submittals specified in this Article shall be included in the proposed contract sum.

- C. Engineer's Action: The Engineer will review the Contractor's submittals and return them within seven (7) days with one of the following actions recorded thereon by appropriate markings:

1. Final Unrestricted Release: Where marked "Approved" the work covered by the submittal may proceed provided it complies with the requirements of the contract documents.

2. Final-But-Restricted Release: When marked "Approved as Noted," the work covered by the submittal may proceed provided it complies with the Engineer's notations or corrections on the submittal, and complies with the requirements of the contract documents.
3. Returned for Re-submittal: When marked "Revise and Resubmit," or "Disapproved," the work covered by the submittal (purchasing, fabrication, delivery or other activity) should not proceed. The submittal should be revised and resubmitted without delay, in accordance with the Engineer's notations stating the reasons for returning the submittal. If a submittal is disapproved more than (2) times by the engineer for cause, cost to review of all additional submissions shall be the responsibility of the contractor and shall be paid in advance of the review and approval.

D. Submission of Shop Drawings

1. Shop drawings shall be complete, giving all information necessary or requested in the individual Sections of the Specifications, and show adjoining work and details of connection thereto.
2. Shop drawings shall be properly identified and contain name of Project, name of firm submitting the shop drawings, shop drawing number, date of shop drawing and revisions, Contractor's stamp of approval and sufficient spaces near the title block for the Engineer's stamp.
3. If the contractor is providing hard copies he shall submit to the Engineer one (1) legible black line print of each shop drawing.
4. The engineer will scan and return the shop via email with a cover sheet indicating "Approved", "Approved as Noted" or "Resubmit". If approved the Contractor shall provide and distribute such number of prints thereof as required for his/her own and his/her subcontractors' use, and in addition submit, within five (5) calendar days after approval, one (1) print thereof to the Owner. If rejected the contractor shall resubmit within five (5) days.

E. Submission of Product Data

1. Submit to the Engineer, one (1) copy of product data. Email PDF is allowed.
2. Product data shall be accompanied by transmittal notice. The Contractor's stamp of approval shall appear on printed information in a location which will not mar legibility.
3. Product data returned by the Engineer with the stamp "Disapproved" shall be resubmitted in one (1) copy until the Engineer's approval is obtained. Additional fee may be required.
4. The engineer shall return via email with cover sheet indicating any changes required and a stamp of "approved", "approved as noted" or "revise and resubmit".

F. Submission of Samples

1. Unless otherwise specified in the individual Section, submit two (2) specimens of each sample.
2. Samples shall be of adequate size to permit proper evaluation of material. Where variations in color or in other characteristics are to be expected, submit samples showing maximum range of variation.
3. All other samples shall be delivered at the field office with a sample identification tag attached and properly filled in. Transmittal notice of samples so delivered with the Contractor's stamp of approval shall be mailed to the Engineer.
4. If sample is rejected by the Engineer, a new sample shall be resubmitted in the manner specified herein-above. This procedure shall be repeated until sample is approved in writing by the Engineer.

5. Samples will not be returned unless return is requested at the time of submission. The right is reserved to require submission of samples whether or not particular mention thereof is made in the Specifications.

1.3 PERMITS, FEES AND INSPECTION REPORTS

- A. Furnish to the Engineer, for transmittal to the Authority, copies of all permits, inspection reports and related fees required under the Contract.
- B. Submission of permits, inspection reports and related fees shall be a condition precedent to final payment.
- C. A copy of the building permit, electrical permit and fire alarm permit must be submitted to the owner and engineer prior to start of work. Provide hard copy to the owner, scan and email to the engineer of record jobrien@owlengineers.com

END OF SECTION

SECTION 02200

SITE PREPERATION AND EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The BIDDING AND CONTRACT REQUIREMENTS, DIVISION 0 and GENERAL REQUIREMENTS, DIVISION 1, are hereby made a part of this Specification Section.
- B. Examine all Drawings and all other Sections of the Specifications for requirements and provisions affecting the work of this Section.

1.2 SECTION INCLUDES

- A. The work to be done under this Section consists of furnishing all materials, labor, tools and equipment, and performing all site preparation and earthwork operations required in the course of work. Earthwork operations include, but are not limited to excavation, disposal, handling, stockpiling and re-handling, hauling, backfill compaction, fine grading, de-watering and sheeting and shoring. All work of this Section shall be performed as specified and shall be in conformity with S dimensions, lines, grades and sections as shown on the Drawings.
- B. This work shall include power and/or hand excavation and all incidental work.
- C. The work includes, but is not limited to, the following items:
 - 1. Trench Excavation, Bedding and Backfill for conduits, handholes, and splice boxes.
 - 2. Excavation and Embankment for Pavements.
 - 3. Site filling as required.
 - 4. Control of water by pumping or other methods, including sediment control.
 - 5. Sheeting, shoring and bracing to support trench walls, sides of excavations, existing structures or utilities.
 - 6. Compaction of embankment, fills, and backfills.
 - 7. Densification by proof-rolling of subgrade areas.
 - 8. Furnishing and placing borrow materials as indicated.
 - 9. Transport and stockpiling of surplus material.
 - 10. Site grading.
 - 11. Dust control.

1.3 RELATED WORK IN OTHER SECTIONS

- 1. Section 16100 – Electrical: Installation of new grounding, cables, conduit, handholes and splice boxes as specified in section.

1.4 REFERENCES

- A. The following Standards and Specifications form a part of these Specifications:
 - 1. American Society for Testing and Materials Standard.

2. ASTM D1556 Density of Soil in Place by the Sand – Cone Method
3. ASTM D1557 Moisture-Density Relation of Soils and Soil-Aggregate Mixtures
Using 10 pound (4.5kg) Rammer and 18 inch (145mm) Drop

1.5 CLASSIFICATION

- A. Excavation required under this contract shall not be classified separately. Excavation includes, but is not limited to, the following:
 1. Removal, handling, stockpiling, re-handling and/or disposal of all materials regardless of their nature encountered in the prosecution of the contract work.
 2. Removal and satisfactory disposal of all materials including the stripping of topsoil and for all other purposes indicated or required regardless of the material encountered.
 3. Removal and disposal of all masonry and concrete structures, concrete foundations, and concrete slabs encountered which require removal and disposal.

1.6 REUSE AND DISPOSAL OF MATERIALS

- A. To the extent possible, all excavated material shall be used for backfilling operations as indicated on the Drawings and within this specification, if suitable, determined by the Engineer.
- B. Rehandling of sub-base and base course materials shall be as directed by the Engineer.

1.7 SUPPORT OF EXCAVATION

- A. The Contractor shall utilize sheeting, shoring and bracing of all excavation as specified herein and as required for compliance with OSHA standards.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Gravel Borrow. Gravel borrow shall be either graded bank-run gravel or screened gravel consisting of hard, durable particles, free from loam or clay, and containing no stone with largest dimension over 4 inches.
- B. Crushed Stone:
 1. Crushed stone shall consist of durable crushed rock consisting of the angular fragments obtained by breaking and crushing solid or shattered natural rock and shall be reasonable free from thin, flat, elongated or other objectionable pieces.
 2. The crushed stone shall be free from any organic soil or perishable material and not more than 1.0 percent by weight of satisfactory material passing a No. 200 sieve will be allowed to adhere to the crushed stone.
- C. Sand Borrow. Sand borrow shall be clean, granular material free from loam or clay, surface coating and deleterious material.
- D. Common Borrow. Common borrow shall be bank-run gravel. It shall be clean, hard, durable, and free from dust or organic matter. Plastic index shall be greater than 10. It shall have

properties such that it may be readily spread and compacted for the formation of the embankment.

- E. Sub-base Course. Sub-base course for construction of fills in areas to be paved or where concrete walkways are to be re-installed shall consist of hard durable particles or fragments of granular aggregates. This material will be mixed or blended with fine sand, stone dust, or other similar binding or filler materials produced from approved sources. This mixture shall be uniform and shall comply with the requirements of these Specifications as to gradation, soil constants, and shall be capable of being compacted into a dense and stable sub-base. The material shall be free from vegetable matter, lumps or excessive amounts of clay, and other objectionable or foreign substances. Pit-run material may be used, provided the material meets the requirements specified.
- F. Pea Gravel. Pea gravel shall be rounded aggregate, particle size not less than 1/8 inch or more than 1/2 inch diameter meeting ASTM C-33 for quality and soundness. Not more than 3 percent shall pass a No. 8 sieve.
- G. Lumber. Lumber used for sheeting, shoring, bracing and other construction purposes shall be sound, straight grained, free from shakes, loose knots and other defects liable to impair its strength or durability. Lumber and sheeting may be reused, if in good condition. Lumber shall be spruce, fir or approved equal thereto.
- H. Steel Sheeting. Steel sheeting shall be an approved standard section, either new or used, weighing not less than 22 pounds per square foot of wall.

PART 3 - EXECUTION

3.1 General:

- A. The Contractor shall inform and satisfy himself as to the character, quantity, and distribution of all material to be excavated.
- B. If in the prosecution of the earthwork, it is necessary to interrupt existing surface drainage, sewers or underdrainage, conduits, utilities, or similar underground structures, or parts thereof, the Contractor shall be responsible for and shall take all necessary precautions to protect and preserve, or provide temporary services. The Contractor shall, at his own expense, satisfactorily repair all damage to such facilities or structures which result from any of his operations. Provide protection of existing drainage systems around all surface structures within the project area which will be subject to excessive run-off and siltation during construction.
- C. Subgrade at the bottom of excavation shall be undisturbed, or restored at the Contractor's expense. Unauthorized over excavation shall be replaced with compacted gravel borrow.
- D. All materials determined surplus shall be disposed of as directed by the Engineer. Unsuitable material as determined by the Engineer will be removed and disposed of off-site by the contractor.
- E. The Contractor shall conduct his operations so that existing ground surfaces not to be worked on within reasonable time will not be disturbed, in order that windblown sand and dust will be held to a minimum.

1. Except when otherwise specifically approved, all excavation shall be performed in the dry.
 2. All excavations shall be in accordance with appropriate OSHA standards.
- F. Equipment. The Contractor may use any type of earth moving, compaction, and watering equipment he may desire or has at his disposal, provided the equipment is in satisfactory condition and is of such capacity that the construction schedule can be maintained as planned by the Contractor and as approved by the Engineer in accordance with the total calendar days or working days bid for the construction.
- G. Movement of Construction Machinery. In compacting by rolling or operating heavy equipment adjacent to or parallel with the utilities or structures, displacement of or injury to the utility or structure shall be avoided. Movement of construction machinery over utility lines and/or structures at any stage of construction shall be at the Contractor's risk. Any damage caused thereby shall be repaired or replaced by the Contractor at no expense to the Authority.
- H. Haul. All hauling will be considered a necessary and incidental part of the work and its cost shall be considered by the Contractor and included in the contract price.

3.2 EXCAVATION

A. General:

1. Excavation shall be performed as indicated on the drawings to the lines, grades, and elevation shown or as directed by the Engineer. During the process of excavation, the grade shall be maintained so that the site will be well drained at all times. When directed, temporary drains and drainage ditches shall be installed to intercept or divert surface water which may affect the work.
2. If, at the time of excavation, it is not possible to place any material in its proper section of the permanent construction, it shall be stockpiled for later use. This includes suitable material to be used as trench backfill.
3. The Contractor shall perform all excavation for conduit, manholes and splice boxes to the lines and grades or elevations required. The excavation shall be of sufficient size to permit the placing of the full width and length of the conduit, manhole or splice box. Excavation shall include the removal of all material necessary for the installation of conduits, manholes and splice boxes.
4. Excavated material not required or acceptable for backfill shall be disposed of by the Contractor. Excavation shall not be carried below the required depth; but when it is, the trench shall be backfilled at the Contractor's expense with material approved by the Engineer and compacted to the density of the surrounding earth material.
5. Boulders, or any other objectionable material encountered in excavation, shall be removed and shall not be considered suitable backfill.
6. Provide sheeting, shoring and bracing as required and as specified herein. Unless otherwise provided, bracing, sheeting, or shoring involved in the construction of this work shall be removed by the Contractor after the completion of the structure. Removal shall be effected in a manner which will not disturb or mar finished construction.
7. After each excavation is completed, the Contractor shall notify the Engineer to that effect; and the conduit, manholes, etc., shall be installed after the Engineer has approved the depth of the excavation and the character of the foundation material.
8. Trench Excavation. Trenches and related excavations shall be of sufficient width and depth at all points to allow conduits to be laid, joints to be formed, and appurtenant

structures to be built in a workmanlike manner, and when needed, to allow for sheeting and shoring, pumping and draining, and/or for removing and replacing any materials unsuitable for foundations. Trench excavation shall meet the following requirements:

- a. The minimum width of the trench at the top of the electrical equipment, when placed, shall be a width that will permit the proper construction of joints and compaction of backfill around the equipment. The sides of the trench shall be vertical, unless otherwise approved by the Engineer. The maximum allowable width of the trench shall not exceed 12 inches on each side of the pipe when placed, unless otherwise approved by the Engineer.
 - b. Bottom trenches shall be carried to lines and shapes approved by the Engineer. Bottom of the trench shall be excavated to a depth of 6 inches below bottom of pipe to allow for the placement of the bedding material.
 - c. No tunneling shall be permitted in place of open trench construction, unless specifically authorized by the Engineer.
9. Excavations adjacent to existing underground utility lines and other underground structures shall be done by hand to insure against possible damage.
 10. Excavation just above the bottom of structures in trenches shall be done by hand so that foundations will rest on undisturbed earth, or disturbed subgrade re-compacted to the 95 percent of maximum dry density as determined by ASTM D1557.
 11. All excavation shall be in accordance with the appropriate OSHA standards.
 12. Final trimming excavation at bottom of trenches shall not be done until the ground water is at least one foot below exposed subgrade and the Contractor is ready to install equipment.
 13. Trenches shall only be opened at such times and to such extent as approved by the Engineer.
 14. Excavations in areas of paving to remain shall have paving cut before removal to provide a clean, square cut at the trench edge. Where permanent paving is to be placed, the paved surfaces shall be re-cut by machine, a minimum of 6 inches beyond the start of the undisturbed sub-base.
 15. Contractor shall remove offsite and properly dispose of any excess site materials.

3.3 SHEETING, SHORING AND BRACING

- A. Whenever the depth and/or locations of any excavation prevents completion with the specified and safe side slopes, the Contractor shall furnish in place and maintain such temporary wood or steel sheeting, sheet piling, shoring bracing, and the like, as may be required to support the sides of excavations and prevent any movement which could in any way injure the work, diminish the necessary width of the trench or other excavation, or otherwise delay the work or endanger workmen, adjacent structures, or utility lines.

3.4 DEWATERING

- A. The Contractor shall remove by pumping, draining, bailing, or otherwise, any water which may accumulate in trenches and other excavations. If an unacceptable quickening condition of bottom and walls of the excavation occurs, preventing the installation of the pipe lines and the storage tank in a satisfactory manner, the Contractor shall lower the water level a sufficient depth below the bottom of the excavation to remedy the condition. The Contractor shall form all pump wells, sumps, dams, flumes, or other works necessary to lower the water level below

the bottom of the excavation or to keep excavations entirely clear of water while pipelines and the storage tank are being installed.

3.5 PREPARATION OF SUBGRADE SURFACE

- A. Construction: Subgrade shall be shaped to line, grade and cross-section as indicated and compacted as specified. This operation shall include plowing, disking, and any moistening or aerating required to obtain specified compaction and cross-section.
- B. All soft and yielding material and material which will not compact readily when rolled or tamped shall be removed as directed by the Engineer and replaced with suitable material. After grading operations are complete, all loose stones larger than 2 inches in their greatest dimension shall be removed from the surface of all graded areas and disposed of.
- C. Any irregularities or depressions that develop under rolling shall be corrected by loosening the material at these places and adding, removing or replacing the material until the surface is smooth and uniform.
- D. Tolerances. In those areas upon which a sub-base or base course is to be placed, the top of the subgrade shall be of such smoothness that, when tested with at 16 foot straightedge applied parallel and at right angles to the centerline, it shall not show any deviation in excess of ½ inch or shall not be more than 0.05 feet from true grade as established by grade hubs or pins. Any deviation in excess of these amounts shall be corrected by loosening, adding, or removing materials, reshaping and re-compacting by sprinkling and rolling.
- E. Compaction. Subgrade in areas of embankments of fills shall be proof-rolled prior to placement of fill material or sub-base course. The subgrade surface in cut section areas shall be proof-rolled prior to placement of fill material or base course material. These areas shall be subjected to continuous passage of a self-propelled steel-wheeled vibratory compactor, weight and dynamic force to be approved by the Engineer. The Contractor shall plan his operations so that as soon as an area to be paved has been proof-rolled, it shall be covered with at least one lift of base course material.
- F. Proof-rolling operations shall be performed as required to result in the specified subgrade density and/or as follows:
 - 1. Rolling shall be continued for 10 passes in areas of cement concrete walkways and bituminous pavements.
 - 2. Proof-rolling operations shall be accomplished in a manner so as to not damage existing utilities or structures. The Contractor shall arrange and perform rolling and compaction of subgrade areas prior to installation of utilities.
- G. Density of Subgrade:
 - 1. Subgrade in areas to be filled shall be compacted to at least 95 percent of the maximum density to a depth of at least 6 inches below the surface.
 - 2. Subgrade in areas to be filled where the subgrade surface is within 8 inches of the bottom of base course elevation shall be compacted to at least 100 percent of the maximum density to a minimum depth of 6 inches.
 - 3. In cut section (excavated) areas, the subgrade shall be compacted to a minimum depth of 6 inches and to a density of not less than 100 percent of the maximum dry density.

4. Subgrade in cut section or fill section areas which will not be paved shall be compacted to 90 percent of the maximum density.
5. Maximum dry density of the material shall be determined by ASTM D1557.

H. Protection. At all times, the top of the subgrade shall be kept in such condition that it will drain readily and effectively. In handling materials, tools, and equipment, the Contractor shall protect the subgrade from damage by laying planks when directed and shall take other precautions as needed. In no case will vehicles be allowed to travel in a single track. If ruts are formed, the subgrade shall be reshaped and rolled. Storage or stockpiling of materials on the top of the subgrade will not be permitted. Until the subgrade has been checked and approved, no sub-base, base or surface course shall be laid thereon.

3.6 BEDDING

A. Equipment shall be placed on a sand borrow bed consisting of concrete sand. The bed shall be leveled and shaped as necessary to provide support for the equipment over its full length. Bedding shall be as specified by specified equipment manufacturer.

3.7 BACKFILL

A. Backfilling Trenches and Excavations

1. All trenches and excavations shall be backfilled within a reasonable time after installation of the conduits, or as directed. Inspection of conduits, manholes and handholes shall be preformed by the local inspectors and engineers prior to backfilling.

B. Compaction of Trenches. Each layer of backfill for trenches shall be compacted to a minimum of 95 percent of the maximum density of the material as determined by ASSTM D1557, except that the top 2 feet of backfill in areas of existing concrete walkways and bituminous pavements or areas to have new concrete walkways or to be paved shall be compacted to 100 percent of maximum density.

C. Densification of Trench Bottom. When trenches are excavated to the depth of the proposed pipeline, and prior to placement of bedding material, the trench bottom shall be densified using a pan type vibratory compactor. This densification shall continue until the settlements have been stabilized or until settlement has reached a depth of six inches, whichever is encountered first.

D. Densification shall be performed in dry trench bottom conditions.

E. Backfill

1. Homogenous backfill consisting of clean sand, gravel or other non-corrosive inert materials shall be placed under, along bottom side and to a depth of not less of one foot over to top of the equipment.
2. Complete backfill with common borrow and other materials as required for proposed finished grade materials.

3.8 DUST CONTROL

- A. The Contractor shall keep the entire construction project free of dust at all times.
- B. The material for this work shall consist of either calcium chloride or water.

3.9 GENERAL REQUIREMENTS

- A. Conduct site preparation operations in a manner to ensure minimum interference with normal traffic, streets, walks, parking areas, and other adjacent facilities.
- B. Protect from damage as a result of site preparation all existing facilities, fences, pavements, trees and planting, and existing improvements which are to remain.
 - 1. Restore any and all damaged items to their original condition and to the satisfaction of the Engineer.

3.10 REMOVALS

- A. Miscellaneous Cement Concrete:
 - 1. Cement concrete shall be broken and removed only after all electrical equipment, wires, cables and conduit have been removed.
 - 2. Disposal of the broken concrete off of the site shall be responsibility of the Contractor.

3.11 DISPOSAL OF UNSUITABLE AND SURPLUS MATERIALS

- A. All unsuitable material, including, but no limited to, broken pavement, concrete, mortar, pipes, conduits, concrete structures, broken or unsalvageable fences, fabric and post resulting from the site preparation shall become the property of the Contractor and shall be removed and disposed of off the site. The Contractor shall be responsible for proper disposal and shall obtain and provide copies to the Owner of all permits and authorizations as required for proper disposal.

3.12 PLACEMENT AND INSTALLATION OF PORTABLE CONSTRUCTION FENCES

- A. As a part of the site preparation work, the Contractor shall furnish, place and install portable fences as specified in Section 02444 of these Specifications. Portable fences shall be in place in an approved arrangement and location, prior to removal of existing fences. Security must be maintained at all times. The Contractor shall arrange, relocate, and reset portable fences throughout the work as required by the Owner or Engineer.

END OF SECTION

SECTION 02960

LAWNS AND PLANTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The BIDDING AND CONTRACT REQUIREMENTS, DIVISION 0 and GERNAL REQUIREMENTS, DIVISION 1, are hereby made a part of this Specification Section.
- B. Examine all Drawings and all other Sections of the Specifications for requirements and provisions affecting the work of this Section.

1.2 SECTION INCLUDES

- A. The work of this Section consists of all lawn work and related items as indicated on the Drawings and/or as specified herein and includes, but is not necessarily limited to, the following:
 - 1. Loam Borrow
 - 2. Fine Grading and Loaming
 - 3. Seeding
 - 4. Maintenance
 - 5. Guarantee
 - 6. Testing

1.3 RELATED WORK UNDER OTHER SECTIONS

- A. The following items of related work as specified and included in other Sections of the Specifications:
 - 1. Site Preparation and Earthwork – Section 02200

1.4 STANDARDS AND DEFINITIONS

- A. The following standards and definitions shall apply to the work of this Section.
 - 1. AOAC: Association of Official Agricultural Chemists.
 - 2. ASTM: American Society for Testing and Materials

1.5 EXAMINATION OF CONDITIONS

- A. All areas to be improved shall be inspected by the Contractor before starting work and any defects such as incorrect grading, or drainage problems shall be reported to the Engineer prior to beginning this work.
- B. The commencement of work by the Contractor shall indicate his acceptance of the areas to be improved, and he shall assume full responsibility for the work of this Section.

- C. The Contractor shall be solely responsible for judging the full extent of work requirements involved, including, but not limited to, the potential need for storing and maintaining plants temporarily and/or re-handling plants prior to final installation.

PART 2 - PRODUCTS

2.1 LOAM

- A. Loam shall be “fine sandy loam” or a “sandy loam” determined by mechanical analysis and based on the “USDA Classification System”. It shall be of uniform composition, without admixture of subsoil. It shall be free of stones greater than 2 inches, lumps, plants and their roots, debris and other extraneous matter as determined by the Engineer. It shall be obtained from naturally well-drained areas which have never been stripped before and have a history of satisfactory vegetative growth.
- B. In addition to the above requirements, all loam to be used for loaming and seeding shall be mechanically screened processed loam which passes a three-quarter inch by six inch (3/4” x 6”) screen size, and is free of excessive stone content as determined by the Engineer.
- C. Loam shall have an acidity range of pH 5.6 to pH 6.5 and shall contain not less than 4 % nor more than 12% organic matter, as certified by required tests.
- D. The loam stripped and stockpiled on the site may be used provided that, after testing and addition of necessary additives, it meets the above specification. The Contractor shall provide additional loam as required to complete the required work.
- E. All loam proposed for use shall be tested for conformance to the specifications.

2.2 SOIL ADDITIVES

- A. General: Soil additives shall be used to counteract soil deficiencies as recommended by the soils analysis and as supplements for particular lawn and planting purposes as specified herein.
- B. Sulfur for adjustment of loam pH shall be commercial of flour sulfur, unadulterated, and shall be delivered in containers with the name of the manufacturer, material, analysis and net weight appearing on each container.
- C. Ground limestone for adjustment of loam pH shall contain not less than 85% of total carbonates and shall be ground to such fineness that 40% will pass through a 100 mesh sieve and 95% will pass through a 20 mesh sieve. Coarser materials will be accepted provided the specified rates of application are increased proportionately on the basis of quantities passing the 100 mesh sieve.
- D. Humus shall be natural humus, reed peat or sedge peat. It shall be free from excessive amounts of zinc, low in wood content, free from hard lumps and in a shredded or granular form.
- E. According to the methods of testing of A.O.A.C., the latest edition, the acidity range shall be approximately 5.5 pH to 7.6 pH and the organic matter shall not be less than 85%. The minimum water absorbing ability shall be 200% by weight on an oven-dry basis.
- F. Peat moss shall be composed of the partly decomposed stems and leaves of any of several species of sphagnum moss. It shall be free from wood, decomposed colloidal residue and other

foreign matter. It shall have an acidity range of 3.5 pH to 5.5pH as determined in accordance with the methods of testing of A.O.A.C., latest edition. Its water-absorbing ability shall be a minimum of 1,100% by weight on an oven-dry basis.

- G. Sand shall consist of hard, durable grains of quartz or other rock, clean and free from foreign matter or chemical contamination.
- H. Fertilizer shall be as specified under LAWNWORK paragraphs.

2.3 LAWN WORK MATERIALS

A. Lawn Fertilizers

- 1. Fertilizer shall be a commercial product complying with the state and United States fertilizer laws. It should be delivered to the site in the original unopened containers that shall bear the manufacturer's certificate of compliance covering analysis. At least 50% by weight of the nitrogen content shall be derived from organic materials. Fertilizer shall contain not less than the percentages of weight of ingredients as follows or as recommended by the soil analysis.

| | | | |
|----|----------|-------------|--------|
| a. | Nitrogen | Phosphorous | Potash |
| | 10% | 6% | 4% |

- 2. Superphosphate shall be composed of finely ground phosphate rock as commonly used for agricultural purposes containing not less than 18% available phosphoric acid.

B. Proportion of Seed

- | | | | |
|----|--|--------------------|-----------|
| 1. | Botanical Name | Common Name | By Weight |
| 2. | Poa Pratensis | Kentucky Bluegrass | 90% |
| | (To consist of a mixture of the following varieties: "A-34", "Baron", "Bristol", "Nassau", and "Plush".) | | |
| 3. | Festa Rubra | Chewing Fescue | 10% |
| | (To consist of "Banner", "Jamestown", "Pennlawn", or other approved variety.) | | |

2.4 CHEMICALS AND INSECTICIDES

- A. Provide chemicals and insecticides as needed for fungus or pest control for lawns.

2.5 WATER

- A. If possible, the Owner shall furnish the Contractor upon request with an adequate source and supply of water at no charge. However, if the Owner's water supply is not available or not functioning, the Contractor shall be held responsible to furnish adequate supplies at his own cost. All work injured or damaged due to the lack of water, or the use of too much water, shall be the Contractor's responsibility to correct. Water shall be free from impurities injurious to vegetation.
- B. The Contractor shall provide all hoses, valves, timers, sprinklers, etc., for the watering system.

PART 3 - EXECUTION

3.1 LAWN CONSTRUCTION

A. Fine Grading and Loaming

1. Contractor shall obtain Engineer's written approval of previously completed rough grading work prior to commencing loam placement work.
2. Immediately prior to dumping and spreading the loam, the subgrade shall be cleaned of all stones greater than two inches (2") and all debris or rubbish. Such material shall be removed from the site.
3. Loam shall be placed and spread over approved areas to a depth sufficiently greater than six inches (6") so that after natural settlement and light rolling, a minimum six inch (6") compacted loam depth will have been provided and the completed work will conform to the lines, grades and elevations indicated. Supply additional loam, after testing and approval, as may be needed to give the specified depths without additional cost to the Owner.
4. No subsoil or loam shall be handled in any way if it is in a wet or frozen condition.
5. After loam has been spread, it shall be carefully prepared by scarifying or harrowing and hand raking. Remove large stiff clods, lumps, brush, roots, stumps, litter and other foreign matter. Remove all stones over one inch (1") in diameter from the top three inches (3") of the loam bed. Loam shall also be free of smaller stones in excessive quantities as determined by the Engineer.
6. The whole surface shall then be compacted with a roller or other suitable means to achieve a maximum dry density of 88 to 90 percent for the placed loam in accordance with compaction standards of ASTM D1557 Method D. During the compaction process, all depressions caused by settlement or rolling shall be filled with additional loam and the surface shall be regraded and rolled until presenting a smooth and even finish.

B. Incorporation of Additives

1. Soil additives shall be spread and thoroughly incorporated into the top four (4") of the loam layer by harrowing or other methods approved by the Engineer. The following soil additives shall be incorporated:
 - a. Ground limestone as required by soil analysis to achieve a pH of 6.0 to 6.5, but the maximum amount applied shall be one (1) pound per square yard.
 - b. Fertilizer at the rate of twenty (20) lbs. Per one thousand (1,000) square feet, or more, as recommended by the soil analysis.
 - c. Superphosphate at the rate of twenty (2) lbs. Per one thousand (1,000) square feet.
 - d. Humus or other soil amendments as required by soil analysis.
2. Following the incorporation of additives, the surface shall be re-compacted as required to meet the standards outline in Paragraph 3.01.A.6 above.

C. Lawn Construction – General

1. Contractor shall obtain Engineer's written approval of fine grading and bed preparation before doing any seeding.
2. Limit of work line shall be as indicated on the Drawings. In general, all grassy areas disturbed by the work of the Contractor shall be re-seeded as herein specified.
3. The season for lawn work shall be from April 1 to June 1, and from August 15 to October 15. The actual lawn construction work shall be done, however, only during periods

within this season which are normal for such work as determined by weather conditions and by accepted practice in this locality. At his option, and on his own responsibility, the Contractor may proceed under unseasonable conditions without additional compensation, but subject to Engineer's approval of time and methods.

4. Seed only when the bed is in friable condition, not muddy or hard.

D. Seeding

1. Hydro seed all existing grass areas disturbed by the construction.
2. Erosion control mesh shall be installed according to manufacturer's specifications in all drainage swales and all slopes of one vertical foot to three horizontal, or steeper, immediately after such areas have been seeded. Secure mesh with pegs following installation.
3. Watering shall be provided by the contractor.

E. Lawn Maintenance

1. Maintenance shall begin immediately after any area is seeded and shall continue for a minimum of sixty (60) days active growing period for planted areas following the completion of all lawn construction work, and until final acceptance of the project.
2. Maintenance shall include reseeding, mowing, watering, weeding, fertilizing, and resetting and straightening of protective barriers. Lawn work maintenance shall also include chemical treatments as required for fungus and/or pest control.
3. Watering:
 - a. The Contractor shall provide all labor and arrange for all watering necessary to establish an acceptable lawn, including any irrigation to maintain moist soil to a depth of at least four inches (4").
 - b. Watering shall be done in a manner which will provide uniform coverage, prevent erosion due to application of excessive quantities over small areas, and prevent damage to the finished surface by the watering equipment. The Contractor shall furnish sufficient watering equipment to apply one (1) complete coverage to the lawn areas in an eight (8) hour period.
4. Protection:
 - a. Lawn areas shall be protected by a three foot (3') high barriers constructed of two inch by two inch (2" x 2") hardwood stakes or iron pipes set eighteen inches (18") in the ground at ten foot (10') intervals and connected by No. 10 wire. Flags of white cloth shall be secured to the wire at center points between stakes.
 - b. Barriers must be raised immediately after lawn work construction and shall be maintained until acceptance.
5. Mowing and Edging:
 - a. The Contractor shall keep lawn areas mowed until acceptance of the contract by cutting to a height of two (2") when growth reaches three inches (3") or as directed by the Engineer.
 - b. At each mowing, all edges of walks, drives, plant beds and other border conditions shall be edge trimmed by hand or machine to produce straight and uniform edge conditions.

- c. Remove and discard clippings and debris generated by each mowing and edging operation.
6. During the maintenance period, any decline in the condition of lawns shall require the Contractor to take immediate action to identify potential problems and undertake corrective measures. If required, the Contractor shall engage and pay all costs for professional horticulturists to inspect lawns and to identify problems and recommend corrective procedures.

3.2 ACCEPTANCE STANDARDS FOR LAWNS

- A. Following the minimum required maintenance periods for lawn work construction, the Contractor shall request the Engineer in writing for a formal inspection of the completed work.
 1. Seeded areas shall be in vigorous growing condition with no discolored, dead or otherwise unacceptable areas. Grasses will have knit firmly to the loam subgrade and no weeds shall be present.
 2. At the time of acceptance, the Contractor shall remove temporary barriers used to protect lawn areas.
- B. Engineer's inspection shall determine whether maintenance shall continue in any part.

3.3 CLEANUP

- A. Absolutely no debris may be left on the site. Excavated material shall be removed as directed. Repair any damage to site or structures to restore them to their original condition, as directed by the Engineer, at no cost to the Owner.

END OF SECTION

SECTION 07841

THROUGH-PENETRATION FIRESTOP SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes through-penetration fire-stop systems for penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items.
- B. Related Sections include the following:
 - 1. Division 16 Sections specifying cable and conduit penetrations.

1.3 PERFORMANCE REQUIREMENTS

- A. General: For penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items, provide through-penetration fire-stop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated.
 - 1. Fire-resistance-rated walls including fire walls, fire partitions, fire barriers, and smoke barriers.
 - 2. Fire-resistance-rated horizontal assemblies including floors, floor/ceiling assemblies, and ceiling membranes of roof/ceiling assemblies.
- B. Rated Systems: Provide through-penetration fire-stop systems with the following ratings determined per UL 1479:

2 hour- data closet sleeves

1 hour- All corridors and as indicated on the drawings

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain through-penetration fire-stop systems, for each kind of penetration and construction condition indicated, through one source from a single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver through-penetration fire-stop 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 multi-component materials.
- B. Store and handle materials for through-penetration fire-stop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.7 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that through-penetration fire-stop systems are installed according to specified requirements.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration fire-stop systems.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the through-penetration fire-stop systems indicated for each application. Acceptable manufacturers are listed below. Manufacturers equal to those listed below are also acceptable
 - 1. A/D Fire Protection Systems Inc.
 - 2. Cooper
 - 3. Hilti, Inc.
 - 4. Johns Manville.
 - 5. Nelson Fire-stop Products.
 - 6. NUCO Inc.
 - 7. RectorSeal Corporation (The).
 - 8. Specified Technologies Inc.
 - 9. 3M; Fire Protection Products Division.
 - 10. Tremco; Sealant/Weatherproofing Division.
 - 11. USG Corporation.
 - 12. or Approved Equal

2.2 FIRESTOPPING, GENERAL

- A. Compatibility: Provide through-penetration fire-stop systems that are compatible with one another; with the substrates forming openings; and with the items, if any, penetrating through-penetration fire-stop systems, under conditions of service and application, as demonstrated by through-penetration fire-stop system manufacturer based on testing and field experience.
- B. Accessories: Provide components for each through-penetration fire-stop system that are needed to install fill materials and to comply with Part 1 "Performance Requirements" Article. Use only components specified by through-penetration fire-stop system manufacturer and approved by qualified testing and inspecting agency for fire-stop systems indicated. Accessories include, but are not limited to, the following items:

1. Permanent backing materials, including the following:
 - a. Slag-/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.
6. Fire stopping for data penetrations shall be removable and reusable pillow type or equal.

2.3 FILL MATERIALS

- A. General: Provide through-penetration fire-stop systems containing the types of fill materials indicated in the Through-Penetration Fire-stop System Schedule at the end of Part 3 by referencing the types of materials described in this Article. Fill materials are those referred to in directories of referenced testing and inspecting agencies as "fill," "void," or "cavity" materials.
- B. Silicone Foams: Multi-component, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, non-shrinking foam.
- C. 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 other surfaces requiring a non-slumping, gun-able sealant, unless indicated fire-stop system limits use to nonsag grade for both opening conditions.
 2. Grade for Horizontal Surfaces: Pour-able (self-leveling) formulation for openings in floors and other horizontal surfaces.
 3. Grade for Vertical Surfaces: Non-sag formulation for openings in vertical and other surfaces.

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 work.
 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Clean out openings immediately before installing through-penetration fire-stop systems to comply with fire-stop system 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 through-penetration fire-stop systems.
 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with through-penetration fire-stop systems. 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 through-penetration fire-stop system 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 through-penetration fire-stop systems from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestop system materials. Remove tape as soon as possible without disturbing firestop system's seal with substrates.

3.3 THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLATION

- A. General: Install through-penetration firestop systems to comply with Part 1 "Performance Requirements" Article and with firestop system manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming/damming/backing 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 fire-stop systems.
- C. Install fill materials for fire-stop systems 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 Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 FIELD QUALITY CONTROL

- A. Where deficiencies are found, repair or replace through-penetration fire-stop systems so they comply with requirements.
- B. Proceed with enclosing through-penetration fire-stop systems with other construction only after inspection reports are issued and fire-stop installations comply with requirements.

3.5 CLEANING AND PROTECTING

- A. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop 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 through-penetration fire-stop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce systems complying with specified requirements.

END OF SECTION 07841

**SECTION 16100
ELECTRICAL**

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SECTION 16100

ELECTRICAL

PART 1 - GENERAL

1.1 REFERENCES

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

1.2 SCOPE

- A. The existing PV conduit is installed both underground and above grade, the EC shall install the entire run underground. The EC shall provide required handholes and junction and extend as necessary. The EC shall provide all building cores required for this utility to be underground. The EC shall provide new grounding, power, data, telephone and fire alarm system and devices including all raceway, conductors, terminations and testing. The EC shall provide all necessary trenching and backfilling. The EC shall repair all landscaping and shall return it to its' original condition. The EC shall repair/patch the existing building where existing utilities have been removed. The EC shall remove all unnecessary exposed raceway even if it is not shown on the plans.
- B. Work shall include, but shall not be limited to, the following:
 - 1. Disconnects
 - 2. New Fire Alarm System including all testing.
 - 3. Conduit and raceways.
 - 4. Wire and cable.
 - 5. Branch circuit wiring.
 - 6. Wiring devices and plates.
 - 7. Fire seal, (and) fire-proof foam.
 - 8. Sleeving.
 - 9. Pull boxes and cable troughs.
 - 10. Building system grounding.
 - 11. Disconnection and removal of fire alarm
 - 12. Installation and testing of new fire alarm

13. Supervision and approval.
 14. Testing and Commissioning.
 15. Owner/Engineer Coordination
 16. Relocating certain parts of existing electrical system.
 17. Trenching and backfilling
 18. Patch/replace landscaping to match existing.
 19. Patch exterior as necessary after the removal of existing equipment located on building.
 20. Nameplates, labels and tags.
 21. Operating and maintenance instructions and manuals.
 22. Coordination drawings and shop drawings.
- C. Remove, extend, alter and reconnect existing conduits as directed by Engineer. Reconnect existing conduit that is cut and disconnected to accommodate work. Pull in new wires between nearest accessible outlets intended for reuse. Provide new conduit where wire cannot be pulled in existing. Connect new and existing work to function as complete, continuously grounded system. Remove conduit and equipment not intended for reuse and store where directed. Use conduit exposed by Work of this Contract in conjunction with nearest outlet intended for reuse as directed.

1.3 CONTRACT DOCUMENTS

- A. Work to be performed under this Section is in conjunction with work shown on the contract drawings.

1.4 SUBMITTALS

- A. Material and equipment requiring Shop Drawing submittals shall include but not be limited to:
1. Underground ductbank
 2. Handholes
 3. Conduit and raceways.
 4. Wire and cable.

5. Branch circuit wiring.
6. Fire watch as required and fire department testing
7. Communications
8. Wiring devices and plates.
9. Fire seal (and) (or) fire-proof foam.
10. Coring and Sleeving.
11. Pull boxes and cable troughs.

PART 2 - PRODUCTS

2.1 RACEWAYS

- A. Rigid metallic conduit shall be zinc-coated steel that conforms to industry standards, by Allied Tube and Conduit, Republic Steel, Wheatland Tube or approved equal.
- B. Intermediate metal conduit (IMC) shall be zinc-coated steel that conforms to industry standards, by Allied tube and Conduit, Triangle/PWC or approved equal.
- C. Electrical metallic tubing (EMT) shall be zinc-coated steel that conforms to industry standards, by Republic Steel, Allied Tube and Conduit, Triangle/PWC or approved equal.
- D. Wireways shall be sheet steel with hinged spring-latched covers, galvanized or painted to protect against corrosion. Provide necessary bends, couplings, connectors and other appurtenances. Interior parts shall be smooth and free of sharp edges and burrs. Wireways shall be by Square D or approved equal.
- E. Non-metallic conduit shall be Schedule 40 100% virgin polyvinyl chloride (PVC), 90°C UL-rated, by Carlon or approved equal.
 1. Conduit shall meet NEMA requirements and shall be UL-listed as required by Article 347 of NEC.
 2. Conduit, fittings and solvent cement shall be by single approved manufacturer.
 3. Material shall have minimum tensile strength of 7,000 psi at 73.4°F, minimum flexural strength of 11,000 psi, and minimum compressive strength of 8,600 psi.
- F. Flexible metallic conduit shall be galvanized, spiral wrapped metallic conduit (Greenfield) or liquid-tight flexible metallic conduit as specified for specific equipment.
- G. Conduit expansion fittings shall be threaded hot-dipped galvanized malleable iron with internal bonding assembly by O.Z./Gedney or approved equal.
- H. Conduit fire seat fittings shall have heat-activated intumescent material for fire rating equal to or higher than that of floor or wall by O.Z./Gedney or approved equal.

- I. Provide water-tight gland sealing assemblies with pressure bushings as required for penetrations.
- J. Provide threaded malleable iron or steel connectors and couplings with insulated throats; manufactured elbows; locknuts; and plastic or bakelite bushings at terminations, as necessary. Couplings and connectors shall be gland and ring compression or stainless steel multiple point locking or steel concrete-tight set screw. Compression couplings and connectors shall form positive ground. Set-screw connectors and couplings shall have wall thickness equal to conduit, case-hardened, hex-head screws and separate ground wire. Bushings for rigid steel and aluminum conduit and connectors for EMT shall have insulating inserts that meet requirements of UL 514 flame test.

2.2 JUNCTION BOXES, PULL BOXES AND CABLE TROUGHS

- A. Provide code gauge galvanized steel junction and pull boxes for conduit 1-1/4" trade size and larger, where indicated and as necessary to facilitate installation, of required dimensions, with accessible, removable screw-on covers. Provide junction and pull boxes in special sizes and shapes determined in field where necessary.
- B. Junction box covers shall be accessible. Do not install junction boxes above suspended ceilings except where ceiling is removable or where access panel is provided.
- C. Sheet metal pull boxes shall be supported adequately to maintain shape. Larger boxes shall have structural steel bracing welded into rigid assembly formed adequately to maintain alignment in shipment and installation. Secure covers with corrosion-resistant screws or bolts.
 - 1. Pull boxes exposed to rain or in wet locations shall be weatherproof.
 - 2. Pull boxes used with aluminum conduit shall be metal compatible with aluminum.
 - 3. Provide clamps, grids and other appurtenances to secure cables. No cable shall be unsupported for more than 30".
 - 4. No pull box shall be within 2 feet of another.
 - 5. Provided sealed, cast-alloy, hazardous-location boxes with sealing fittings in garages and other areas in which flammable gases or vapors may be present to prevent transmission of gases or vapors through conduits.
 - 6. Pull boxes connected to concealed conduits shall be mounted with covers flush with finished wall or ceiling. No aluminum pull box shall be embedded in concrete.
- D. Provide cable troughs of special shapes, design and construction required to install, support and enclose feeder cable throughout indicated routing. Troughs shall be as specified above for junction and pull boxes, with reinforcing, insulating supports and clamping for cable installation. Cables shall be continuous throughout troughs, and shall be racked in distributed phase groupings arranged with phase cables surrounding neutral conductors.

2.3 WIRE AND CABLE (600 V INSULATION)

- A. Provide single-conductor, annealed copper wire and cable with insulation rated 600 V, of sizes specified and scheduled on Drawings, by General Electric, Rome, Okonite or approved equal, for secondary service, feeders, branch and system wiring. Wire insulated for 300 V may be used where voltage is less than 100 V, if isolated from higher voltages. Wire sizes shown and specified are American Wire Gauge for copper. Aluminum wire and cable of ampacities equal to copper wire and cable may be used for conductors #1/0 and larger. Aluminum cable and wire shall be at least 61% conductive aluminum alloy, Excelloy by Alcoa or approved equal, except as specified otherwise.
- B. Wire #10 and larger shall be stranded; #12 and smaller shall be solid. Wire and cable shall have THWN-THHN or XHHW insulation.
- C. Motor control circuits and signal wiring may be #14 if NEC requirements are met. Branch circuits longer than 75' for 120 V and 175' for 277 V shall be at least #10 from panel to last outlet.
- D. Wiring within light fixtures and other high-temperature equipment shall have 150°C insulation as required by NEC.
- E. Cable for direct burial shall be UF.
- F. Splices and Terminations
 - 1. Make splices in branch circuit wiring with UL-listed, solderless connectors rated 600 V, of sizes and types required by manufacturer's recommendations with temperature ratings equal to those of wires. Splice connectors shall be screw-on. Insulate splices with integral covers or with plastic or rubber friction tape to preserve characteristics of wire and cable insulation.
 - 2. Provide standard bolt-on lugs with hex screws to attach copper wire and cable to panelboards, switchboards, disconnect switches and electrical equipment.
 - 3. Make terminations and splices for conductors #6 and larger with corrosion-resistant, high-conductivity pressure indent, hex screw or bolt-clamp connectors, with or without tongues, designed specifically for intended service. Connectors for cables 250 MCM and larger shall have two clamping elements or compression indents. Terminals for bus connections shall have two bolt holes.
 - 4. Ampacity of splices and connectors shall be equal to those of associated wires and cables.
- G. Arc-proofing
 - 1. Provide flexible, flame-retardant, organic-composition-coated elastomer arc-proofing tape on power cable in manholes and handholes, suitable to withstand 200 A arc for 30 seconds. Tape shall be self-extinguishing and shall not support combustion.
 - 2. Apply tape in single, half-lapped layer as required by manufacturer's recommendations. Secure with strips of red plastic film tape on 208Y/120V conductors and yellow plastic film tape on 408Y/277V conductors.

3. Tape shall have been tested with 186-hour distilled water exposure and 3% salt water and shall be ultra-violet- and weather resistant.
- H. Provide three-ply marlin twine lacing or self-extinguishing nylon straps with -65 to 350°F range for bundling conductors.

2.4 FEEDER IDENTIFICATION

- A. Provide nonferrous identifying tags or pressure-sensitive labels for cables, feeders, and power circuits in vaults, pull boxes, manholes and switchboard rooms, at cable termination and in other locations.
- B. Tags or labels shall be stamped or printed to correspond with markings on Drawings or marked so that feeder or cable may be identified readily. If suspended tags are provided, attach with 1/32" diameter nylon 55-pound test monofilament line or slip-free plastic cable lacing unit.

2.5 COLOR CODING

- A. Color code secondary service, feeders and branch circuit conductors as follows:

| <u>208/120 Volts</u> | <u>Phase</u> | <u>480/277 Volts</u> |
|----------------------|--------------|----------------------|
| Black | A | Brown |
| Red | B | Orange |
| Blue | C | Yellow |
| White | Neutral | Gray |
| Green | Ground | Green |

- B. Colors shall be factory-applied entire length of conductors by one of the following methods except as noted and limited below:
 1. solid color compound,
 2. solid color coating,
 3. colored stripping (2 stripes 180 degrees apart),
 4. colored bands or hash marks with maximum spacing of 18",
 5. colored fibrous covering, or
 6. surface printing every 12", maximum spacing of 18".
- C. Branch circuit conductors #12 and #10 shall have solid color compound, solid color coating. Neutrals and equipment grounds shall have solid compound or solid color coating (white, gray and green), except that neutrals with colored stripe shall be used where required by NEC. Conductors #8 and larger with stripes, bands or hash marks shall have background color other than white, green and gray.
- D. Solid color coating, stripes, bands or hash marks shall be strongly adherent paint or dye, sufficiently wide and clear to be readily distinguishable after installation.

- E. Alternative field-applied color coding methods may be used for wire #10 or larger, with color code specified in Subparagraph A:
 - 1. Apply 3/4" colored pressure-sensitive plastic tape in half overlapping turns for 6" from all terminal points and in boxes in which splices or taps are made. Apply last two laps of tape with no tension. Do not cover cable identification markings.
 - 2. Identify with nylon, self-extinguishing, self-locking colored cable ties. Ties shall accommodate wire sizes 1/16" through 1-3/4" in diameter and shall not be less than 0.18" wide. Minimum tensile strength shall be at least 50 lbs. Temperature range shall be -65⁰F to +350⁰F. Provide three ties to each wire at each terminal point starting 3" from terminal and spaced 3" apart and three ties to each wire in boxes where splices or taps are made with special tool or pliers, and cut off excess.

2.6 WIRE PULLING EQUIPMENT

- A. Provide polyethylene ropes for pulling wire.
- B. Provide fish wires in telephone conduits and other empty conduit systems required, without splices and with ample exposed lengths at each end.
- C. Provide wire pulling lubricants that meet applicable UL requirements as necessary.

2.7 CABLE SUPPORTS AND BOXES

- A. Provide cable supports and boxes for vertical feeders as required by NEC. Boxes shall be 10 gauge steel plates fastened to angle iron frame with removable covers secured with brass machine screws.
- B. Provide split wedge cable supports with clamps for cable without metallic sheath. Provide basket weave or approved equal cable supports approved by cable manufacturer for cable with metallic sheath. Supports shall be by O.Z./Gedney or approved equal.

2.8 HANDHOLES AND UNDERGROUND DUCT

- A. Handholes, Frames and Covers
 - 1. Enclosures shall be injection molded plastic.
 - 2. Covers shall be heavy -duty cast iron with machined bearing surfaces suitable for truck loading. Frame and cover shall weigh at least 400 pounds. Covers shall be indented, solid top, with anti-skid surface. PV, ELECTRIC or COMMUNICATIONS, as appropriate, shall be cast on upper side of each cover.
 - 3. Hardware shall be galvanized steel or stainless steel.
 - 4. Product shall comply with ATSM-d-635 or UL-94
 - 5. Boxes shall have adequate soil surface to prevent setting.

B. Rigid PVC Duct and Fittings

1. Provide 100% virgin PVC duct and fittings as specified in RACEWAYS Paragraph and as required by NEMA TC6 by Carlon or approved equal, rated for operating temperature of cable contained, of size and in locations indicated on Drawings.
2. Conduit and fittings shall be free of substances deleterious to wire and cable insulation.
3. Submit manufacturer's certification of compliance with Contract Documents.

C. Rigid Steel Duct and Fittings

1. Provide intermediate, rigid steel conduit by Allied Tube and Conduit, Wheatland Tube, Republic Steel or approved equal, of size and in locations indicated on Drawings.
2. Fittings shall be hot-dipped, zinc-coated malleable iron with internal bonding assemblies, by O.Z./Gedney or approved equal.

2.9 FIRE ALARM - ADDRESSABLE

A. General

1. Provide a complete addressable fire detection, alarm and control system with horn/strobe signaling devices in compliance with all applicable codes and authorities having jurisdiction. The system shall interface with all other building systems for monitoring and control functions as specified.
2. Provide automatic and manual, closed circuit, multiplex fire alarm communications according to the following Specifications and as shown on the Drawings, wired, connected and left in first class operating condition.
3. The system design and installation shall conform to the following standards:
 - a. All equipment shall be UL listed for its intended purpose.
 - b. All applicable NFPA standards, including but not limited to: 70, 72, 90A, 92A, and 101.
 - c. State Building Code.
 - d. The Americans with Disabilities Act (ADA)
 - e. All requirements of the Authority Having Jurisdiction (AHJ)
4. The equipment supplier and the Contractor shall demonstrate a minimum 5 years experience in the successful design and installation of addressable fire alarm systems similar in size and scope to that required for this project.
5. System shall operate from 3 wire AC supply with emergency generator backup on failure of normal system and integral standby battery source backup on failure of the emergency generator.
6. The installer and manufacturer's warranty shall be for a minimum period of one (1) year from the date of the final acceptance test approval.
7. Equipment shall be by one of the following manufacturers:
 - a. Edwards Systems Technology (EST)
 - b. FCI
 - c. Notifier
 - d. Simplex Grinnell

All references to manufacturers or suppliers model numbers are supplied to establish minimum standards of performance, function and quality. Equivalent equipment from one of the listed manufacturers above may be substituted for that specified.

- B. Sequence of Operation
1. Refer to Sequence of Operation Matrix on the plans and the Fire Protection Narrative for the intended system operation.
- C. Control
1. General Requirements
 - a. The microprocessor-based fire alarm system shall be designed and UL listed for Fire Alarm applications. The system operational characteristics shall be stored in non-volatile EEPROM memory, shall be field programmable and capable of being edited with no factory involvement.
 - b. The system shall support analog sensing techniques to monitor individual devices enabling the user to manually or automatically change the sensitivity parameters in accordance with design and application requirements. All inputs shall be subject to multi-level alarm verification. The system shall be capable of displaying status of the sensor by device. The system shall automatically identify any analog sensor which becomes dirty (maintenance alert), prior to false alarming. The system shall automatically conduct a recognized functional check of each sensor a minimum of three times daily. Failure of a sensor shall initiate a Trouble signal.
 - c. Standby batteries shall support the system in the event of a loss of primary power for 24 hours of full supervisory operation followed by 15 minutes of alarm. Batteries shall be mounted integral to the FACP.
 - d. An integral real time clock will provide time control functions including day of week programming to schedule control of detector sensitivity and alarm functions. The system shall be capable of multiple levels of alarm prioritization, and allow control by event, and may include cross zoning, stepping, and/or logic statement inputs.
 - e. Addressable loop wiring (Signaling Line Circuits - SLC) shall be wired in a Class A method. Each circuit shall allow for a minimum of 25% additional devices.
 - f. Communication circuits between networked fire alarm control panels shall be Class A.
 - g. Isolation Modules shall be provided to maintain circuit integrity in the event of an open, short or ground fault. Each addressable loop shall have a minimum of one (1) isolation module for every 20 devices or one (1) per floor; whichever is greater.
 - h. Non-addressable loop wiring (Initiating Device Circuits - IDC) shall be wired in a Class B OR Class A method.
 - i. Audible and visual circuits (Notification Appliance Circuits - NAC) shall be wired in a Class A method. Each circuit shall allow for a minimum of 25% additional devices. Provide a minimum of two (2) circuits per floor or area, alternately wiring adjacent notification appliances between circuits.
 2. Control Panel
 - a. The Fire Alarm Control Panel (FACP) shall support up to 250 supervised analog/addressable devices, 4 dedicated notification appliance circuits, RS485 peer-to-peer network communications and an RS232 printer/programming port. The panel shall be capable of operating in default mode whereby the system will respond to an alarm condition even in the event of an addressable loop communications failure. Peer-to-peer operation is the ability to perform global annunciation and control on a network-wide basis from any network panel or annunciator.
 - b. The FACP shall provide the overall system monitoring, testing, display, reporting and firefighter controls to override automatic actions.
 - c. The FACP shall monitor all initiating devices and respond in accordance with the Sequence of Operation. Each initiating device shall have full analog sensing capabilities. The FACP will identify the exact type and location of every device and maintain operating characteristics stored in on-board EEPROM memory.
 - d. The FACP shall be enclosed in a locking semi-flush enclosure. All panel initiating and control status indicators shall be visible through a clear Lexan window. Access to the control panel shall be by key. The FACP shall incorporate a primary CPU, complete system power supplies, standby batteries, annunciation and the required switch

functions to provide the system operation as specified. The main CPU shall have the necessary firmware to provide via software programming the following:

- 1) Logic statements/stepping alarm functions
- 2) Weekday/Holiday schedules
- 3) Analog sensitivity reporting
- 4) System sensor maintenance alerts
- 5) Individual sensor sensitivity adjustments
- 6) Day/night sensitivity adjustments
- 7) Alarm verification by point or zone
- 8) Alarm verification activity report
- 9) On demand system status printout
- 10) Normal and silent walk test
- 11) 1800 event history log and printout

e. All alarm and supervisory information shall be displayed on an 80-character backlit LCD display. The display shall be an integral part of the FACP and shall include a keypad with separate buttons for system status scrolling, alarm acknowledge, trouble acknowledge, reset and system drill. The unit shall have LED indicators for Normal, Alarm, Supervisory, Trouble and Test/Program.

f. Provide matrix switch and LED status panels for zone annunciation, zone disconnect, HVAC override or other related monitoring and control functions, integral to the FACP. These are intended for use by the Fire Department during an event, or by authorized personnel during testing periods. Keypad entered commands for these functions shall not be an acceptable substitute. Alarm LEDs shall be provided by type of device on a per floor and/or zone basis. Programmable two (2) position zone disconnect switches shall be provided on a per floor and/or zone basis with corresponding status LEDs. Placement of a switch in other than the normal condition shall initiate a supervisory signal.

3. Remote Cabinets

a. Provide distributed intelligent power supplies to accommodate the power requirements of NAC circuits. Power supplies shall communicate with the FACP via data communications, whereby each power supply shall report a loss of AC power, battery fail or ground fault, and each notification appliance circuit served shall be individually monitored for wiring integrity.

b. Provide fire alarm terminal cabinets where necessary. The cabinets shall have a removable hinged cover with lock and high barrier terminal strips with 64 or 128 point capacity mounted to a plywood backboard. Terminal cabinets shall be red and labeled with permanent white lettering

D. Initiating Devices and Accessories

1. Provide addressable detectors as shown on the drawings. Detectors shall be connected to the addressable loop with two wires. All detectors shall incorporate built-in identification for the system to automatically identify various types of sensors. Detectors shall utilize a flashing LED which denotes normal operation, and latched LED which indicates an alarm condition. All common types of analog detectors shall be interchangeable with common twist-lock bases. The standard base shall have a supervised LED output, and optional relay and isolator bases shall be available.

2. Analog sensors shall provide indication to the control panel that a detector requires maintenance, and shall operate in stand-alone mode in the event of an addressable loop communications failure.

3. Analog Photoelectric Smoke Detectors shall be continually monitored to measure any change in their sensitivity because of the environment (dirt, air temperature, humidity, etc.), and shall allow changes in sensitivity levels within the UL approved sensor's range. The photoelectric detector shall consist of a dust resistant, field cleanable photo chamber with microprocessor based solid state electronics.

4. Analog Ionization Smoke Detectors shall be continually monitored to measure any change in their sensitivity because of the environment (dirt, air temperature, humidity, etc.), and

- shall allow changes in sensitivity levels within the UL approved sensor's range. The ionization detector shall consist of self-compensating dual ionization chamber, microcomputer chip and solid state electronics.
5. Analog Duct Smoke Detectors shall be continually monitored to measure any change in their sensitivity because of the environment (dirt, air temperature, humidity, etc.), and shall allow changes in sensitivity levels within the UL approved sensor's range. Detector shall be photoelectric OR ionization in accordance with the ceiling mounted device specified above. Duct detectors shall be supplied with a housing, remote indicator and sampling tubes sized according to duct width.
 6. Furnish each duct smoke detector with alarm and remote test control station. Test control shall be key actuated two position Test-Normal.
 7. Analog Multi-Sensing Detectors shall employ photoelectric, ionization and thermal sensing principles. Sensors shall allow changes in sensitivity levels within the UL approved sensor's range.
 8. Analog Thermal detectors shall monitor the ambient temperature from 32 to 158° F, and provide fast response to rapid increases in temperature. Rate of rise detection rate and fixed setpoint shall be panel selectable.
 9. Manual Pull Stations shall be double action type with screw terminals and an integral toggle switch. The station shall be constructed of red Lexan with white raised letters, a key reset switch. The station shall have integral addressable electronics and mount to a standard single gang switch box or to a red cast aluminum, surface mount box when required.
 10. Provide clear Lexan covers over specified pull stations. Cover shall be provided with integral battery operated alarm module, which will emit a loud audible alert when the cover is opened. Covers shall be equal to Stopper or Sentry.
 11. Monitor Modules shall be provided to monitor and connect conventional initiating devices onto the addressable loop.
 12. Provide wall mounted Linear Beam Smoke Detectors including transmitter, receiver and remote test/indicator station where shown. Each detector shall provide 60 x 350 foot coverage, and have auxiliary Form "C" contacts monitored by a dedicated addressable input module.
- E. Notification Appliances and Accessories
1. Primary Notification Appliances shall be flush mounted combination horn/strobe units. Assembly shall be mounted on red lexan frame, on surface or flush wall/ceiling box. Where box is surface mounted, it shall be red cast aluminum.
 2. Visual notification appliances shall be self-synchronizing xenon strobes rated by UL 1971 test criteria and in accordance with the Americans with Disabilities Act and NFPA 72. Appliances shall have a field adjustable intensity listing ranging from 15 candela (cd) to 110 candela (cd) or as otherwise specified on the drawings.
 3. Audible notification appliances shall have a field adjustable UL 464 sound pressure level listing ranging from 80dBA to 90dBA at 10 ft.
 4. Exterior alarm bells shall be 24VDC, 6-inch diameter – red suitable for wet location.
- F. Remote Alarm Indicators shall be LED indicators on single gang plastic plates for smoke detectors as indicated on the plans.
- G. Control and Relay Modules shall be used to control conventional devices (notification circuits, AHUs, door holders, etc.) over the addressable loop. Modules shall provide a supervised output rated for 2 amps at 24VDC, and .5 amps at 120VAC.
- I. Provide BACnet interface to allow transmission of all alarm and status information for monitoring and/or control functions by the building ATC system.
- J. Exterior Strobe shall be a flashing weatherproof strobe/beacon with a minimum 150,000 candlepower. The strobe shall be installed on a weatherproof cast aluminum box and cover.
- M. Provide Digital Alarm Communicator/Transmitter for transmission of the alarm, Supervisory and Trouble signals to the Remote Supervisory Station. The Remote Supervisory Station shall retransmit these signals to the Owner's designated representative.
- N. Door Holders shall be rated 24VAC/DC magnetic flush, semi-flush, surface and/or floor mounted as indicated on the drawings. Minimum holding force shall be 25 pounds. Body shall be die cast with

polished chrome finish. Provide swivel catch with required rod lengths and back plates for secure mounting to door.

O. Provide a Knox Box Key Repository where shown and required in accordance with local requirements. Provide with microswitch for interconnection with the building security alarms to send signal when opened.

P. Provide As-Built Drawing Cabinet to house a complete set of as-built drawings housed in a red cabinet clearly marked 'As-Built Drawings' locked and keyed the same as the FACP.

Q. Submittals

1. The manufacturer shall provide copies of the following documents for review and evaluation in accordance with general requirements of Division 01 and 16:
 - a. Point to point wiring diagrams of the entire system including all conductor quantity and sizing, labeling (numerical and color coding) and interconnections. Each initiating device and notification appliance shall be given a unique identification. This identification and visual notification appliance devices and audible notification appliance tap settings shall be illustrated on the floor plans and submitted for approval with the wiring diagrams.
 - b. Individual device interconnection diagrams. Panel layouts shall indicate module placement and spare capacity allowance for future expansion.
 - c. Manufacturers catalog cut sheets of all components and devices.
 - d. Battery capacity calculations clearly indicating required and spare capacity.
 - e. Power supply capacity calculations including each circuit load, voltage drop and spare capacity.
2. Submission of certification records for qualifications of the technicians performing final connection and testing.
3. Submit written test report in accordance with NFPA72 Chapter 14 for notification of successful completion of each required test and a system Record of Completion in accordance with NFPA72 Section 10.18. Provide floor plan illustrating ambient and alarm sound levels to document notification appliance testing.
4. Submit operations manual detailing all functions and operations of the system. User operating instructions shall be provided prominently displayed on a separate sheet located next to the control unit in accordance with UL Standard 864.
5. Submit maintenance manuals and recommended spare parts list required to conform to NFPA maintenance guidelines. Instructions shall include but not be limited to:
 - a. Instructions for replacing any components of the system, including internal parts.
 - b. Instructions for periodic cleaning and adjustment of equipment with a schedule of these functions.
 - c. A complete list of all equipment and components with information as to the address and telephone number of both the manufacturer and local supplier of each item.
6. As-built drawings shall include all device addresses, alphanumeric descriptors assigned in the control panel, and final notification appliance tap settings with modified spare power supply capacity illustrated.

PART 3 - EXECUTION

3.1 REFERENCE

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

3.2 SPECIAL RESPONSIBILITIES

- A. Coordinate work of this Section with work of other Sections.

1. Provide information about items furnished under this Section to be installed under other Sections, as necessary.
 2. Obtain detailed information from manufacturers of equipment provided under this Section as to proper methods of installation.
 3. Obtain final roughing dimensions and other information as needed for complete installation of items furnished under other Sections or by Owner.
 4. Keep fully informed of shape, size and position of openings required for material and equipment provided under this and other Sections. Ensure that openings required for work of this Section are coordinated with work of other Sections. Provide cutting and patching as necessary.
- B. Coordinate installation and pay backcharges to local electric and telephone companies and city building and fire departments.

3.3 TESTING, INSPECTION AND CLEANING

- A. Test and inspect work provided under this Section as required by Contract Documents, codes, standards and authorities that have jurisdiction, to satisfaction of Architect. Notify Architect and authorities at least 48 hours before testing or inspection. Do not cover work before testing or inspection.
- B. Furnish Architect with certificates of testing and inspection for electrical systems, indicating approval of authorities that have jurisdiction and conformance with requirements of Contract Documents.
- C. Test wiring and connections for continuity and grounds before fixtures are connected; demonstrate insulation resistance by megger test as required. Insulation resistance between conductors and grounds for secondary distributions systems shall meet NEC requirements.
- D. Verify and correct as necessary: voltages, tap settings, trip settings and phasing on equipment from secondary distribution system to points of use. Test secondary voltages at bus in main switchboard, at panelboards, and at other locations on distribution systems as necessary. Test secondary voltages under no-load and full-load conditions.
- E. Test lighting fixtures with specified lamps in place for 10 hours; check fixtures in sections. Do not operate lamps other than for testing before final inspection by Architect. Replace lamps that fail within 90 days after acceptance by Engineer within Contract Price.
- F. Provide necessary testing equipment and testing.
- G. Failure or defects in workmanship or materials revealed by tests or inspection shall be corrected promptly and retested. Replace defective material.
- H. Clean switchboard, panels, and other equipment. Panelboard interiors shall be cleaned and vacuumed. Equipment with damage to painted finish shall be repaired to Engineer's satisfaction.
- I. Equipment

1. After completion of project, clean the exterior surface of equipment included in this section, including concrete residue.

3.4 NAMEPLATES

- A. Provide nameplates in or on panelboards, junction boxes and cabinets, and for special purpose switches, or other controls furnished or installed under this Section. Nameplates shall designate equipment controlled and function.
- B. Nameplates shall be laminated black with 1/4" high white recessed letters. Nameplates shall be securely attached to the equipment. All labels shall indicate the name of the panel or equipment and the panel and circuit number serving said equipment.

3.5 WIRING METHODS

- A. Install wire and cable in approved raceways as specified and as approved by authorities that have jurisdiction. Surface metal raceways shall not be used unless explicitly specified and shown on Drawings. Do not use surface raceways on floor. Do not use armored cable except as approved by local code for lighting and receptacle circuits in suspended ceilings and stud-wall partitions. Homeruns for lighting circuits shall be 3-phase, 4-wire run in conduit.
- B. Wire from point of service connection to receptacles, lighting fixtures, devices, equipment, outlets for future extension, and other electrical aparata as shown on Drawings. Provide slack wire for connections. Tape ends of wires and provide blank covers for outlet boxes designated for future use.
- C. Conductors #10 and smaller in branch circuit panelboards, signal cabinets, signal control boards, switchboards and motor control centers shall be bundled. Conductors larger than #10 in switchboards, motor control centers and pull boxes shall be cabled in individual circuits.
- D. Two or more conduits installed instead of single conduit shall contain duplicate conductors, including neutrals and ground conductors where required; total capacity of duplicate conductors shall be at least equal to capacity of conductors replaced.
- E. Follow homerun circuit numbers shown on Drawings to connect circuits to panelboards. Where homerun circuit numbers are not shown on Drawings, divide similar types of connected loads among phase buses so that currents are approximately equal in normal usage. Connect each branch circuit homerun with two or more circuits and common neutral to circuit breaker or switch in three-wire or four-wire branch circuit panelboard so that no two circuits are fed from same bus. Where panelboard cabinets are recessed, provide conduits with sufficient capacity for future conductors for spare branch circuit protective devices and spaces in panelboard; stub up concealed to junction box. Provide extensions above ceiling.
- F. Electrical metallic tubing may be used generally, if approved by local codes, for lighting fixture and receptacle circuits, telephone, inter-communications, signal and instrumentation circuits, and for control circuits. EMT may be used generally, if approved by authorities, in masonry walls, above hung ceilings, in equipment rooms, in mechanical and electrical chases and closets, in exposed locations along ceilings or walls above normal traffic level and where not subject to accidental damage or abuse. Do not

run EMT exposed below 8 feet above finished floor. All exposed conduit in finished areas shall be approved by the owner and engineer.

- G. Install connectors and couplings as recommended by manufacturers. Compression fittings shall not be used with rigid steel, intermediate metallic or aluminum conduit. Set screw fittings shall not be used with rigid aluminum conduit and shall not be used for other applications, unless specified and approved by Architect. If set-screw connectors are used, tighten to imbed screws in conduit.
- H. Conduit in concrete shall be rigid steel. EMT shall not be installed underground, in slabs on grade, in wet locations, in hazardous areas, or for circuits operating at more than 600 V. Buried metallic conduit shall be rigid steel. Run conduit in slabs above bottom steel reinforcing, below top reinforcing and inside beam stirrup, wall reinforcements and column ties.
- I. Rigid non-metallic conduit as specified in Part 2 of this Section may be used, if approved by local authorities, for installation in concrete slabs when installed as required by NEC and manufacturer's requirements. Penetrations from concrete slabs shall be made with rigid steel conduit and rigid steel conduit fittings only.
- J. Maximum outside diameters of raceways in conduit shall be 1/3 slab thickness. No more than two 20mm (3/4") raceways shall cross in floor slab at a single point. Submit raceway crossing locations for approval before pouring slabs and relocate at no expense to Owner as directed by Architect. Lateral spacing of parallel raceways shall be at least 153mm (6") on centers. Do not run conduit in slab less than 73mm(3") thick without express approval and direction of Architect.
- K. Raceways with outside diameters larger than 1/3 slab thickness shall be run concealed in hung ceilings in finished areas, exposed in unfinished Mechanical/Electrical and storage areas, below slabs on grade.
- L. Penetrate waterproof walls of structural slabs and foundation walls only where approved by Architect. Submit proposed penetration points, size openings and penetration methods to Architect for approval.
- M. Provide flexible conduits for connections to electrical equipment and to equipment furnished under Divisions 14 and 15 that are subject to movement, vibration or misalignment; where available space dictates; and where noise transmission must be eliminated or reduced. Flexible conduit shall be liquid-tight under following conditions:
 - 1. Exterior locations
 - 2. Moisture or humidity-laden atmospheres
 - 3. Corrosive atmospheres
 - 4. Where wash-down operations are possible
 - 5. where seepage or dripping of oil, grease or water is possible
- N. Run concealed conduit and EMT in as direct lines as possible with minimum number of bends of longest possible radius. Run exposed conduit and EMT parallel to or at right angles to building lines. Ends shall be free from dents or flattening.
- O. Conduit and EMT runs shall be mechanically and electrically continuous from service entrance to outlets. Conduit shall enter and be secured to cabinet, junction box, pull box or outlet box with locknut outside and bushing inside, or with liquid-tight, threaded, self-locking, cold-weld wedge adapter. Provide additional locknut for rigid conduit and wrench-tighten locknut for EMT or flexible conduit where circuit voltage exceeds 250

- V. Locknuts and bushings or self-locking adapters will not be required where conduits are screwed into tapped connections. Vertical conduit runs that terminate in bottoms of wall boxes or cabinets shall be protected from entrance of foreign material before installation of conductors.
- P. Size rigid steel conduit, EMT and flexible metallic conduit as required by NEC except as specified or shown on Drawings otherwise. Unless shown otherwise on Drawings, telephone conduits shall be at least 1”.
- Q. Check raceway sizes to determine that green equipment ground conductor fits in same raceway with phase and neutral conductors to meet NEC percentage of fill requirements. Increase duct, conduit, tubing and raceway sizes shown or specified as required to accommodate conductors.
- R. Unless specified or shown on Drawings otherwise, install conduit and EMT concealed. Unless specified or shown otherwise, conduit and EMT may be run exposed on unfinished walls and unfurred basement ceilings and in unfinished penthouses, attics and roof spaces. Provide stand-off clips for conduits on exterior masonry walls.
- S. Install conduit systems complete before drawing in conductors. Blow through and swab after plaster is finished and dry, and before conductors are installed.
- T. Expansion/Deflection Fittings: Conduit buried or secured rigidly on opposite sides of building expansion joints and long runs of exposed conduit subject to stress shall have expansion fittings. Fittings shall safely deflect and expand to twice distance of structural movement.
1. Provide separate external copper bonding jumper secured with grounding straps on each end of fitting.
 2. Conduits buried in concrete shall cross building expansion joints at right angles; provide expansion fittings as required by manufacturer’s instructions. Provide insulated bushings at ends of conduits.
- U. Sealing Fittings: Threaded sealing fittings for rigid steel conduits shall be zinc- or cadmium-coated, cast or malleable iron; sealing fittings for aluminum conduit shall be threaded cast aluminum. Fittings that prevent passage of water vapor shall be continuous drain.
1. Install and seal fittings as required by manufacturer’s recommendations. In concealed work, install fittings in flush steel box with blank cover plate.
 2. Install sealing fittings at following points, and elsewhere as shown:
 - a) Where conduits enter or leave hazardous areas equipped with explosion-proof lighting fixtures, switches, receptacles and other electrical devices.
 - b) Where conduits pass from warm to cold locations.
 - c) Where required by MEC.
 3. Secure conduit system as required by MEC.

- V. Attach pull ropes to conductors with basket-weave grips on pulling eyes. Pull cables that share conduit at same time.
- W. Provide inserts, hangers, anchors and steel supports as necessary.

3.6 UNDERGROUND CONDUITS

- A. Steel conduits in ground or on vapor barrier shall be field-coated with asphalt or shall have additional outside factory coating of polyvinyl chloride or phenomic-resin-epoxy material or other equally flexible and chemical-resistant material. Couplings and damaged areas of coated conduits shall be field-coated with same compound as conduits. Joints shall be threaded.
- B. Joints in conduits and fittings shall be watertight and shall meet requirements of manufacturer's installation recommendations. Threaded portions of steel conduits not encased in concrete, and adjoining ends of conduits, couplings and fittings, shall be coated with asphalt after installation. Connections between conduits of different types shall be made in approved manner, using adapters and other materials and methods recommended by conduit manufacturers.
- C. Where nonmetallic underground conduit enters building and continues inside to pull box, cabinet, or other electric apparatus, portion through floor or wall and within building shall be steel. Provide adapter below floor or outside wall to connect plastic and metal conduit.
- D. Where underground conduit enters building through membrane-waterproofed wall or floor, provide malleable iron seal with gland assembly and adjustable pressure bushings secured to masonry construction with one or more integral flanges. Membrane waterproofing shall be secured to device in watertight manner.
- E. Where underground conduit without concrete enveloped enters building through non-waterproofed wall or floor, provide Schedule 40 galvanized pipe sleeve. Fill space between conduit and sleeve with suitable plastic expandable compound or oakum and lead joint on each side of wall or floor.
- F. Excavation, shoring, bracing, backfiring and grading will be provided under Division 2. Trenches shall be evenly graded so that conduits slope uniformly at least 3" per 100 feet, without horizontal or vertical waves. Unless specified otherwise, conduit shall slope uniformly from one manhole to next or from high point between manholes. Avoid low points between manholes, or upturned elbows. Where it is impossible to avoid trap or low point in conduit without concrete envelope, drill ½" hole in bottom of conduit at low point and provide crushed stone sump below conduit.
- G. Run conduits straight between manholes and upturned elbows. Unavoidable bends in nonmetallic conduits shall be made with assembling couplings at slight angle if resulting radius is at least 100'. For radii less than 100', use 5° angle couplings or 5 factory-made bend sections. Conduits shall terminate in end bells where lines enter manholes.
- H. Support multiple conduit runs and banks on performed nonmetallic spacing blocks separators on 4' centers. Separator containing metal shall have metal noncontinuous and shall not form magnetic loop. Spacing between exterior surfaces of conduits shall be least 2" between telephone conduits, 2" between conduits containing cables operating at 600 V or less, 6" between telephone conduit and power conduit in same envelope, and 2-1/2" between conduits that contain cables operating at more than 600 V. Space

separators to prevent sagging of conduits and breaking of couplings and watertight seals, to maintain deformation of conduit at separators to 0.10" or less. Secure with cords where necessary. Do not use tie wires, reinforcing rods or metallic materials.

- I. Conduit envelopes shall be 2500 psi under Division 3, CONCRETE and shall extend at least three inches beyond exterior surface of each conduit in bank. Coordinate work of this section with that of Division 3.
 1. Envelopes may be poured directly against sides of trenches, if trench wall is clean, even and free of loose material. Remove loose dirt and extraneous material. Concrete shall be spaded during pouring to eliminate voids under and between conduits and honeycombing of exterior surfaces. Power-driven tampers or agitators shall not be used. Secure bolts sufficiently to prevent movement during concrete placement.
 2. Envelope between manholes shall be poured in single operation. Where more than one pour is necessary, provide 3/4" reinforcing rod dowels extending 18" into concrete on each side of joint.
- J. Envelope installed over extensive area of disturbed earth shall have separate 2500 psi concrete base.
- K. Envelope that crosses conduits, pipe lines under roads and driveways shall be reinforced. Provide reinforcement where envelopes connect to manhole and building walls. Envelopes that terminate for future extension shall have dowels as specified for joints between pours. Reinforcement shall be 3/4" rods in single layer 1-1/2" above bottom of envelope. Outside rods shall be 1-1/2" from outside edges of envelope and intermediate rod shall be placed in center of each space between conduits in lowest row.
- L. Trenches shall not be backfilled until envelopes have set sufficiently.
- M. After concrete envelopes have set, nonmetallic conduits shall be cleared with mandrel of same size as conduit.
- N. Where conduits cross under existing roadways, walks and other paved areas, steel or wrought iron conduits may be driven instead of conduits in trenches. After installation, paved grass areas and other areas disturbed shall be restored to original condition. Cap ends of spare conduits five feet beyond pavement and protect from mechanical damage. Mark conduit ends with concrete monuments 6" in diameter by 18" long set flush in ground with "S/C" indented in top.
- O. Arrange multiple conduit as shown on drawings. Make minor changes in location or cross sectional arrangement shall be made as necessary. Where conduit runs cannot be installed as shown because of conditions not discoverable prior to digging of trenches, request Architect's instructions before further work is done. Coordinate with other outside service work. Maintain existing outside services, unless directed otherwise by Architect and Owner.
- P. Seal active and spare conduit and duct that enters building shall be completely and at first termination with oakum or plastic expandable compound.
- Q. Underground conduits, including conduits underground outside of the building, in ground below floors within building and in inaccessible spaces between lowest floors and ground, shall be plastic encased in concrete envelopes. Secondary electric service

and telephone conduits run underground from utility service pole to building shall be steel fiber plastic.

3.7 GROUNDING

- A. Provide equipment grounding system as required by MEC. Equipment grounding system shall be designed so metallic structures, enclosures, raceways, junction boxes, outlet boxes, cabinets, machine frames, portable equipment and other conductive items in close proximity with electrical circuits operate continuously at ground potential and provide low impedance path for possible ground fault currents.
- B. Provide grounding network consisting of:
 - 1. Appropriate number of 3/4" diameter, 10' long copper-clad steel ground rod clusters and #4/0 copper ground wire connections from grounding loop to column as indicated.
 - 2. #4/0 grounding conductor at each panel cluster and to main switchgear and service transformers.
 - 3. Ground points shall be driven to achieve 5 ohms. Provide additional rods as required to achieve 5 ohms overall. Where geological conditions dictate, ground wire mesh may be provided or additional rods shall be driven in compacted earth areas as required to meet 5 ohm resistance requirement.
 - 4. Connections to ground loop system shall be made with Cadweld Process.
- C. Provide separate green insulated equipment grounding conductor for each single or three-phase feeder and each branch circuit. Install grounding conductor in common conduit with related phase or neutral conductors, or both. Parallel feeders installed in more than one raceway shall have individual full size green insulated equipment ground conductors.
- D. Determine numbers and sizes of screw terminals for equipment grounding bars in panelboards and other electrical equipment. Provide screw terminals for active circuits, spares and spaces.
- E. Provide green insulated grounding conductor in same raceway with associated phase conductors, as follows:
 - 1. From green ground terminals of receptacles to green 10-32 washer-in-head outlet box machine screw. (Receptacles with special cast boxes and factory-designed and approved ground path do not require separate ground jumper.)
 - 2. From green 10-32 washer-in-head machine screw in ceiling outlet box or junction box through flexible metallic conduit to ground terminal in fixture.
 - 3. From green 10-32 washer-in-head machine screw in ceiling outlet box or junction box through flexible metallic conduit to green 10-32 washer-in-head machine screw in switch outlet box in movable partitions.
 - 4. From green 10-32 washer-in-head machine screw in junction box or disconnect switch through flexible metallic conduit to ground terminal in connection box mounted on single phase fractional horsepower motor.

5. From distribution panel equipment ground bus to panelboard equipment ground bus.
 6. From distribution panel equipment ground bar to equipment grounding bar on busway.
- F. Provide green insulated grounding conductor in nonmetallic conduits or ducts unless specified otherwise.

3.8 FIRE ALARM SYSTEM - ADDRESSABLE

A. Installation

1. All interconnections shall be installed in accordance with the manufacturer's system wiring diagrams.
2. Final connections, panel start up, program, editing, and testing shall be conducted by qualified personnel with one of the following qualifications:
 - a. Factory trained and certified by the equipment manufacturer.
 - b. National Institute of Certification in Engineering Technologies (NICET) or IMSA fire alarm certified.
 - c. Trained and qualified by an organization listed by a national testing laboratory for the servicing of fire alarm systems.
3. Provide UL certification of the installation by a UL certified testing company.
4. The control panel manufacturer's representative shall be present to supervise panel start up, program editing and all tests.
5. A dedicated circuit connection for supplying power to each building fire alarm panel shall be provided. The power supply shall be equipped with a UL listed locking mechanism and identified with a red "FIRE ALARM CIRCUIT CONTROL" label.
6. Labels
 - a. All panels, terminal cabinets and annunciators shall be labeled with the Red plastic nameplates in accordance with other sections of this specification.
 - b. Remote Alarm Indicators and Remote Test and Alarm Stations shall be labeled with the Red plastic nameplates in accordance with other sections of this specification. The label shall indicate the device monitored and associated mechanical equipment tag or room designation where applicable.
 - c. All detectors shall be labeled with its assigned address on both the detector housing and the base with a black on clear typed label equal to Kroy 0.375 Industrial UV. The base address shall be legible without removal of the detector. The detector address shall be concealed when placed into the base.
 - d. Provide an engraved brass nameplate at the exterior beacon, mounted on the weatherproof box, indicating "BUILDING FIRE ALARM SYSTEM IN ALARM".
7. Wiring
 - a. Wiring for the fire alarm system shall not be installed in conduits, junction boxes, or outlet boxes with conductors of lighting and power systems.
 - b. Wiring for the fire alarm system shall be installed in conduit with limitations as outlined in Section 3.02 of this specification. The use of MC cable shall follow the guidelines provided in Section 3.03 of this specification. Exposed plenum rated wire/cable and/or fire alarm low energy cable will not be accepted.
 - c. Minimum wire sizes shall be as follows:
 - 1) Addressable loop wiring shall utilize minimum #16 AWG.
 - 2) Notification appliance circuits shall utilize minimum #14 AWG.
 - 3) Network communications wiring shall be a solid conductor non-shielded #16 twisted pair minimum.
 - d. All junction boxes shall be sprayed red and labeled "Fire Alarm". Conduit couplings shall be spray painted red prior to installation.

- e. Connections and splices shall be made using screw terminal blocks. No more than one conductor shall be installed under any screw terminal. The uses of wire nut type connectors are prohibited in the system.
 - f. All circuit conductors entering or leaving any mounting box, outlet box enclosure or cabinet shall be labeled in accordance with the wiring diagram. Labeling and color coding shall be consistent throughout the conductor run.
 - g. Wiring within any enclosure shall be readily accessible without removing any component parts.
 - h. No more than half loudspeaker/strobes or horn/strobes serving any floor or zone shall be connected to same circuit. Adjacent devices shall be alternately wired between circuits.
 - i. The fire alarm equipment manufacturer's representative shall be present for the connection of wiring to the control panel.
8. Control Panel
- a. The control panel and its assorted components shall be mounted so that no part of the enclosing cabinet is less than 12 inches nor more than 78 inches above the finished floor.
 - b. All manually operable controls shall be between 36 inches to 42 inches above the finished floor.
9. Detectors
- a. Detectors placement shall be in accordance with NFPA 72 requirements and recommendations.
 - b. Detectors shall be at least 12 inches from any part of any lighting fixture and at least 3 feet from diffusers of air handling systems.
 - c. Each detector shall be provided with appropriate mounting hardware as required by its mounting location.
 - d. Smoke detectors shall not be installed until the building has been thoroughly cleaned. Dust covers shall be installed over all smoke detectors until final testing commences. All detectors, which indicate reduced sensitivity due to dirty condition, shall be cleaned prior to commencement of final testing.
 - e. Detectors shall be provided with wire guard cages where subjected to physical abuse, such as in gymnasiums.
10. Notification Appliances
- a. Notification appliances shall be mounted in accordance with NFPA 72.
 - b. Coordinate final quantity, location and power settings of audible notification appliances with ambient sound levels and interior finishes to comply with minimum & maximum sound pressure level requirements as follows:
 - 1) Total sound pressure level produced by combining ambient with all audible notification appliances operating shall not exceed 110dBA at the minimum hearing distance.
 - 2) An average ambient sound pressure level of 105dBA shall require the use of visible notification appliances.
 - 3) Unless otherwise permitted by NFPA 72, minimum sound pressure level produced by audible notification appliances shall be 15 dBA above the average ambient sound level or 5 dBA above the maximum sound level having a duration of at least 60 seconds, whichever is greater, measured 5-ft above the floor.
11. Coordinate the proper notification system as required by the municipal fire department system. Provide all required equipment.
- B. Testing
- 1. The Contractor shall notify the Owner's Representative 10 business days before the tests are to be conducted. The tests shall be performed in accordance with the approved test procedures in the presence of the Owner's Representative. The Contractor shall furnish all instruments and personnel required for the tests.
 - 2. Preliminary Tests

- a. The Contractor shall perform insulation testing (megger), continuity and loop resistance checks on all system conductors to determine that the system is free from grounded, shorted, or open circuits. These tests shall be conducted prior to the installation of fire alarm equipment. Loop resistance measurement shall verify that the loop resistance does not exceed the manufacturers specified limits. Corrections shall be made and the system shall be retested to assure if deficiencies are found.
 - b. Measure air flow with pressure sensor at each duct smoke detector sampling port, at the lowest design air flow of the duct system. Sampling air flow shall exceed smoke detector manufacturer's requirements.
 - c. The Contractor shall perform complete functional and operational performance tests. Testing shall include verification that the circuits and components are electrically supervised and operate as intended. Coordinate functional testing with Elevator and HVAC Contractors where applicable to verify function of all control interfaces such as elevator recall and air handling unit shutdowns.
 - d. A written report detailing the results of the preliminary tests shall accompany the request for Final Acceptance Test. The written Preliminary Test Report shall be submitted with:
 - 1) The Operations and Maintenance Manual for the system.
 - 2) The record (as-built) drawings.
3. Final Acceptance Test
- a. The Fire Alarm System, other systems and equipment associated with the fire alarm system and accessory equipment shall be tested in accordance with NFPA 72. Verification of system completion shall be documented with a fully executed copy of the Record of Completion per NFPA 72 Figure 10.18.2.1.1. The listed tests in NFPA 72 Table 14.4.2.2 shall be conducted and documented with an executed copy of Figure 14.6.2.4 as well as manufacturer and job specific procedures to verify that the circuits and components are electrically supervised and operate as intended. The test shall include but shall not be limited to the following:
 - 1) Visual inspection of all wiring connections.
 - 2) Test of each function of the control panel.
 - 3) Test of each circuit in both trouble and normal modes.
 - 4) Tests of each alarm initiating device in both normal and trouble conditions. Remove each device from its base to test the supervisory feature.
 - 5) Tests of each control circuit and device.
 - 6) Tests of each alarm notification appliance. Open the wiring at the midpoint of the circuit to test the wiring supervisory feature. Provide copy of FACP printer output verifying proper operation. Verify each device's audible and visual output.
 - 7) Tests of the primary and secondary power supplies and associated loss of each.
 - 8) Complete operational tests under emergency power supply.
 - 9) Ground fault monitoring circuit function.
 - 10) Measurement of sound pressure levels throughout the protected space. Provide background and evacuation signal sound levels on the floor plan submitted with device address and tap settings.
- C. Maintenance Contract
1. The Contractor shall include as part of their base bid the cost of a one-year test and inspection contract, to be held by the company which shall certify the completed installation. The contract shall provide for quarterly inspections in accordance with NFPA72 and local requirements. Any equipment found to be defective during the warrantee period shall be replaced by the Contractor at no additional charge to the Owner.
- D. Training

1. Training course shall be provided for the operations and maintenance staff. The course shall be conducted in the building where the system is installed or as designated by the Owner's Representative. The training period shall consist of one training day (8 hours per day) and shall start after the system is functionally completed but prior to final acceptance tests. The instructions shall cover all of the items contained in the operating and maintenance instructions.

END OF SECTION

4. **BID INSTRUCTIONS and GENERAL CONTRACT TERMS**

See the Sample Contract, attached for detailed contract terms and conditions

1. Sealed Bids, plainly marked **“Bid for Northfield Town Hall Electrical Upgrades- PHASE 3”** in the lower left corner of the envelope, should be submitted to Andrea Woods, Chief Procurement Officer, Franklin Regional Council of Governments, 12 Olive Street, Suite 2, Greenfield, MA 01301-3313. **The original (UNBOUND) and one copy should be submitted. Emailed or faxed bids will not be accepted.**
2. If you received this bid package from any source other than the Franklin Regional Council of Governments, you must request / download the bid from <https://frcog.org/bids> to receive any addenda/notices that may be issued regarding this bid.
3. All work is to be done by licensed, certified, and skilled tradespeople.
4. The contractor will be bound by all applicable statutory provisions of law of the Federal Government, the Commonwealth of Massachusetts, and local codes (including current building and fire codes).
5. As the Town is exempt from the payment of Federal Excise Taxes and Massachusetts Sales Tax, prices quoted herein are not to include these taxes.
6. Prevailing Wage rates set at the Massachusetts Department of Labor and Industries apply. Appropriate wage schedule is attached.
7. Labor and Materials/Payment Bond is required at the time of contract signing in the amount of 50% of the construction bid. Bond form will be provided by FRCOG.
8. A bidder will be held to the terms and the prices submitted for the duration of the contract period if a contract is signed by both parties within 30 days from bid opening.
9. Contract execution will be conditioned upon producing an insurance certificate as outlined on the INSURANCE REQUIREMENTS page.
10. A contract substantially in accord with the Sample Contract found in this bid package will be required to be signed by the Contractor and the Town of Northfield. The Engineer’s specifications will be central to the legally binding contract. Any terms or conditions that cannot be met by the bidder must be brought to the FRCOG’s attention in a Written Question before the deadline. If the matter can be resolved in an Addendum, one will be issued so that all Bidders are notified of any exceptions allowed.
11. The contract resulting from this bid will be awarded to the lowest responsible and responsive contractor based upon price, past performance and reliability of the contractor, quality of product and/or service, and degree of exclusion, exemption, or restrictions on the bid.
12. A contract will be signed between the awarded contractor and the Town of Northfield. .
13. The Franklin Regional Council of Governments Chief Procurement Officer will be available to answer any general questions about procedure, etc., but no question will be answered that in any way could give an unfair advantage to a contractor except through a written Addendum. Written questions will be accepted up to 4 days prior to the bid deadline.

Inquiries should be directed to:

Andrea Woods, Chief Procurement Officer
Franklin Regional Council of Governments
12 Olive Street, Suite 2, Greenfield, MA 01301-3313
(413) 774-3167 X 104
bids@frcog.org

14. The Contractor must submit with their response a list of **at least five (5)** projects which they have successfully completed, giving the name and address of the projects so that they may be investigated prior to the award of the contract. **Public** projects of similar size and scope are preferred. A contact person with CURRENT PHONE NUMBER must be provided for each reference.
15. Bids which are incomplete, not properly endorsed or signed, or otherwise contrary to instructions may be rejected as non-responsive by the Chief Procurement Officer. Conditional Bids will not be accepted.
16. Any inferior or damaged product, as determined by the Town of Northfield, will be replaced at the total expense of the Vendor.
17. Any restrictions, qualifications, or deviations from specifications must appear either on the Bid Form or on an attachment thereto.
18. OSHA Certification
All contractors working on public works projects will be required to certify that ALL employees employed at the work site have successfully completed an OSHA approved course in construction safety at least 10 hours in duration. This law requires general contractors to have on file records of all employees' OSHA 10- hour training and provide proof to the various agencies in charge of the work. This also applies to all subcontractors, hired trucks, and hired equipment with operators. Every bidder must certify that all persons who are employed by them for this bid are certified. Proof does not have to be submitted with this bid, but must be available upon request.

19. INSURANCE REQUIREMENTS

The Contractor shall at all times during the Contract maintain in full force and effect Employer's Liability, Worker's Compensation, Bodily Injury Liability, and Property Damage and General Liability Insurance, including contractual liability coverage. All insurance shall be by insurers and for policy limits acceptable to the **TOWN OF NORTHFIELD** and before commencement of work hereunder the Contractor agrees to furnish the TOWN certificates of insurance or other evidence satisfactory to the TOWN to the effect that such insurance has been procured and is in force.

For the purpose of the Contract, the Contractor shall carry the following types of insurance in at least the limits specified below:

| COVERAGES | LIMITS OF LIABILITY |
|-----------------------|---------------------|
| Worker's Compensation | Statutory ** |
| Employer's Liability | \$500,000.00 |

| | |
|---------------------------|--|
| Automobile Liability | \$1,000,000.00 combined single limit for bodily injury and property damage |
| General Liability | \$1,000,000.00 each occurrence \$2,000,000.00 aggregate |
| Excess Umbrella Liability | \$1,000,000 |

** A "Workers Compensation Insurance Affidavit: General Business" as issued by the Massachusetts Department of Industrial Accidents will be required of the winning bidder(s) at contract signing if any employees/owners of the Company are not covered under the WC policy.. See <http://www.mass.gov/lwd/docs/dia/forms/f-aff-general.pdf>

The Town of Northfield shall be named as additional insured under the liability and automobile insurance. The excess/umbrella liability insurance policy should contain a broad form general liability endorsement.

Failure or refusal of the successful bidder to execute and deliver a Signed Contract, Certificate of Insurance, and Performance and Payment Bonds acceptable to the Town within ten days after notice of contract award will result in the forfeiture of the Bid Deposit/Bond as Liquidated Damages. The Contract will be awarded to the next lowest qualified bidder or the IFB re-advertised, as the Town believes is in the best public interest.

Checklist of Required Signed Submittals:

- Bid Form
- Bid Signature Page with Corporate Resolution or List of Partners if applicable
- Tax Compliance Form
- Non Collusion Form
- Debarment Form
- OSHA Statement
- 5% Bid Deposit/ Bond (payable to TOWN OF NORTHFIELD)

Items required at Contract Signing:

- Proof of Insurance with the Town of Northfield named as Additional Insured
- 50% Labor and Materials Payment Bonds drawn on a MA Licensed Surety

SAMPLE CONTRACT – A CONTRACT SUBSTANTIALLY IN ACCORD WITH THIS CONTRACT WILL BNE SIGNED
BETWEEN THE TOWN AND THE AWARDED CONTRACTOR

OWNER-CONTRACTOR AGREEMENT

NORTHFIELD TOWN HALL ELECTRICAL UPGRADES – PHASE 2

THIS AGREEMENT made this _____ day of _____ in the year 2019 , between _____ with a usual place of business at _____ hereinafter called the CONTRACTOR, and the Town of NORTHFIELD, MA, acting by its Board of Selectmen, at its usual place of business 69 MAIN STREET, NORTHFIELD, MA 01360, hereinafter called the OWNER.

The CONTRACTOR and the OWNER, for the consideration hereinafter named, agree as follows:

1. Scope of Work

The Contractor shall furnish all labor, materials, equipment, bonds and insurance to perform all work required for the project known as NORTHFIELD TOWN HALL ELECTRICAL UPGRADES PHASE 3 (the "**Project**"), in strict accordance with the Contract Documents and all related Drawings and Specifications. The said Documents, Specifications, Drawings and any general and supplementary conditions included in the Invitation for Bids soliciting this Agreement and the Contractor's bid submitted in response thereto are incorporated herein by reference and are made a part of this Agreement.

2. Contract Price

The Owner shall pay the Contractor for the performance of this Agreement, subject to additions and deductions provided herein, in current funds, the sum of \$_____ (in words).

3. Commencement and Completion of Work

It is agreed that time is of the essence of this Agreement. The Contractor shall commence and prosecute the work under this Agreement upon the Owner's issuance of a Notice to Proceed. In the absence of appropriate funding, the Owner shall have the right to terminate this Agreement without further liability to the Contractor. All work pursuant to this Agreement shall be completed within 90 DAYS of the Notice to Proceed.

- A. Definition of Term: The Term "Substantial completion" shall mean the date certified by the Owner when the Project is sufficiently complete, in accordance with the Contract Documents, so the Owner may utilize the project, or designated portion(s) thereof, for the use for which it is intended.
- B. Time as Essential Condition: It is understood and agreed that the commencement of and substantial completion of the work are essential conditions of this Agreement. It is further agreed that time is of the essence for each and every portion of the Contract Documents wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the Contract Documents any additional time is allowed for the completion of any work, the new time fixed by such extension shall be of the essence of this Agreement. It is understood and agreed that the times for the completion of the work are reasonable, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.
- C. Progress and Completion: Contractor shall commence work promptly upon receipt of a Notice to Proceed and shall prosecute and complete the work regularly, diligently and uninterruptedly at such a rate of progress as will insure Substantial Completion within the stipulated Project Schedule.

4. Performance of the Work

- A. Direction of the Work: The Contractor shall supervise and direct the Work, using his best skills and attention which shall not be less than such state of skill and attention generally rendered by the contracting profession for projects similar to the Project in scope, difficulty and location. The Contractor shall maintain adequate supervisory personnel at the project site during the performance of the Work. He shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Agreement.
- B. Responsibility for the Work:
- (1) The Contractor shall be responsible to the Owner for the acts and omissions of his employees, Subcontractors and their agents and employees, and other persons performing any of the Work under a contract with the Contractor. This obligation shall also extend to the presence on the Site of suppliers of materials or equipment, their employees, contractors, and agents engaged in the work.
 - (2) The Contractor shall not be relieved from his obligations to perform the Work in accordance with the Contract Documents either by the activities or duties of the Owner in its administration of the Agreement, or by inspections, tests or approvals required or performed by persons other than the Contractor.
- C. Permits and Fees: Unless otherwise expressly provided, the Contractor shall secure and pay for all permits and fees, licenses and inspections necessary for the proper execution and completion of the Work which are customarily secured after execution of the Agreement and which are legally required at the time the bids are received, and the same shall at all times be the property of the Owner and shall be delivered to the Owner upon completion of the Project.
- D. Notices, Compliance With Laws:
- (1) The Contractor shall give all notices and comply with all federal, state and local laws, ordinances, rules, regulations and lawful orders of any public authority bearing on the performance of the Work. The Contractor shall provide the Owner with reproductions of all permits, licenses and receipts for any fees paid. The Owner represents that it has disclosed to the Contractor all orders and requirements known to the Owner of any public authority particular to this Agreement.
 - (2) If the Contractor observes that any of the Contract Documents are at variance with applicable laws, statutes, codes and regulations in any respect, he shall promptly notify the Owner in writing, and any necessary changes shall be accomplished by appropriate modification.
 - (3) If the Contractor performs any Work which he knows or should know is contrary to such laws, ordinances, rules and regulations, and without such notice to the Owner, he shall assume full responsibility therefor and shall bear all costs attributable thereto that are incurred by the Owner.
 - (4) In the performance of the Work, the Contractor shall comply with all applicable federal, state and local laws and regulations including those relating to workplace and employee safety. All workers on the site must have OSHA 10 certification at a minimum. The Contractor shall notify the Owner immediately of any conditions at the place of the work which violate said laws and regulations and shall take prompt action to correct and eliminate any such violations.
- E. Project Superintendent: The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site at all times during the progress of the Work. The superintendent shall represent the Contractor and all communications given to the superintendent shall be as binding as if given to the Contractor. Important communications shall be confirmed in writing. Other communications shall be so confirmed on written request in each case.
- F. Progress Schedule: The Contractor, immediately after being awarded the Contract, shall prepare and submit for the Owner's information an estimated progress schedule for the Work. The progress schedule shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.
- G. Drawings, Specifications and Submittals:

- (1) The Contractor shall maintain at the site for the Owner one record copy of all Drawings, Specifications, Addenda, Change Orders and other Modifications, and "As-Built" Drawings and Specifications in good order and marked currently to record all changes made during construction of the installation, and approved Shop Drawings, Product Data and Samples. These shall be delivered to the Owner upon completion of the Work.
 - (2) By approving and submitting Shop Drawings, Product Data and Samples, the Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that he has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.
 - (3) The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Owner's approval of Shop Drawings, Product Data or Samples unless the Contractor has specifically informed the Owner in writing of such deviation at the time of submission and the Owner has given written approval to the specific deviation. The Contractor shall not be relieved from responsibility for errors or omissions in the Shop Drawings, Product Data or Samples by the Owner's approval thereof.
 - (4) The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data or Samples, to revisions other than those requested by the Owner on previous submittals.
 - (5) No portion of the Work requiring submission of a Shop Drawing, Product Data or Sample shall be commenced until the submittal has been approved by the Owner. All such portions of the Work shall be in accordance with approved submittals.
- H. Protection of the Work and Owner's Property: The Contractor shall at all times safely guard the Owner's property from injury or loss in connection with this Agreement. He shall at all times safely guard and protect his own work, and that of adjacent property from damage. All Work shall be performed in compliance with the conditions for on-site work defined in the Technical Specifications included in the Invitation for Bids soliciting this Agreement. The Contractor, and its subcontractors, if any, shall be responsible for the security of all material, supplies and equipment maintained on the premises until the completion of the Work.
- I. Quality of the Work: The Contractor shall perform the work in a good, workmanlike manner. The Contractor hereby guarantees that the entire work constructed by him under the Agreement will meet fully all requirements thereof as to quality of workmanship and materials. The Contractor hereby agrees to make at his own expense any repairs or replacements made necessary by defects in materials or workmanship supplied to him that become evident within one year after the date of the final payment, and to restore to full compliance with the requirements set forth herein any part of the work constructed hereunder, which during said period is found to be deficient with respect to any provisions of the Contract Documents. The Contractor also agrees to indemnify and hold the Owner harmless from claims of any kind arising from damage due to said defects. The Contractor shall make all repairs and replacements promptly upon receipt of written orders for same from the Owner. If the Contractor fails to make the repairs and replacements promptly, the Owner may do the work and the Contractor shall be liable to the Owner for the cost thereof.
- J. Warranty: The Contractor guarantees to Owner that all materials incorporated into the work will be new unless otherwise specified or agreed. Prior to final payment, the Contractor shall deliver to the Owner all manufacturers' warranties, together with such endorsements or assignments as are necessary to ensure to the Owner the full rights and benefits of such warranties.
- K. Affirmative Action/Equal Employment Opportunity: The Contractor is directed to comply with all applicable federal laws, state laws, Ordinances, Bylaws, and rules and regulations regarding affirmative action/equal employment opportunity requirements. The Contractor shall not discriminate against any person because of race, age, handicap, sex, creed, color, religion, national origin, ancestry, sexual orientation, or any protected class under the law. Failure of the Contractor to comply with any such law, rule or regulation shall constitute grounds for the Owner to terminate the Agreement.

- L. Site Information Not Guaranteed; Contractor's Investigation: All information given in the Contract Documents relating to existing conditions, natural phenomena, existing structures is from the best sources at present available to the Owner. All such information is furnished only for the information and convenience of the Contractor and is not guaranteed. It is agreed and understood that the Owner does not warrant or guarantee that the conditions, natural phenomena, existing structures encountered during construction will be the same as those indicated in the Contract Documents. Contractor has familiarized himself with the nature and extent of the Contract Documents, work, locality, and with all local conditions and federal, state, and local laws, rules, ordinances, and regulations that in any manner may affect costs, progress, or performance of the Work. Contractor has made, or has caused to be made, examinations, investigations, and tests and studies of such reports and related data in addition to those referred to in the paragraph above as he deems necessary for the performance of the Work at the Contract Price, within the Contract Time, and in accordance with the other Terms and Conditions of the Contract Documents; and no additional examinations, tests, investigations, reports, and similar data are or will be required by the Contractor for such purposes. Contractor has correlated the results of all such observations, examinations, investigations, tests, reports, and data with the Contract Documents. Contractor has given the Owner written notice of all conflicts, errors, or discrepancies that he has discovered in the Contract Documents, and the resolution thereof by the Owner is acceptable to the Contractor. It is further agreed and understood that the Contractor shall not use or be entitled to use any of the information made available to him or obtained in any examination made by him in any manner as a basis of or ground for any claim or demand against the Owner, arising from or by reason of any variance which may exist between the information made available and the actual subsurface conditions or other conditions or structures actually encountered during the construction work, except as may otherwise be expressly provided for in the Contract Documents.

5. Wage Rates

Prevailing Wage Rates as determined by the Commissioner of the Department of Labor and Workforce Development under the provisions of Massachusetts General Laws, Chapter 149, Section 26 to 27G, as amended, apply to this project. It is the responsibility of the Contractor to provide the Owner with certified payrolls and to comply with all requirements of the above-cited statutes. The schedules of prevailing wage rates are included in the Contract Documents.

6. Payments to the Contractor

Within fifteen (15) days after receipt from the Contractor of a proper and satisfactory payment request of the amount due, the Owner shall have fifteen (15) days to make payment for:

- A. The work performed during the billing period.
- B. The materials not incorporated in the Work but delivered and suitably stored at the site (or at some location agreed upon in writing) to which the Contractor has title, or to which a Subcontractor has title and has authorized the Contractor to transfer title to the Owner.
- C. Less the following retention items:
 - 1. A retention based on an estimate of the fair value of the Owner's claims against the Contractor.
 - 2. A retention for direct payments to Subcontractors, if any, based on demands for same in accordance with the provisions of Section 39F of Chapter 30 of the General Laws.
 - 3. A retention not exceeding five percent (5%) of the approved amount of the periodic payment.
- D. After the receipt of a request for final payment and within sixty-five (65) days after the Contractor fully completes the Work, or substantially completes the Work so that the value of the Work remaining to be done is, on the estimate of the Owner, less than 1% of the original Contract Price, the Owner shall pay the Contractor the entire balance due on the Contract less:

1. A retention based on an estimate of the fair value of the Owner's claims against the Contractor and of the cost of completing the incomplete and unsatisfactory items of work.
 2. A retention for direct payments to Subcontractors, if any, based on demands of same in accordance with the provisions of Section 39F of Chapter 30 of the General Laws, or based on the record of payments by the Contractor to the Subcontractors under this Contract if such record of payment indicates that the Contractor has not paid Subcontractors as provided in Section 39F of Chapter 30 of the General Laws.
- E. Changes in the Work: No changes in the work covered by the approved Contract Documents shall be made without prior written approval of the Owner.
- F. Claims for Additional Costs: If the Contractor wishes to make a claim for an increase in the Contract Sum, he shall give the Owner written notice thereof within twenty (20) days after the occurrence of the event giving rise to such claim. This notice shall be given by the Contractor before proceeding to execute the Work, except in an emergency endangering life or property. No such claim shall be valid unless so made. Any change in the Contract Sum resulting from such claim shall be authorized by Change Order.
- G. Final Payment, Effect: The acceptance of final payment by the Contractor shall constitute a waiver of all claims by the Contractor arising under the Agreement.
- H. Contract Documents: The Contract Documents consist of the following, together with this Agreement:
- Invitation for Bids
 - This Contract Form
 - Contractor's Bid and Bid Form and any Graphics submitted
 - Labor & Materials Payment Bond
 - Non-Collusion Certificate
 - Tax Compliance Certificate
 - Clerk's Certificate of Corporate Vote
 - Certificate of Insurance
 - General Requirements
 - Specifications and Addenda
 - Schedule of Prevailing Wages

7. Terms Required By Law

This Agreement shall be considered to include all terms required to be included in it by the Massachusetts General Laws, and all federal laws, as though such terms were set forth in full herein.

A. Indemnification:

- a. To the fullest extent permitted by law, the Contractor shall defend, indemnify, and save harmless the Town and its respective duly elected or appointed officials, agents and employees (referred to collectively as "**Town**") from and against all demands, claims, damages, liabilities, losses, costs, and expenses (including, but not limited to, reasonable attorney fees) (referred to collectively as "**demands**") arising out of or resulting from any work performed pursuant to this Agreement including but not limited to any negligent acts, errors, or omissions of the Contractor, any subcontractor of the Contractor, or any person directly or indirectly employed by any of them, or by a defect of a product or design supplied by the Contractor or subcontractor. Such obligation shall not negate, abridge, or reduce in any way any additional indemnification rights of the Town, that otherwise may exist under statute or in law or equity.
- b. Contractor assumes full responsibility for relations with any subcontractors employed directly or indirectly by the Contractor and the Contractor shall defend, indemnify, and save harmless the Town from all demands made against the Town by such subcontractor, such subcontractor's agent or employee, or any person, as the result of such subcontractor's work performed pursuant to this

Agreement including but not limited to negligent acts, errors, or omissions that arise out of, result from, or are connected with the performance of this Agreement or any subsequent Agreement and is not otherwise subject to indemnifications under subparagraph "a" above.

- c. The Contractor shall defend, indemnify, and hold harmless the Town from any and all demands relating to wages, overtime compensation, or other employee benefits by employees employed directly or indirectly by the Contractor for work performed in connection with the work hereunder or required by state or federal law, including but not limited to Fair Labor Standards Act and Massachusetts Prevailing Wage Law.
- d. The indemnification obligations of the Contractor and subcontractor shall not be limited in any way by any limitations on the amount or type of damages, compensations, or benefits payable by or for the Contractor or subcontractor under any federal or state law.
- e. In the event of a breach of this Agreement by the Contractor, the Contractor shall pay the Town all reasonable attorney fees, costs and other litigation expenses incurred by the Town in enforcing its rights as a result of said breach in addition to any damages for said breach.

B. Insurance

The Contractor shall purchase and maintain such insurance as will protect both the Owner and the Contractor from claims which may arise under the Agreement, including operations performed for the named insured by independent contractors and general inspection thereof by the named insured. In addition, the Contractor shall require its subcontractors to maintain such insurance. Coverage shall be provided for:

- (1) claims under workers' or workmen's compensation, disability benefit and other applicable employee benefit acts;
- (2) claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
- (3) claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
- (4) claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or (2) by any other person;
- (5) claims for damages, including damages to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
- (6) claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle; and
- (7) claims involving contractual liability applicable to the Contractor's obligations under Article 15. The limits of liability for coverage required under the preceding paragraph shall be as required by the Owner.

Except for Workmen's Compensation, all liability coverage shall name the Town of NORTHFIELD as an additional insured and shall provide for 30 days prior written notice to the Owner of any modification or termination of coverage provided thereby. The Contractor shall provide the Owner with appropriate certificate(s) of insurance evidencing compliance with this provision prior to the commencement of any work under this Agreement.

7. Notice: All notices required to be given hereunder shall be in writing and delivered to, or mailed first class to, the parties' respective addresses stated above. In the event that immediate notice is required, it may be given by telephone, e-mail or facsimile, but shall, to the extent possible, be followed by notice in writing in the manner set forth above.

8. Termination:

- A. Each party shall have the right to terminate this Agreement in the event of a failure of the other party to comply with the terms of the Agreement. Such termination shall be effective upon seven days' notice to the party in default and the failure within that time of said party to cure its default.
- B. The Owner shall have the right to terminate the Agreement without cause, upon ten (10) days' written notice to the Contractor. In the event that the Agreement is terminated pursuant to this subparagraph,

the Contractor shall be reimbursed in accordance with the Contract Documents for all Work performed up to the termination date, and for all materials or equipment not incorporated in the Work, but delivered and suitably stored at the site. Payment for material or equipment stored at the site shall be conditioned upon submission by the Contractor of bills of sale

9. Miscellaneous:

- A. Royalties and Patents: The Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof, except that the Owner shall be responsible for all such loss when a particular design, process or the product of a particular manufacturer or manufacturers is specified; but if the Contractor believes or has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the Owner, and thereafter the Owner insists on the use of the design, process or products specified.
- B. Assignment: The Contractor shall not assign or transfer any of its rights, duties or obligations under this Agreement without the prior written approval of the Owner.
- C. Governing Law: This Contract shall be construed under and governed by the laws of the Commonwealth of Massachusetts. The Contractor, and agents thereof, agree to bring any federal or state proceedings arising under this Contract, in which either the Commonwealth or the Awarding Authority is party, in a court of competent jurisdiction in the County of Franklin, Massachusetts. The parties agree to pursue Dispute Resolution before proceeding to Court. This section shall not be construed to limit any rights a party may have to intervene in any action, in any court or wherever, pending, in which the other is a party.
- D. CONFLICT OF INTEREST: Each party shall adhere to the provisions of Massachusetts General Laws, Chapter 268A, with respect to the Conduct of Public Employees. In addition, no member, officer, or employee of either party, or its designees, or agents, no member of the governing body of the locality in which the program is situated, and no other public official of such locality or localities who exercises any functions or responsibilities with respect to the program during his tenure or for one (1) year thereafter (or such longer period as may be provided in Chapter 268A of the Massachusetts General Laws), shall have any interest in any contract or subcontract, or the proceeds thereof, for work to be performed in connection with the program assisted under this Agreement. Each party shall incorporate, or cause to be incorporated, in all such contracts or subcontracts a provision prohibiting such interest, pursuant to the purposes of this subsection.
- E. By its signature hereon, the Contractor certifies, under the pains and penalties of perjury, that it has complied with all laws of the Commonwealth of Massachusetts relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

IN WITNESS WHEREOF, the parties hereto have set their hands and seals, the Owner by its authorized representatives who, however, incur no personal liability by reason of the execution hereof or of anything herein contained, as of the day and year first above written.

CONTRACTOR

OWNER: TOWN OF NORTHFIELD

By: _____
Signature

By: _____
Chair, Board of Selectmen

Print or Type Name

Print or Type Name

Title:

In accordance with M.G.L. C.44, Section 31C, this is to certify that an appropriation in the amount of this contract is available therefore and that the Board of Selectmen has been authorized to execute the contract and approve all requisitions and change orders.

By: _____ Print Name: _____
Town Accountant

EXHIBIT 1

PREVAILING WAGE SCHEDULE AND REPORTING DOCUMENTS



THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF LABOR
DIVISION OF OCCUPATIONAL SAFETY
PREVAILING WAGE PROGRAM
www.mass.gov/dos/pw

The Massachusetts Prevailing Wage Law
M.G.L. c. 149, §§26-27

NOTICE TO AWARDING AUTHORITIES

The enclosed wage schedule applies only to the specific project listed at the top of the schedule, and these rates will remain in effect for the duration of the project.

You should request an updated wage schedule from the Division of Occupational Safety if you have not opened bids or selected a contractor within 90 days of the date of issuance of the enclosed wage schedule.

The wage schedule shall be incorporated in any advertisement or call for bids for the project for which it has been issued.

Once a contractor has been selected by the awarding authority, the wage schedule shall be made a part of the contract for that project.

NOTICE TO CONTRACTORS

The enclosed wage schedule must be posted in a conspicuous place at the work site during the life of the project.

The wages listed on the enclosed wage schedule must be paid to employees on public works projects regardless of whether they are employed by the prime contractor, a filed sub-bidder, or any sub-contractor.

The enclosed wage schedule applies to all phases of the project, including the final clean-up. Contractors whose only role is to perform final clean-up must pay their employees according to this wage schedule.

All apprentices must be registered with the Massachusetts Division of Apprenticeship Training (DAT) in order to be paid at the lower apprentice rates. All apprentices must keep his/her apprentice identification card on his/her person during all work hours. If a worker is not registered with DAT, they must be paid the "total rate" listed on the wage schedule regardless of experience or skill level. For further information, please call 617-626-5409, or write to DAT, 19 Staniford Street, Floor 1, P.O. Box 146759, Boston, MA 02114.

**WEEKLY PAYROLL RECORDS REPORT
& STATEMENT OF COMPLIANCE**

In accordance with Massachusetts General Law c. 149, §27B, a true and accurate record must be kept of all persons employed on the public works project for which the enclosed rates have been provided. A Payroll Form has been printed on the reverse of this page and includes all the information required to be kept by law. Every contractor or subcontractor is required to keep these records and preserve them for a period of three years from the date of completion of the contract.

In addition, every contractor and subcontractor is required to submit a copy of their weekly payroll records to the awarding authority. This is required to be done on a weekly basis. Once collected, the awarding authority is also required to preserve those records for three years from the date of completion of the project.

Each such contractor or subcontractor shall furnish to the awarding authority directly within 15 days after completion of its portion of the work, a statement, executed by the contractor, subcontractor or by any authorized officer thereof who supervised the payment of wages, this form.

STATEMENT OF COMPLIANCE

_____, 20_____

I, _____, _____
(Name of signatory party) (Title)

do hereby state:

That I pay or supervise the payment of the persons employed by

_____ on the _____
(Contractor, subcontractor or public body) (Building or project)

and that all mechanics and apprentices, teamsters, chauffeurs and laborers employed on said project have been paid in accordance with wages determined under the provisions of sections twenty-six and twenty-seven of chapter one hundred and forty nine of the General Laws.

Signature _____
Title _____

MASSACHUSETTS WEEKLY CERTIFIED PAYROLL REPORT FORM



| Company's Name: | | | Address: | | | | Phone No.: | | | Payroll No.: | | | | | | | | |
|------------------------------------|-----------------------------------|----------------------|----------------------------|--------------|-----|-----|--|-----|-------------------|---------------------------|--------------------------------------|----------------------|---------------------------------|------------------------|------------------|--|---|---------------|
| Employer's Signature: | | | Title: | | | | Contract No.: | | Tax Payer ID No.: | | Work Week Ending: | | | | | | | |
| Awarding Authority's Name: | | | Public Works Project Name: | | | | Public Works Project Location: | | | Min. Wage Rate Sheet No.: | | | | | | | | |
| General / Prime Contractor's Name: | | | Subcontractor's Name: | | | | "Employer" Hourly Fringe Benefit Contributions | | | | | | | | | | | |
| Employee Name & Complete Address | Employee is OSHA 10 Certified (?) | Work Classification: | Appr. Rate (%) | Worked Hours | | | | | | | Project Hours (A) All Other Hours | Hourly Base Wage (B) | Health & Welfare Insurance (C') | ERISA Pension Plan (D) | Supp. Unemp. (E) | (B+C+D+E) Total Hourly Prev. Wage (F) | (A x F) Project Gross Wages (G) Total Gross Wages | Check No. (H) |
| | | | | Su. | Mo. | Tu. | We. | Th. | Fr. | Sa. | | | | | | | | |
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NOTE: Pursuant to MGL Ch. 149 s.27B, every contractor and subcontractor is required to submit a "true and accurate" copy of their weekly payroll records directly to the awarding authority. Failure to comply may result in the commencement of a criminal action or the issuance of a civil citation.



**THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR STANDARDS**

Prevailing Wage Rates

**As determined by the Director under the provisions of the
Massachusetts General Laws, Chapter 149, Sections 26 to 27H**

CHARLES D. BAKER
Governor

ROSALIN ACOSTA
Secretary

KARYN E. POLITO
Lt. Governor

WILLIAM D MCKINNEY
Director

Awarding Authority: Town of Northfield
Contract Number: **City/Town:** NORTHFIELD
Description of Work: Electrical Improvements Phase III - PV wiring, fire alarm improvements, miscellaneous electrical improvements to Town Hall building
Job Location: 69 Main Street, Northfield, MA

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the “Wage Request Number” on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule from the Department of Labor Standards (“DLS”) if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or any sub-contractor.
- All apprentices working on the project are required to be registered with the Massachusetts Department of Labor Standards, Division of Apprentice Standards (DLS/DAS). Apprentice must keep his/her apprentice identification card on his/her person during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DLS/DAS regardless of whether or not they are registered with any other federal, state, local, or private agency must be paid the journeyworker's rate for the trade.**
- The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule. Awarding authorities are required to request these updates no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. Contractors are required to obtain the wage schedules from awarding authorities, and to pay no less than these rates to covered workers. The annual update requirement is not applicable to 27F “rental of equipment” contracts.
- Every contractor or subcontractor which performs construction work on the project is required to submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee’s name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. A sample of a payroll reporting form may be obtained at <http://www.mass.gov/dols/pw>.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may report the violation to the Fair Labor Division of the office of the Attorney General at (617) 727-3465.
- Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|---|----------------|-----------|---------|---------|---------------------------|------------|
| Construction | | | | | | |
| (2 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i> | 06/01/2019 | \$34.25 | \$11.91 | \$12.70 | \$0.00 | \$58.86 |
| | 08/01/2019 | \$34.25 | \$12.41 | \$12.70 | \$0.00 | \$59.36 |
| | 12/01/2019 | \$34.25 | \$12.41 | \$13.72 | \$0.00 | \$60.38 |
| | 06/01/2020 | \$35.15 | \$12.41 | \$13.72 | \$0.00 | \$61.28 |
| | 08/01/2020 | \$35.15 | \$12.91 | \$13.72 | \$0.00 | \$61.78 |
| | 12/01/2020 | \$35.15 | \$12.91 | \$14.82 | \$0.00 | \$62.88 |
| | 06/01/2021 | \$35.95 | \$12.91 | \$14.82 | \$0.00 | \$63.68 |
| | 08/01/2021 | \$35.95 | \$13.41 | \$14.82 | \$0.00 | \$64.18 |
| | 12/01/2021 | \$35.95 | \$13.41 | \$16.01 | \$0.00 | \$65.37 |
| (3 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i> | 06/01/2019 | \$34.32 | \$11.91 | \$12.70 | \$0.00 | \$58.93 |
| | 08/01/2019 | \$34.32 | \$12.41 | \$12.70 | \$0.00 | \$59.43 |
| | 12/01/2019 | \$34.32 | \$12.41 | \$13.72 | \$0.00 | \$60.45 |
| | 06/01/2020 | \$35.22 | \$12.41 | \$13.72 | \$0.00 | \$61.35 |
| | 08/01/2020 | \$35.22 | \$12.91 | \$13.72 | \$0.00 | \$61.85 |
| | 12/01/2020 | \$35.22 | \$12.91 | \$14.82 | \$0.00 | \$62.95 |
| | 06/01/2021 | \$36.02 | \$12.91 | \$14.82 | \$0.00 | \$63.75 |
| | 08/01/2021 | \$36.02 | \$13.41 | \$14.82 | \$0.00 | \$64.25 |
| | 12/01/2021 | \$36.02 | \$13.41 | \$16.01 | \$0.00 | \$65.44 |
| (4 & 5 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i> | 06/01/2019 | \$34.44 | \$11.91 | \$12.70 | \$0.00 | \$59.05 |
| | 08/01/2019 | \$34.44 | \$12.41 | \$12.70 | \$0.00 | \$59.55 |
| | 12/01/2019 | \$34.44 | \$12.41 | \$13.72 | \$0.00 | \$60.57 |
| | 06/01/2020 | \$35.34 | \$12.41 | \$13.72 | \$0.00 | \$61.47 |
| | 08/01/2020 | \$35.34 | \$12.91 | \$13.72 | \$0.00 | \$61.97 |
| | 12/01/2020 | \$35.34 | \$12.91 | \$14.82 | \$0.00 | \$63.07 |
| | 06/01/2021 | \$36.14 | \$12.91 | \$14.82 | \$0.00 | \$63.87 |
| | 08/01/2021 | \$36.14 | \$13.41 | \$14.82 | \$0.00 | \$64.37 |
| | 12/01/2021 | \$36.14 | \$13.41 | \$16.01 | \$0.00 | \$65.56 |
| ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 3)</i> | 08/01/2018 | \$97.80 | \$9.90 | \$21.15 | \$0.00 | \$128.85 |
| | 08/01/2019 | \$102.78 | \$9.90 | \$21.15 | \$0.00 | \$133.83 |
| For apprentice rates see "Apprentice- PILE DRIVER" | | | | | | |
| AIR TRACK OPERATOR <i>LABORERS - ZONE 3 (BUILDING & SITE)</i> | 06/03/2019 | \$32.25 | \$7.85 | \$14.22 | \$0.00 | \$54.32 |
| | 12/02/2019 | \$33.06 | \$7.85 | \$14.22 | \$0.00 | \$55.13 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| AIR TRACK OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i> | 06/01/2019 | \$32.25 | \$7.85 | \$12.18 | \$0.00 | \$52.28 |
| | 12/01/2019 | \$33.04 | \$7.85 | \$12.18 | \$0.00 | \$53.07 |
| | 06/01/2020 | \$33.85 | \$7.85 | \$12.18 | \$0.00 | \$53.88 |
| | 12/01/2020 | \$34.66 | \$7.85 | \$12.18 | \$0.00 | \$54.69 |
| | 06/01/2021 | \$35.50 | \$7.85 | \$12.18 | \$0.00 | \$55.53 |
| | 12/01/2021 | \$36.33 | \$7.85 | \$12.18 | \$0.00 | \$56.36 |
| For apprentice rates see "Apprentice- LABORER (Heavy and Highway)" | | | | | | |
| ASBESTOS WORKER (PIPES & TANKS) <i>HEAT & FROST INSULATORS LOCAL 6 (SPRINGFIELD)</i> | 06/01/2019 | \$32.76 | \$12.50 | \$8.00 | \$0.00 | \$53.26 |
| | 12/01/2019 | \$33.66 | \$12.50 | \$8.00 | \$0.00 | \$54.16 |
| | 06/01/2020 | \$34.56 | \$12.50 | \$8.00 | \$0.00 | \$55.06 |
| | 12/01/2020 | \$35.46 | \$12.50 | \$8.00 | \$0.00 | \$55.96 |

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|---|----------------|-----------|---------|---------|---------------------------|------------|
| ASPHALT RAKER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i> | 06/03/2019 | \$31.75 | \$7.85 | \$14.22 | \$0.00 | \$53.82 |
| | 12/02/2019 | \$32.56 | \$7.85 | \$14.22 | \$0.00 | \$54.63 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| ASPHALT RAKER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i> | 06/01/2019 | \$31.75 | \$7.85 | \$12.18 | \$0.00 | \$51.78 |
| | 12/01/2019 | \$32.54 | \$7.85 | \$12.18 | \$0.00 | \$52.57 |
| | 06/01/2020 | \$33.35 | \$7.85 | \$12.18 | \$0.00 | \$53.38 |
| | 12/01/2020 | \$34.16 | \$7.85 | \$12.18 | \$0.00 | \$54.19 |
| | 06/01/2021 | \$35.00 | \$7.85 | \$12.18 | \$0.00 | \$55.03 |
| | 12/01/2021 | \$35.83 | \$7.85 | \$12.18 | \$0.00 | \$55.86 |
| For apprentice rates see "Apprentice- LABORER (Heavy and Highway)" | | | | | | |
| AUTOMATIC GRADER-EXCAVATOR (RECLAIMER) <i>OPERATING ENGINEERS LOCAL 98</i> | 06/01/2019 | \$35.05 | \$11.69 | \$14.08 | \$0.00 | \$60.82 |
| | 12/01/2019 | \$35.65 | \$11.69 | \$14.35 | \$0.00 | \$61.69 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| BACKHOE/FRONT-END LOADER OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i> | 06/01/2019 | \$35.05 | \$11.69 | \$14.08 | \$0.00 | \$60.82 |
| | 12/01/2019 | \$35.65 | \$11.69 | \$14.35 | \$0.00 | \$61.69 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i> | 06/03/2019 | \$31.75 | \$7.85 | \$14.22 | \$0.00 | \$53.82 |
| | 12/02/2019 | \$32.56 | \$7.85 | \$14.22 | \$0.00 | \$54.63 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| BATCH/CEMENT PLANT - ON SITE <i>OPERATING ENGINEERS LOCAL 98</i> | 06/01/2019 | \$34.52 | \$11.69 | \$14.08 | \$0.00 | \$60.29 |
| | 12/01/2019 | \$35.12 | \$11.69 | \$14.35 | \$0.00 | \$61.16 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| BLOCK PAVER, RAMMER / CURB SETTER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i> | 06/03/2019 | \$32.25 | \$7.85 | \$14.22 | \$0.00 | \$54.32 |
| | 12/02/2019 | \$33.06 | \$7.85 | \$14.22 | \$0.00 | \$55.13 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i> | 06/01/2019 | \$32.25 | \$7.85 | \$12.18 | \$0.00 | \$52.28 |
| | 12/01/2019 | \$33.04 | \$7.85 | \$12.18 | \$0.00 | \$53.07 |
| | 06/01/2020 | \$33.85 | \$7.85 | \$12.18 | \$0.00 | \$53.88 |
| | 12/01/2020 | \$34.66 | \$7.85 | \$12.18 | \$0.00 | \$54.69 |
| | 06/01/2021 | \$35.50 | \$7.85 | \$12.18 | \$0.00 | \$55.53 |
| | 12/01/2021 | \$36.33 | \$7.85 | \$12.18 | \$0.00 | \$56.36 |
| For apprentice rates see "Apprentice- LABORER (Heavy and Highway)" | | | | | | |
| BOILER MAKER <i>BOILERMAKERS LOCAL 29</i> | 01/01/2019 | \$44.71 | \$7.07 | \$17.72 | \$0.00 | \$69.50 |
| | 01/01/2020 | \$46.10 | \$7.07 | \$17.98 | \$0.00 | \$71.15 |

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - BOILERMAKER - Local 29

Effective Date - 01/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 65 | \$29.06 | \$7.07 | \$11.52 | \$0.00 | \$47.65 |
| 2 | 65 | \$29.06 | \$7.07 | \$11.52 | \$0.00 | \$47.65 |
| 3 | 70 | \$31.30 | \$7.07 | \$12.40 | \$0.00 | \$50.77 |
| 4 | 75 | \$33.53 | \$7.07 | \$13.30 | \$0.00 | \$53.90 |
| 5 | 80 | \$35.77 | \$7.07 | \$14.18 | \$0.00 | \$57.02 |
| 6 | 85 | \$38.00 | \$7.07 | \$15.07 | \$0.00 | \$60.14 |
| 7 | 90 | \$40.24 | \$7.07 | \$15.95 | \$0.00 | \$63.26 |
| 8 | 95 | \$42.47 | \$7.07 | \$16.84 | \$0.00 | \$66.38 |

Effective Date - 01/01/2020

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 65 | \$29.97 | \$7.07 | \$11.69 | \$0.00 | \$48.73 |
| 2 | 65 | \$29.97 | \$7.07 | \$11.69 | \$0.00 | \$48.73 |
| 3 | 70 | \$32.27 | \$7.07 | \$12.59 | \$0.00 | \$51.93 |
| 4 | 75 | \$34.58 | \$7.07 | \$13.49 | \$0.00 | \$55.14 |
| 5 | 80 | \$36.88 | \$7.07 | \$14.38 | \$0.00 | \$58.33 |
| 6 | 85 | \$39.19 | \$7.07 | \$15.29 | \$0.00 | \$61.55 |
| 7 | 90 | \$41.49 | \$7.07 | \$16.18 | \$0.00 | \$64.74 |
| 8 | 95 | \$43.80 | \$7.07 | \$17.09 | \$0.00 | \$67.96 |

Notes:

Apprentice to Journeyworker Ratio:1:4

| | | | | | | |
|--|------------|---------|---------|---------|--------|---------|
| BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) | 02/01/2019 | \$41.96 | \$10.75 | \$18.77 | \$0.00 | \$71.48 |
| BRICKLAYERS LOCAL 3 (SPRINGFIELD/PITTSFIELD) | 08/01/2019 | \$42.81 | \$10.75 | \$19.41 | \$0.00 | \$72.97 |
| | 02/01/2020 | \$43.36 | \$10.75 | \$19.41 | \$0.00 | \$73.52 |
| | 08/01/2020 | \$44.71 | \$10.75 | \$19.56 | \$0.00 | \$75.02 |
| | 02/01/2021 | \$45.26 | \$10.75 | \$19.56 | \$0.00 | \$75.57 |
| | 08/01/2021 | \$46.66 | \$10.75 | \$19.72 | \$0.00 | \$77.13 |
| | 02/01/2022 | \$47.19 | \$10.75 | \$19.72 | \$0.00 | \$77.66 |

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Springfield/Pittsfield

Effective Date - 02/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 50 | \$20.98 | \$10.75 | \$18.77 | \$0.00 | \$50.50 |
| 2 | 60 | \$25.18 | \$10.75 | \$18.77 | \$0.00 | \$54.70 |
| 3 | 70 | \$29.37 | \$10.75 | \$18.77 | \$0.00 | \$58.89 |
| 4 | 80 | \$33.57 | \$10.75 | \$18.77 | \$0.00 | \$63.09 |
| 5 | 90 | \$37.76 | \$10.75 | \$18.77 | \$0.00 | \$67.28 |

Effective Date - 08/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 50 | \$21.41 | \$10.75 | \$19.41 | \$0.00 | \$51.57 |
| 2 | 60 | \$25.69 | \$10.75 | \$19.41 | \$0.00 | \$55.85 |
| 3 | 70 | \$29.97 | \$10.75 | \$19.41 | \$0.00 | \$60.13 |
| 4 | 80 | \$34.25 | \$10.75 | \$19.41 | \$0.00 | \$64.41 |
| 5 | 90 | \$38.53 | \$10.75 | \$19.41 | \$0.00 | \$68.69 |

Notes:

Apprentice to Journeyworker Ratio:1:5

| | | | | | | |
|--|------------|---------|---------|---------|--------|---------|
| BULLDOZER/POWER SHOVEL/TREE SHREDDER /CLAM SHELL OPERATING | 06/01/2019 | \$35.05 | \$11.69 | \$14.08 | \$0.00 | \$60.82 |
| ENGINEERS LOCAL 98 For apprentice rates see "Apprentice- OPERATING ENGINEERS" | 12/01/2019 | \$35.65 | \$11.69 | \$14.35 | \$0.00 | \$61.69 |
| CAISSON & UNDERPINNING BOTTOM MAN LABORERS - FOUNDATION AND MARINE | 06/01/2019 | \$40.25 | \$7.85 | \$16.05 | \$0.00 | \$64.15 |
| | 12/01/2019 | \$41.25 | \$7.85 | \$16.05 | \$0.00 | \$65.15 |
| | 06/01/2020 | \$42.24 | \$7.85 | \$16.05 | \$0.00 | \$66.14 |
| | 12/01/2020 | \$43.22 | \$7.85 | \$16.05 | \$0.00 | \$67.12 |
| | 06/01/2021 | \$44.24 | \$7.85 | \$16.05 | \$0.00 | \$68.14 |
| | 12/01/2021 | \$45.25 | \$7.85 | \$16.05 | \$0.00 | \$69.15 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| CAISSON & UNDERPINNING LABORER LABORERS - FOUNDATION AND MARINE | 06/01/2019 | \$39.10 | \$7.85 | \$16.05 | \$0.00 | \$63.00 |
| | 12/01/2019 | \$40.10 | \$7.85 | \$16.05 | \$0.00 | \$64.00 |
| | 06/01/2020 | \$41.09 | \$7.85 | \$16.05 | \$0.00 | \$64.99 |
| | 12/01/2020 | \$42.07 | \$7.85 | \$16.05 | \$0.00 | \$65.97 |
| | 06/01/2021 | \$43.09 | \$7.85 | \$16.05 | \$0.00 | \$66.99 |
| | 12/01/2021 | \$44.10 | \$7.85 | \$16.05 | \$0.00 | \$68.00 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| CAISSON & UNDERPINNING TOP MAN LABORERS - FOUNDATION AND MARINE | 06/01/2019 | \$39.10 | \$7.85 | \$16.05 | \$0.00 | \$63.00 |
| | 12/01/2019 | \$40.10 | \$7.85 | \$16.05 | \$0.00 | \$64.00 |
| | 06/01/2020 | \$41.09 | \$7.85 | \$16.05 | \$0.00 | \$64.99 |
| | 12/01/2020 | \$42.07 | \$7.85 | \$16.05 | \$0.00 | \$65.97 |
| | 06/01/2021 | \$43.09 | \$7.85 | \$16.05 | \$0.00 | \$66.99 |
| | 12/01/2021 | \$44.10 | \$7.85 | \$16.05 | \$0.00 | \$68.00 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|---|----------------|-----------|--------|---------|---------------------------|------------|
| CARBIDE CORE DRILL OPERATOR <i>LABORERS - ZONE 3 (BUILDING & SITE)</i> | 06/03/2019 | \$31.75 | \$7.85 | \$14.22 | \$0.00 | \$53.82 |
| | 12/02/2019 | \$32.56 | \$7.85 | \$14.22 | \$0.00 | \$54.63 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| CARPENTER <i>CARPENTERS LOCAL 108 - HAMPDEN HAMPSHIRE FRANKLIN</i> | 03/04/2019 | \$38.64 | \$8.26 | \$15.00 | \$0.00 | \$61.90 |

Apprentice - CARPENTER - Local 108 Hampden Hampshire Franklin

Effective Date - 03/04/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 50 | \$19.32 | \$8.26 | \$1.22 | \$0.00 | \$28.80 |
| 2 | 60 | \$23.18 | \$8.26 | \$1.22 | \$0.00 | \$32.66 |
| 3 | 70 | \$27.05 | \$8.26 | \$11.34 | \$0.00 | \$46.65 |
| 4 | 75 | \$28.98 | \$8.26 | \$11.34 | \$0.00 | \$48.58 |
| 5 | 80 | \$30.91 | \$8.26 | \$12.56 | \$0.00 | \$51.73 |
| 6 | 80 | \$30.91 | \$8.26 | \$12.56 | \$0.00 | \$51.73 |
| 7 | 90 | \$34.78 | \$8.26 | \$13.78 | \$0.00 | \$56.82 |
| 8 | 90 | \$34.78 | \$8.26 | \$13.78 | \$0.00 | \$56.82 |

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 \$25.93/ 3&4 \$30.77/ 5&6 \$46.41/ 7&8 \$51.29

Apprentice to Journeyworker Ratio:1:5

| | | | | | | |
|--|------------|---------|--------|--------|--------|---------|
| CARPENTER WOOD FRAME <i>CARPENTERS LOCAL 108 - HAMPDEN HAMPSHIRE FRANKLIN</i> | 04/01/2019 | \$23.10 | \$7.07 | \$7.86 | \$0.00 | \$38.03 |
| | 10/01/2019 | \$23.49 | \$7.07 | \$7.86 | \$0.00 | \$38.42 |
| All Aspects of New Wood Frame Work | | | | | | |

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - CARPENTER (Wood Frame) - 108 Hampden Hampshire

Effective Date - 04/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 60 | \$13.86 | \$7.07 | \$0.00 | \$0.00 | \$20.93 |
| 2 | 60 | \$13.86 | \$7.07 | \$0.00 | \$0.00 | \$20.93 |
| 3 | 65 | \$15.02 | \$7.07 | \$7.86 | \$0.00 | \$29.95 |
| 4 | 70 | \$16.17 | \$7.07 | \$7.86 | \$0.00 | \$31.10 |
| 5 | 75 | \$17.33 | \$7.07 | \$7.86 | \$0.00 | \$32.26 |
| 6 | 80 | \$18.48 | \$7.07 | \$7.86 | \$0.00 | \$33.41 |
| 7 | 85 | \$19.64 | \$7.07 | \$7.86 | \$0.00 | \$34.57 |
| 8 | 90 | \$20.79 | \$7.07 | \$7.86 | \$0.00 | \$35.72 |

Effective Date - 10/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 60 | \$14.09 | \$7.07 | \$0.00 | \$0.00 | \$21.16 |
| 2 | 60 | \$14.09 | \$7.07 | \$0.00 | \$0.00 | \$21.16 |
| 3 | 65 | \$15.27 | \$7.07 | \$7.86 | \$0.00 | \$30.20 |
| 4 | 70 | \$16.44 | \$7.07 | \$7.86 | \$0.00 | \$31.37 |
| 5 | 75 | \$17.62 | \$7.07 | \$7.86 | \$0.00 | \$32.55 |
| 6 | 80 | \$18.79 | \$7.07 | \$7.86 | \$0.00 | \$33.72 |
| 7 | 85 | \$19.97 | \$7.07 | \$7.86 | \$0.00 | \$34.90 |
| 8 | 90 | \$21.14 | \$7.07 | \$7.86 | \$0.00 | \$36.07 |

Notes:
 % Indentured After 10/1/17; 45/45/55/55/70/70/80/80
 Step 1&2 \$17.47/ 3&4 \$24.53/ 5&6 \$31.10/ 7&8 \$33.41

Apprentice to Journeyworker Ratio:1:5

| | | | | | | |
|--|------------|---------|---------|---------|--------|---------|
| CEMENT MASONRY/PLASTERING | 07/01/2019 | \$40.46 | \$12.70 | \$17.64 | \$0.62 | \$71.42 |
| BRICKLAYERS LOCAL 3 (SPRINGFIELD/PITTSFIELD) | 01/01/2020 | \$41.94 | \$12.70 | \$17.64 | \$0.62 | \$72.90 |

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - CEMENT MASONRY/PLASTERING - Springfield/Pittsfield

Effective Date - 07/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 50 | \$20.23 | \$12.70 | \$15.41 | \$0.00 | \$48.34 |
| 2 | 60 | \$24.28 | \$12.70 | \$17.64 | \$0.62 | \$55.24 |
| 3 | 65 | \$26.30 | \$12.70 | \$17.64 | \$0.62 | \$57.26 |
| 4 | 70 | \$28.32 | \$12.70 | \$17.64 | \$0.62 | \$59.28 |
| 5 | 75 | \$30.35 | \$12.70 | \$17.64 | \$0.62 | \$61.31 |
| 6 | 80 | \$32.37 | \$12.70 | \$17.64 | \$0.62 | \$63.33 |
| 7 | 90 | \$36.41 | \$12.70 | \$17.64 | \$0.62 | \$67.37 |

Effective Date - 01/01/2020

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 50 | \$20.97 | \$12.70 | \$15.41 | \$0.00 | \$49.08 |
| 2 | 60 | \$25.16 | \$12.70 | \$17.64 | \$0.62 | \$56.12 |
| 3 | 65 | \$27.26 | \$12.70 | \$17.64 | \$0.62 | \$58.22 |
| 4 | 70 | \$29.36 | \$12.70 | \$17.64 | \$0.62 | \$60.32 |
| 5 | 75 | \$31.46 | \$12.70 | \$17.64 | \$0.62 | \$62.42 |
| 6 | 80 | \$33.55 | \$12.70 | \$17.64 | \$0.62 | \$64.51 |
| 7 | 90 | \$37.75 | \$12.70 | \$17.64 | \$0.62 | \$68.71 |

Notes:

Steps 3,4 are 500 hrs. All other steps are 1,000 hrs.

Apprentice to Journeyworker Ratio:1:3

| | | | | | | |
|---|------------|---------|---------|---------|--------|---------|
| CHAIN SAW OPERATOR <i>LABORERS - ZONE 3 (BUILDING & SITE)</i> | 06/03/2019 | \$31.75 | \$7.85 | \$14.22 | \$0.00 | \$53.82 |
| For apprentice rates see "Apprentice- LABORER" | 12/02/2019 | \$32.56 | \$7.85 | \$14.22 | \$0.00 | \$54.63 |
| COMPRESSOR OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i> | 06/01/2019 | \$34.52 | \$11.69 | \$14.08 | \$0.00 | \$60.29 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | 12/01/2019 | \$35.12 | \$11.69 | \$14.35 | \$0.00 | \$61.16 |
| CRANE OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i> | 06/01/2019 | \$38.55 | \$11.69 | \$14.08 | \$0.00 | \$64.32 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | 12/01/2019 | \$39.15 | \$11.69 | \$14.35 | \$0.00 | \$65.19 |
| DELEADER (BRIDGE) <i>PAINTERS LOCAL 35 - ZONE 3</i> | 07/01/2019 | \$50.66 | \$8.20 | \$21.45 | \$0.00 | \$80.31 |
| | 01/01/2020 | \$50.96 | \$8.20 | \$22.10 | \$0.00 | \$81.26 |
| | 07/01/2020 | \$52.06 | \$8.20 | \$22.10 | \$0.00 | \$82.36 |
| | 01/01/2021 | \$53.16 | \$8.20 | \$22.10 | \$0.00 | \$83.46 |

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date - 07/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 50 | \$25.33 | \$8.20 | \$0.00 | \$0.00 | \$33.53 |
| 2 | 55 | \$27.86 | \$8.20 | \$5.78 | \$0.00 | \$41.84 |
| 3 | 60 | \$30.40 | \$8.20 | \$6.30 | \$0.00 | \$44.90 |
| 4 | 65 | \$32.93 | \$8.20 | \$6.83 | \$0.00 | \$47.96 |
| 5 | 70 | \$35.46 | \$8.20 | \$18.30 | \$0.00 | \$61.96 |
| 6 | 75 | \$38.00 | \$8.20 | \$18.83 | \$0.00 | \$65.03 |
| 7 | 80 | \$40.53 | \$8.20 | \$19.35 | \$0.00 | \$68.08 |
| 8 | 90 | \$45.59 | \$8.20 | \$20.40 | \$0.00 | \$74.19 |

Effective Date - 01/01/2020

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 50 | \$25.48 | \$8.20 | \$0.00 | \$0.00 | \$33.68 |
| 2 | 55 | \$28.03 | \$8.20 | \$5.94 | \$0.00 | \$42.17 |
| 3 | 60 | \$30.58 | \$8.20 | \$6.48 | \$0.00 | \$45.26 |
| 4 | 65 | \$33.12 | \$8.20 | \$7.02 | \$0.00 | \$48.34 |
| 5 | 70 | \$35.67 | \$8.20 | \$18.51 | \$0.00 | \$62.38 |
| 6 | 75 | \$38.22 | \$8.20 | \$19.05 | \$0.00 | \$65.47 |
| 7 | 80 | \$40.77 | \$8.20 | \$19.59 | \$0.00 | \$68.56 |
| 8 | 90 | \$45.86 | \$8.20 | \$20.67 | \$0.00 | \$74.73 |

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

| | | | | | | |
|---|------------|---------|--------|---------|--------|---------|
| DEMO: ADZEMAN LABORERS - ZONE 3 (BUILDING & SITE) | 06/01/2019 | \$39.30 | \$7.85 | \$15.85 | \$0.00 | \$63.00 |
| | 12/01/2019 | \$40.30 | \$7.85 | \$15.85 | \$0.00 | \$64.00 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| DEMO: BACKHOE/LOADER/HAMMER OPERATOR LABORERS - ZONE 3 (BUILDING & SITE) | 06/01/2019 | \$40.30 | \$7.85 | \$15.85 | \$0.00 | \$64.00 |
| | 12/01/2019 | \$41.30 | \$7.85 | \$15.85 | \$0.00 | \$65.00 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| DEMO: BURNERS LABORERS - ZONE 3 (BUILDING & SITE) | 06/01/2019 | \$40.05 | \$7.85 | \$15.85 | \$0.00 | \$63.75 |
| | 12/01/2019 | \$41.05 | \$7.85 | \$15.85 | \$0.00 | \$64.75 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| DEMO: CONCRETE CUTTER/SAWYER LABORERS - ZONE 3 (BUILDING & SITE) | 06/01/2019 | \$40.30 | \$7.85 | \$15.85 | \$0.00 | \$64.00 |
| | 12/01/2019 | \$41.30 | \$7.85 | \$15.85 | \$0.00 | \$65.00 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| DEMO: JACKHAMMER OPERATOR LABORERS - ZONE 3 (BUILDING & SITE) | 06/01/2019 | \$40.05 | \$7.85 | \$15.85 | \$0.00 | \$63.75 |
| | 12/01/2019 | \$41.05 | \$7.85 | \$15.85 | \$0.00 | \$64.75 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| DEMO: WRECKING LABORER LABORERS - ZONE 3 (BUILDING & SITE) | 06/01/2019 | \$39.30 | \$7.85 | \$15.85 | \$0.00 | \$63.00 |
| | 12/01/2019 | \$40.30 | \$7.85 | \$15.85 | \$0.00 | \$64.00 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|--|----------------|-----------|---------|---------|---------------------------|------------|
| DIVER <i>PILE DRIVER LOCAL 56 (ZONE 3)</i> | 08/01/2018 | \$65.20 | \$9.90 | \$21.15 | \$0.00 | \$96.25 |
| | 08/01/2019 | \$68.52 | \$9.90 | \$21.15 | \$0.00 | \$99.57 |
| For apprentice rates see "Apprentice- PILE DRIVER" | | | | | | |
| DIVER TENDER <i>PILE DRIVER LOCAL 56 (ZONE 3)</i> | 08/01/2018 | \$46.57 | \$9.90 | \$21.15 | \$0.00 | \$77.62 |
| | 08/01/2019 | \$48.94 | \$9.90 | \$21.15 | \$0.00 | \$79.99 |
| For apprentice rates see "Apprentice- PILE DRIVER" | | | | | | |
| DIVER TENDER (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 3)</i> | 08/01/2018 | \$69.86 | \$9.90 | \$21.15 | \$0.00 | \$100.91 |
| | 08/01/2019 | \$73.41 | \$9.90 | \$21.15 | \$0.00 | \$104.46 |
| For apprentice rates see "Apprentice- PILE DRIVER" | | | | | | |
| DIVER/SLURRY (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 3)</i> | 08/01/2018 | \$97.80 | \$9.90 | \$21.15 | \$0.00 | \$128.85 |
| | 08/01/2019 | \$102.78 | \$9.90 | \$21.15 | \$0.00 | \$133.83 |
| For apprentice rates see "Apprentice- PILE DRIVER" | | | | | | |
| ELECTRICIAN (Including Core Drilling) <i>ELECTRICIANS LOCAL 7</i> | 06/30/2019 | \$42.66 | \$10.75 | \$12.33 | \$0.00 | \$65.74 |
| | 12/29/2019 | \$43.41 | \$11.00 | \$12.60 | \$0.00 | \$67.01 |

Apprentice - ELECTRICIAN - Local 7

Effective Date - 06/30/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 40 | \$17.06 | \$5.85 | \$0.51 | \$0.00 | \$23.42 |
| 2 | 45 | \$19.20 | \$5.85 | \$0.58 | \$0.00 | \$25.63 |
| 3 | 50 | \$21.33 | \$10.75 | \$6.94 | \$0.00 | \$39.02 |
| 4 | 55 | \$23.46 | \$10.75 | \$7.00 | \$0.00 | \$41.21 |
| 5 | 65 | \$27.73 | \$10.75 | \$8.13 | \$0.00 | \$46.61 |
| 6 | 70 | \$29.86 | \$10.75 | \$9.20 | \$0.00 | \$49.81 |

Notes:

Steps 1-2 are 1000 hrs; Steps 3-6 are 1500 hrs.

Apprentice to Journeyworker Ratio:2:3****

| | | | | | | |
|---|------------|---------|---------|---------|--------|---------|
| ELEVATOR CONSTRUCTOR <i>ELEVATOR CONSTRUCTORS LOCAL 41</i> | 01/01/2019 | \$53.11 | \$15.58 | \$17.51 | \$0.00 | \$86.20 |
| | 01/01/2020 | \$54.85 | \$15.73 | \$18.41 | \$0.00 | \$88.99 |
| | 01/01/2021 | \$56.69 | \$15.88 | \$19.31 | \$0.00 | \$91.88 |
| | 01/01/2022 | \$58.62 | \$16.03 | \$20.21 | \$0.00 | \$94.86 |

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - ELEVATOR CONSTRUCTOR - Local 41

Effective Date - 01/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 50 | \$26.56 | \$15.58 | \$0.00 | \$0.00 | \$42.14 |
| 2 | 55 | \$29.21 | \$15.58 | \$17.51 | \$0.00 | \$62.30 |
| 3 | 65 | \$34.52 | \$15.58 | \$17.51 | \$0.00 | \$67.61 |
| 4 | 70 | \$37.18 | \$15.58 | \$17.51 | \$0.00 | \$70.27 |
| 5 | 80 | \$42.49 | \$15.58 | \$17.51 | \$0.00 | \$75.58 |

Effective Date - 01/01/2020

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 50 | \$27.43 | \$15.73 | \$0.00 | \$0.00 | \$43.16 |
| 2 | 55 | \$30.17 | \$15.73 | \$18.41 | \$0.00 | \$64.31 |
| 3 | 65 | \$35.65 | \$15.73 | \$18.41 | \$0.00 | \$69.79 |
| 4 | 70 | \$38.40 | \$15.73 | \$18.41 | \$0.00 | \$72.54 |
| 5 | 80 | \$43.88 | \$15.73 | \$18.41 | \$0.00 | \$78.02 |

Notes:

Steps 1-2 are 6 mos.; Steps 3-5 are 1 year

Apprentice to Journeyworker Ratio:1:1

| | | | | | | |
|--|------------|---------|---------|---------|--------|---------|
| ELEVATOR CONSTRUCTOR HELPER <i>ELEVATOR CONSTRUCTORS LOCAL 41</i> | 01/01/2019 | \$37.18 | \$15.58 | \$17.51 | \$0.00 | \$70.27 |
| | 01/01/2020 | \$38.40 | \$15.73 | \$18.41 | \$0.00 | \$72.54 |
| | 01/01/2021 | \$39.68 | \$15.88 | \$19.31 | \$0.00 | \$74.87 |
| | 01/01/2022 | \$41.03 | \$16.03 | \$20.21 | \$0.00 | \$77.27 |
| For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR" | | | | | | |
| FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i> | 06/01/2019 | \$31.75 | \$7.85 | \$12.18 | \$0.00 | \$51.78 |
| | 12/01/2019 | \$32.54 | \$7.85 | \$12.18 | \$0.00 | \$52.57 |
| | 06/01/2020 | \$33.35 | \$7.85 | \$12.18 | \$0.00 | \$53.38 |
| | 12/01/2020 | \$34.16 | \$7.85 | \$12.18 | \$0.00 | \$54.19 |
| | 06/01/2021 | \$35.00 | \$7.85 | \$12.18 | \$0.00 | \$55.03 |
| | 12/01/2021 | \$35.83 | \$7.85 | \$12.18 | \$0.00 | \$55.86 |
| For apprentice rates see "Apprentice- LABORER (Heavy and Highway)" | | | | | | |
| FIELD ENG.INST/ROD-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 98</i> | 06/01/1999 | \$18.84 | \$4.80 | \$4.10 | \$0.00 | \$27.74 |
| FIELD ENG.PARTY CHIEF:BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 98</i> | 06/01/1999 | \$21.33 | \$4.80 | \$4.10 | \$0.00 | \$30.23 |
| FIELD ENG.SURVEY CHIEF-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 98</i> | 06/01/1999 | \$22.33 | \$4.80 | \$4.10 | \$0.00 | \$31.23 |
| FIRE ALARM INSTALLER <i>ELECTRICIANS LOCAL 7</i> | 06/30/2019 | \$42.66 | \$10.75 | \$12.33 | \$0.00 | \$65.74 |
| | 12/29/2019 | \$43.41 | \$11.00 | \$12.60 | \$0.00 | \$67.01 |
| For apprentice rates see "Apprentice- ELECTRICIAN" | | | | | | |
| FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING <i>ELECTRICIANS LOCAL 7</i> | 06/30/2019 | \$42.66 | \$10.75 | \$12.33 | \$0.00 | \$65.74 |
| | 12/29/2019 | \$43.41 | \$11.00 | \$12.60 | \$0.00 | \$67.01 |
| For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN" | | | | | | |

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|-------------------------------------|----------------|-----------|---------|---------|---------------------------|------------|
| FIREMAN | 06/01/2019 | \$34.52 | \$11.69 | \$14.08 | \$0.00 | \$60.29 |
| <i>OPERATING ENGINEERS LOCAL 98</i> | 12/01/2019 | \$35.12 | \$11.69 | \$14.35 | \$0.00 | \$61.16 |

Apprentice - OPERATING ENGINEERS - Local 98 Class 3

Effective Date - 06/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 60 | \$20.71 | \$11.69 | \$14.08 | \$0.00 | \$46.48 |
| 2 | 70 | \$24.16 | \$11.69 | \$14.08 | \$0.00 | \$49.93 |
| 3 | 80 | \$27.62 | \$11.69 | \$14.08 | \$0.00 | \$53.39 |
| 4 | 90 | \$31.07 | \$11.69 | \$14.08 | \$0.00 | \$56.84 |

Effective Date - 12/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 60 | \$21.07 | \$11.69 | \$14.35 | \$0.00 | \$47.11 |
| 2 | 70 | \$24.58 | \$11.69 | \$14.35 | \$0.00 | \$50.62 |
| 3 | 80 | \$28.10 | \$11.69 | \$14.35 | \$0.00 | \$54.14 |
| 4 | 90 | \$31.61 | \$11.69 | \$14.35 | \$0.00 | \$57.65 |

Notes:

Steps 1-2 are 1000 hrs.; Steps 3-4 are 2000 hrs.

Apprentice to Journeyworker Ratio:1:6

| | | | | | | |
|--|------------|---------|--------|---------|--------|---------|
| FLAGGER & SIGNALER (HEAVY & HIGHWAY) | 06/01/2019 | \$22.50 | \$7.85 | \$12.18 | \$0.00 | \$42.53 |
| <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i> | 12/01/2019 | \$23.50 | \$7.85 | \$12.18 | \$0.00 | \$43.53 |
| | 06/01/2020 | \$23.50 | \$7.85 | \$12.18 | \$0.00 | \$43.53 |
| | 12/01/2020 | \$24.50 | \$7.85 | \$12.18 | \$0.00 | \$44.53 |
| | 06/01/2021 | \$24.50 | \$7.85 | \$12.18 | \$0.00 | \$44.53 |
| | 12/01/2021 | \$24.50 | \$7.85 | \$12.18 | \$0.00 | \$44.53 |

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)

| | | | | | | |
|--|------------|---------|--------|---------|--------|---------|
| FLOORCOVERER | 03/01/2016 | \$32.60 | \$8.55 | \$14.42 | \$0.00 | \$55.57 |
| <i>FLOORCOVERERS LOCAL 2168 ZONE III</i> | | | | | | |

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - FLOORCOVERER - Local 2168 Zone III

Effective Date - 03/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 50 | \$16.30 | \$8.55 | \$1.20 | \$0.00 | \$26.05 |
| 2 | 55 | \$17.93 | \$8.55 | \$1.20 | \$0.00 | \$27.68 |
| 3 | 60 | \$19.56 | \$8.55 | \$10.82 | \$0.00 | \$38.93 |
| 4 | 65 | \$21.19 | \$8.55 | \$10.82 | \$0.00 | \$40.56 |
| 5 | 70 | \$22.82 | \$8.55 | \$12.02 | \$0.00 | \$43.39 |
| 6 | 75 | \$24.45 | \$8.55 | \$12.02 | \$0.00 | \$45.02 |
| 7 | 80 | \$26.08 | \$8.55 | \$13.22 | \$0.00 | \$47.85 |
| 8 | 85 | \$27.71 | \$8.55 | \$13.22 | \$0.00 | \$49.48 |

Notes: Steps are 750 hrs.
 % After 09/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)
 Step 1&2 \$24.42/ 3&4 \$28.84/ 5&6 \$43.39/ 7&8 \$47.85

Apprentice to Journeyworker Ratio:1:1

| | | | | | | |
|--|------------|---------|---------|---------|--------|---------|
| FORK LIFT | 06/01/2019 | \$34.74 | \$11.69 | \$14.08 | \$0.00 | \$60.51 |
| <i>OPERATING ENGINEERS LOCAL 98</i> | 12/01/2019 | \$35.34 | \$11.69 | \$14.35 | \$0.00 | \$61.38 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| GENERATORS/LIGHTING PLANTS | 06/01/2019 | \$31.29 | \$11.69 | \$14.08 | \$0.00 | \$57.06 |
| <i>OPERATING ENGINEERS LOCAL 98</i> | 12/01/2019 | \$31.89 | \$11.69 | \$14.35 | \$0.00 | \$57.93 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) | 06/01/2019 | \$38.18 | \$10.60 | \$9.90 | \$0.00 | \$58.68 |
| <i>GLAZIERS LOCAL 1333</i> | 06/01/2020 | \$39.18 | \$10.80 | \$10.45 | \$0.00 | \$60.43 |

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - GLAZIER - Local 1333

Effective Date - 06/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 50 | \$19.09 | \$10.60 | \$1.80 | \$0.00 | \$31.49 |
| 2 | 56 | \$21.48 | \$10.60 | \$1.80 | \$0.00 | \$33.88 |
| 3 | 63 | \$23.86 | \$10.60 | \$2.40 | \$0.00 | \$36.86 |
| 4 | 69 | \$26.25 | \$10.60 | \$2.40 | \$0.00 | \$39.25 |
| 5 | 75 | \$28.64 | \$10.60 | \$2.90 | \$0.00 | \$42.14 |
| 6 | 81 | \$31.02 | \$10.60 | \$2.90 | \$0.00 | \$44.52 |
| 7 | 88 | \$33.41 | \$10.60 | \$9.90 | \$0.00 | \$53.91 |
| 8 | 94 | \$35.79 | \$10.60 | \$9.90 | \$0.00 | \$56.29 |

Effective Date - 06/01/2020

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 50 | \$19.59 | \$10.80 | \$1.80 | \$0.00 | \$32.19 |
| 2 | 56 | \$22.04 | \$10.80 | \$1.80 | \$0.00 | \$34.64 |
| 3 | 63 | \$24.49 | \$10.80 | \$2.45 | \$0.00 | \$37.74 |
| 4 | 69 | \$26.94 | \$10.80 | \$2.45 | \$0.00 | \$40.19 |
| 5 | 75 | \$29.39 | \$10.80 | \$3.15 | \$0.00 | \$43.34 |
| 6 | 81 | \$31.83 | \$10.80 | \$3.15 | \$0.00 | \$45.78 |
| 7 | 88 | \$34.28 | \$10.80 | \$10.45 | \$0.00 | \$55.53 |
| 8 | 94 | \$36.73 | \$10.80 | \$10.45 | \$0.00 | \$57.98 |

Notes:

Apprentice to Journeyworker Ratio:1:3

| | | | | | | |
|--|------------|---------|---------|---------|--------|---------|
| GRADER/TRENCHING MACHINE/DERRICK <i>OPERATING ENGINEERS LOCAL 98</i> | 06/01/2019 | \$35.05 | \$11.69 | \$14.08 | \$0.00 | \$60.82 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | 12/01/2019 | \$35.65 | \$11.69 | \$14.35 | \$0.00 | \$61.69 |
| HVAC (DUCTWORK) <i>SHEETMETAL WORKERS LOCAL 63</i> | 07/01/2019 | \$35.74 | \$10.64 | \$16.22 | \$1.77 | \$64.37 |
| For apprentice rates see "Apprentice- SHEET METAL WORKER" | 01/01/2020 | \$36.99 | \$10.64 | \$16.22 | \$1.77 | \$65.62 |
| HVAC (ELECTRICAL CONTROLS) <i>ELECTRICIANS LOCAL 7</i> | 06/30/2019 | \$42.66 | \$10.75 | \$12.33 | \$0.00 | \$65.74 |
| For apprentice rates see "Apprentice- ELECTRICIAN" | 12/29/2019 | \$43.41 | \$11.00 | \$12.60 | \$0.00 | \$67.01 |
| HVAC (TESTING AND BALANCING - AIR) <i>SHEETMETAL WORKERS LOCAL 63</i> | 07/01/2019 | \$35.74 | \$10.64 | \$16.22 | \$1.77 | \$64.37 |
| For apprentice rates see "Apprentice- SHEET METAL WORKER" | 01/01/2020 | \$36.99 | \$10.64 | \$16.22 | \$1.77 | \$65.62 |
| HVAC (TESTING AND BALANCING -WATER) <i>PLUMBERS & PIPEFITTERS LOCAL 104</i> | 03/17/2019 | \$40.21 | \$8.75 | \$16.35 | \$0.00 | \$65.31 |
| For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER" | | | | | | |
| HVAC MECHANIC <i>PLUMBERS & PIPEFITTERS LOCAL 104</i> | 03/17/2019 | \$40.21 | \$8.75 | \$16.35 | \$0.00 | \$65.31 |
| For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER" | | | | | | |

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|---|----------------|-----------|---------|---------|---------------------------|------------|
| HYDRAULIC DRILLS (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i> | 06/01/2019 | \$32.25 | \$7.85 | \$12.18 | \$0.00 | \$52.28 |
| | 12/01/2019 | \$33.04 | \$7.85 | \$12.18 | \$0.00 | \$53.07 |
| | 06/01/2020 | \$33.85 | \$7.85 | \$12.18 | \$0.00 | \$53.88 |
| | 12/01/2020 | \$34.66 | \$7.85 | \$12.18 | \$0.00 | \$54.69 |
| | 06/01/2021 | \$35.50 | \$7.85 | \$12.18 | \$0.00 | \$55.53 |
| | 12/01/2021 | \$36.33 | \$7.85 | \$12.18 | \$0.00 | \$56.36 |
| For apprentice rates see "Apprentice- LABORER (Heavy and Highway) | | | | | | |
| INSULATOR (PIPES & TANKS) <i>HEAT & FROST INSULATORS LOCAL 6 (SPRINGFIELD)</i> | 09/01/2018 | \$37.67 | \$12.50 | \$15.60 | \$0.00 | \$65.77 |
| | 09/01/2019 | \$39.67 | \$12.50 | \$15.60 | \$0.00 | \$67.77 |

Apprentice - ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Springfield

Effective Date - 09/01/2018

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 50 | \$18.84 | \$12.50 | \$11.40 | \$0.00 | \$42.74 |
| 2 | 60 | \$22.60 | \$12.50 | \$12.24 | \$0.00 | \$47.34 |
| 3 | 70 | \$26.37 | \$12.50 | \$13.08 | \$0.00 | \$51.95 |
| 4 | 80 | \$30.14 | \$12.50 | \$13.92 | \$0.00 | \$56.56 |

Effective Date - 09/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 50 | \$19.84 | \$12.50 | \$11.40 | \$0.00 | \$43.74 |
| 2 | 60 | \$23.80 | \$12.50 | \$12.24 | \$0.00 | \$48.54 |
| 3 | 70 | \$27.77 | \$12.50 | \$13.08 | \$0.00 | \$53.35 |
| 4 | 80 | \$31.74 | \$12.50 | \$13.92 | \$0.00 | \$58.16 |

Notes:

Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

| | | | | | | |
|--|------------|---------|--------|---------|--------|---------|
| IRONWORKER/WELDER <i>IRONWORKERS LOCAL 7 (SPRINGFIELD AREA)</i> | 03/16/2019 | \$34.20 | \$8.00 | \$20.75 | \$0.00 | \$62.95 |
| | 09/16/2019 | \$35.10 | \$8.00 | \$20.75 | \$0.00 | \$63.85 |
| | 03/16/2020 | \$35.95 | \$8.00 | \$20.75 | \$0.00 | \$64.70 |
| | 09/16/2020 | \$36.85 | \$8.00 | \$20.75 | \$0.00 | \$65.60 |
| | 03/16/2021 | \$37.70 | \$8.00 | \$20.75 | \$0.00 | \$66.45 |

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - IRONWORKER - Local 7 Springfield

Effective Date - 03/16/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 60 | \$20.52 | \$8.00 | \$20.75 | \$0.00 | \$49.27 |
| 2 | 70 | \$23.94 | \$8.00 | \$20.75 | \$0.00 | \$52.69 |
| 3 | 75 | \$25.65 | \$8.00 | \$20.75 | \$0.00 | \$54.40 |
| 4 | 80 | \$27.36 | \$8.00 | \$20.75 | \$0.00 | \$56.11 |
| 5 | 85 | \$29.07 | \$8.00 | \$20.75 | \$0.00 | \$57.82 |
| 6 | 90 | \$30.78 | \$8.00 | \$20.75 | \$0.00 | \$59.53 |

Effective Date - 09/16/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 60 | \$21.06 | \$8.00 | \$20.75 | \$0.00 | \$49.81 |
| 2 | 70 | \$24.57 | \$8.00 | \$20.75 | \$0.00 | \$53.32 |
| 3 | 75 | \$26.33 | \$8.00 | \$20.75 | \$0.00 | \$55.08 |
| 4 | 80 | \$28.08 | \$8.00 | \$20.75 | \$0.00 | \$56.83 |
| 5 | 85 | \$29.84 | \$8.00 | \$20.75 | \$0.00 | \$58.59 |
| 6 | 90 | \$31.59 | \$8.00 | \$20.75 | \$0.00 | \$60.34 |

Notes:

Structural 1:6; Ornamental 1:4

Apprentice to Journeyworker Ratio:

| | | | | | | |
|---|------------|---------|--------|---------|--------|---------|
| JACKHAMMER & PAVING BREAKER OPERATOR LABORERS - ZONE 3 (BUILDING & SITE) | 06/03/2019 | \$31.75 | \$7.85 | \$14.22 | \$0.00 | \$53.82 |
| | 12/02/2019 | \$32.56 | \$7.85 | \$14.22 | \$0.00 | \$54.63 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| LABORER LABORERS - ZONE 3 (BUILDING & SITE) | 06/03/2019 | \$31.50 | \$7.85 | \$14.22 | \$0.00 | \$53.57 |
| | 12/02/2019 | \$32.31 | \$7.85 | \$14.22 | \$0.00 | \$54.38 |

Apprentice - LABORER - Zone 3 Building & Site

Effective Date - 06/03/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 60 | \$18.90 | \$7.85 | \$14.22 | \$0.00 | \$40.97 |
| 2 | 70 | \$22.05 | \$7.85 | \$14.22 | \$0.00 | \$44.12 |
| 3 | 80 | \$25.20 | \$7.85 | \$14.22 | \$0.00 | \$47.27 |
| 4 | 90 | \$28.35 | \$7.85 | \$14.22 | \$0.00 | \$50.42 |

Effective Date - 12/02/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 60 | \$19.39 | \$7.85 | \$14.22 | \$0.00 | \$41.46 |
| 2 | 70 | \$22.62 | \$7.85 | \$14.22 | \$0.00 | \$44.69 |
| 3 | 80 | \$25.85 | \$7.85 | \$14.22 | \$0.00 | \$47.92 |
| 4 | 90 | \$29.08 | \$7.85 | \$14.22 | \$0.00 | \$51.15 |

Notes:

Apprentice to Journeyworker Ratio:1:5

| | | | | | | |
|-------------------------------------|------------|---------|--------|---------|--------|---------|
| LABORER (HEAVY & HIGHWAY) | 06/01/2019 | \$31.50 | \$7.85 | \$12.18 | \$0.00 | \$51.53 |
| LABORERS - ZONE 3 (HEAVY & HIGHWAY) | 12/01/2019 | \$32.29 | \$7.85 | \$12.18 | \$0.00 | \$52.32 |
| | 06/01/2020 | \$33.10 | \$7.85 | \$12.18 | \$0.00 | \$53.13 |
| | 12/01/2020 | \$33.91 | \$7.85 | \$12.18 | \$0.00 | \$53.94 |
| | 06/01/2021 | \$34.75 | \$7.85 | \$12.18 | \$0.00 | \$54.78 |
| | 12/01/2021 | \$35.58 | \$7.85 | \$12.18 | \$0.00 | \$55.61 |

Apprentice - LABORER (Heavy & Highway) - Zone 3

Effective Date - 06/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 60 | \$18.90 | \$7.85 | \$12.18 | \$0.00 | \$38.93 |
| 2 | 70 | \$22.05 | \$7.85 | \$12.18 | \$0.00 | \$42.08 |
| 3 | 80 | \$25.20 | \$7.85 | \$12.18 | \$0.00 | \$45.23 |
| 4 | 90 | \$28.35 | \$7.85 | \$12.18 | \$0.00 | \$48.38 |

Effective Date - 12/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 60 | \$19.37 | \$7.85 | \$12.18 | \$0.00 | \$39.40 |
| 2 | 70 | \$22.60 | \$7.85 | \$12.18 | \$0.00 | \$42.63 |
| 3 | 80 | \$25.83 | \$7.85 | \$12.18 | \$0.00 | \$45.86 |
| 4 | 90 | \$29.06 | \$7.85 | \$12.18 | \$0.00 | \$49.09 |

Notes:

Apprentice to Journeyworker Ratio:1:5

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|---|----------------|-----------|---------|---------|---------------------------|------------|
| LABORER: CARPENTER TENDER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i> | 06/03/2019 | \$31.50 | \$7.85 | \$14.22 | \$0.00 | \$53.57 |
| | 12/02/2019 | \$32.31 | \$7.85 | \$14.22 | \$0.00 | \$54.38 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| LABORER: CEMENT FINISHER TENDER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i> | 06/03/2019 | \$31.75 | \$7.85 | \$14.22 | \$0.00 | \$53.82 |
| | 12/02/2019 | \$32.56 | \$7.85 | \$14.22 | \$0.00 | \$54.63 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i> | 06/01/2019 | \$31.60 | \$7.85 | \$14.22 | \$0.00 | \$53.67 |
| | 12/01/2019 | \$32.41 | \$7.85 | \$14.22 | \$0.00 | \$54.48 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| LABORER: MASON TENDER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i> | 06/03/2019 | \$32.50 | \$7.85 | \$14.22 | \$0.00 | \$54.57 |
| | 12/02/2019 | \$33.31 | \$7.85 | \$14.22 | \$0.00 | \$55.38 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| LABORER: MASON TENDER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i> | 06/01/2019 | \$31.75 | \$7.85 | \$12.18 | \$0.00 | \$51.78 |
| | 12/01/2019 | \$32.54 | \$7.85 | \$12.18 | \$0.00 | \$52.57 |
| | 06/01/2020 | \$33.35 | \$7.85 | \$12.18 | \$0.00 | \$53.38 |
| | 12/01/2020 | \$34.16 | \$7.85 | \$12.18 | \$0.00 | \$54.19 |
| | 06/01/2021 | \$35.00 | \$7.85 | \$12.18 | \$0.00 | \$55.03 |
| | 12/01/2021 | \$35.83 | \$7.85 | \$12.18 | \$0.00 | \$55.86 |
| For apprentice rates see "Apprentice- LABORER (Heavy and Highway)" | | | | | | |
| LABORER: MULTI-TRADE TENDER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i> | 06/03/2019 | \$31.50 | \$7.85 | \$14.22 | \$0.00 | \$53.57 |
| | 12/02/2019 | \$32.31 | \$7.85 | \$14.22 | \$0.00 | \$54.38 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| LABORER: TREE REMOVER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i> | 06/03/2019 | \$31.50 | \$7.85 | \$14.22 | \$0.00 | \$53.57 |
| | 12/02/2019 | \$32.31 | \$7.85 | \$14.22 | \$0.00 | \$54.38 |
| This classification applies to all tree work associated with the removal of standing trees, and trimming and removal of branches and limbs when the work is not done for a utility company for the purpose of operation, maintenance or repair of utility company equipment. For apprentice rates see "Apprentice- LABORER" | | | | | | |
| LASER BEAM OPERATOR <i>LABORERS - ZONE 3 (BUILDING & SITE)</i> | 06/03/2019 | \$31.75 | \$7.85 | \$14.22 | \$0.00 | \$53.82 |
| | 12/02/2019 | \$32.56 | \$7.85 | \$14.22 | \$0.00 | \$54.63 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| LASER BEAM OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i> | 06/01/2019 | \$31.75 | \$7.85 | \$12.18 | \$0.00 | \$51.78 |
| | 12/01/2019 | \$32.54 | \$7.85 | \$12.18 | \$0.00 | \$52.57 |
| | 06/01/2020 | \$33.35 | \$7.85 | \$12.18 | \$0.00 | \$53.38 |
| | 12/01/2020 | \$34.16 | \$7.85 | \$12.18 | \$0.00 | \$54.19 |
| | 06/01/2021 | \$35.00 | \$7.85 | \$12.18 | \$0.00 | \$55.03 |
| | 12/01/2021 | \$35.83 | \$7.85 | \$12.18 | \$0.00 | \$55.86 |
| For apprentice rates see "Apprentice- LABORER (Heavy and Highway)" | | | | | | |
| MARBLE & TILE FINISHERS <i>BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE</i> | 02/01/2019 | \$34.67 | \$10.75 | \$18.26 | \$0.00 | \$63.68 |
| | 08/01/2019 | \$35.17 | \$10.75 | \$18.87 | \$0.00 | \$64.79 |
| | 02/01/2020 | \$35.67 | \$10.75 | \$18.87 | \$0.00 | \$65.29 |
| | 08/01/2020 | \$36.67 | \$10.75 | \$18.99 | \$0.00 | \$66.41 |
| | 02/01/2021 | \$37.17 | \$10.75 | \$18.99 | \$0.00 | \$66.91 |
| | 08/01/2021 | \$38.17 | \$10.75 | \$19.12 | \$0.00 | \$68.04 |
| | 02/01/2022 | \$38.62 | \$10.75 | \$19.12 | \$0.00 | \$68.49 |

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - MARBLE-TILE FINISHER-Local 3 Marble/Tile (Spr/Pitt)

Effective Date - 02/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 50 | \$17.34 | \$10.75 | \$18.26 | \$0.00 | \$46.35 |
| 2 | 60 | \$20.80 | \$10.75 | \$18.26 | \$0.00 | \$49.81 |
| 3 | 70 | \$24.27 | \$10.75 | \$18.26 | \$0.00 | \$53.28 |
| 4 | 80 | \$27.74 | \$10.75 | \$18.26 | \$0.00 | \$56.75 |
| 5 | 90 | \$31.20 | \$10.75 | \$18.26 | \$0.00 | \$60.21 |

Effective Date - 08/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 50 | \$17.59 | \$10.75 | \$18.87 | \$0.00 | \$47.21 |
| 2 | 60 | \$21.10 | \$10.75 | \$18.87 | \$0.00 | \$50.72 |
| 3 | 70 | \$24.62 | \$10.75 | \$18.87 | \$0.00 | \$54.24 |
| 4 | 80 | \$28.14 | \$10.75 | \$18.87 | \$0.00 | \$57.76 |
| 5 | 90 | \$31.65 | \$10.75 | \$18.87 | \$0.00 | \$61.27 |

Notes:

Apprentice to Journeyworker Ratio:1:5

MARBLE MASON/TILE LAYER(SP/PT)SeeBrick
BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE

See "BRICK/STONE/ARTIFICIAL MASONRY(INCL.MASONRY WATERPROOFING)

| | | | | | | |
|--|------------|---------|---------|---------|--------|---------|
| MECH. SWEEPER OPERATOR (ON CONST. SITES) OPERATING ENGINEERS LOCAL 98 | 06/01/2019 | \$35.05 | \$11.69 | \$14.08 | \$0.00 | \$60.82 |
| | 12/01/2019 | \$35.65 | \$11.69 | \$14.35 | \$0.00 | \$61.69 |

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

| | | | | | | |
|--|------------|---------|---------|---------|--------|---------|
| MECHANIC/WELDER/BOOM TRUCK OPERATING ENGINEERS LOCAL 98 | 06/01/2019 | \$34.52 | \$11.69 | \$14.08 | \$0.00 | \$60.29 |
| | 12/01/2019 | \$35.12 | \$11.69 | \$14.35 | \$0.00 | \$61.16 |

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

| | | | | | | |
|--|------------|---------|--------|---------|--------|---------|
| MILLWRIGHT (Zone 3) MILLWRIGHTS LOCAL 1121 - Zone 3 | 04/01/2019 | \$37.11 | \$9.90 | \$18.50 | \$0.00 | \$65.51 |
|--|------------|---------|--------|---------|--------|---------|

Apprentice - MILLWRIGHT - Local 1121 Zone 3

Effective Date - 04/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 55 | \$20.41 | \$9.90 | \$5.31 | \$0.00 | \$35.62 |
| 2 | 65 | \$24.12 | \$9.90 | \$15.13 | \$0.00 | \$49.15 |
| 3 | 75 | \$27.83 | \$9.90 | \$16.10 | \$0.00 | \$53.83 |
| 4 | 85 | \$31.54 | \$9.90 | \$17.06 | \$0.00 | \$58.50 |

Notes:

Steps are 2,000 hours

Apprentice to Journeyworker Ratio:1:5

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|--|----------------|-----------|---------|---------|---------------------------|------------|
| MORTAR MIXER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i> | 06/03/2019 | \$31.75 | \$7.85 | \$14.22 | \$0.00 | \$53.82 |
| | 12/02/2019 | \$32.56 | \$7.85 | \$14.22 | \$0.00 | \$54.63 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| OILER <i>OPERATING ENGINEERS LOCAL 98</i> | 06/01/2019 | \$30.21 | \$11.69 | \$14.08 | \$0.00 | \$55.98 |
| | 12/01/2019 | \$30.81 | \$11.69 | \$14.35 | \$0.00 | \$56.85 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| OTHER POWER DRIVEN EQUIPMENT - CLASS VI <i>OPERATING ENGINEERS LOCAL 98</i> | 06/01/2019 | \$28.23 | \$11.69 | \$14.08 | \$0.00 | \$54.00 |
| | 12/01/2019 | \$28.83 | \$11.69 | \$14.35 | \$0.00 | \$54.87 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| PAINTER (BRIDGES/TANKS) <i>PAINTERS LOCAL 35 - ZONE 3</i> | 07/01/2019 | \$50.66 | \$8.20 | \$21.45 | \$0.00 | \$80.31 |
| | 01/01/2020 | \$50.96 | \$8.20 | \$22.10 | \$0.00 | \$81.26 |
| | 07/01/2020 | \$52.06 | \$8.20 | \$22.10 | \$0.00 | \$82.36 |
| | 01/01/2021 | \$53.16 | \$8.20 | \$22.10 | \$0.00 | \$83.46 |

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date - 07/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 50 | \$25.33 | \$8.20 | \$0.00 | \$0.00 | \$33.53 |
| 2 | 55 | \$27.86 | \$8.20 | \$5.78 | \$0.00 | \$41.84 |
| 3 | 60 | \$30.40 | \$8.20 | \$6.30 | \$0.00 | \$44.90 |
| 4 | 65 | \$32.93 | \$8.20 | \$6.83 | \$0.00 | \$47.96 |
| 5 | 70 | \$35.46 | \$8.20 | \$18.30 | \$0.00 | \$61.96 |
| 6 | 75 | \$38.00 | \$8.20 | \$18.83 | \$0.00 | \$65.03 |
| 7 | 80 | \$40.53 | \$8.20 | \$19.35 | \$0.00 | \$68.08 |
| 8 | 90 | \$45.59 | \$8.20 | \$20.40 | \$0.00 | \$74.19 |

Effective Date - 01/01/2020

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 50 | \$25.48 | \$8.20 | \$0.00 | \$0.00 | \$33.68 |
| 2 | 55 | \$28.03 | \$8.20 | \$5.94 | \$0.00 | \$42.17 |
| 3 | 60 | \$30.58 | \$8.20 | \$6.48 | \$0.00 | \$45.26 |
| 4 | 65 | \$33.12 | \$8.20 | \$7.02 | \$0.00 | \$48.34 |
| 5 | 70 | \$35.67 | \$8.20 | \$18.51 | \$0.00 | \$62.38 |
| 6 | 75 | \$38.22 | \$8.20 | \$19.05 | \$0.00 | \$65.47 |
| 7 | 80 | \$40.77 | \$8.20 | \$19.59 | \$0.00 | \$68.56 |
| 8 | 90 | \$45.86 | \$8.20 | \$20.67 | \$0.00 | \$74.73 |

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

| | | | | | | |
|--|------------|---------|--------|--------|--------|---------|
| PAINTER (SIGN, PICTORIAL & DISPLAY) <i>PAINTERS LOCAL 35 - ZONE 3</i> | 06/01/2013 | \$25.81 | \$7.07 | \$7.05 | \$0.00 | \$39.93 |
|--|------------|---------|--------|--------|--------|---------|

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER SIGN - Local 35 Zone 3

Effective Date - 06/01/2013

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 50 | \$12.91 | \$7.07 | \$0.00 | \$0.00 | \$19.98 |
| 2 | 55 | \$14.20 | \$7.07 | \$2.45 | \$0.00 | \$23.72 |
| 3 | 60 | \$15.49 | \$7.07 | \$2.45 | \$0.00 | \$25.01 |
| 4 | 65 | \$16.78 | \$7.07 | \$2.45 | \$0.00 | \$26.30 |
| 5 | 70 | \$18.07 | \$7.07 | \$7.05 | \$0.00 | \$32.19 |
| 6 | 75 | \$19.36 | \$7.07 | \$7.05 | \$0.00 | \$33.48 |
| 7 | 80 | \$20.65 | \$7.07 | \$7.05 | \$0.00 | \$34.77 |
| 8 | 85 | \$21.94 | \$7.07 | \$7.05 | \$0.00 | \$36.06 |
| 9 | 90 | \$23.23 | \$7.07 | \$7.05 | \$0.00 | \$37.35 |

Notes:
Steps are 4 mos.

Apprentice to Journeyworker Ratio:1:1

| | | | | | | |
|---|------------|---------|--------|---------|--------|---------|
| PAINTER (SPRAY OR SANDBLAST, NEW) * | 07/01/2019 | \$34.03 | \$8.20 | \$17.55 | \$0.00 | \$59.78 |
| * If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 3 | 01/01/2020 | \$34.33 | \$8.20 | \$18.20 | \$0.00 | \$60.73 |
| | 07/01/2020 | \$35.43 | \$8.20 | \$18.20 | \$0.00 | \$61.83 |
| | 01/01/2021 | \$36.53 | \$8.20 | \$18.20 | \$0.00 | \$62.93 |

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 Zone 3 - Spray/Sandblast - New

Effective Date - 07/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 50 | \$17.02 | \$8.20 | \$0.00 | \$0.00 | \$25.22 |
| 2 | 55 | \$18.72 | \$8.20 | \$3.63 | \$0.00 | \$30.55 |
| 3 | 60 | \$20.42 | \$8.20 | \$3.96 | \$0.00 | \$32.58 |
| 4 | 65 | \$22.12 | \$8.20 | \$4.29 | \$0.00 | \$34.61 |
| 5 | 70 | \$23.82 | \$8.20 | \$15.57 | \$0.00 | \$47.59 |
| 6 | 75 | \$25.52 | \$8.20 | \$15.90 | \$0.00 | \$49.62 |
| 7 | 80 | \$27.22 | \$8.20 | \$16.23 | \$0.00 | \$51.65 |
| 8 | 90 | \$30.63 | \$8.20 | \$16.89 | \$0.00 | \$55.72 |

Effective Date - 01/01/2020

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 50 | \$17.17 | \$8.20 | \$0.00 | \$0.00 | \$25.37 |
| 2 | 55 | \$18.88 | \$8.20 | \$3.80 | \$0.00 | \$30.88 |
| 3 | 60 | \$20.60 | \$8.20 | \$4.14 | \$0.00 | \$32.94 |
| 4 | 65 | \$22.31 | \$8.20 | \$4.49 | \$0.00 | \$35.00 |
| 5 | 70 | \$24.03 | \$8.20 | \$15.78 | \$0.00 | \$48.01 |
| 6 | 75 | \$25.75 | \$8.20 | \$16.13 | \$0.00 | \$50.08 |
| 7 | 80 | \$27.46 | \$8.20 | \$16.47 | \$0.00 | \$52.13 |
| 8 | 90 | \$30.90 | \$8.20 | \$17.16 | \$0.00 | \$56.26 |

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

| | | | | | | |
|---------------------------------------|------------|---------|--------|---------|--------|---------|
| PAINTER (SPRAY OR SANDBLAST, REPAINT) | 07/01/2019 | \$31.35 | \$8.20 | \$17.55 | \$0.00 | \$57.10 |
| PAINTERS LOCAL 35 - ZONE 3 | 01/01/2020 | \$31.65 | \$8.20 | \$18.20 | \$0.00 | \$58.05 |
| | 07/01/2020 | \$32.75 | \$8.20 | \$18.20 | \$0.00 | \$59.15 |
| | 01/01/2021 | \$33.85 | \$8.20 | \$18.20 | \$0.00 | \$60.25 |

Apprentice - PAINTER Local 35 Zone 3 - Spray/Sandblast - Repaint

Effective Date - 07/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 50 | \$15.68 | \$8.20 | \$0.00 | \$0.00 | \$23.88 |
| 2 | 55 | \$17.24 | \$8.20 | \$3.63 | \$0.00 | \$29.07 |
| 3 | 60 | \$18.81 | \$8.20 | \$3.96 | \$0.00 | \$30.97 |
| 4 | 65 | \$20.38 | \$8.20 | \$4.29 | \$0.00 | \$32.87 |
| 5 | 70 | \$21.95 | \$8.20 | \$15.57 | \$0.00 | \$45.72 |
| 6 | 75 | \$23.51 | \$8.20 | \$15.90 | \$0.00 | \$47.61 |
| 7 | 80 | \$25.08 | \$8.20 | \$16.23 | \$0.00 | \$49.51 |
| 8 | 90 | \$28.22 | \$8.20 | \$16.89 | \$0.00 | \$53.31 |

Effective Date - 01/01/2020

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 50 | \$15.83 | \$8.20 | \$0.00 | \$0.00 | \$24.03 |
| 2 | 55 | \$17.41 | \$8.20 | \$3.80 | \$0.00 | \$29.41 |
| 3 | 60 | \$18.99 | \$8.20 | \$4.14 | \$0.00 | \$31.33 |
| 4 | 65 | \$20.57 | \$8.20 | \$4.49 | \$0.00 | \$33.26 |
| 5 | 70 | \$22.16 | \$8.20 | \$15.78 | \$0.00 | \$46.14 |
| 6 | 75 | \$23.74 | \$8.20 | \$16.13 | \$0.00 | \$48.07 |
| 7 | 80 | \$25.32 | \$8.20 | \$16.47 | \$0.00 | \$49.99 |
| 8 | 90 | \$28.49 | \$8.20 | \$17.16 | \$0.00 | \$53.85 |

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

| | | | | | | |
|---|------------|---------|--------|---------|--------|---------|
| PAINTER / TAPER (BRUSH, NEW) * | 07/01/2019 | \$32.63 | \$8.20 | \$17.55 | \$0.00 | \$58.38 |
| * If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 3 | 01/01/2020 | \$32.93 | \$8.20 | \$18.20 | \$0.00 | \$59.33 |
| | 07/01/2020 | \$34.03 | \$8.20 | \$18.20 | \$0.00 | \$60.43 |
| | 01/01/2021 | \$35.13 | \$8.20 | \$18.20 | \$0.00 | \$61.53 |

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER - Local 35 Zone 3 - BRUSH NEW

Effective Date - 07/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 50 | \$16.32 | \$8.20 | \$0.00 | \$0.00 | \$24.52 |
| 2 | 55 | \$17.95 | \$8.20 | \$3.63 | \$0.00 | \$29.78 |
| 3 | 60 | \$19.58 | \$8.20 | \$3.96 | \$0.00 | \$31.74 |
| 4 | 65 | \$21.21 | \$8.20 | \$4.29 | \$0.00 | \$33.70 |
| 5 | 70 | \$22.84 | \$8.20 | \$15.57 | \$0.00 | \$46.61 |
| 6 | 75 | \$24.47 | \$8.20 | \$15.90 | \$0.00 | \$48.57 |
| 7 | 80 | \$26.10 | \$8.20 | \$16.23 | \$0.00 | \$50.53 |
| 8 | 90 | \$29.37 | \$8.20 | \$16.89 | \$0.00 | \$54.46 |

Effective Date - 01/01/2020

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 50 | \$16.47 | \$8.20 | \$0.00 | \$0.00 | \$24.67 |
| 2 | 55 | \$18.11 | \$8.20 | \$3.80 | \$0.00 | \$30.11 |
| 3 | 60 | \$19.76 | \$8.20 | \$4.14 | \$0.00 | \$32.10 |
| 4 | 65 | \$21.40 | \$8.20 | \$4.49 | \$0.00 | \$34.09 |
| 5 | 70 | \$23.05 | \$8.20 | \$15.78 | \$0.00 | \$47.03 |
| 6 | 75 | \$24.70 | \$8.20 | \$16.13 | \$0.00 | \$49.03 |
| 7 | 80 | \$26.34 | \$8.20 | \$16.47 | \$0.00 | \$51.01 |
| 8 | 90 | \$29.64 | \$8.20 | \$17.16 | \$0.00 | \$55.00 |

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

| | | | | | | |
|----------------------------------|------------|---------|--------|---------|--------|---------|
| PAINTER / TAPER (BRUSH, REPAINT) | 07/01/2019 | \$29.95 | \$8.20 | \$17.55 | \$0.00 | \$55.70 |
| PAINTERS LOCAL 35 - ZONE 3 | 01/01/2020 | \$30.25 | \$8.20 | \$18.20 | \$0.00 | \$56.65 |
| | 07/01/2020 | \$31.35 | \$8.20 | \$18.20 | \$0.00 | \$57.75 |
| | 01/01/2021 | \$32.45 | \$8.20 | \$18.20 | \$0.00 | \$58.85 |

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 Zone 3 - BRUSH REPAINT

Effective Date - 07/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 50 | \$14.98 | \$8.20 | \$0.00 | \$0.00 | \$23.18 |
| 2 | 55 | \$16.47 | \$8.20 | \$3.63 | \$0.00 | \$28.30 |
| 3 | 60 | \$17.97 | \$8.20 | \$3.96 | \$0.00 | \$30.13 |
| 4 | 65 | \$19.47 | \$8.20 | \$4.29 | \$0.00 | \$31.96 |
| 5 | 70 | \$20.97 | \$8.20 | \$15.57 | \$0.00 | \$44.74 |
| 6 | 75 | \$22.46 | \$8.20 | \$15.90 | \$0.00 | \$46.56 |
| 7 | 80 | \$23.96 | \$8.20 | \$16.23 | \$0.00 | \$48.39 |
| 8 | 90 | \$26.96 | \$8.20 | \$16.89 | \$0.00 | \$52.05 |

Effective Date - 01/01/2020

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 50 | \$15.13 | \$8.20 | \$0.00 | \$0.00 | \$23.33 |
| 2 | 55 | \$16.64 | \$8.20 | \$3.80 | \$0.00 | \$28.64 |
| 3 | 60 | \$18.15 | \$8.20 | \$4.14 | \$0.00 | \$30.49 |
| 4 | 65 | \$19.66 | \$8.20 | \$4.49 | \$0.00 | \$32.35 |
| 5 | 70 | \$21.18 | \$8.20 | \$15.78 | \$0.00 | \$45.16 |
| 6 | 75 | \$22.69 | \$8.20 | \$16.13 | \$0.00 | \$47.02 |
| 7 | 80 | \$24.20 | \$8.20 | \$16.47 | \$0.00 | \$48.87 |
| 8 | 90 | \$27.23 | \$8.20 | \$17.16 | \$0.00 | \$52.59 |

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

| | | | | | | |
|--|------------|---------|--------|---------|--------|---------|
| PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY) | 06/01/2019 | \$31.50 | \$7.85 | \$12.18 | \$0.00 | \$51.53 |
| LABORERS - ZONE 3 (HEAVY & HIGHWAY) | 12/01/2019 | \$32.29 | \$7.85 | \$12.18 | \$0.00 | \$52.32 |
| | 06/01/2020 | \$33.10 | \$7.85 | \$12.18 | \$0.00 | \$53.13 |
| | 12/01/2020 | \$33.91 | \$7.85 | \$12.18 | \$0.00 | \$53.94 |
| | 06/01/2021 | \$34.75 | \$7.85 | \$12.18 | \$0.00 | \$54.78 |
| | 12/01/2021 | \$35.58 | \$7.85 | \$12.18 | \$0.00 | \$55.61 |

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)

| | | | | | | |
|---------------------------------------|------------|---------|---------|---------|--------|---------|
| PANEL & PICKUP TRUCKS DRIVER | 06/01/2019 | \$34.08 | \$11.91 | \$12.70 | \$0.00 | \$58.69 |
| TEAMSTERS JOINT COUNCIL NO. 10 ZONE B | 08/01/2019 | \$34.08 | \$12.41 | \$12.70 | \$0.00 | \$59.19 |
| | 12/01/2019 | \$34.08 | \$12.41 | \$13.72 | \$0.00 | \$60.21 |
| | 06/01/2020 | \$34.98 | \$12.41 | \$13.72 | \$0.00 | \$61.11 |
| | 08/01/2020 | \$34.98 | \$12.91 | \$13.72 | \$0.00 | \$61.61 |
| | 12/01/2020 | \$34.98 | \$12.91 | \$14.82 | \$0.00 | \$62.71 |
| | 06/01/2021 | \$35.78 | \$12.91 | \$14.82 | \$0.00 | \$63.51 |
| | 08/01/2021 | \$35.78 | \$13.41 | \$14.82 | \$0.00 | \$64.01 |
| | 12/01/2021 | \$35.78 | \$13.41 | \$16.01 | \$0.00 | \$65.20 |

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|--|----------------|-----------|--------|---------|---------------------------|------------|
| PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) | 08/01/2018 | \$41.57 | \$9.90 | \$21.15 | \$0.00 | \$72.62 |
| <i>PILE DRIVER LOCAL 56 (ZONE 3)</i> | 08/01/2019 | \$43.79 | \$9.90 | \$21.15 | \$0.00 | \$74.84 |
| For apprentice rates see "Apprentice- PILE DRIVER" | | | | | | |
| PILE DRIVER | 08/01/2018 | \$41.57 | \$9.90 | \$21.15 | \$0.00 | \$72.62 |
| <i>PILE DRIVER LOCAL 56 (ZONE 3)</i> | 08/01/2019 | \$43.79 | \$9.90 | \$21.15 | \$0.00 | \$74.84 |

Apprentice - PILE DRIVER - Local 56 Zone 3

Effective Date - 08/01/2018

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 0 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 |

Notes: Apprentice wages shall be no less than the following Steps;
 (Same as set in Zone 1)
 1\$54.34/2\$58.99/3\$63.65/4\$65.98/5\$68.31/6\$68.31/7\$72.96/8\$72.96

Apprentice to Journeyworker Ratio:1:5

| | | | | | | |
|--|------------|---------|--------|---------|--------|---------|
| PIPELAYER | 06/03/2019 | \$31.75 | \$7.85 | \$14.22 | \$0.00 | \$53.82 |
| <i>LABORERS - ZONE 3 (BUILDING & SITE)</i> | 12/02/2019 | \$32.56 | \$7.85 | \$14.22 | \$0.00 | \$54.63 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| PIPELAYER (HEAVY & HIGHWAY) | 06/01/2019 | \$31.75 | \$7.85 | \$12.18 | \$0.00 | \$51.78 |
| <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i> | 12/01/2019 | \$32.54 | \$7.85 | \$12.18 | \$0.00 | \$52.57 |
| | 06/01/2020 | \$33.35 | \$7.85 | \$12.18 | \$0.00 | \$53.38 |
| | 12/01/2020 | \$34.16 | \$7.85 | \$12.18 | \$0.00 | \$54.19 |
| | 06/01/2021 | \$35.00 | \$7.85 | \$12.18 | \$0.00 | \$55.03 |
| | 12/01/2021 | \$35.83 | \$7.85 | \$12.18 | \$0.00 | \$55.86 |
| For apprentice rates see "Apprentice- LABORER (Heavy and Highway)" | | | | | | |
| PLUMBER & PIPEFITTER | 03/17/2019 | \$40.21 | \$8.75 | \$16.35 | \$0.00 | \$65.31 |
| <i>PLUMBERS & PIPEFITTERS LOCAL 104</i> | | | | | | |

Apprentice - PLUMBER/PIPEFITTER - Local 104

Effective Date - 03/17/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 45 | \$18.09 | \$8.75 | \$9.60 | \$0.00 | \$36.44 |
| 2 | 50 | \$20.11 | \$8.75 | \$9.60 | \$0.00 | \$38.46 |
| 3 | 55 | \$22.12 | \$8.75 | \$9.60 | \$0.00 | \$40.47 |
| 4 | 60 | \$24.13 | \$8.75 | \$9.60 | \$0.00 | \$42.48 |
| 5 | 65 | \$26.14 | \$8.75 | \$9.60 | \$0.00 | \$44.49 |
| 6 | 70 | \$28.15 | \$8.75 | \$9.60 | \$0.00 | \$46.50 |
| 7 | 75 | \$30.16 | \$8.75 | \$9.60 | \$0.00 | \$48.51 |
| 8 | 80 | \$32.17 | \$8.75 | \$9.60 | \$0.00 | \$50.52 |
| 9 | 80 | \$32.17 | \$8.75 | \$16.35 | \$0.00 | \$57.27 |
| 10 | 80 | \$32.17 | \$8.75 | \$16.35 | \$0.00 | \$57.27 |

Notes: **1:1,2:5,3:9,4:12

Apprentice to Journeyworker Ratio:**

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|---|----------------|-----------|---------|---------|---------------------------|------------|
| PNEUMATIC CONTROLS (TEMP.) <i>PLUMBERS & PIPEFITTERS LOCAL 104</i> | 03/17/2019 | \$40.21 | \$8.75 | \$16.35 | \$0.00 | \$65.31 |
| For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER" | | | | | | |
| PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i> | 06/01/2019 | \$31.75 | \$7.85 | \$12.18 | \$0.00 | \$51.78 |
| | 12/01/2019 | \$32.54 | \$7.85 | \$12.18 | \$0.00 | \$52.57 |
| | 06/01/2020 | \$33.35 | \$7.85 | \$12.18 | \$0.00 | \$53.38 |
| | 12/01/2020 | \$34.16 | \$7.85 | \$12.18 | \$0.00 | \$54.19 |
| | 06/01/2021 | \$35.00 | \$7.85 | \$12.18 | \$0.00 | \$55.03 |
| | 12/01/2021 | \$35.83 | \$7.85 | \$12.18 | \$0.00 | \$55.86 |
| For apprentice rates see "Apprentice- LABORER (Heavy and Highway)" | | | | | | |
| POWDERMAN & BLASTER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i> | 06/03/2019 | \$32.50 | \$7.85 | \$14.22 | \$0.00 | \$54.57 |
| | 12/02/2019 | \$33.31 | \$7.85 | \$14.22 | \$0.00 | \$55.38 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| POWDERMAN & BLASTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i> | 06/01/2019 | \$32.50 | \$7.85 | \$12.18 | \$0.00 | \$52.53 |
| | 12/01/2019 | \$33.29 | \$7.85 | \$12.18 | \$0.00 | \$53.32 |
| | 06/01/2020 | \$34.10 | \$7.85 | \$12.18 | \$0.00 | \$54.13 |
| | 12/01/2020 | \$34.91 | \$7.85 | \$12.18 | \$0.00 | \$54.94 |
| | 06/01/2021 | \$35.75 | \$7.85 | \$12.18 | \$0.00 | \$55.78 |
| | 12/01/2021 | \$36.58 | \$7.85 | \$12.18 | \$0.00 | \$56.61 |
| For apprentice rates see "Apprentice- LABORER (Heavy and Highway)" | | | | | | |
| PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 98</i> | 06/01/2019 | \$35.05 | \$11.69 | \$14.08 | \$0.00 | \$60.82 |
| | 12/01/2019 | \$35.65 | \$11.69 | \$14.35 | \$0.00 | \$61.69 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 98</i> | 06/01/2019 | \$34.52 | \$11.69 | \$14.08 | \$0.00 | \$60.29 |
| | 12/01/2019 | \$35.12 | \$11.69 | \$14.35 | \$0.00 | \$61.16 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| READY-MIX CONCRETE DRIVER <i>TEAMSTERS 404 - Construction Service (Northampton)</i> | 05/01/2016 | \$20.54 | \$10.57 | \$8.39 | \$0.00 | \$39.50 |
| RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 3 (BUILDING & SITE)</i> | 06/03/2019 | \$31.75 | \$7.85 | \$14.22 | \$0.00 | \$53.82 |
| | 12/02/2019 | \$32.56 | \$7.85 | \$14.22 | \$0.00 | \$54.63 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| ROLLER OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i> | 06/01/2019 | \$33.91 | \$11.69 | \$14.08 | \$0.00 | \$59.68 |
| | 12/01/2019 | \$34.51 | \$11.69 | \$14.35 | \$0.00 | \$60.55 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| ROOFER (Coal tar pitch) <i>ROOFERS LOCAL 248</i> | 07/16/2019 | \$32.66 | \$10.05 | \$16.20 | \$0.00 | \$58.91 |
| For apprentice rates see "Apprentice- ROOFER" | | | | | | |
| ROOFER (Inc.Roofers Waterproofing &Roofers Damproofg) <i>ROOFERS LOCAL 248</i> | 07/16/2019 | \$32.16 | \$10.05 | \$15.70 | \$0.00 | \$57.91 |

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - ROOFER - Local 248

Effective Date - 07/16/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 60 | \$19.30 | \$10.05 | \$0.00 | \$0.00 | \$29.35 |
| 2 | 65 | \$20.90 | \$10.05 | \$15.70 | \$0.00 | \$46.65 |
| 3 | 70 | \$22.51 | \$10.05 | \$15.70 | \$0.00 | \$48.26 |
| 4 | 75 | \$24.12 | \$10.05 | \$15.70 | \$0.00 | \$49.87 |
| 5 | 80 | \$25.73 | \$10.05 | \$15.70 | \$0.00 | \$51.48 |
| 6 | 85 | \$27.34 | \$10.05 | \$15.70 | \$0.00 | \$53.09 |
| 7 | 90 | \$28.94 | \$10.05 | \$15.70 | \$0.00 | \$54.69 |
| 8 | 95 | \$30.55 | \$10.05 | \$15.70 | \$0.00 | \$56.30 |

Notes:
Steps are 750 hrs.Roofeer(Tear Off)1:1; Same as above

Apprentice to Journeyworker Ratio:1:3

| | | | | | | |
|---|------------|---------|---------|---------|--------|---------|
| ROOFER SLATE / TILE / PRECAST CONCRETE <i>ROOFERS LOCAL 248</i> | 07/16/2019 | \$32.66 | \$10.05 | \$16.20 | \$0.00 | \$58.91 |
| For apprentice rates see "Apprentice- ROOFER" | | | | | | |
| SCRAPER <i>OPERATING ENGINEERS LOCAL 98</i> | 06/01/2019 | \$34.52 | \$11.69 | \$14.08 | \$0.00 | \$60.29 |
| | 12/01/2019 | \$35.12 | \$11.69 | \$14.35 | \$0.00 | \$61.16 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| SELF-POWERED ROLLERS AND COMPACTORS (TAMPERS) <i>OPERATING ENGINEERS LOCAL 98</i> | 06/01/2019 | \$33.91 | \$11.69 | \$14.08 | \$0.00 | \$59.68 |
| | 12/01/2019 | \$34.51 | \$11.69 | \$14.35 | \$0.00 | \$60.55 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| SELF-PROPELLED POWER BROOM <i>OPERATING ENGINEERS LOCAL 98</i> | 06/01/2019 | \$31.29 | \$11.69 | \$14.08 | \$0.00 | \$57.06 |
| | 12/01/2019 | \$31.89 | \$11.69 | \$14.35 | \$0.00 | \$57.93 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| SHEETMETAL WORKER <i>SHEETMETAL WORKERS LOCAL 63</i> | 07/01/2019 | \$35.74 | \$10.64 | \$16.22 | \$1.77 | \$64.37 |
| | 01/01/2020 | \$36.99 | \$10.64 | \$16.22 | \$1.77 | \$65.62 |

Apprentice - SHEET METAL WORKER - Local 63

Effective Date - 07/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 45 | \$16.08 | \$6.21 | \$4.67 | \$0.00 | \$26.96 |
| 2 | 50 | \$17.87 | \$6.55 | \$5.19 | \$0.00 | \$29.61 |
| 3 | 55 | \$19.66 | \$6.88 | \$9.33 | \$1.08 | \$36.95 |
| 4 | 60 | \$21.44 | \$7.22 | \$9.33 | \$1.14 | \$39.13 |
| 5 | 65 | \$23.23 | \$7.55 | \$9.33 | \$1.20 | \$41.31 |
| 6 | 70 | \$25.02 | \$7.88 | \$9.33 | \$1.27 | \$43.50 |
| 7 | 75 | \$26.81 | \$8.22 | \$9.33 | \$1.33 | \$45.69 |
| 8 | 80 | \$28.59 | \$9.30 | \$15.18 | \$1.59 | \$54.66 |
| 9 | 85 | \$30.38 | \$9.64 | \$15.18 | \$1.66 | \$56.86 |
| 10 | 90 | \$32.17 | \$9.98 | \$15.18 | \$1.72 | \$59.05 |

Effective Date - 01/01/2020

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 45 | \$16.65 | \$6.21 | \$4.67 | \$0.00 | \$27.53 |
| 2 | 50 | \$18.50 | \$6.55 | \$5.19 | \$0.00 | \$30.24 |
| 3 | 55 | \$20.34 | \$6.88 | \$9.33 | \$1.08 | \$37.63 |
| 4 | 60 | \$22.19 | \$7.22 | \$9.33 | \$1.14 | \$39.88 |
| 5 | 65 | \$24.04 | \$7.55 | \$9.33 | \$1.20 | \$42.12 |
| 6 | 70 | \$25.89 | \$7.88 | \$9.33 | \$1.27 | \$44.37 |
| 7 | 75 | \$27.74 | \$8.22 | \$9.33 | \$1.33 | \$46.62 |
| 8 | 80 | \$29.59 | \$9.30 | \$15.18 | \$1.59 | \$55.66 |
| 9 | 85 | \$31.44 | \$9.64 | \$15.18 | \$1.66 | \$57.92 |
| 10 | 90 | \$33.29 | \$9.98 | \$15.18 | \$1.72 | \$60.17 |

Notes:

Apprentice to Journeyworker Ratio:1:3

| | | | | | | |
|--|------------|---------|---------|---------|--------|---------|
| SPECIALIZED EARTH MOVING EQUIP < 35 TONS | 06/01/2019 | \$34.54 | \$11.91 | \$12.70 | \$0.00 | \$59.15 |
| TEAMSTERS JOINT COUNCIL NO. 10 ZONE B | 08/01/2019 | \$34.54 | \$12.41 | \$12.70 | \$0.00 | \$59.65 |
| | 12/01/2019 | \$34.54 | \$12.41 | \$13.72 | \$0.00 | \$60.67 |
| | 06/01/2020 | \$35.44 | \$12.41 | \$13.72 | \$0.00 | \$61.57 |
| | 08/01/2020 | \$35.44 | \$12.91 | \$13.72 | \$0.00 | \$62.07 |
| | 12/01/2020 | \$35.44 | \$12.91 | \$14.82 | \$0.00 | \$63.17 |
| | 06/01/2021 | \$36.24 | \$12.91 | \$14.82 | \$0.00 | \$63.97 |
| | 08/01/2021 | \$36.24 | \$13.41 | \$14.82 | \$0.00 | \$64.47 |
| | 12/01/2021 | \$36.24 | \$13.41 | \$16.01 | \$0.00 | \$65.66 |

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|--|----------------|-----------|---------|---------|---------------------------|------------|
| SPECIALIZED EARTH MOVING EQUIP > 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i> | 06/01/2019 | \$34.83 | \$11.91 | \$12.70 | \$0.00 | \$59.44 |
| | 08/01/2019 | \$34.83 | \$12.41 | \$12.70 | \$0.00 | \$59.94 |
| | 12/01/2019 | \$34.83 | \$12.41 | \$13.72 | \$0.00 | \$60.96 |
| | 06/01/2020 | \$35.73 | \$12.41 | \$13.72 | \$0.00 | \$61.86 |
| | 08/01/2020 | \$35.73 | \$12.91 | \$13.72 | \$0.00 | \$62.36 |
| | 12/01/2020 | \$35.73 | \$12.91 | \$14.82 | \$0.00 | \$63.46 |
| | 06/01/2021 | \$36.53 | \$12.91 | \$14.82 | \$0.00 | \$64.26 |
| | 08/01/2021 | \$36.53 | \$13.41 | \$14.82 | \$0.00 | \$64.76 |
| | 12/01/2021 | \$36.53 | \$13.41 | \$16.01 | \$0.00 | \$65.95 |
| SPRINKLER FITTER <i>SPRINKLER FITTERS LOCAL 669</i> | 01/01/2019 | \$41.51 | \$10.02 | \$13.08 | \$0.00 | \$64.61 |

Apprentice - SPRINKLER FITTER - Local 669

Effective Date - 01/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 45 | \$18.68 | \$7.75 | \$0.00 | \$0.00 | \$26.43 |
| 2 | 50 | \$20.76 | \$7.75 | \$0.00 | \$0.00 | \$28.51 |
| 3 | 55 | \$22.83 | \$10.02 | \$7.25 | \$0.00 | \$40.10 |
| 4 | 60 | \$24.91 | \$10.02 | \$7.25 | \$0.00 | \$42.18 |
| 5 | 65 | \$26.98 | \$10.02 | \$7.50 | \$0.00 | \$44.50 |
| 6 | 70 | \$29.06 | \$10.02 | \$7.50 | \$0.00 | \$46.58 |
| 7 | 75 | \$31.13 | \$10.02 | \$7.50 | \$0.00 | \$48.65 |
| 8 | 80 | \$33.21 | \$10.02 | \$7.50 | \$0.00 | \$50.73 |
| 9 | 85 | \$35.28 | \$10.02 | \$7.50 | \$0.00 | \$52.80 |
| 10 | 90 | \$37.36 | \$10.02 | \$7.50 | \$0.00 | \$54.88 |

Notes:

Apprentice to Journeyworker Ratio:1:1

| | | | | | | |
|---|------------|---------|---------|---------|--------|---------|
| TELECOMMUNICATION TECHNICIAN <i>ELECTRICIANS LOCAL 7</i> | 06/30/2019 | \$42.66 | \$10.75 | \$12.33 | \$0.00 | \$65.74 |
| | 12/29/2019 | \$43.41 | \$11.00 | \$12.60 | \$0.00 | \$67.01 |

Apprentice - TELECOMMUNICATION TECHNICIAN - Local 7

Effective Date - 06/30/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 40 | \$17.06 | \$5.85 | \$0.51 | \$0.00 | \$23.42 |
| 2 | 45 | \$19.20 | \$5.85 | \$0.58 | \$0.00 | \$25.63 |
| 3 | 50 | \$21.33 | \$10.75 | \$6.94 | \$0.00 | \$39.02 |
| 4 | 55 | \$23.46 | \$10.75 | \$7.00 | \$0.00 | \$41.21 |
| 5 | 65 | \$27.73 | \$10.75 | \$8.13 | \$0.00 | \$46.61 |
| 6 | 70 | \$29.86 | \$10.75 | \$9.20 | \$0.00 | \$49.81 |

Notes:

Steps are 800 hours

Apprentice to Journeyworker Ratio:1:1

| | | | | | | |
|--|------------|---------|---------|---------|--------|---------|
| TERRAZZO FINISHERS BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE | 02/01/2019 | \$52.49 | \$10.75 | \$20.66 | \$0.00 | \$83.90 |
| | 08/01/2019 | \$53.34 | \$10.75 | \$21.30 | \$0.00 | \$85.39 |
| | 02/01/2020 | \$53.98 | \$10.75 | \$21.30 | \$0.00 | \$86.03 |
| | 08/01/2020 | \$55.33 | \$10.75 | \$21.45 | \$0.00 | \$87.53 |
| | 02/01/2021 | \$55.97 | \$10.75 | \$21.45 | \$0.00 | \$88.17 |
| | 08/01/2021 | \$57.37 | \$10.75 | \$21.61 | \$0.00 | \$89.73 |
| | 02/01/2022 | \$57.96 | \$10.75 | \$21.61 | \$0.00 | \$90.32 |

Apprentice - TERRAZZO FINISHER-Local 3 Marble/Tile (Spr/Ptt)

Effective Date - 02/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 50 | \$26.25 | \$10.75 | \$20.66 | \$0.00 | \$57.66 |
| 2 | 60 | \$31.49 | \$10.75 | \$20.66 | \$0.00 | \$62.90 |
| 3 | 70 | \$36.74 | \$10.75 | \$20.66 | \$0.00 | \$68.15 |
| 4 | 80 | \$41.99 | \$10.75 | \$20.66 | \$0.00 | \$73.40 |
| 5 | 90 | \$47.24 | \$10.75 | \$20.66 | \$0.00 | \$78.65 |

Effective Date - 08/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 50 | \$26.67 | \$10.75 | \$21.30 | \$0.00 | \$58.72 |
| 2 | 60 | \$32.00 | \$10.75 | \$21.30 | \$0.00 | \$64.05 |
| 3 | 70 | \$37.34 | \$10.75 | \$21.30 | \$0.00 | \$69.39 |
| 4 | 80 | \$42.67 | \$10.75 | \$21.30 | \$0.00 | \$74.72 |
| 5 | 90 | \$48.01 | \$10.75 | \$21.30 | \$0.00 | \$80.06 |

Notes:

Apprentice to Journeyworker Ratio:1:5

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|--|----------------|-----------|---------|---------|---------------------------|------------|
| TERRAZZO MECHANIC <i>BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE</i> | 02/01/2019 | \$53.57 | \$10.75 | \$20.66 | \$0.00 | \$84.98 |
| | 08/01/2019 | \$54.42 | \$10.75 | \$21.30 | \$0.00 | \$86.47 |
| | 02/01/2020 | \$55.05 | \$10.75 | \$21.30 | \$0.00 | \$87.10 |
| | 08/01/2020 | \$56.40 | \$10.75 | \$21.45 | \$0.00 | \$88.60 |
| | 02/01/2021 | \$57.04 | \$10.75 | \$21.45 | \$0.00 | \$89.24 |
| | 08/01/2021 | \$58.44 | \$10.75 | \$21.61 | \$0.00 | \$90.80 |
| | 02/01/2022 | \$59.01 | \$10.75 | \$21.61 | \$0.00 | \$91.37 |

Apprentice - TERRAZZO MECH - Local 3 Marble/Tile (Spr/Pitt)

Effective Date - 02/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 50 | \$26.79 | \$10.75 | \$20.66 | \$0.00 | \$58.20 |
| 2 | 60 | \$32.14 | \$10.75 | \$20.66 | \$0.00 | \$63.55 |
| 3 | 70 | \$37.50 | \$10.75 | \$20.66 | \$0.00 | \$68.91 |
| 4 | 80 | \$42.86 | \$10.75 | \$20.66 | \$0.00 | \$74.27 |
| 5 | 90 | \$48.21 | \$10.75 | \$20.66 | \$0.00 | \$79.62 |

Effective Date - 08/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 50 | \$27.21 | \$10.75 | \$21.30 | \$0.00 | \$59.26 |
| 2 | 60 | \$32.65 | \$10.75 | \$21.30 | \$0.00 | \$64.70 |
| 3 | 70 | \$38.09 | \$10.75 | \$21.30 | \$0.00 | \$70.14 |
| 4 | 80 | \$43.54 | \$10.75 | \$21.30 | \$0.00 | \$75.59 |
| 5 | 90 | \$48.98 | \$10.75 | \$21.30 | \$0.00 | \$81.03 |

Notes:

Apprentice to Journeyworker Ratio:1:5

| | | | | | | |
|--|------------|---------|--------|---------|--------|---------|
| TEST BORING DRILLER <i>LABORERS - FOUNDATION AND MARINE</i> | 06/01/2019 | \$40.50 | \$7.85 | \$16.05 | \$0.00 | \$64.40 |
| | 12/01/2019 | \$41.50 | \$7.85 | \$16.05 | \$0.00 | \$65.40 |
| | 06/01/2020 | \$42.49 | \$7.85 | \$16.05 | \$0.00 | \$66.39 |
| | 12/01/2020 | \$43.47 | \$7.85 | \$16.05 | \$0.00 | \$67.37 |
| | 06/01/2021 | \$44.49 | \$7.85 | \$16.05 | \$0.00 | \$68.39 |
| | 12/01/2021 | \$45.50 | \$7.85 | \$16.05 | \$0.00 | \$69.40 |

For apprentice rates see "Apprentice- LABORER"

| | | | | | | |
|---|------------|---------|--------|---------|--------|---------|
| TEST BORING DRILLER HELPER <i>LABORERS - FOUNDATION AND MARINE</i> | 06/01/2019 | \$39.22 | \$7.85 | \$16.05 | \$0.00 | \$63.12 |
| | 12/01/2019 | \$40.22 | \$7.85 | \$16.05 | \$0.00 | \$64.12 |
| | 06/01/2020 | \$41.21 | \$7.85 | \$16.05 | \$0.00 | \$65.11 |
| | 12/01/2020 | \$42.19 | \$7.85 | \$16.05 | \$0.00 | \$66.09 |
| | 06/01/2021 | \$43.21 | \$7.85 | \$16.05 | \$0.00 | \$67.11 |
| | 12/01/2021 | \$44.22 | \$7.85 | \$16.05 | \$0.00 | \$68.12 |

For apprentice rates see "Apprentice- LABORER"

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|---|----------------|-----------|---------|---------|---------------------------|------------|
| TEST BORING LABORER <i>LABORERS - FOUNDATION AND MARINE</i> | 06/01/2019 | \$39.10 | \$7.85 | \$16.05 | \$0.00 | \$63.00 |
| | 12/01/2019 | \$40.10 | \$7.85 | \$16.05 | \$0.00 | \$64.00 |
| | 06/01/2020 | \$41.09 | \$7.85 | \$16.05 | \$0.00 | \$64.99 |
| | 12/01/2020 | \$42.07 | \$7.85 | \$16.05 | \$0.00 | \$65.97 |
| | 06/01/2021 | \$43.09 | \$7.85 | \$16.05 | \$0.00 | \$66.99 |
| | 12/01/2021 | \$44.10 | \$7.85 | \$16.05 | \$0.00 | \$68.00 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| TRACTORS <i>OPERATING ENGINEERS LOCAL 98</i> | 06/01/2019 | \$33.91 | \$11.69 | \$14.08 | \$0.00 | \$59.68 |
| | 12/01/2019 | \$34.51 | \$11.69 | \$14.35 | \$0.00 | \$60.55 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| TRAILERS FOR EARTH MOVING EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i> | 06/01/2019 | \$35.12 | \$11.91 | \$12.70 | \$0.00 | \$59.73 |
| | 08/01/2019 | \$35.12 | \$12.41 | \$12.70 | \$0.00 | \$60.23 |
| | 12/01/2019 | \$35.12 | \$12.41 | \$13.72 | \$0.00 | \$61.25 |
| | 06/01/2020 | \$36.02 | \$12.41 | \$13.72 | \$0.00 | \$62.15 |
| | 08/01/2020 | \$36.02 | \$12.91 | \$13.72 | \$0.00 | \$62.65 |
| | 12/01/2020 | \$36.02 | \$12.91 | \$14.82 | \$0.00 | \$63.75 |
| | 06/01/2021 | \$36.82 | \$12.91 | \$14.82 | \$0.00 | \$64.55 |
| | 08/01/2021 | \$36.82 | \$13.41 | \$14.82 | \$0.00 | \$65.05 |
| | 12/01/2021 | \$36.82 | \$13.41 | \$16.01 | \$0.00 | \$66.24 |
| TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i> | 06/01/2019 | \$51.38 | \$7.85 | \$16.45 | \$0.00 | \$75.68 |
| | 12/01/2019 | \$52.38 | \$7.85 | \$16.45 | \$0.00 | \$76.68 |
| | 06/01/2020 | \$53.37 | \$7.85 | \$16.45 | \$0.00 | \$77.67 |
| | 12/01/2020 | \$54.35 | \$7.85 | \$16.45 | \$0.00 | \$78.65 |
| | 06/01/2021 | \$55.37 | \$7.85 | \$16.45 | \$0.00 | \$79.67 |
| | 12/01/2021 | \$56.38 | \$7.85 | \$16.45 | \$0.00 | \$80.68 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i> | 06/01/2019 | \$53.38 | \$7.85 | \$16.45 | \$0.00 | \$77.68 |
| | 12/01/2019 | \$54.38 | \$7.85 | \$16.45 | \$0.00 | \$78.68 |
| | 06/01/2020 | \$55.37 | \$7.85 | \$16.45 | \$0.00 | \$79.67 |
| | 12/01/2020 | \$56.35 | \$7.85 | \$16.45 | \$0.00 | \$80.65 |
| | 06/01/2021 | \$57.37 | \$7.85 | \$16.45 | \$0.00 | \$81.67 |
| | 12/01/2021 | \$58.38 | \$7.85 | \$16.45 | \$0.00 | \$82.68 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i> | 06/01/2019 | \$43.45 | \$7.85 | \$16.45 | \$0.00 | \$67.75 |
| | 12/01/2019 | \$44.45 | \$7.85 | \$16.45 | \$0.00 | \$68.75 |
| | 06/01/2020 | \$45.44 | \$7.85 | \$16.45 | \$0.00 | \$69.74 |
| | 12/01/2020 | \$46.42 | \$7.85 | \$16.45 | \$0.00 | \$70.72 |
| | 06/01/2021 | \$47.44 | \$7.85 | \$16.45 | \$0.00 | \$71.74 |
| | 12/01/2021 | \$48.45 | \$7.85 | \$16.45 | \$0.00 | \$72.75 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i> | 06/01/2019 | \$45.45 | \$7.85 | \$16.45 | \$0.00 | \$69.75 |
| | 12/01/2019 | \$46.45 | \$7.85 | \$16.45 | \$0.00 | \$70.75 |
| | 06/01/2020 | \$47.44 | \$7.85 | \$16.45 | \$0.00 | \$71.74 |
| | 12/01/2020 | \$48.42 | \$7.85 | \$16.45 | \$0.00 | \$72.72 |
| | 06/01/2021 | \$49.44 | \$7.85 | \$16.45 | \$0.00 | \$73.74 |
| | 12/01/2021 | \$50.45 | \$7.85 | \$16.45 | \$0.00 | \$74.75 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|--|----------------|-----------|---------|---------|---------------------------|------------|
| VAC-HAUL <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i> | 06/01/2019 | \$34.54 | \$11.91 | \$12.70 | \$0.00 | \$59.15 |
| | 08/01/2019 | \$34.54 | \$12.41 | \$12.70 | \$0.00 | \$59.65 |
| | 12/01/2019 | \$34.54 | \$12.41 | \$13.72 | \$0.00 | \$60.67 |
| | 06/01/2020 | \$35.44 | \$12.41 | \$13.72 | \$0.00 | \$61.57 |
| | 08/01/2020 | \$35.44 | \$12.91 | \$13.72 | \$0.00 | \$62.07 |
| | 12/01/2020 | \$35.44 | \$12.91 | \$14.82 | \$0.00 | \$63.17 |
| | 06/01/2021 | \$36.24 | \$12.91 | \$14.82 | \$0.00 | \$63.97 |
| | 08/01/2021 | \$36.24 | \$13.41 | \$14.82 | \$0.00 | \$64.47 |
| | 12/01/2021 | \$36.24 | \$13.41 | \$16.01 | \$0.00 | \$65.66 |
| WAGON DRILL OPERATOR <i>LABORERS - ZONE 3 (BUILDING & SITE)</i> | 06/03/2019 | \$31.75 | \$7.85 | \$14.22 | \$0.00 | \$53.82 |
| | 12/02/2019 | \$32.56 | \$7.85 | \$14.22 | \$0.00 | \$54.63 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| WAGON DRILL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i> | 06/01/2019 | \$31.75 | \$7.85 | \$12.18 | \$0.00 | \$51.78 |
| | 12/01/2019 | \$32.54 | \$7.85 | \$12.18 | \$0.00 | \$52.57 |
| | 06/01/2020 | \$33.35 | \$7.85 | \$12.18 | \$0.00 | \$53.38 |
| | 12/01/2020 | \$34.16 | \$7.85 | \$12.18 | \$0.00 | \$54.19 |
| | 06/01/2021 | \$35.00 | \$7.85 | \$12.18 | \$0.00 | \$55.03 |
| | 12/01/2021 | \$35.83 | \$7.85 | \$12.18 | \$0.00 | \$55.86 |
| For apprentice rates see "Apprentice- LABORER (Heavy and Highway)" | | | | | | |
| WATER METER INSTALLER <i>PLUMBERS & PIPEFITTERS LOCAL 104</i> | 03/17/2019 | \$40.21 | \$8.75 | \$16.35 | \$0.00 | \$65.31 |
| For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER" | | | | | | |
| Outside Electrical - West | | | | | | |
| EQUIPMENT OPERATOR <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i> | 09/02/2018 | \$42.26 | \$8.00 | \$12.50 | \$0.00 | \$62.76 |
| | 09/01/2019 | \$44.67 | \$8.00 | \$12.55 | \$0.00 | \$65.22 |
| For apprentice rates see "Apprentice- LINEMAN" | | | | | | |
| GROUNDMAN <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i> | 09/02/2018 | \$28.17 | \$8.00 | \$5.41 | \$0.00 | \$41.58 |
| | 09/01/2019 | \$30.58 | \$8.00 | \$5.48 | \$0.00 | \$44.06 |
| For apprentice rates see "Apprentice- LINEMAN" | | | | | | |
| GROUNDMAN / TRUCK DRIVER <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i> | 09/02/2018 | \$37.56 | \$8.00 | \$10.89 | \$0.00 | \$56.45 |
| | 09/01/2019 | \$39.97 | \$8.00 | \$10.96 | \$0.00 | \$58.93 |
| For apprentice rates see "Apprentice- LINEMAN" | | | | | | |
| HEAVY EQUIPMENT OPERATOR <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i> | 09/02/2018 | \$44.60 | \$8.00 | \$13.15 | \$0.00 | \$65.75 |
| | 09/01/2019 | \$47.01 | \$8.00 | \$13.22 | \$0.00 | \$68.23 |
| For apprentice rates see "Apprentice- LINEMAN" | | | | | | |
| JOURNEYMAN LINEMAN <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i> | 09/02/2018 | \$49.30 | \$8.00 | \$15.48 | \$0.00 | \$72.78 |
| | 09/01/2019 | \$51.71 | \$8.00 | \$15.55 | \$0.00 | \$75.26 |

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - LINEMAN (Outside Electrical) - West Local 42

Effective Date - 09/02/2018

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 60 | \$29.58 | \$8.00 | \$3.39 | \$0.00 | \$40.97 |
| 2 | 65 | \$32.05 | \$8.00 | \$3.46 | \$0.00 | \$43.51 |
| 3 | 70 | \$34.51 | \$8.00 | \$3.54 | \$0.00 | \$46.05 |
| 4 | 75 | \$36.98 | \$8.00 | \$5.11 | \$0.00 | \$50.09 |
| 5 | 80 | \$39.44 | \$8.00 | \$5.18 | \$0.00 | \$52.62 |
| 6 | 85 | \$41.91 | \$8.00 | \$5.26 | \$0.00 | \$55.17 |
| 7 | 90 | \$44.37 | \$8.00 | \$7.33 | \$0.00 | \$59.70 |

Effective Date - 09/01/2019

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 60 | \$31.03 | \$8.00 | \$3.43 | \$0.00 | \$42.46 |
| 2 | 65 | \$33.61 | \$8.00 | \$3.51 | \$0.00 | \$45.12 |
| 3 | 70 | \$36.20 | \$8.00 | \$3.59 | \$0.00 | \$47.79 |
| 4 | 75 | \$38.78 | \$8.00 | \$5.16 | \$0.00 | \$51.94 |
| 5 | 80 | \$41.37 | \$8.00 | \$5.24 | \$0.00 | \$54.61 |
| 6 | 85 | \$43.95 | \$8.00 | \$5.32 | \$0.00 | \$57.27 |
| 7 | 90 | \$46.54 | \$8.00 | \$7.40 | \$0.00 | \$61.94 |

Notes:

Apprentice to Journeyworker Ratio:1:2

| | | | | | | |
|--|------------|---------|--------|---------|--------|---------|
| TELEDATA CABLE SPLICER <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i> | 02/04/2019 | \$30.73 | \$4.70 | \$3.17 | \$0.00 | \$38.60 |
| TELEDATA LINEMAN/EQUIPMENT OPERATOR <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i> | 02/04/2019 | \$28.93 | \$4.70 | \$3.14 | \$0.00 | \$36.77 |
| TELEDATA WIREMAN/INSTALLER/TECHNICIAN <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i> | 02/04/2019 | \$28.93 | \$4.70 | \$3.14 | \$0.00 | \$36.77 |
| TRACTOR-TRAILER DRIVER <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i> | 09/02/2018 | \$42.26 | \$8.00 | \$12.50 | \$0.00 | \$62.76 |
| TREE TRIMMER <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i> | 09/01/2019 | \$44.67 | \$8.00 | \$12.55 | \$0.00 | \$65.22 |
| TREE TRIMMER <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i> | 01/31/2016 | \$18.51 | \$3.55 | \$0.00 | \$0.00 | \$22.06 |
| TREE TRIMMER GROUNDMAN <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i> | 01/31/2016 | \$16.32 | \$3.55 | \$0.00 | \$0.00 | \$19.87 |

This classification applies only to tree work done: (a) for a utility company, R.E.A. cooperative, or railroad or coal mining company, and (b) for the purpose of operating, maintaining, or repairing the utility company's equipment, and (c) by a person who is using hand or mechanical cutting methods and is not on the ground. This classification does not apply to wholesale tree removal.

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Additional Apprentices Information:

Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the pre-determined hourly wage rate established by the Commissioner under the provisions of the M.G.L. c. 149, ss. 26-27D. Apprentices ratios are established by the Division of Apprenticeship Training pursuant to M.G.L. c. 23, ss. 11E-11L.

All apprentices must be registered with the Division of Apprenticeship Training in accordance with M.G.L. c. 23, ss. 11E-11L.

All steps are six months (1000 hours.)

Ratios are expressed in allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified.

** Multiple ratios are listed in the comment field.

*** APP to JM; 1:1, 2:2, 2:3, 3:4, 4:4, 4:5, 4:6, 5:7, 6:7, 6:8, 6:9, 7:10, 8:10, 8:11, 8:12, 9:13, 10:13, 10:14, etc.

**** APP to JM; 1:1, 1:2, 2:3, 2:4, 3:5, 4:6, 4:7, 5:8, 6:9, 6:10, 7:11, 8:12, 8:13, 9:14, 10:15, 10:16, etc.

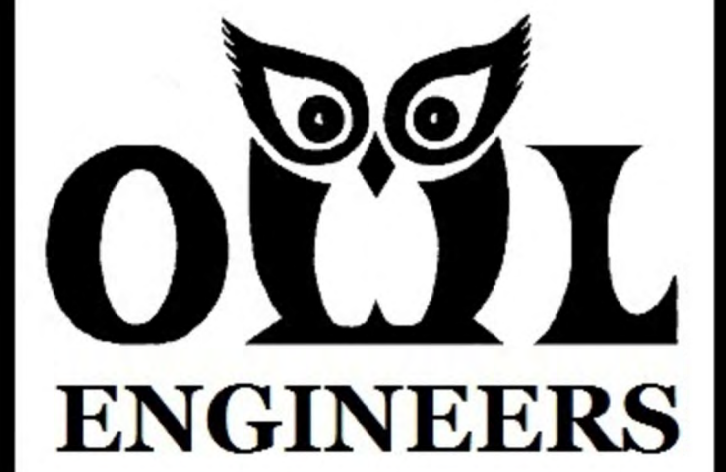
EXHIBIT 2

ENGINEER'S PLANS

TOWN OF NORTHFIELD

NORTHFIELD TOWN HALL

ELECTRICAL ENGINEERING PHASE 3



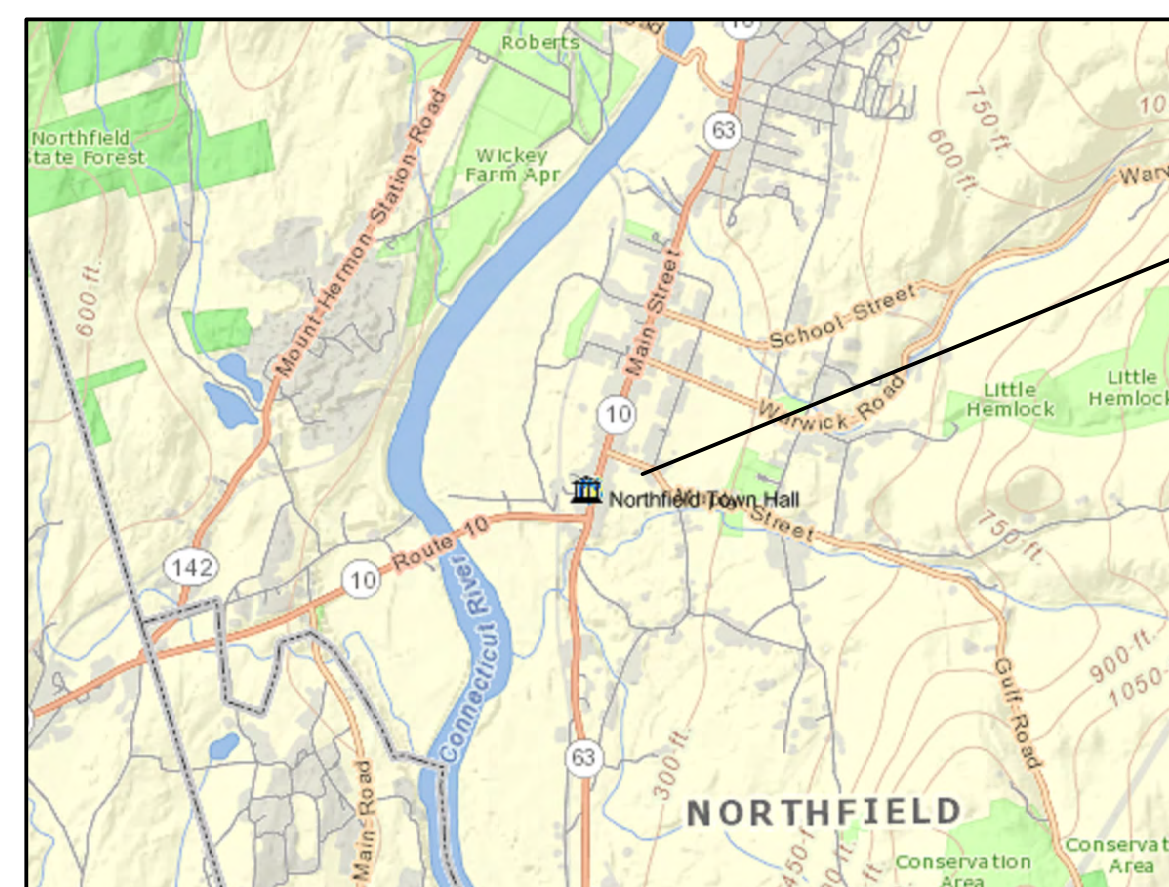
OWL Engineers
 105 Abbot Street
 Andover, MA 01810
 t:(978)621-2391
 f:(978)470-1849
 e:info@owlengineers.com
 www.owlengineers.com



PREPARED BY

OWL ENGINEERS
 Judith O'Brien, PE
 978.621.2391
 jobrien@owlengineers.com

LOCUS PLAN



Northfield Town Hall

DRAWING LIST

| Sheet | Title |
|-------|--|
| T-0 | Title Sheet |
| E-0 | Legend and Notes |
| E-1 | Electrical Details and Schedules |
| E-2 | Electrical Basement New Work and Demo. |
| E-3 | Electrical First Floor New Work and Demo. |
| E-4 | Electrical Second Floor New Work and Demo. |

LICENSED PROFESSIONAL STAMP

| REV. No. | DATE | ENGINEER | TITLE |
|----------|------|----------|-------|
| 4 | | | |
| 3 | | | |
| 2 | | | |
| 1 | | | |

Northfield Town Hall
 69 Main Street
 Northfield, MA 01360

Northfield Town Hall
 Electrical Engineering

TITLE SHEET

| | | | | |
|----------------|--|-------|---------------|-----------|
| DRAWING SCALE | | None | J.O'Brien | J.O'Brien |
| DRAWN BY | | | | |
| ENGINEERED BY | | | | |
| PROJECT NUMBER | | 16003 | July 25, 2019 | |
| DATE | | | | |

Bid Documents

T-0

GENERAL SPECIFICATIONS

- 1. CONDITIONS OF THE CONTRACT AND DIVISION 1, GENERAL REQUIREMENTS APPLY TO WORK SHOWN ON THESE DRAWINGS. EXAMINE DRAWINGS AND OTHER SPECIFICATIONS FOR REQUIREMENTS THAT AFFECT WORK SHOWN ON THESE DRAWINGS.
2. PROVIDE ITEMS REFERRED TO IN SINGULAR NUMBER IN CONTRACT DOCUMENTS IN QUANTITIES NECESSARY TO COMPLETE WORK.
3. VISIT SITE AND EXAMINE CONDITIONS UNDER WHICH WORK MUST BE PERFORMED. REPORT ADVERSE CONDITIONS IN WRITING TO ARCHITECT. COMMENCEMENT OF WORK SHALL BE CONSTRUED AS COMPLETE ACCEPTANCE OF EXISTING CONDITIONS INCLUDING PREPARATORY WORK DONE BY OTHERS.
4. PERFORM WORK AND PROVIDE MATERIALS AND EQUIPMENT AS SHOWN ON DRAWINGS. COORDINATE ELECTRICAL WORK WITH WORK SHOWN ON THESE DRAWINGS.
5. GIVE NOTICES, FILE PLANS, OBTAIN PERMITS AND LICENSES, PAY FEES AND BACK CHARGES, AND OBTAIN NECESSARY APPROVALS FROM AUTHORITIES THAT HAVE JURISDICTION.
6. PERFORM WORK AS REQUIRED BY CODES, REGULATIONS AND LAWS OF LOCAL, STATE AND FEDERAL GOVERNMENTS AND OTHER AUTHORITIES WITH LAWFUL JURISDICTION.
7. MATERIAL AND EQUIPMENT SHALL BE UL, NEMA, ANSL, IEEE, ADA & CEM APPROVED FOR INTENDED SERVICE. MATERIAL AND INSTALLATION SHALL MEET REQUIREMENTS OF NATIONAL AND STATE ELECTRICAL CODE.
8. MAINTAIN RECORD DRAWINGS ON SITE. RECORD SET MUST BE COMPLETE, CURRENT AND AVAILABLE FOR INSPECTION WHEN REQUESTIONS FOR PAYMENT ARE SUBMITTED.
9. GUARANTEE WORK IN WRITING FOR ONE (1) YEAR FROM DATE OF FINAL ACCEPTANCE. REPAIR OR REPLACE DEFECTIVE MATERIALS OR INSTALLATION AT NO COST TO OWNER. CORRECT DAMAGE CAUSED IN MAKING NECESSARY REPAIRS AND REPLACEMENTS UNDER GUARANTEE AT NO COST TO OWNER.
10. SUBMIT GUARANTEE TO ARCHITECT BEFORE FINAL PAYMENT.
11. STATEMENT OF GUARANTEE REQUIREMENTS SHALL NOT BE INTERPRETED TO LIMIT OWNER'S RIGHTS UNDER LAW AND THIS CONTRACT.
12. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS. PROVIDE INFORMATION AND COMPONENTS SHOWN ON RISER DIAGRAMS BUT NOT SHOWN ON PLANS, AND VICE VERSA, AS IF EXPRESSLY REQUIRED ON BOTH.
13. UTILIZE MOLDED CASE CIRCUIT BREAKERS. MINIMUM INTERRUPTING CAPACITY SHALL BE 10,000 AMPS SYMMETRICAL AT 240 VOLTS, AND 14,000 AMPS SYMMETRICAL AT 480 VOLTS.
14. TEMPORARY LIGHT AND POWER SHALL BE PROVIDED ON SITE BY THE ELECTRICAL CONTRACTOR.
15. ADDRESS QUESTIONS REGARDING DRAWINGS TO ARCHITECT IN WRITING BEFORE AWARD OF CONTRACT. OTHERWISE, ARCHITECT INTERPRETATION OF MEANING AND INTENT OF DRAWINGS SHALL BE FINAL.
16. SUBMIT SHOP DRAWINGS AND PRODUCT DATA WITHIN THIRTY (30) DAYS AFTER AWARD OF CONTRACT. CHECK, STAMP AND MARK WITH PROJECT NAMES SUBMITTALS BEFORE TRANSMITTING TO ARCHITECT. INDICATE DEVIATIONS FROM CONTRACT DOCUMENTS. SHOP DRAWINGS SHALL BE PROVIDED FOR ALL EQUIPMENT SHOWN ON THE DRAWINGS. PROVIDE SHOP DRAWINGS ON CONDUIT, WIRING DEVICES, CABLE AND CONDUCTORS, FIRE ALARM INCLUDING BATTERY CALCS, RISER DIAGRAM, EQUIPMENT CUTS AND DISCONNECTS.
17. DEVIATION FROM CONTRACT DOCUMENTS, OR PROPOSED SUBSTITUTION OF MATERIALS OR EQUIPMENT FOR THOSE SPECIFIED, SHALL BE REQUESTED IN SEPARATE LETTER, WHETHER DEVIATIONS ARE DUE TO FIELD CONDITIONS, STANDARD SHOP PRACTICE, OR OTHER CAUSE.
18. SUBSTITUTIONS FOR SCHEDULED LIGHTING EQUIPMENT WILL BE REJECTED UNLESS SUBSTITUTION SUBMITAL IS RECEIVED WITHIN TEN (10) DAYS AFTER CONTRACT AWARD.
19. SCHEDULE AT LEAST TEN (10) WORKING DAYS, EXCLUSIVE ON TRANSMITTAL TIME FOR SUBMITTAL REVIEW.
20. ALL WIRING SHALL BE RUN CONCEALED UNLESS SPECIFIED OTHERWISE.
21. ALL EQUIPMENT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER, RECTILINEAR TO BUILDING STRUCTURE.
22. ALL RACEWAY RUNNING THROUGH BUILDING EXPANSION JOINTS SHALL BE EQUIPPED WITH EXPANSION FITTINGS.
23. CONDUIT NOMERLANS SHOWN ON THE DRAWING WITH MORE THAN THREE (3) CURRENT CARRYING CONDUCTORS ARE SHOWN DIAGRAMMATICALLY. THE CONTRACTOR SHALL NOT INSTALL MORE THAN THREE (3) CURRENT CARRYING CONDUCTORS IN A RACEWAY UNLESS DONE SO STRICTLY BY THE NATIONAL ELECTRICAL CODE AS AMENDED BY THE STATE OF MASSACHUSETTS.
24. CONTRACTOR SHALL REVIEW ALL TRADES' CONTRACT DOCUMENTS TO DETERMINE SPECIFIC MOUNTING LOCATIONS FOR ELECTRICAL EQUIPMENT. COORDINATE EXACT MOUNTING LOCATIONS WITH THE ARCHITECT.
25. BRANCH CIRCUIT WIRING MAY NOT BE SHOWN GRAPHICALLY ON DRAWINGS AND MAY BE INDICATED BY CIRCUIT NUMBERS BESIDE FIXTURES, DEVICES AND EQUIPMENT. PROVIDE COMPLETE WIRING SYSTEM WHETHER OR NOT INDICATED GRAPHICALLY. PHASE BALANCE ALL PANELBOARDS IN FIELD.
26. ALL NEW WIRING SHALL BE TYPE THHN/THWN RATED 75-90C, 600V. WET-DRY LOCATIONS. MINIMUM BRANCH CIRCUIT WIRING SHALL BE NO. 12 AWG SOLID COPPER. BRANCH CIRCUITS LONGER THAN 75 FEET FOR 120 VOLTS OR 175 FEET FOR 277 VOLTS SHALL BE AT LEAST NO. 10 AWG FROM PANEL TO LAST OUTLET.
27. ALL NEW EXPOSED INTERIOR WIRING SHALL BE INSTALLED IN ELECTRIC METALLIC TUBING. ALL WIRING IN CONCRETE SLABS OR EXPOSED IN ROOM BELOW 6'-0" SHALL BE INSTALLED IN RIGID STEEL CONDUIT. EXTERIOR WIRING SHALL BE IN GALVANIZED RIGID METALLIC CONDUIT.
28. INTERRUPTIONS TO EXISTING ELECTRIC SERVICES AND SYSTEMS SHALL BE AS SHORT AS POSSIBLE AND AT A TIME AND DURATION APPROVED BY THE ARCHITECT OR OWNER. INCLUDE ALL PREMIUM TIME ASSOCIATED WITH INTERRUPTIONS, TWENTY-FOUR (24) HOUR NOTICE IS REQUIRED.
29. ALL GROUNDING SHALL BE PERFORMED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AS AMENDED BY THE STATE OF MASSACHUSETTS.
30. ALL FIREPROOFING FOR ELECTRICAL PENETRATIONS SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.
31. SYSTEM FEEDERS AND BRANCH CIRCUITS THAT PASS THROUGH ALTERED AREAS AND SERVE OTHER AREAS SHALL BE MAINTAINED.

GENERAL NOTES

- 1. ALL WIRING SHALL BE RUN CONCEALED UNLESS SPECIFIED OTHERWISE.
2. ALL FLOOR, MASONRY WALLS AND STRUCTURAL CEILING PENETRATIONS SHALL BE SLEEVED.
3. PROVIDED FIRE/MOISTURE SEAL FOR WALL, FLOOR OR CEILING PENETRATIONS.
4. PLACE ALL CABLE/WIRING IN CONDUIT OR RACEWAY. DO NOT LAY ON, OR SUPPORT CONDUIT FROM SUSPENDED CEILING OR PIPING AND DUCTWORK.
5. OUTLET BOXES SHALL BE MOUNTED FLUSH. CONDUIT SHALL BE RUN CONCEALED. WHERE WALLS ARE BLOCK, DEVICES AND WIRING SHALL BE SURFACE MOUNTED. PROVIDE WIREMOLD OR EQUAL TO SURFACE MOUNTED RACEWAY WITH FINISHED BOXES.
6. ALL WIRING WITHIN UTILITY CLOSETS MAY BE IN SURFACE MOUNTED CONDUIT. EMT MAY BE UTILIZED.
7. FLEXIBLE CONDUIT CONNECTIONS SHALL BE A MAXIMUM OF 6'-0".
8. CIRCUIT NUMBERS SHOWN ARE DIAGRAMMATIC. ELECTRICAL CONTRACTOR SHALL UTILIZE SPARE CIRCUIT AND PROVIDE CIRCUIT BREAKERS TO MATCH EXISTING. MINIMUM AIC RATING SHALL BE 10,000.
9. MC TYPE CONDUCTOR WITH INTEGRAL GROUND WIRE MAY BE UTILIZED FOR POWER AND LIGHTING CIRCUITS. MC CABLE SHALL BE UTILIZED ONLY WHERE COMPLETELY CONCEALED.
10. IN LOCATIONS WITH CMU WALL TYPE, DEVICES SHALL BE SURFACE MOUNTED. WIRING SHALL BE INSTALLED IN WIREMOLD #700 AND DEVICES SHALL BE IN FINISHED BOXES. ALL LOCATIONS MUST BE APPROVED.

FIRE ALARM NOTES

- 1. THE ELECTRICAL CONTRACTOR SHALL COMPLETE A CERTIFICATE CERTIFYING THAT THE SYSTEM HAS BEEN 100 PERCENT TESTED AND FUNCTIONS IN COMPLETE COMPLIANCE WITH THE SYSTEM SPECIFICATIONS AND MANUFACTURER'S RECOMMENDATIONS. THE CERTIFICATE SHALL BE SIGNED BY THE INSTALLER, ELECTRICAL CONTRACTOR AND THE OWNER. AFTER RECEIPT OF THE CERTIFICATION, THE FIRE PREVENTION OFFICER AND/OR THE FIRE ALARM SUPERVISOR WILL CONDUCT AN INSPECTION IN THE COMPANY OF THE INSTALLER AND A REPRESENTATIVE OF THE OWNER WITHIN SCOPE OF WORK PLUS 10% OF EXISTING.
2. ALL PULL STATIONS MUST BE OF THE DOUBLE ACTION TYPE. BREAKGLASS RODS WILL NOT BE PERMITTED.
3. ALL FIRE ALARM VISUAL DEVICES SHALL BE SYNCHRONIZED.
4. ALL WIRING METHODS SHALL BE AS APPROVED BY THE WIRING INSPECTOR AND THE FIRE DEPARTMENT.
5. ALL SYSTEM COMPONENTS SHALL BE UL LISTED WITH EXISTING EQUIPMENT.
6. ALL WIRING SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, NFPA 72 SERIES PAMPHLETS, AND ALL STATE AND LOCAL CODES.
7. THE ELECTRICAL CONTRACTOR MUST OBTAIN AN ELECTRICAL PERMIT FROM THE TOWN BUILDING DEPARTMENT AND A PERMIT FROM THE FIRE DEPARTMENT PRIOR TO COMMENCEMENT OF EQUIPMENT INSTALLATION. A FLOOR PLAN SHOWING ALL ALARM DEVICES, LOCATION OF MASTER BOX, PANELS, ANNUNCIATORS, A ONE-LINE WIRING DIAGRAM AND AN ANNUNCIATOR DETAIL SHOWING ZONE LABELING WILL BE REQUIRED TO BE SUBMITTED BEFORE THE FIRE DEPARTMENT ISSUES A PERMIT.
8. INSTALLATION OF EQUIPMENT SHALL BE IN ACCORDANCE WITH CURRENT STANDARDS AND SPECIFICATIONS APPROVED BY THE AUTHORITY HAVING JURISDICTION.
9. ALL FIRE ALARM EQUIPMENT, INSTALLATION AND OPERATION SHALL BE IN CONFORMANCE WITH THE FIRE DEPARTMENT INSTALLATION REQUIREMENTS AND SYSTEM INSTALLATION GUIDELINES.
10. ALL EQUIPMENT SHOWN ON DRAWINGS IS DIAGRAMMATIC.
11. THE FIRE ALARM SYSTEM SHOP DRAWINGS SHALL BE REVIEWED AND APPROVED BY BOTH THE ENGINEER AND THE FIRE DEPARTMENT. THE SHOP DRAWINGS MUST BE SIGNED OFF BY THE FIRE DEPARTMENT AND ENGINEER PRIOR TO ORDERING AND INSTALLATION OF EQUIPMENT.
12. ABSOLUTELY NO CONNECTIONS WILL BE MADE TO THE MUNICIPAL FIRE ALARM CIRCUITS, EXCEPT BY FIRE DEPARTMENT PERSONNEL.
13. ALL WORK BEYOND THE MASTER BOX AND INSIDE OF THE BUILDING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
14. ALL JOINTS AND CONNECTIONS SHALL BE IN JUNCTION BOXES. ALL CONNECTIONS NOT ON APPROVED TERMINAL STRIPS SHALL BE SOLDERED AND TAPED. ALL JUNCTION BOXES SHALL BE PAINTED RED.
15. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR THAT ALL CONNECTING WIRING MAINTAIN ELECTRICAL INTEGRITY, WITH NO OPEN CIRCUITS, GROUNDS, LEAKAGE OR OTHER FAULTS. CONNECTION TO THE MUNICIPAL SYSTEM WILL NOT BE PERMITTED IF ANY FAULTS EXIST, AND THE CONTRACTOR HAS THE PERMANENT RESPONSIBILITY FOR THE MAINTENANCE OF ALL SUCH WIRING FOR A ONE-YEAR PERIOD. IF FAULTS DEVELOP AFTER INSTALLATION, CORRECTION MUST BE MADE BY THE CONTRACTOR FOR A PERIOD OF ONE YEAR AFTER THE DATE OF FINAL COMPLETION. THE FIRE DEPARTMENT MAY REQUIRE DISCONNECTION OF THE FIRE ALARM BOX FROM THE MUNICIPAL SYSTEM UNTIL PROPER CONNECTIONS AND/OR REPAIRS ARE MADE. SUCH A DISCONNECTION MAY REQUIRE A FIRE WATCH DURING THAT TIME THE BUILDING IS WITHOUT A MASTER FIRE ALARM BOX AND ALARM SYSTEM. THIS FIRE WATCH WILL BE AT THE FIRE DEPARTMENT'S DISCRETION AND PAYMENT FOR SUCH A WATCH WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
16. ALL EQUIPMENT SHALL BE MADE AVAILABLE FOR TEST AND INSPECTION WHEN REQUIRED BY THE FIRE DEPARTMENT.
17. ALL EQUIPMENT USED SHALL BE OF A TYPE APPROVED BY THE FIRE CHIEF THROUGH THE ALARM SUPERINTENDENT AND THE FIRE PREVENTION OFFICER.
18. THE BATTERIES USED WITH THE FIRE ALARM CONTROL PANEL SHALL BE CAPABLE OF OPERATING THE PANEL FOR TWENTY-FOUR (24) HOURS WITH A FIVE (5) MINUTE RING-DOWN AT THE END OF THE TWENTY-FOUR (24) HOUR PERIOD. THE CALCULATION USED TO DETERMINE BATTERY CAPACITY SHALL BE PRESENTED TO THE FIRE DEPARTMENT AT THE TIME OF INSPECTION. PROVIDE BATTERY CALCULATIONS WITH SHOP DRAWINGS. THE EC SHALL PROVIDE ADDITIONAL BATTERY IF NECESSARY.

POWER NOTES

- 1. ALL CONDUIT, WIRING AND ELECTRICAL EQUIPMENT SHALL BE INSTALLED AND GROUNDED IN ACCORDANCE WITH THE LATEST STANDARDS OF THE NATIONAL & STATE ELECTRICAL CODES AND ANY APPLICABLE LOCAL REGULATIONS.
2. ALL CONDUITS ARE SHOWN DIAGRAMMATICALLY. EXACT LOCATION AND METHOD OF SUPPORT SHALL BE DETERMINED IN THE FIELD, EXCEPT WHERE SPECIFIC DIMENSIONS AND DETAILS ARE SHOWN. ALL CONDUIT RUNS SHALL BE RIGIDLY SUPPORTED.
3. THE ELECTRICAL CONTRACTOR SHALL CONSULT AND COOPERATE WITH CONTRACTORS OF OTHER TRADES TO AVOID ANY INTERFERENCE IN THE INSTALLATION OF THEIR RESPECTIVE EQUIPMENT.
4. ALL CONDUIT SHALL BE EMT. NO CONDUIT SMALLER THAN 3/4 INCH ELECTRICAL TRADE SIZE SHALL BE USED, UNLESS SPECIFICALLY CALLED FOR ON THE DRAWINGS.
5. VISIT SITE AND EXAMINE CONDITIONS UNDER WHICH WORK MUST BE PERFORMED. COMMENCEMENT OF WORK SHALL BE CONSTRUED AS COMPLETE ACCEPTANCE OF EXISTING CONDITIONS INCLUDING PREPARATORY WORK DONE BY OTHERS.
6. PERFORM WORK AND PROVIDE MATERIALS AND EQUIPMENT TO MAKE INSTALLATION COMPLETE IN EVERY DETAIL UNDER THIS CONTRACT WHETHER OR NOT SPECIFICALLY SHOWN ON DRAWINGS.
7. MATERIAL AND EQUIPMENT SHALL BE UNDERWRITER LABORATORIES LISTED FOR INTENDED SERVICE. MATERIALS AND INSTALLATION SHALL MEET REQUIREMENTS OF STATE ELECTRICAL CODE.
8. WIRING DEVICES SHALL BE SPECIFICATION GRADE, 20 AMP, WITH SMOOTH NYLON DEVICE PLATES AS MANUFACTURED BY HUBBELL, OR EQUAL. COLOR TO MATCH EXISTING OR AS APPROVED BY ARCHITECT.
9. CONDUCTORS AND CABLE SHALL BE MINIMUM #12 AWG, 600 VOLT, COPPER WITH TYPE THHN/THWN INSULATION. PROVIDE SEPARATE GREEN GROUND IN ALL FEEDERS. WIRE SIZE #8 AWG AND LARGER SHALL BE STRANDED, #10 AWG AND SMALLER SHALL BE SOLID. COLOR CODE CONDUCTORS BLACK, RED, BLUE, WITH WHITE NEUTRAL AND GREEN GROUND EXCEPT AS NOTED FOR 120 VOLT
10. INTERIOR BRANCH CIRCUITRY SHALL BE RUN IN "EMT", "IMC" OR "RGS".
11. MOUNTING HEIGHTS OF ELECTRICAL EQUIPMENT SHALL BE AS FOLLOWS UNLESS OTHERWISE NOTED:
a.) CONVENIENCE RECEPTACLE (GENERAL), 1'-6" FROM FLOOR TO CENTERLINE.
b.) CONVENIENCE RECEPTACLE (OFFICE), 1'-6" FROM FLOOR TO CENTERLINE.
c.) TELEPHONE OUTLETS, 1'-6" FROM FLOOR TO CENTERLINE.

DEMOLITION NOTES

- 1. DISCONNECT AND MAKE SAFE ALL ELECTRICAL EQUIPMENT IDENTIFIED FOR REMOVAL ON THE PLANS.
2. THE ELECTRICAL PLANS AND DETAILS INDICATE THE GENERAL INTENT AND ARE NOT INTENDED TO SHOW ALL ITEMS TO BE REMOVED OR RETAINED. THE ELECTRICAL CONTRACTOR SHALL VISIT THE SITE PRIOR TO THE SUBMISSION OF BIDS TO BECOME FAMILIAR WITH THE ACTUAL CONDITIONS AND EXTENT OF WORK. DEVICES AND EQUIPMENT LOCATED ON WALLS AND/OR CEILINGS TO BE REMOVED SHALL BE DISCONNECTED AND MADE SAFE. THE ELECTRICAL CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE OF ANY UNANTICIPATED HIDDEN CONDITIONS ENCOUNTERED DURING DEMOLITION.
3. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OF ALL SYSTEMS OR BUILDING COMPONENTS DAMAGED DURING THE EXECUTION OF THE WORK.
4. THE ELECTRICAL CONTRACTOR SHALL CIRCUIT TRACE AND LABEL ALL EXISTING BRANCH CIRCUITS AND FEEDERS WITHIN THE AREA OF DEMOLITION SCOPE PRIOR TO DE-ENERGIZING AND DISCONNECTION. ALL CIRCUITS WITHIN PANELBOARDS IDENTIFIED FOR REMOVAL SHALL BE TRACED AND LABELED TO ENSURE THAT NO AREA OUTSIDE THE DEMOLITION SCOPE LIMIT IS AFFECTED.
5. THE ELECTRICAL CONTRACTOR SHALL IDENTIFY ALL BRANCH CIRCUITS, FEEDERS AND SYSTEM COMPONENTS, WHICH ARE TO REMAIN WITHIN THE AREA OF DEMOLITION SCOPE. THERE SHALL BE NO INTERRUPTION OF SERVICE TO ANY AREA OUTSIDE THE SCOPE LIMITS WITHOUT APPROVAL FROM THE OWNER'S REPRESENTATIVE. EXISTING EQUIPMENT TO REMAIN SHALL BE LEFT IN A CODE COMPLIANT MANNER.
6. THE ELECTRICAL CONTRACTOR SHALL DE-ENERGIZE AND REMOVE ALL CONDUCTORS AND RACEWAYS TO THEIR POINTS OF ORIGIN WITHIN THE AREA OF DEMOLITION SCOPE. ITEMS IDENTIFIED FOR DEMOLITION SHALL NOT BE ABANDONED IN PLACE. RACEWAYS THAT ENTER MASONRY WALLS AND FLOORS SHALL BE CUT FLUSH AT THE SURFACE FOR PATCHING BY OTHERS. ALL CIRCUIT BREAKERS ASSOCIATED WITH THE DEMOLITION SCOPE SHALL BE DE-ENERGIZED AND LABELED SPARE.
7. ALL REMOVED ITEMS SHALL BE LEGALLY DISPOSED OF UNLESS IDENTIFIED FOR REUSE. THE OWNER'S REPRESENTATIVE SHALL INSPECT ALL RETAINED ITEMS PRIOR TO PLACEMENT IN THE IDENTIFIED STORAGE LOCATION BY THE ELECTRICAL CONTRACTOR.
8. THE EXISTING FIRE ALARM SYSTEM SHALL REMAIN FULLY FUNCTIONAL DURING THE ENTIRE DEMOLITION AND CONSTRUCTION PERIOD. ALL REQUIRED SYSTEM SHUTDOWNS SHALL BE COORDINATED WITH AND APPROVED BY THE OWNER'S REPRESENTATIVE AND THE AUTHORITY HAVING JURISDICTION.
9. ALL DEMOLITION SCOPE ASSOCIATED WITH LOW VOLTAGE SYSTEMS INCLUDING BUT NOT LIMITED TO FIRE ALARM, TELEPHONE, DATA, ETC. SHALL BE INCLUDED IN THIS CONTRACT.

ABBREVIATIONS

Table with 4 columns: Abbreviation, Description, Abbreviation, Description. Includes terms like A/AMP (AMPERE), AC (ALTERNATING CURRENT), AF (AMPERE FRAME), AFF (ABOVE FINISHED FLOOR), AFG (ABOVE FINISHED GRADE), AIC (APPREHE INTERRUPTING CAPACITY), AL (ALUMINUM), AT (AMPERE TRIP), ATS (AUTOMATIC TRANSFER SWITCH), AWG (AMERICAN WIRE GAUGE), C (CONDUIT), CBK (CIRCUIT BREAKER), CB (COPPER), CL (CENTERLINE), DC (DIRECT CURRENT), DE (DUAL ELEMENT), DWG (DRAWING), EC (ELECTRICAL CONTRACTOR), EMH (ELECTRICAL MANHOLE), EWC (ELECTRIC WATER COOLER), EMT (ELECTRIC METALLIC CONDUIT), FLMT (FLEXIBLE LIQUID TIGHT METALLIC TUBING), GC (GENERAL CONTRACTOR), GND (GROUND), GFI (GROUND FAULT INTERRUPTING), HVAC (HEATING, VENTILATION AND AIR CONDITIONING), HP (HORSEPOWER), IMC (INTERMEDIATE METALLIC CONDUIT), JB (JUNCTION BOX), KVA (KILOVOLT-AMPERE), KW (KILOWATT), LTG (LIGHTING), PWR (POWER), MCB (MAIN CIRCUIT BREAKER), MEC (MASSACHUSETTS ELECTRICAL CODE), MLO (MAIN LUGS ONLY), MTD (MOUNTING), MCC (MOTOR CONTROL CENTER), NEC (NATIONAL ELECTRICAL CODE), NS (NON-SYSTEM), NTS (NOT TO SCALE), No. # (NUMBER), PC (PLUMBING CONTRACTOR), RPM (REVOLUTIONS PER MINUTE), RMS (ROOT MEAN SQUARE VALUE), RGS (RIGID STEEL CONDUIT), SF (SQUARE FOOT), SN (SOLID NEUTRAL), SWBD (SWITCHBOARD), CC (TYPICAL), V (VOLTS), VA (VOLT-AMPERE), VFD (VARIABLE FREQUENCY DRIVE), WP (WEATHERPROOF).

EXISTING EQUIPMENT DESIGNATIONS

Table with 2 columns: Designation, Description. Includes X (EXISTING TO BE REMOVED), XM (EXISTING TO REMAIN), XN (EXISTING EQUIPMENT TO BE REPLACED WITH NEW), XR (EXISTING EQUIPMENT TO BE REPLACED), XC (EXISTING EQUIPMENT TO REMAIN, CIRCUITRY TO BE REPLACED), and NO DESIGNATION (INDICATES A NEW DEVICE AND ASSOCIATED CONDUIT AND WIRE).

FIRE ALARM SYSTEM

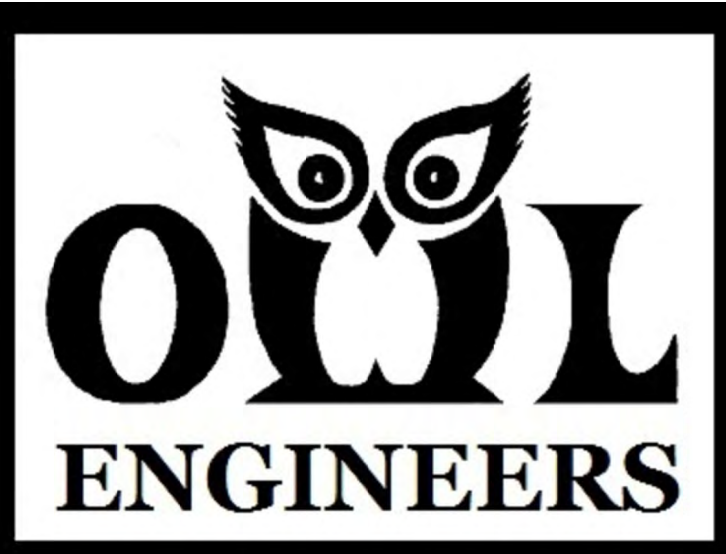
Table with 2 columns: Symbol, Description. Includes symbols for audible/visual device, visual device, manual pull station, smoke detector, heat detector, remote LED indicator, remote test station, and fire alarm control panel.

BRANCH CIRCUIT AND FEEDER SYMBOLS

Table with 2 columns: Symbol, Description. Includes symbols for branch circuit or feeder concealed, branch circuit diagonal lines, and flexible connection to motor or equipment.

MISCELLANEOUS

Table with 2 columns: Symbol, Description. Includes symbols for utility meter, automatic transfer switch, disconnect switch, lighting or power panel, and junction box.



OWL Engineers
105 Abbot Street
Andover, MA 01810
t:(978)621-2391
f:(978)470-1849
e:info@owlengineers.com
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Table for revisions with columns for revision number, date, engineer, and title.

Northfield Town Hall
69 Main Street
Northfield, MA 01360

PROJECT LOCATION

Northfield Town Hall
Electrical Engineering

PROJECT TITLE

LEGEND AND NOTES

DRAWING TITLE

Table with 2 columns: Drawing Scale and Drawing/Engineer Name. Includes None, J.O'Brien, and J.O'Brien.

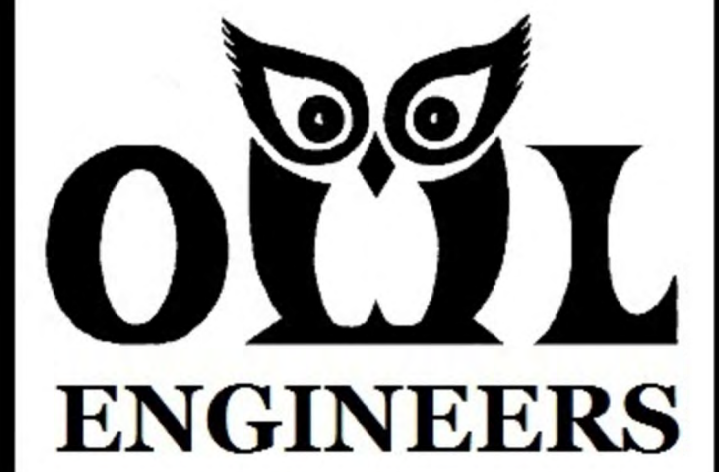
Table with 2 columns: Project Number and Date. Includes 16003 and July 25, 2019.

Bid Documents

SUBMISSION TITLE

E-O

DRAWING NUMBER



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 105 Abbot Street
 Andover, MA 01810
 t:(978)621-2391
 f:(978)470-1849
 e:info@owlengineers.com
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LICENSED PROFESSIONAL STAMP

REV. No. DATE ENGINEER TITLE

Northfield Town Hall
 69 Main Street
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Northfield Town Hall
 Electrical Engineering

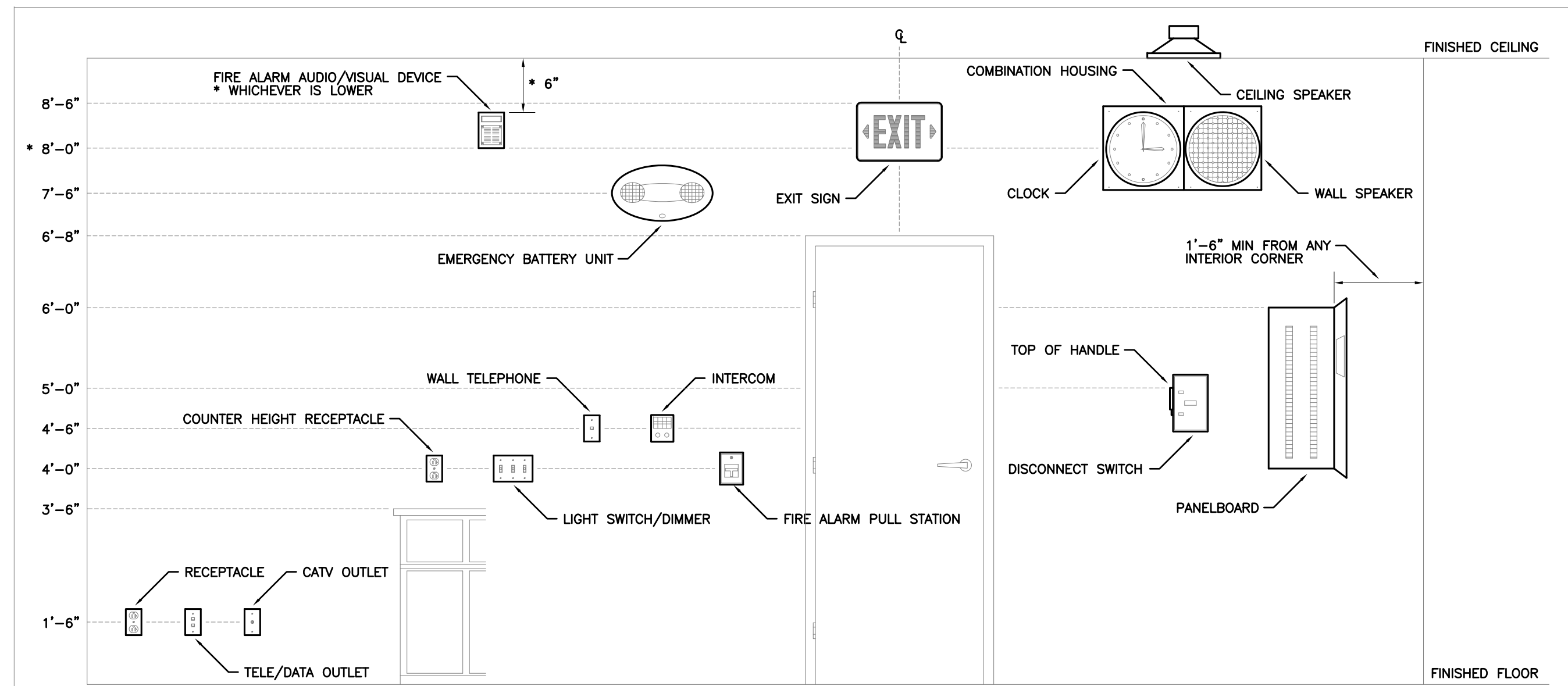
Electrical
 Details and Schedules

DRAWING SCALE: None
 DRAWN BY: J.O'Brien
 ENGINEERED BY: J.O'Brien

PROJECT NUMBER: 16003
 DATE: July 25, 2019

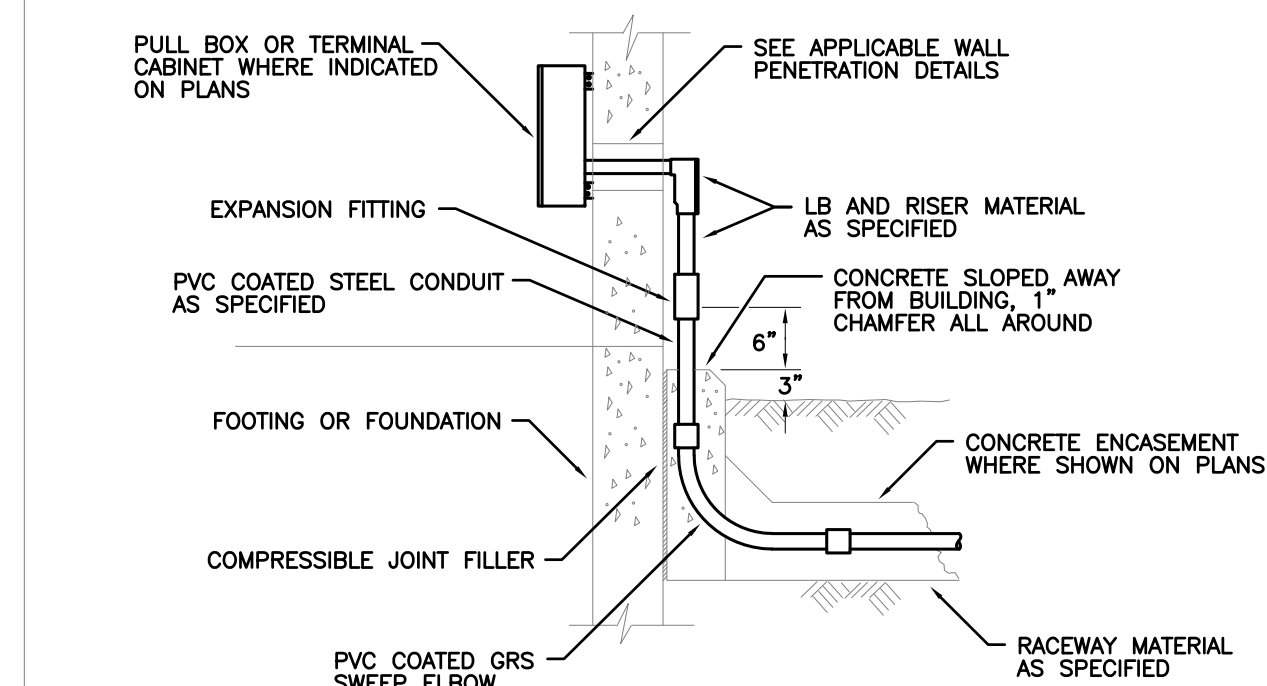
SUBMISSION TITLE: Bid Documents

E-1



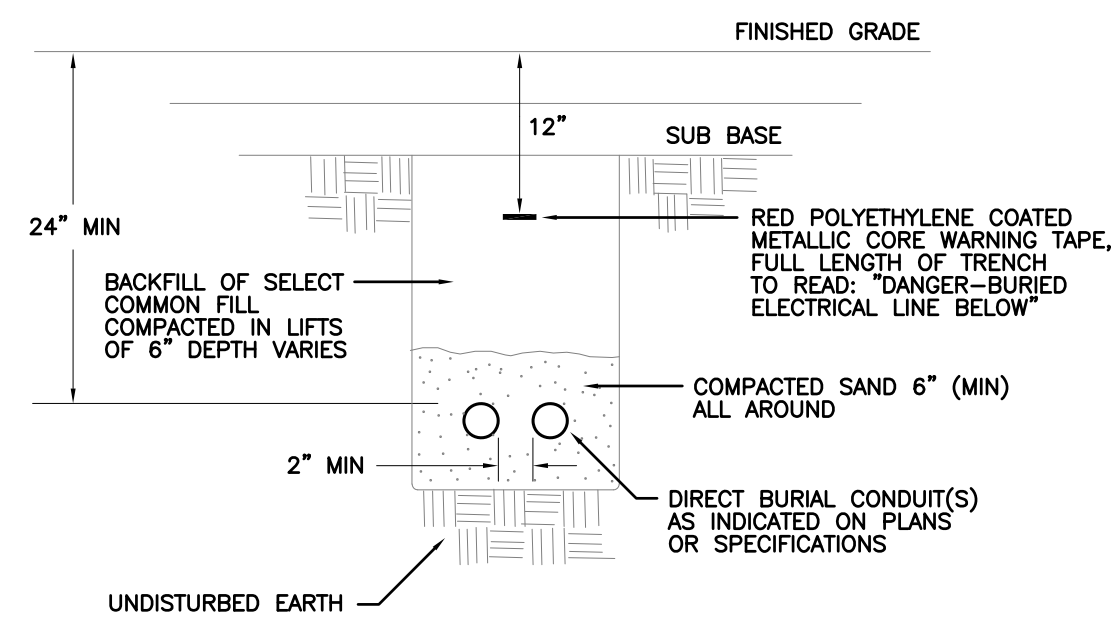
1 DEVICE MOUNTING HEIGHT DETAIL

N.T.S.



2 CONDUIT PENETRATION THROUGH STRUCTURE ABOVE GROUND DETAIL

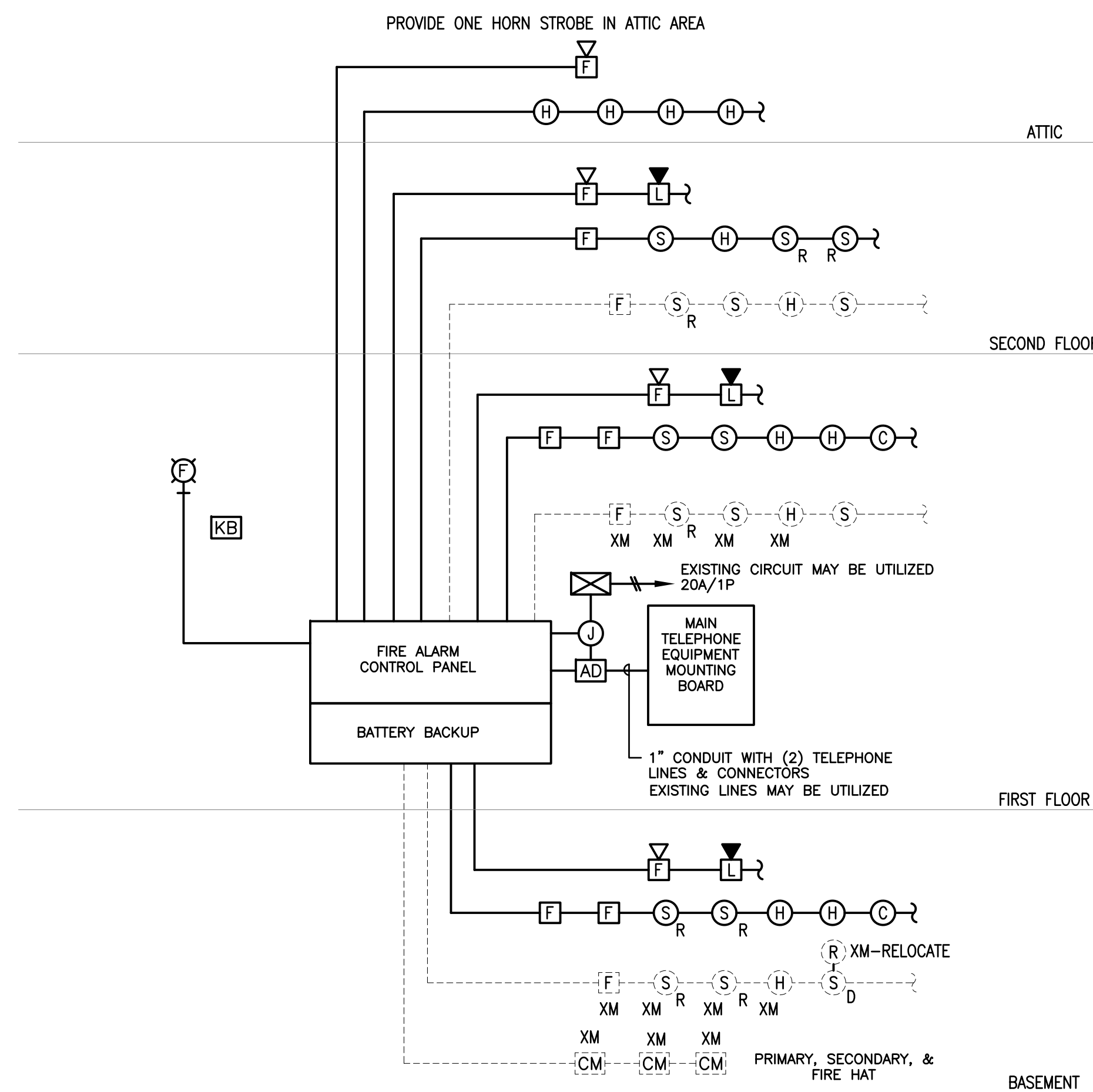
N.T.S.



3 DIRECT BURIAL CONDUIT DETAIL

N.T.S.

- NOTE:
- CONTRACTOR SHALL DEVELOP SPECIFIC MATRIX FOR EACH DEVICE AND CROSS REFERENCE TO DEVICE ADDRESS NUMBER FOR ENGINEER'S APPROVAL.
 - CONTRACTOR'S SHOP DRAWINGS SHALL INCLUDE FLOOR PLANS WITH DEVICE LAYOUT. EACH DEVICE SHALL HAVE ITS ASSOCIATED ADDRESS ILLUSTRATED AND CROSS REFERENCED TO THE SEQUENCE OF OPERATIONS MATRIX.
 - CONTRACTOR SHALL OBTAIN A FIRE ALARM PERMIT PRIOR TO PURCHASE AND/OR INSTALLATION.
 - TROUBLE SIGNALS SHALL INCLUDE: BOOSTER PANEL MONITOR MODULE,S, FIRE ALARM AC POWER FAILURE, FIRE ALARM LOW BATTERY, OPEN CIRCUIT AND GROUND FAULT.



FIRE ALARM RISER DIAGRAM

N.T.S.

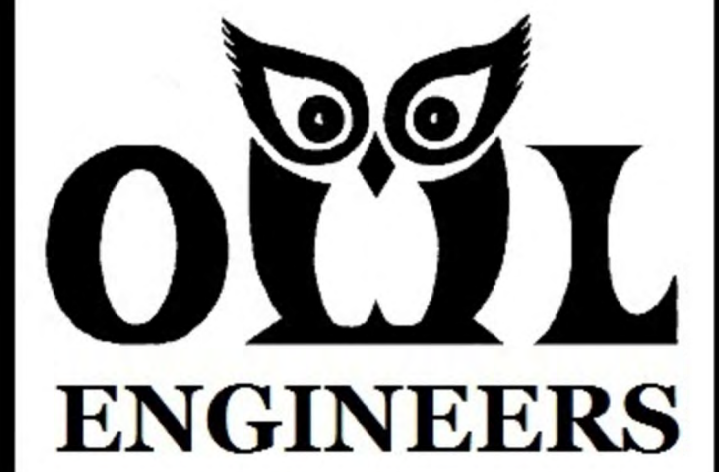
NOTES:

- PROVIDE KEY BOX. ELECTRICAL CONTRACTOR SHALL PURCHASE THROUGH LOCAL FIRE DEPARTMENT.
- ELECTRICAL CONTRACTOR SHALL PROVIDE CIRCUIT BREAKER HANDLE-LOCK ON POWER CIRCUITS. HANDLE LOCK SHALL ALLOW THE CIRCUIT BREAKER TO TRIP, BUT PREVENT SWITCHING OF THE CIRCUIT BREAKER TO THE "OFF" POSITION.
- PROVIDE SMOKE DETECTOR IN VICINITY OF FIRE ALARM CONTROL PANEL AND REMOTE ANNUNCIATOR. SMOKE DETECTORS IN ELEVATOR LOBBY SHALL BE PROGRAMMED WITH ELEVATOR RECALL AS NOTED IN SEQUENCE.
- ALL SYSTEM WIRING SHALL BE INSTALLED IN CONDUIT (FIRE ALARM RATED FPLR METALLIC FLEXIBLE CONDUIT) AND IN ACCORDANCE WITH EQUIPMENT SUPPLIER'S APPROVED SHOP DRAWINGS AND WIRING DIAGRAMS.
- RISER DIAGRAM MAY NOT SHOW ENTIRE SYSTEM. REFER TO FLOOR PLANS FOR QUANTITIES AND LOCATIONS OF ALL SYSTEM DEVICES.
- PROVIDE A 20AMP, 120VOLT, 1 PHASE SURGE PROTECTOR. SURGE PROTECTOR SHALL BE INSTALLED BETWEEN THE CIRCUIT BREAKER IN THE PANEL AND THE FIRE ALARM PANEL, AND IN ACCORDANCE WITH MANUFACTURER'S WIRING RECOMMENDATIONS.
- PROVIDE A NEW FIRE ALARM CONTROL PANEL WHICH IS UL LISTED COMPATIBLE WITH EXISTING DEVICES OR REPLACE ALL EXISTING DEVICES WHICH ARE COMPATIBLE WITH NEW FIRE ALARM CONTROL PANEL.
- EXISTING FIRE ALARM SYSTEM SHALL REMAIN OPERATIONAL UNTIL NEW SYSTEM HAS BEEN TESTED AND APPROVED BY THE OWNER, ENGINEER AND FIRE DEPARTMENT.
- THE EC SHALL REMOVE ALL EXISTING DEVICES AND PATCH TO MATCH SURROUNDINGS, MAKE PAINT READY FOR OWNER TO PROVIDE PAINTING.

| SYSTEM INPUTS | SYSTEM OUTPUTS | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|--------------|---|---|---|---|---|---|------------------------------|---|---|---|---|---|
| | CONTROL UNIT ANNUNCIATION | | | | | | | | | | | | | NOTIFICATION | | | | | | | REQUIRED FIRE SAFETY CONTROL | | | | | |
| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |
| 1 SMOKE DETECTORS - LOWER LEVEL | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 2 SMOKE DETECTORS - LOWER LEVEL-ELEVATOR RECALL | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 3 HEAT DETECTORS - LOWER LEVEL FLOOR | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 4 SMOKE DETECTORS - 1ST FLOOR | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 5 SMOKE DETECTORS - 1ST FLOOR-ELEVATOR RECALL | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 6 SMOKE DETECTOR - 2ND FLOOR | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 7 SMOKE DETECTORS - 2ND FLOOR-ELEVATOR RECALL | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 8 HEAT DETECTOR - ATTIC | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 9 | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 11 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 MANUAL PULL STATION - GARAGE FLOOR | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 13 MANUAL PULL STATION - FIRST FLOOR | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 14 MANUAL PULL STATION - SECOND FLOOR | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 15 MANUAL PULL STATION - THIRD FLOOR | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 16 MANUAL PULL STATION - ROOF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 17 SPRINKLER FLOW SWITCH | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 18 SPRINKLER TAMPER SWITCH | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 19 SUPERVISORY | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 20 TROUBLE | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
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| 23 | | | | | | | | | | | | | | | | | | | | | | | | | | |

FIRE ALARM SEQUENCE OF OPERATION MATRIX - TYPICAL

N.T.S.



OWL Engineers
 105 Abbot Street
 Andover, MA 01810
 t:(978)621-2391
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| 1 | | | |
| REV. No. | DATE | ENGINEER | TITLE |

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 69 Main Street
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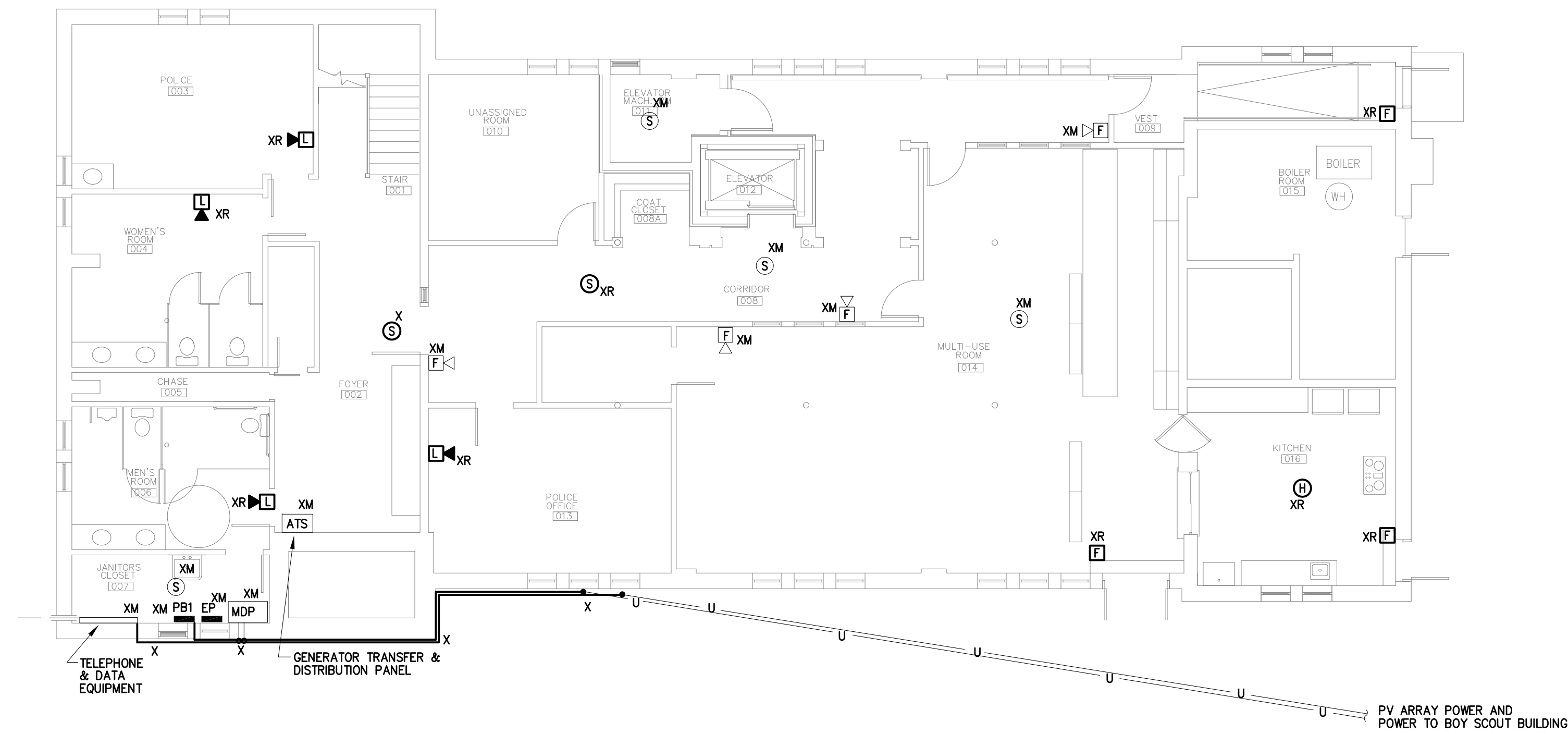
Northfield Town Hall
 Electrical Engineering

Electrical Basement
 New Work and Demo

| | | |
|----------------|---------------|---------------|
| 1/8"=1'-0" | J.O'Brien | J.O'Brien |
| DRAWING SCALE | DRAWN BY | ENGINEERED BY |
| 16003 | July 25, 2019 | |
| PROJECT NUMBER | DATE | |

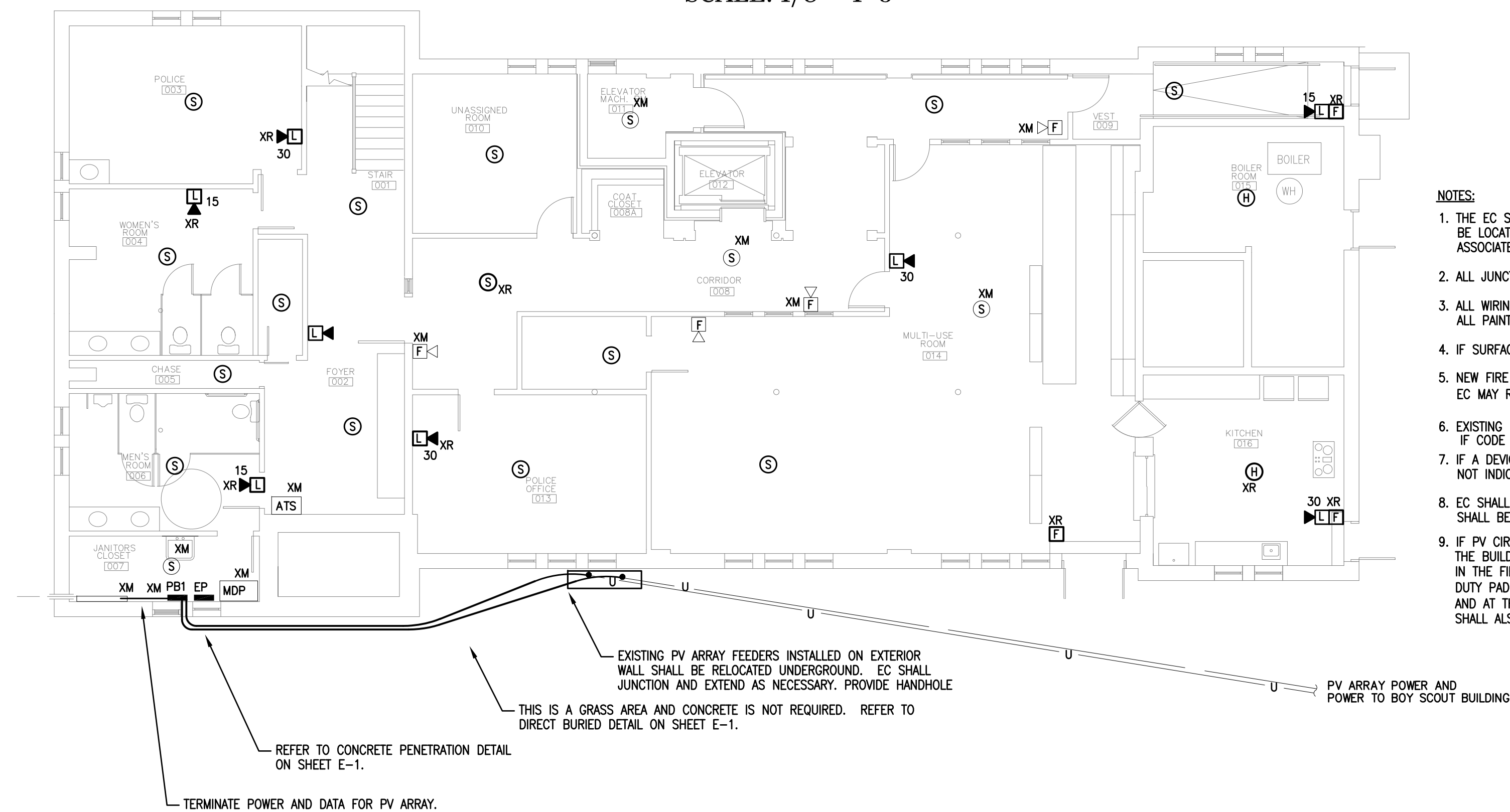
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E-2



ELECTRICAL BASEMENT DEMOLITION PLAN

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



ELECTRICAL BASEMENT NEW WORK PLAN

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

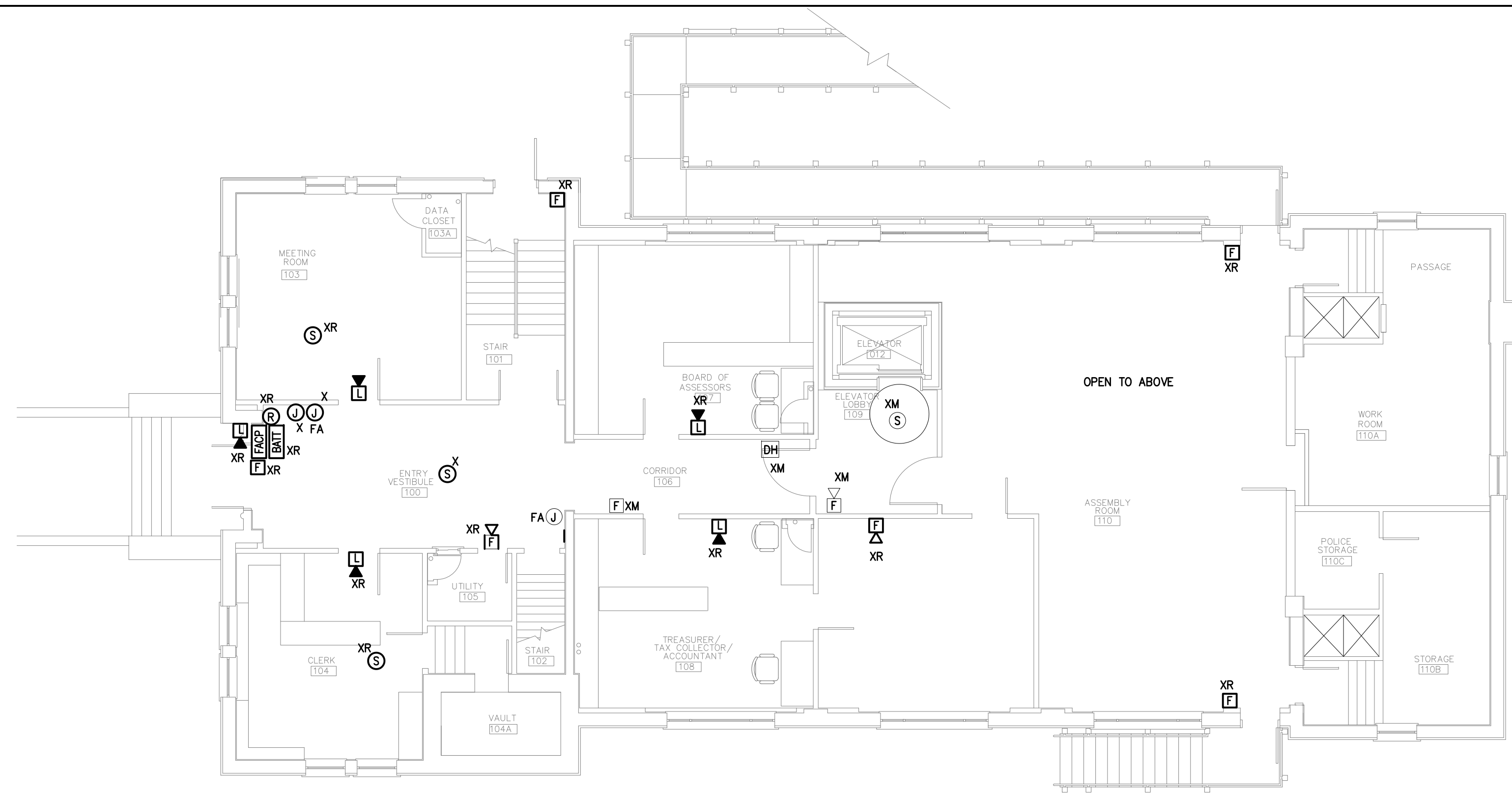
NOTES:

1. THE EC SHALL PROVIDE HIGH TEMPERATURE HEAT DETECTORS WITHIN THE ATTIC SPACE. HEAT DETECTORS SHALL BE LOCATED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS. EC SHALL CARRY (6) DETECTORS, ALL ASSOCIATED WIRING, EQUIPMENT AND TESTING REQUIRED.
2. ALL JUNCTION BOXES SHOWN OR NOT SHOWN WHICH CAN BE REMOVED SHALL BE REMOVED BY THE EC.
3. ALL WIRING SHALL BE CONCEALED WITHIN WALLS. EC SHALL PATCH ALL LOCATIONS AND MAKE PAINT READY. ALL PAINTING SHALL BE BY THE OWNER.
4. IF SURFACE MOUNTED CONDUIT IS REQUIRED, ALL LOCATIONS MUST BE APPROVED.
5. NEW FIRE ALARM CONTROL PANEL SHALL BE UL LISTED COMPATIBLE WITH EXISTING FIRE ALARM DEVICES TO REMAIN. THE EC MAY REPLACE ALL DEVICES IF MORE COST EFFECTIVE.
6. EXISTING FIRE ALARM WIRING FOR DEVICES WHICH ARE EXISTING TO REMAIN AND ALL FIRE ALARM CONDUIT MAY BE REUSED IF CODE COMPLIANT, TESTED AND GUARANTEED BY THE EC.
7. IF A DEVICE IS NOTED TO BE REMOVED THE EC SHALL VERIFY THE NEED TO JUNCTION AND EXTEND. ALL DEVICES NOT INDICATED TO BE REMOVED SHALL BE REWIRED AS NECESSARY.
8. EC SHALL COORDINATE WITH ELECTRICAL AND COMMUNICATIONS UTILITY AS WELL AS FIRE DEPARTMENT. ALL UTILITIES SHALL BE RELOCATED UNDERGROUND. EXACT LOCATION SHALL BE VERIFIED WITH THE UTILITY, OWNER AND ENGINEER.
9. IF PV CIRCUITRY IS NOT SUFFICIENT IN LENGTH TO REUSE IT SHALL BE REPLACED WITH NEW OR THE EC MAY ENTER THE BUILDING AT THE POLICE OFFICE AND PROVIDE THE NECESSARY DISCONNECTS. COORDINATE EXACT LOCATION IN THE FIELD WITH THE OWNER AND ENGINEER PRIOR TO INSTALLATION. THE DISCONNECTS WILL BE REQUIRED TO BE HEAVY DUTY PAD LOCKABLE PROPERLY LABELED SERVICE DISCONNECT 2 OF 2 (PV ARRAY) WITH A FRAMED FLOOR PLAN AT THIS LOCATION AND AT THE MAIN ELECTRICAL ROOM SERVICE DISCONNECT WITH BOTH LOCATIONS CLEARLY SHOWN. THE MAIN SERVICE DISCONNECT SHALL ALSO BE PROPERLY LABELED SERVICE DISCONNECT 1 OF 2 (UTILITY SERVICE).

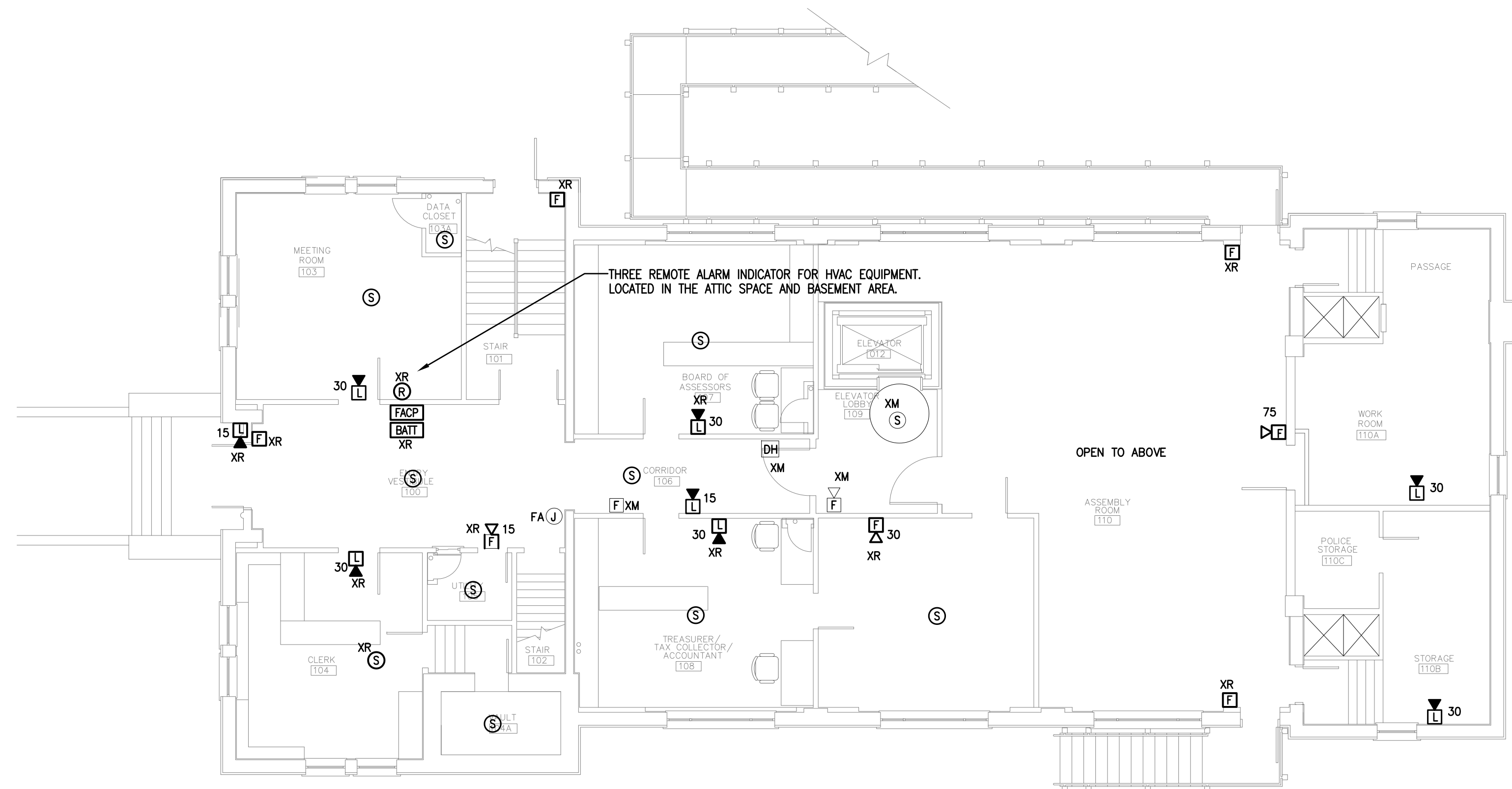
REFER TO CONCRETE PENETRATION DETAIL ON SHEET E-1.

TERMINATE POWER AND DATA FOR PV ARRAY.

EXISTING PV ARRAY FEEDERS INSTALLED ON EXTERIOR WALL SHALL BE RELOCATED UNDERGROUND. EC SHALL JUNCTION AND EXTEND AS NECESSARY. PROVIDE HANDHOLE. THIS IS A GRASS AREA AND CONCRETE IS NOT REQUIRED. REFER TO DIRECT BURIED DETAIL ON SHEET E-1.

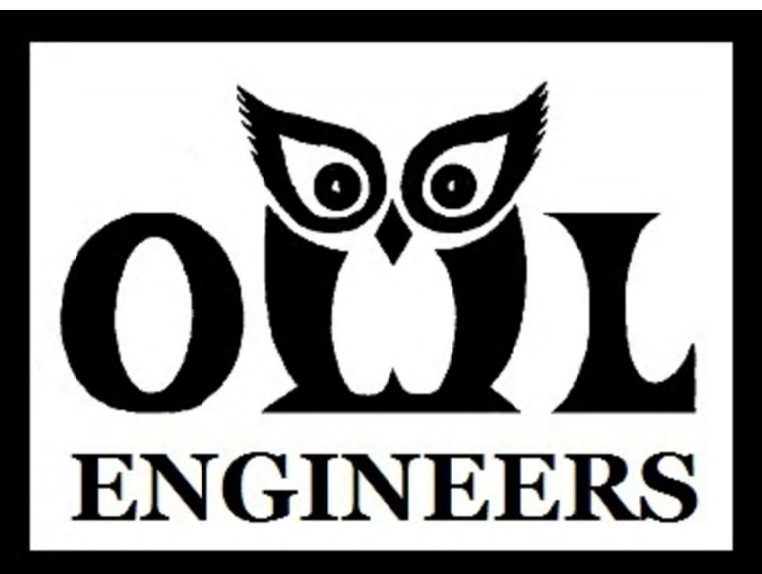


ELECTRICAL FIRST FLOOR DEMOLITION PLAN
SCALE: 1/8" = 1'-0"



ELECTRICAL FIRST FLOOR NEW WORK PLAN
SCALE: 1/8" = 1'-0"

- NOTES:**
1. THE EC SHALL PROVIDE HIGH TEMPERATURE HEAT DETECTORS WITHIN THE ATTIC SPACE. HEAT DETECTORS SHALL BE LOCATED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS. EC SHALL CARRY (6) DETECTORS, ALL ASSOCIATED WIRING, EQUIPMENT AND TESTING REQUIRED.
 2. ALL JUNCTION BOXES SHOWN OR NOT SHOWN WHICH CAN BE REMOVED SHALL BE REMOVED BY THE EC.
 3. ALL WIRING SHALL BE CONCEALED WITHIN WALLS. EC SHALL PATCH ALL LOCATIONS AND MAKE PAINT READY. ALL PAINTING SHALL BE BY THE OWNER.
 4. IF SURFACE MOUNTED CONDUIT IS REQUIRED, ALL LOCATIONS MUST BE APPROVED.
 5. NEW FIRE ALARM CONTROL PANEL SHALL BE UL LISTED COMPATIBLE WITH EXISTING FIRE ALARM DEVICES TO REMAIN. THE EC MAY REPLACE ALL DEVICES IF MORE COST EFFECTIVE.
 6. EXISTING FIRE ALARM WIRING FOR DEVICES WHICH ARE EXISTING TO REMAIN AND ALL FIRE ALARM CONDUIT MAY BE REUSED IF CODE COMPLIANT, TESTED AND GUARANTEED BY THE EC.
 7. IF A DEVICE IS NOTED TO BE REMOVED THE EC SHALL VERIFY THE NEED TO JUNCTION AND EXTEND. ALL DEVICES NOT INDICATED TO BE REMOVED SHALL BE REWIRED AS NECESSARY.
 8. CONDUIT MAY RUN EXPOSED IN UTILITY SPACES, WORK ROOM, STORAGE AND CLOSETS.



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105 Abbot Street
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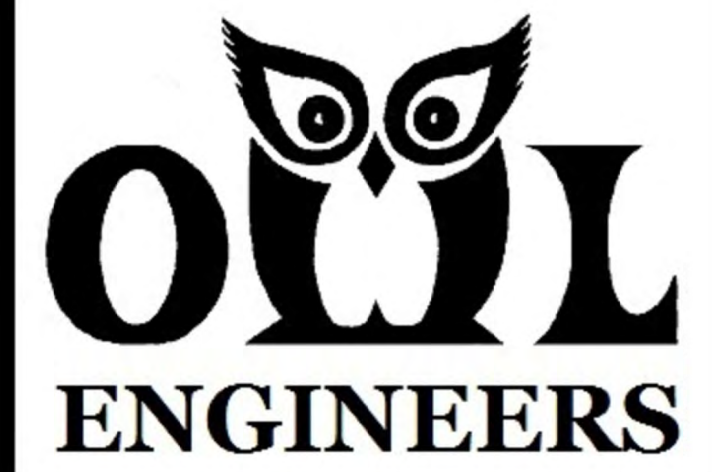
Northfield Town Hall
69 Main Street
Northfield, MA 01360

Northfield Town Hall
Electrical Engineering

Electrical First Floor
New Work and Demo

| | |
|------------------|---------------|
| KEY PLAN | |
| DRAWING SCALE | 1/8" = 1'-0" |
| DRAWN BY | J.O'Brien |
| ENGINEERED BY | J.O'Brien |
| PROJECT NUMBER | 16003 |
| DATE | July 25, 2019 |
| SUBMISSION TITLE | Bid Documents |

E-3



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 105 Abbot Street
 Andover, MA 01810
 t:(978)621-2391
 f:(978)470-1849
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| 4 | | | |
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REVISIONS

Northfield Town Hall
 69 Main Street
 Northfield, MA 01360

PROJECT LOCATION

Northfield Town Hall
 Electrical Engineering

PROJECT TITLE

Electrical Second Floor
 New Work and Demo

DRAWING TITLE

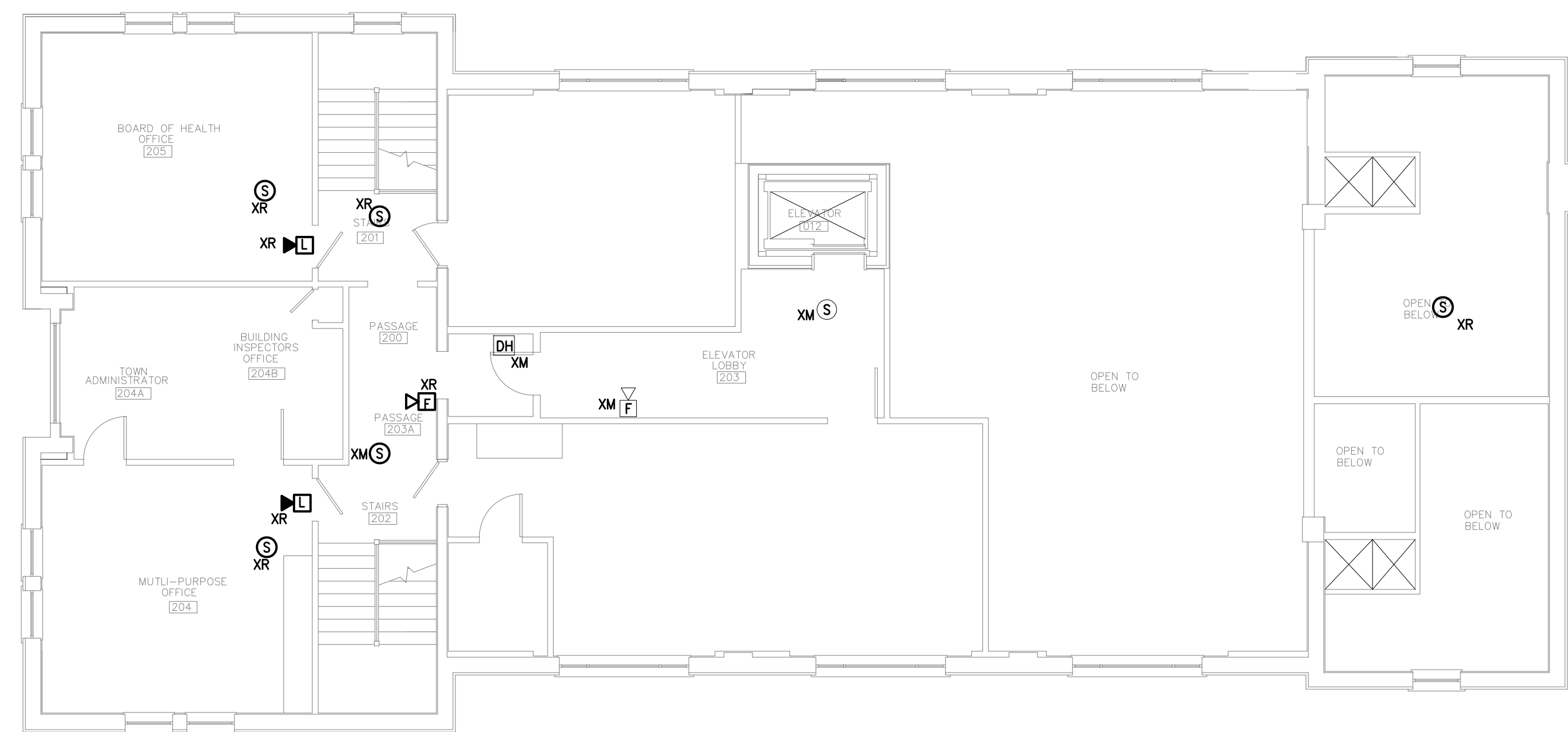
| | |
|-----------------------------|--|
| KEY PLAN | |
| DRAWING SCALE 1/8"=1'-0" | J.O'Brien DRAWN BY ENGINEERED BY |
| PROJECT NUMBER 16003 | DATE July 25, 2019 |

Bid Documents

SUBMISSION TITLE

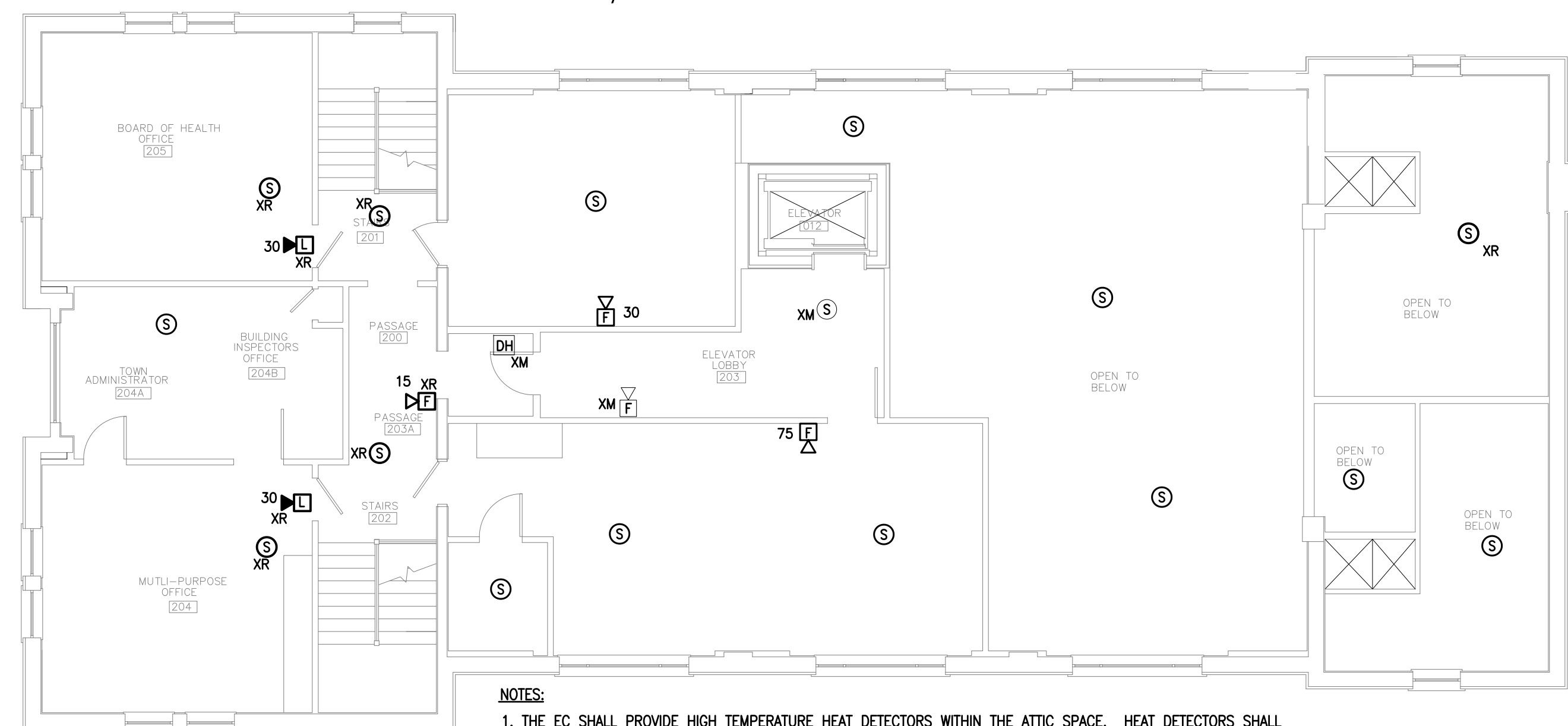
E-4

DRAWING NUMBER



ELECTRICAL SECOND FLOOR DEMOLITION PLAN

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



NOTES:

1. THE EC SHALL PROVIDE HIGH TEMPERATURE HEAT DETECTORS WITHIN THE ATTIC SPACE. HEAT DETECTORS SHALL BE LOCATED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS. EC SHALL CARRY (6) DETECTORS, ALL ASSOCIATED WIRING, EQUIPMENT AND TESTING REQUIRED.
2. ALL JUNCTION BOXES SHOWN OR NOT SHOWN WHICH CAN BE REMOVED SHALL BE REMOVED BY THE EC.
3. ALL WIRING SHALL BE CONCEALED WITHIN WALLS. EC SHALL PATCH ALL LOCATIONS AND MAKE PAINT READY. ALL PAINTING SHALL BE BY THE OWNER.
4. IF SURFACE MOUNTED CONDUIT IS REQUIRED, ALL LOCATIONS MUST BE APPROVED.
5. PLACE SMOKE DETECTORS A MINIMUM OF 5' FROM CEILING FAN.
6. EXISTING FIRE ALARM WIRING FOR DEVICES WHICH ARE EXISTING TO REMAIN AND ALL FIRE ALARM CONDUIT MAY BE REUSED IF CODE COMPLIANT, TESTED AND GUARANTEED BY THE EC.
7. IF A DEVICE IS NOTED TO BE REMOVED THE EC SHALL VERIFY THE NEED TO JUNCTION AND EXTEND. ALL DEVICES NOT INDICATED TO BE REMOVED SHALL BE REWIRED AS NECESSARY.
8. NEW FIRE ALARM CONTROL PANEL SHALL BE UL LISTED COMPATIBLE WITH EXISTING FIRE ALARM DEVICES TO REMAIN. THE EC MAY REPLACE ALL DEVICES IF MORE COST EFFECTIVE.

ELECTRICAL SECOND FLOOR NEW WORK PLAN

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