



THE COMMISSIONERS OF KENT COUNTY, MARYLAND REQUEST FOR PROPOSAL

BM 25-02

FOR

LOBBY ALTERATIONS WITHIN THE KENT COUNTY COURTHOUSE

AT

103 N. CROSS STREET CHESTERTOWN, MD 21620

Director of Public Works 709 Morgnec Road Chestertown, Maryland 21620

SCHEDULE

RFP # BM 25-02

Date	Step
August 6, 2024	Mail/Email Notices to Bidders on Bid List; Post on Kent County, MD website; Post on eMaryland Marketplace Advantage (eMMA).
August 16, 2024	1:00 p.m. Pre-bid meeting at Kent County Courthouse, 103 N. Cross Street, Chestertown, MD, 21620.
August 28, 2024	11:00 a.m. Bid Opening at Department of Public Works Complex, 709 Morgnec Road, Chestertown MD, 21620.
September 10, 2024	Tentative Award by County Commissioners.

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Prepared by Crabtree, Rohrbaugh & Associates- Architects (CRA) on July 25, 2024

SECTION A. GENERAL MATTERS

1. Summary

The County Commissioners of Kent County, Maryland, a body corporate, politic and a political subdivision of the State of Maryland (the "County") is requesting proposals from qualified bidders to perform a variety of alterations, including but not limited to selective demolition, re-construction, and other upgrades, at the Kent County Courthouse, located at 103 N. Cross Street, Chestertown, MD 21620, in accordance with Chapter 49 of the Code of Public Local Laws of Kent County (CPLL).

2. <u>Issuing Office</u>

Daniel F. Mattson, P.E., C.F.M., C.M.E. Director of Public Works 709 Morgnec Road Chestertown, MD 21620

Telephone #: (410) 778-2600 dmattson@kentgov.org

The individual listed above shall serve as the "Director of Purchasing" and as the sole point of contact for purposes of this procurement.

3. <u>Silence of Specification</u>

The apparent silence of the specifications as to any detail, or the apparent omission from it of detailed description concerning any point, shall be regarded as meaning that only the best commercial practice is to prevail and only material and workmanship of the first quality are to be used. Proof of specifications compliance will be the responsibility of the vendor.

4. <u>Preparation of Proposal</u>

- a. The bidder's proposal shall be written in ink or typewritten on the form provided.
- b. If items are listed with a zero quantity, bidder shall state unit price **ONLY** (intended for open end purchases where estimated requirements are not known). The proposal shall show a total bid price for each item bid and the total bid price of the proposal, excluding zero quantity items.

5. Prices Quoted

The prices quoted are those for which the material will be furnished F.O.B. Destination and must include all charges that may be imposed during the period of the contract.

6. <u>Samples or Brochures</u>

Samples or brochures may be required by the County for evaluation purposes. They shall be such as to permit the County to compare and determine if the item offered complies with the intent of the specifications.

7. <u>Questions and Inquiries</u>

All questions and inquiries regarding the terms of this RFP should be directed to the Director of Purchasing identified in Section A.2. prior to the pre-bid meeting.

Questions subsequent to the pre-bid meeting must be submitted in writing to the person below.

Please refer any questions to: Carrie Klein, Deputy Director of Public Works Kent County Department of Public Works Phone: 410-778-2600 Email: cklein@kentgov.org

Questions must be received by the close of business (4:00 p.m.) on August 20th, 2024. A summary of questions and answers, including those addressed at the pre-bid meeting conference, will be distributed to all attendees of the pre-bid meeting and any others known to have received the bid documents.

Written responses shall be considered the official answers and shall supersede any verbal discussions. Verbal answers at or subsequent to the pre-bid meeting are not binding and reliance should not be placed on the same.

8. <u>Submission Deadline and Instructions</u>

All proposals must arrive at the Attention of the Director of Purchasing ("Issuing Office") by August 28th, 2024, no later than 11:00 A.M. in order to be considered. Requests for extension of this date or time will not be granted. Offerors mailing proposals should allow sufficient mail and internal delivery time to ensure timely receipt at the Issuing Office. Proposals or unsolicited amendments to proposals arriving after the closing date and time will **NOT** be considered.

Bidders are cautioned that bids mailed, shipped by express, sent by courier, or hand-delivered to arrive the day of the bid opening must be in the hands of the Issuing Office no later than 11:00 a.m. on the date specified. Bids received later than that time will be returned unopened. Please check your method of delivery to see if it conforms to this requirement. Proposals must be mailed, shipped, or hand delivered to the following address:

Attn: Director of Purchasing Kent County Department of Public Works 709 Morgnec Road Chestertown, Maryland 21620-1312

BIDDERS ARE ADVISED THAT MAIL IS DELIVERED ONCE A DAY, AND USUALLY ARRIVES AFTER THE TIME SPECIFIED FOR BID DELIVERY ON THE APPLICABLE DATE.

BIDS WILL NOT BE ACCEPTED AT ANY OTHER LOCATION.

THE COUNTY WILL NOT BE RESPONSIBLE FOR ANY BIDS DELIVERED TO ANY OTHER LOCATION THAN THE ISSUING OFFICE OF THE DIRECTOR OF PURCHASING, WHETHER SUCH OTHER LOCATION IS A COUNTY OFFICE OR OTHERWISE.

THIS IS A SEALED BID PROPOSAL FOR

KENT COUNTY - RFP # BM 25-02

Please note that if a bid is mailed, sent by messenger service, or delivered by commercial carrier (e.g. FEDEX, UPS, etc.). **THE OUTSIDE ENVELOPE, AS WELL AS THE INSIDE ENVELOPE, IF ANY, MUST CONTAIN THE LEGEND SHOWN ABOVE**. County staff receives many items by such services and if the legend does not appear, a response may be misrouted or delayed in opening. The bidder takes full responsibility for the legend and THE COUNTY WILL NOT DEEM A BID AS TIMELY RECEIVED, EVEN IF RECEIVED ON TIME, IF OPENED LATER THAN THE DEADLINE DUE TO LACK OF THE APPROPRIATE LEGEND ON THE MAILER/OUTSIDE ENVELOPE.

9. Duration of Offer

Unless otherwise specified by the County, proposals submitted in response to this solicitation are irrevocable for ninety (90) days following the closing date. This period may be extended only with the offeror's written agreement.

10. Withdrawal of Proposals

A bidder may withdraw its proposal unopened after it has been deposited, if such a request is made prior to the time set for the opening of the proposal.

11. <u>Public Inspection of Proposals</u>

If the bidder designates a portion of its bid as confidential, it shall isolate and identify in writing the confidential portions. The bidder shall include with this designation a statement that explains and supports for firm's claim that the bid items identified as confidential contain trade secrets or other proprietary data.

12. <u>Changes in Contract Documents</u>

Changes to contract documents shall be made only in writing and copies will be emailed, faxed, or mailed to all known prospective bidders. The County assumes no responsibility for verbal instructions or interpretations. The contract documents contain the provisions required for the contract. Information obtained from an officer, agent, or employee of the County or any other person shall not affect the risks or obligations assumed by the bidder or relieve him of fulfilling any of the conditions of the contract.

13. <u>Revisions to the RFP</u>

If it becomes necessary to revise this RFP, amendments will be provided to all prospective offerors that were sent this RFP or are known otherwise by the Director of Purchasing to have obtained this RFP. Acknowledgment of the receipt of all amendments will be required.

14. Cancellation of the RFP; Rejection of All Proposals

The County may cancel this RFP, in whole or in part, or may reject any/all proposals submitted in response

whenever this action is determined to be in the best interest of the County. Kent County shall have no liability or obligation to any of the proposers preparing or submitting proposals under this RFP.

15. <u>Proposal Acceptance; Discussions</u>

The County reserves the right to accept or reject any or all proposals, in whole or in part, received in response to this RFP, to waive or permit cure of minor irregularities; and to conduct discussions with all qualified offerors in any manner necessary to serve the best interests of the County. The County also reserves the right, at its sole discretion; to award a contract based upon the written proposals received without prior discussions or negotiations.

16. Disqualification of Bidders

Any one or more of the following causes may be considered sufficient for the disqualification of a bidder and the rejection of its proposal(s):

- a. More than one proposal for the same contract from an individual, firm, or corporation under the same or different names.
- b. Evidence of collusion among bidders.
- c. Unsatisfactory performance record as evidenced by past experience.
- d. If the unit prices are obviously unbalanced either in excess or below reasonable cost analysis values.
- e. If there are any unauthorized additions, interlineation, conditional, or alternate bids or irregularities of any kind which may render the proposal incomplete, indefinite, or ambiguous as to its meaning.
- f. Non-attendance of mandatory pre-bid meetings may be cause of disqualification.

17. Bid Opening

All bids will be opened and publicly read by designated County staff at 11:00 a.m. on August 28th, 2024, at the Kent County Department of Public Works, 709 Morgnec Road, Chestertown, Maryland 21620. Bidders and other interested parties are invited to attend these public forums.

18. Omission of Specifications

The omission of any specifications, or details of any specifications which would normally apply to the products or service herein stated, shall not relieve the bidder from fulfilling the required specifications necessary to provide a finished product best suited for the intended purpose. The best commercial practices are to prevail, and only materials of first quality, correct type, size, and design are to be used.

Workmanship shall be of first quality. All parts and materials, whether specified herein or not, shall be rated to meet or exceed the maximum rating required by the product or service and its maximum intended purpose.

19. <u>Incurred Expenses</u>

The County will not be responsible for any costs incurred by an offeror in preparing and submitting a proposal in response to this RFP.

20. <u>Compliance with Law</u>

By submitting an offer in response to this RFP, the offeror, if awarded the contract, agrees that it will

comply with all federal, state, and local laws applicable to its activities and obligations under the contract.

21. Acceptance of Terms and Conditions

By submitting a response to this RFP, an offeror shall be deemed to have accepted all the terms, conditions, and requirements set forth in this RFP unless otherwise clearly noted and explained in its proposal. All proposals submitted in response to this Request for Proposal become the property of the County.

All County agreements are subject to the County's General Terms and Conditions unless otherwise specifically changed or waived hereunder or in the Contract.

22. <u>Term</u>

Any contract(s) resulting from this procurement will be for the stated period; however, all contracts are subject to non-appropriations and termination for convenience clauses.

23. Failure To Deliver or Perform

In the event the offeror fails to deliver the goods or services covered by the contract and in accordance with the delivery dates stipulated in the contract, the County reserves the right to purchase on the open market those goods and services which the offeror has failed to deliver and shall deduct any additional costs incurred by the County as a result of such failure to deliver, from any money due to the offeror under the contract or other contracts with the County.

24. Termination of Contract

The County reserves the right to cancel the contract entered into as a result of this bid if, in its opinion, there shall be a failure on the part of the offeror at any time to perform faithfully any of the contract requirements. Should the offeror fail to comply with contract requirements, except for circumstances beyond its control such as, but not limited to an Act of God, war, flood, and governmental restrictions, the County reserves the right to purchase the required goods or services in the open market and charge the offeror with any excess costs, or to complete the required work or obtain the required goods at the expense of the offeror and to withhold any monies that may be due or become due and apply same to any expenses or excess costs incurred to the County.

The County may terminate this agreement at any time, for any reason, and shall be liable only for time and costs incurred as of the date of termination.

25. <u>Changes to the Contract</u>

The County may at any time make changes within the general scope of the contract in the design or specifications of the services to be delivered. The contract shall be modified in writing to reflect any equitable adjustment caused by any increase or decrease in the offeror's cost or time required for performance or change in scope of service. The County reserves the right to increase or decrease quantities and/or projects at their discretion.

26. Agreement/Contract

Any agreement or contract resulting from the acceptance of a Proposal shall be on forms either supplied by or approved by the County and shall contain, at a minimum, applicable provisions of the Request for

Proposal. The County reserves the right to reject any agreement that does not conform to the Request for Proposal and any County requirements for agreements and contracts.

27. Contract and Related Data

No reports, information or data given to or prepared by the County under the contract shall be made available to any person by the firm without the prior written approval of the County.

28. Contract Award

It is the intent of the County to award a contract to the lowest qualified responsible and responsive bidder within thirty (30) calendar days following bid opening; however, the County requires bidders to sign the "Standard Bid Acceptance" form to guarantee their bid for a period of ninety (90) days following the bid opening date. The County reserves the right to reject any and/or all bids.

The County reserves the right to award all or any of the individual Bid Items depending on the lowest responsible bid for the Bid Items selected.

The County also reserves the right to further negotiate further the terms of the contract, including the award amount, with the selected bidder prior to entering into a contract. If contract negotiations cannot be concluded successfully with the selected bidder, the County may negotiate a contract with the next selected bidder, and so on. The County reserves the right to negotiate with the bidder whose proposal is the closest to being acceptable or to seek additional proposals after the proposal date. The County reserves the right to waive any irregularities and technicalities and may, at its discretion, request a follow-up or amended proposal.

29. <u>Contract Extension</u>

There is no anticipated contract extension required for this project.

30. <u>Contract Documents</u>

The Contract Documents shall include this RFP, Schedule, Information to Bidders, Bid Forms, Specifications, Drawings, Addenda, the County General Terms and Conditions, the resulting contract, and any other documents which are clearly intended to be a part of the terms, conditions, requirements, and specifications for the subject products or services.

31. Kent County Purchasing Code

All County purchases are subject to and to be accomplished in accordance with Chapter 49 of the CPLL. Bidders should familiarize themselves with Chapter 49. A copy of Chapter 49 may be obtained from the Clerk of the County Commissioners, by phone at 410-778-4600 or is available online through the County's website at <u>http://www.kentcounty.com/</u>.

32. <u>Termination for Convenience</u>

Contracts shall remain in effect for the time duration and quantity specified unless the contract is terminated by the County. The County may terminate the contract at any time by giving written notice of such termination and specifying the effective date thereof at least thirty (30) days before the effective date of termination.

33. Termination for Cause

If, for any reasons or through any cause, the Contractor fails to fulfill in a timely and proper manner, its obligations under this Contract, or if the Contractor violates any of the covenants, agreements, or stipulations of this Contract, the County shall thereupon have the right to terminate this contract by giving written notice to the Contractor of such termination and specifying the effective date thereof, at least five (5) days before the effective date of such termination. In the event of termination, all finished or unfinished documents, data, studies, surveys, drawings, maps, models, photographs, reports, or other material prepared by the Contractor under this Contract shall, at the option of the County, become property of the County. The Contractor shall be entitled to receive just and equitable compensation for any satisfactory work completed on such documents and other materials which is usable to the County.

34. Non-discrimination

The County is an equal opportunity employer. The County complies with Title VI of the Civil Rights Act of 1964, which provides that no person shall be denied on the grounds of race, color, or national origin, be excluded from, be denied the benefits of, or discriminated against under any program or activity receiving Federal financial assistance. Each bidder shall verify through execution of the bid form that it does not discriminate on the basis of race, color, creed, religion, gender, age, lawful sexual orientation, marital status, national origin, or on any other basis generally prohibited by any federal, State, or local law, rule, or regulation.

35. Kent County Ethics Ordinance

By submitting a bid in response hereto, the bidder acknowledges that it is familiar with the County's Code of Ethics, CPLL, Chapter 29, and certifies that it has no knowledge of any violation of that Chapter, any conflict of interest which may exist or arise under Chapter 29 if the bidder is awarded a contract, and of giving any gift (as that term is defined in Chapter 29) to anyone who has or may participate in the awarding of this contract or the management or supervision thereof. Contact the County's Attorney Office at 410-810-0428 if any additional information is required. A copy of Chapter 29 may be obtained from the Clerk of the County Commissioners at 410-778-4600 or can be found online through the County's website at http://www.kentcounty.com/.

SECTION B. BID PROPOSALS AND RELATED MATTERS

1. Pre-Bid Meeting

A pre-bid meeting will be held on August 16th, 2024 beginning at 1:00 p.m. in the Kent County Courthouse, located at 103 N. Cross Street, Chestertown, Maryland 21620. All interested offerors are recommended to attend. Nothing stated at the pre-bid meeting may change the Request for Proposal unless the Director of Purchasing makes a change by written amendment.

2. Presentation

Offerors may be required to make individual written or oral presentations to the County representatives in order to clarify their proposals.

3. Proposal Form

Proposals should be simply and economically prepared to provide a straightforward, concise description of the offeror's proposal for meeting the requirements of this procurement.

4. Bid Forms

All Bids must be made on the required bid forms. All blank spaces for bid prices must be completed in ink or typewritten, and the bid form must be fully completed and executed when submitted. Unless otherwise specifically required, only one copy of the bid form is required. A conditional or qualified bid will not be accepted. The base price on the bid form shall be the total cost of the item being bid in accordance with the specifications in the RFP. Alternates shall only be used to reflect increases or decreases in the base bid price. Only those alternates which are specifically requested by the County will be considered.

5. <u>Bid Notice Disclaimer</u>

The mailing of bid solicitations (notices) to incumbent and/or potential vendors of goods and services is a courtesy extended by the County, as well as a method for generating interest among vendors. For purposes of bidding opportunities, generally, interested vendors should rely on the public notices published in the newspapers of general circulation in Kent County and posted online at eMaryland Marketplace Advantage.

6. Bid Surety

All bids shall be accompanied by a Bid Surety in the form of a certified check, or bid bond, made payable to the County Commissioners of Kent County, Maryland for the penal sum of 5% of the bid price. Bid Surety will be returned to all bidders upon completion of the contract award process, with the exception of the successful bidder. Non-Performance or failure to sign the contract within ten (10) business days after the award, (or later within the bid guarantee period at the discretion of the County), or withdrawal of a bid subsequent to opening but prior to award, shall result in forfeiture of the Bid Surety. Any Bid Surety and related forms and instruments required must be executed and attached to the bid submittal.

7. <u>Waiver of Technicalities</u>

The County reserves the right to waive formalities or technicalities in bids, as the interest of the County may require in accordance with the terms of the County's Purchasing Ordinance, Chapter 49, Code of

Public Local Laws of Kent County, Maryland ("CPLL").

8. Basis of Award

All responsive proposals from responsible bidders will be eligible for contract award, based on the following:

- a. Lowest price from a responsive and responsible bidder as indicated by the total price on the bid form for the Bid Items selected by the County.
- b. Compliance with specifications.
- c. Compliance with terms of the bid package.
- d. Ability to perform or deliver on time.

The County may undertake such investigations or inquiries as it deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish the County with all requested information and data for this purpose.

9. Modification or Withdrawal of Bids

- Pre-Opening Modification or Withdrawal of Bids:
 Bids may be modified or withdrawn by written notice received by the Director of Purchasing before the time and date set for bid opening.
- b. Disposition of Bid Bond:If a bid is withdrawn in accordance with this regulation, the Bid Bond, if any, shall be returned to the Bidder.
- Late Bids, Late Withdrawals, and Late Modifications:
 Any bid and any request for Withdrawal or Modification received after the time and date set for receipt and opening of bids is late and will be disregarded.

10. Performance and Payment Bonds

In accordance with the specifications, the selected bidder will be required to furnish a Performance Bond and a Payment Bond, each in an amount of one hundred percent (100%) of the contract price. The successful bidder shall be required to furnish the bond(s) at the time of the execution of the contract. Where attorneys-in-fact sign bid, payment, and/or performance bonds, bidders must provide with each bond, a certified and effective dated copy of their Power of Attorney. The bidder to whom the contract is awarded will be required to execute the contract and obtain the requisite bonds within ten (10) calendar days from the date when Notice to Award is delivered by the County to the bidder.

11. Substitutions

The material, products, and equipment described in the bidding documents establish a standard of required function, dimension, appearance, and equality to be met by any proposed substitution, unless specifically stated otherwise. No substitutions will be considered prior to receipt of the bids unless a written request for approval has been received at least ten (10) days prior to the receipt of bids. Each such request shall include the name of material or equipment for which a substitution is proposed and a complete description of the proposed substitute including drawings, cuts, performance, test data, and any other information necessary for evaluation.

12. Alternates

An alternate is a dollar amount to be added to or subtracted from the base bid price. The County may request alternate prices to compare various options that may be in their best interest. The County shall have the right to accept alternates in any order or combination, and to determine the low bidder on the basis of the base bid and alternates accepted.

13. Addenda

Addenda, if any, will be emailed, mailed, or delivered to all that are known to have received a complete set of bidding documents and will be posted on the eMaryland Marketplace Advantage and Kent County, MD website. Copies of Addenda will be made available for inspection wherever bidding documents are on file for that purpose. No addenda will be issued later than three (3) days prior to the date for receipt of bid, except an Addendum withdrawing the request for bids or one which includes postponement of the date for receipt of bids.

14. Trade and Brand Names

Unless specifically provided otherwise in an RFP, the use of or references to any trade or brand names in this bid package shall be solely for the purpose of establishing a standard and shall in no way infer that other trade and brand names will not be acceptable.

15. Product Literature

Bidders shall include with their bid submittal literature detailing make, model, and specifications of the product which they are bidding, if applicable.

16. Exceptions to Bid Specifications

Any bidder taking an exception to the stated specifications or requirements must make such exceptions clear and in writing, and shall attach such exceptions to, or include them in, the sealed bid proposal. This section is not to be construed to mean that the county is obligated to accept any such exception.

THE COUNTY IS NOT OBLIGATED TO ACCEPT ANY BID NOT IN CONFORMANCE WITH BID SPECIFICATIONS AND MAY REJECT SUCH BIDS WITHOUT COMMENT OR REVIEW. BIDDERS TAKING SUCH EXCEPTIONS DO SO AT THEIR OWN RISK.

17. <u>Time of Delivery</u>

The Contractor, after receipt of written notice of the award of the contract and receipt of the purchase order, shall diligently prosecute same so that it will be fully completed within the number of consecutive calendar days stated in the proposal. Calendar days for completing delivery of the bid items shall start from the date of notice of said award and purchase order.

18. <u>Default in Contracting</u>

Should the bidder to whom the contract is awarded fail or be unable to execute the contract for any reason within seven (7) calendar days after notification of award, then an amount equal to the difference between the accepted bid price and that of the next highest bidder shall be forfeited to the owner as liquidated

damages.

19. Payment Terms

Payment will be made only for County-approved invoices supported by adequate information and details enabling the County to determine that the appropriate level of performance has been reached, and invoices for materials already delivered and services already performed; Otherwise, payment will not be made if an invoice is not approved. Invoices must include the period covered and a detailed itemization of the items or services, which shall be subject to review by the County. Invoices shall be submitted monthly (for ongoing projects or orders) or within thirty (30) days of delivery or completion (for single-service or ongoing delivery contracts) by paper or by email. Approved payment shall be made to the contractor within thirty (30) calendar days of receipt of an acceptable invoice. Invoices shall be mailed or emailed directly to the designated Contract Administrator.

20. Kent County Substance Abuse Policy

The County adopted the "Kent County Government Substance Abuse Policy," a policy to which the successful bidder must strictly adhere. Prospective bidders are cautioned to make themselves familiar with the policy. Bidders must state on the "Standard Bid Form" whether or not you have a drug abuse program in effect.

21. Insurance

Prior to execution of this contract, the successful bidder shall submit a "**Certificate of Insurance**" indicating it carries the appropriate insurances in the amount specified in this RFP. Coverages shall be maintained continuously throughout the term of the contract with no lapses in coverage. Unless otherwise specified, coverage levels shall be required as follows:

- a. Professional malpractice, negligence, and errors and omissions coverage in minimum amounts of \$2,000,000.00 per event and \$1,000,000.00 per person.
- b. General Liability Minimum \$2,000,000.00 per occurrence.
- c. Workers' Compensation Insurance as required by law.
- Comprehensive Liability Insurance with minimum limits of \$1,000,000.00 per person, \$2,000,000.00 per occurrence. Policy shall include the broad form of Comprehensive General Liability Endorsement or its equivalent.
- e. All required coverages shall include and specifically name the County as an additional insured and loss payee with respect to all operations under the contract, and for the duration of the contract, in full.
- f. The successful bidder will furnish the County any up-to-date certificates of insurance stating the requirements listed above at contract implementation and should insurance coverage change or be renewed at any time.

22. Immigration Law Compliance

By submitting and signing a proposal, each bidder hereby certifies that it does not, and if awarded the

contract, will not during the performance of the contract, employ illegal workers or otherwise violate any provisions of any applicable federal, State, or local law concerning the employment of illegal aliens, the certification of nationality of workers, or otherwise.

23. Federal Taxpayer Identification Certificate (W-9)

All first-time successful bidders doing business with the County must submit a completed standard "Federal Taxpayer Identification Certificate – W-9" with accurate remit-to address for payments and correspondence and is to be signed and dated for the current calendar year.

SECTION C. GENERAL SCOPE OF WORK, SPECIFICATIONS AND RELATED MATTERS

1. SUMMARY

It is the intent of these specifications to cover all aspects of the Kent County Courthouse Lobby Alterations, as warranted by this RFP. The Circuit Courthouse is in need of alterations to operate certain security equipment and to control the entrance sequence and flow of visitors more efficiently. The proposed work will include that of general construction (i.e. selective demolition, re-construction, etc.) and electrical installment/incorporation to expand the lobby area.

Further detailed specifications for this project include building plans and technical specifications prepared by Crabtree, Rohrbaugh & Associates- Architects (CRA) entitled CRA Project No. 3734: "Courthouse Lobby Alterations", dated July 25, 2024, and are hereby attached to and made a part of this Request for Proposal and its inclusive contract documents. These plans can be found in Section E.

It shall be the responsibility of all bidders to visit the site and verify existing conditions, and all bidders are highly encouraged to attend the Pre-Bid Meeting (ref. Section B.1).

Any incidental or additional work required to fulfill the requirements of the specified work shall be considered a part of said specified work and no additional payment shall be made. All work shall be performed in accordance with the prevailing code for the trade or trades involved and shall be done in a first-class workmanship manner. Inferior or shoddy workmanship or materials will not be tolerated nor accepted for payment. It shall be fully understood that the Department of Public Works shall make the final decision as to the acceptance of all work and material and that in the event of an adverse decision, no claim of any sort shall be made against the county or any of its employees, agents, or assigns.

All work shall be performed in accordance with the following:

- Kent County Building Code
- "The B.O.C.A. Basic Building Code", latest edition, with all revisions.
- All applicable Federal, State, and local regulations.

2. SUBSTITUTIONS

Whenever a material, method of construction, article or piece of equipment is identified on the plans or specifications by reference to brand name or catalog numbers, it shall be understood that this is referenced for the purpose of defining the scope of work, performance or other salient requirements and that other materials, methods of construction, or products of equal capacities, quality and function shall be considered. The contractor may recommend the substitution of a material, method of construction, article, or piece of equipment of equal substance and function for those specified herein, if in the opinion of the county, such substitution is of equal substance and function to that specified. The contractor warrants that if substitutes are approved, no major changes in the function or general design of the project will result. Incidental changes or extra component parts required to accommodate the substitute will be made by the contractor without a change in the contract price or to the contract time.

3. EXPERIENCE REQUIRED

In addition to the bid price, bidders shall submit evidence of their experience and qualifications as it relates to this project. References shall also be provided with current contact information. Past performance, staff qualifications and availability, and other resources will be major criteria in the review of proposals.

4. <u>COMPLETION TIME</u>

This project must be completed within ninety (90) calendar days after issuance of the Notice to Proceed.

5. WARRANTY

The contractor shall provide a one (1) year labor and materials warranty exclusive of natural disaster and/or third-party damage.

6. <u>AWARD</u>

The successful bidder shall be selected based upon a review of qualifications, experience, and price. The decision of the County Commissioners of Kent County shall be final. The County Commissioners of Kent County reserve the right to accept or reject any or all proposals should it be in the best interest of the county to do so.

7. <u>PREVAILING WAGE REQUIREMENTS</u>

There are no prevailing wage rate requirements on this project.

8. PROGRESS MEETINGS

Progress meetings shall be held bi-weekly at a minimum to review progress and schedule. More regularly scheduled meetings may be required if deemed necessary by the contractor or county for specific issues. The contractor is responsible for preparation and distribution of meeting minutes.

9. TEMPORARY FACILITIES

The Contractor must partition of active work areas, when possible, to reduce the impact on the day-today operations of the Courthouse.

10. STAGING AREA

The Contractor will coordinate on-site staging with the Owner and Architect.

11. SUBMITTALS

Contractor shall submit in PDF format where appropriate. Physical samples are required for color selections. The contractor shall allow 10-14 days for review of each submittal. A maximum of 2 reviews per submittal will be allowed before the contractor will be responsible for review costs. Submittals shall be provided as required by the project specifications.

12. FINAL CLEANING

Prior to requesting final completion inspection, the contractor shall thoroughly clean the building of all, dirt, trash, debris, etc. including the surrounding grounds and any staging area used during construction. The overall site shall be left in a condition "better than or equal" to that prior to construction.

13. CLOSEOUT PROCEDURES

A. FINAL INSPECTION

- i. When contractor considers work has reached final completion, they shall submit written certification that contract documents have been reviewed, work has been inspected, and that work is complete in accordance with contract documents and ready for County's and Architect's inspection/punch list.
- ii. If Architect performs re-inspection due to failure of work to comply with claims and status of completion made by the contractor, the County will compensate the Architect for such additional services and deduct the amount of such compensation from the final payment to the Contractor.

B. CLOSEOUT DOCUMENTS

i. After acceptance by the County and Architect, the contractor shall provide release of lien documentation, as-built plans, all equipment operation and maintenance manuals, project owner's manual, with the list of all subcontractors and their contact information, warranties and the final project invoice.

SECTION D. INDEX OF BID FORMS

The following pages are to be completed and returned to the Issuing Office by the date and time aforementioned in Section A.8. These forms are in the order found on the Table of Contents, but are also listed here:

- 1. Standard Sealed Bid Price Sheet
- 2. Standard Sealed Bid Form
- 3. Bid Surety
- 4. Signature Form
- 5. Affidavit of Qualifications to Bid
- 6. Non-Collusion Certificate
- 7. General Terms and Conditions between County and Contractor

STANDARD SEALED BID PRICE SHEET RFP # BM 25-02

To the County Commissioners of Kent County, Maryland:

We hereby submit, for your review, our proposal requested by the RFP. This proposal includes and incorporates all information and specifications, required by and contained within the Contract Documents, as also described in the RFP, the same as if specifically written herein. A completed, signed, and accepted copy of this Standard Sealed Bid Form shall serve as a valid and binding contract.

TOTAL BID PRICE:

\$_____

Written Bid Price

_____Dollars and _____Cents

County reserves the right to award the contract to the lowest responsible bidder for any bid item. Contractor to begin work as specified in the "Notice to Proceed" and to prosecute said work to complete the contract within ninety (90) calendar days.

Drug Abuse Policy in Effect (Circle One)	YES	NO
Certificate of Insurance attached (Circle One)	YES	NO
Bid Surety Attached (Circle One)	YES	NO
Signature Form executed (Circle One)	YES	NO
Affidavit of Qualification to Bid completed (Circle One)	YES	NO
Non-Collusion Certificate completed (Circle One)	YES	NO

STANDARD SEALED BID FORM

RFP # BM 25-02

BIDDER:			
AGENT (TYPED):			
FIRM NAME:			
ADDRESS:			
TELEPHONE:			
EMAIL:			
Submitted by:	(Signature of	authorized agent above)	
On	, the	day of	2024.
		Accepted by:	
		Daniel F. Mattson, P.E., C.F.M., C.M.E., b Authority of the County Commissioners	у
ATTEST:			
		DATE	

BID SURETY

KNOWN ALL MEN BY '	THESE PRESENTS,	, that we the undersigned,
--------------------	-----------------	----------------------------

as principal, and
as surety, are hereby
held and firmly bound unto the County Commissioners of Kent County AS OWNER in the penal sum of
for the payment of which, well and truly to be made, we hereby
jointly and severally bind ourselves, successors and assigns.
The condition of the above obligation is such that whereas the principal has submitted to the County
Commissioners of Kent County a certain BID, attached hereto and hereby made a part of hereof to enter into a
contract in writing, for the

NOW, THEREFORE,

a) If said BID shall be rejected, or

b) If said BID shall be accepted and the principal shall execute and deliver a contract in the form of Contract attachment hereto (properly completed in accordance with said BID) and shall furnish a BOND for his faithful performance of said contract, and for the payment of all persons performing labor, furnishings, materials, in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID, this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of the obligation as herein stated.

The Surety, for value received, hereby stipulated and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID, and said Surety does hereby waive notice of any such extension. IN WITNESS WHEREOF, the Principal and Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

Principal

Surety

By: _____ By: _____

IMPORTANT: Surety companies executing BONDS must authorized to transact business in the State of Maryland.

SIGNATURE FORM

NAME OF BIDDER:
SIGNATURE OF AUTHORIZED PERSON:
PRINT AUTHORIZED PERSON:
TITLE OF AUTHORIZED PERSON:
STREET NAME AND NUMBER:
CITY, STATE, ZIP CODE:
TELEPHONE NUMBER:
E-MAIL
DATE:
BIDDERS FEDERAL EMPLOYER IDENTIFICATION NO
BIDDERS CONTRACTORS LICENSE AND PERMIT NUMBERS:

AFFIDAVIT OF QUALIFICATION TO BID

I HEREBY AFFIRM THAT

1. I am the (Title)	and
the duly authorized representative of the firm of (Name of Corporation)	
	whose address is
	and that I

possess the legal authority to make this affidavit on behalf of myself and the firm for which I am acting.

Except as described in paragraph 3 below, neither I nor the above firm, nor to the best of my knowledge, any of its officers, directors, or partners, or any of its employees directly involved in obtaining contracts with the State of any county, bi-county, or multi-county agency, or subdivision of the State, have been convicted of, or have pleaded no contender to a charge of, or having during the course of an official investigation or other proceeding, admitted in writing or under oath, acts or omissions which constitute bribery, attempted bribery, or conspiracy to bribe under the provisions of Criminal Law Article of the Annotated Code of Maryland, or under the laws of any state or the Federal government.

2. (State "none", or as appropriate, list any conviction, plea, or admission described in paragraph 2 above, with the data: court, position with the firm, and the sentence or disposition, if any)

I acknowledge that this affidavit is to be furnished to the County Attorney for the County Commissioners of Kent County, and where appropriate, to others. I acknowledge that, if the representations set forth in this affidavit are not true and correct, the County Commissioners of Kent County may terminate any contract awarded and take any other appropriate action. I further acknowledge that I am executing this affidavit in compliance with Section 16D of Article 78A of the Annotated Code of Maryland, which provides those certain persons who have been convicted of, or have admitted to bribery, attempted bribery, or conspiracy to bribe may be disqualified, either by operation of law or after hearing, from entering into contracts with the State or any of its agencies or subdivisions.

I do solemnly declare and affirm under the penalties of perjury that the contents of this affidavit are true and correct.

Signature Date

NON-COLLUSION CERTIFICATE

I HEREBY CERTIFY I am the		
	(Title)	
and the duly authorized representative of the firm of		_
		-
whose address is		

AND THAT NEITHER I, nor to the best of my knowledge, information, and belief, the above firm, nor any of its other representatives I here represent, have:

- a. Agreed, conspired, connived, or colluded to produce a deceptive show of competition in the compilation of the bid, or offer being submitted herewith.
- b. Not in any manner, directly or indirectly, entered into any agreement, participated in any collusion to fix the bid price or price proposal of the bidder, or offer of herein or any competitor, or otherwise taken into action in restraint of free competition bidding in connection with the Contract for which the within bid or offer is submitted.

In making this affidavit, I represent that I have personal knowledge of the matters and facts herein stated.

Date

Signature

Date

Print Name or Type



GENERAL TERMS & CONDITIONS OF CONTRACT BETWEEN COUNTY & CONTRACTOR

1. ACCOUNTING SYSTEM AND AUDIT, ACCURATE INFORMATION

The Contractor certifies that all information the Contractor has provided or will provide to the County is true and correct and can be relied upon by the County in awarding, modifying, making payments, or taking any other action with respect to this contract including resolving claims and disputes. False or misleading information constitutes grounds for the County to terminate this contract for cause and to pursue any other appropriate remedy. The Contractor certifies that the Contractor's accounting system conforms to generally accepted accounting principles, is sufficient to comply with the contract's budgetary and financial obligations, and is sufficiently able to produce reliable financial information.

The County may examine the Contractor's and any first-tier subcontractor's records to determine and verify compliance with the contract and to resolve or decide any claim or dispute arisen under this contract. The Contractor and any first-tier subcontractor must grant the County access to these records at all reasonable times during the contract term and for three (3) years after final payment (or for such longer period as may be required pursuant to any federal, state, or other loan or grant condition). If the contract is supported to any extent with federal or state funds, the appropriate federal or state authorities may also examine these records. The Contractor must include the preceding language of this paragraph in all first-tier subcontracts.

2. <u>AMERICANS WITH DISABILITIES ACT</u>

The Contractor agrees to comply with the nondiscrimination requirements of Titles II and III, and other provisions, of the Americans with Disabilities Act of 1990, Pub. Law 101-336, as amended, currently found at 42 U.S.C., § 12101, et seq.

3. <u>APPLICABLE LAWS</u>

This contract must be construed in accordance with the applicable laws, rules, and regulations of the State of Maryland (without regard to its conflicts of laws principles) and of Kent County. All Kent County laws, rules, and regulations are incorporated by reference into, and made a part of, this contract. In the case of any inconsistency between this contract and such laws, rules, and regulations, the laws, rules, and regulations shall govern. The Contractor must, without additional cost to the County, pay any necessary fees and charges, obtain any necessary licenses and permits, and comply with applicable federal, state and local laws, codes and regulations. For purposes of litigation involving this contract, except for Contract Disputes discussed in paragraph 8 below, exclusive venue and jurisdiction must be in the Maryland State courts located in Kent County, Maryland.

4. <u>ASSIGNMENTS AND SUBCONTRACTS</u>

The Contractor may not assign or transfer this contract, any interest herein or any claim hereunder, except as expressly authorized in writing by County's County Administrator, or as otherwise specifically provided for in the contract. Unless performance is separately and expressly waived in writing by the County Administrator, an assignment does not release the Contractor from responsibility for performance of this contract. Unless otherwise provided in the contract, the Contractor may not contract with any other party for furnishing any of the materials or

services herein contracted for without the written approval of the County Administrator.

5. <u>CHANGES</u>

The County Administrator may unilaterally change the work, materials and services to be performed, in accordance with County law, rule, or regulation. The change must be in writing and within the general scope of the contract. The contract will be modified to reflect any time or money adjustment the Contractor is entitled to receive. Any claim concerning an adjustment in time or money due to a change must be given in writing to the County Administrator, or the designated Contract Administrator, within thirty (30) days from the date that the change was ordered, or the claim will be waived. Any failure to agree upon a time or money adjustment must be resolved under the "Disputes" clause (Section 8) of this contract. The Contractor must proceed with the prosecution of the work as changed, even if there is an unresolved claim. No charge for any extra work, time or material will be allowed, except as provided in this section.

6. <u>CONTRACT ADMINISTRATION</u>

- A. The Contract Administrator, subject to paragraph B below, is the Department Representative designated by the County Administrator. The Contract Administrator is authorized to:
 - 1) Serve as liaison between the County and Contractor;
 - 2) Give direction to the Contractor to ensure satisfactory and complete performance;
 - Monitor and inspect the Contractor's performance to ensure acceptable timeliness and quality of service;
 - 4) Serve as records custodian for this contract;
 - 5) Accept or reject the Contractor's performance or service;
 - 6) Furnish timely written notice of the Contractor's performance failures, if applicable, to the County Administrator;
 - 7) Prepare required documents and reports;
 - 8) Approve or reject invoices for payment;
 - 9) Recommend contract modifications or terminations to the County Administrator; and
 - 10) Issue Notice to Proceed.
- B. The Contract Administrator is NOT authorized to make determinations (as opposed to recommendations) that alter, modify, terminate, or cancel the contract, effect a procurement, interpret ambiguities in contract language, or waive the County's contractual rights.

7. <u>COST & PRICING DATA</u>

The Contractor guarantees that any cost and/or pricing data provided to the County will be accurate and complete. The Contractor grants the County access to all books, records, documents, and other supporting data in order to permit adequate evaluation of the Contractor's proposed price(s). The Contractor also agrees that the price to the County, including profit or fee, may, at the option of the County, be reduced to the extent that the price was based on inaccurate, incomplete, or non-current data supplied by the Contractor.

8. <u>DISPUTES DURING CONTRACT PERFORMANCE</u>

Any dispute by Contractor arising during the performance of the contract, which dispute is not disposed of by mutual agreement, must be decided as provided hereunder. Pending final resolution of a dispute, the Contractor must proceed diligently with contract performance. Subject to the discretion of the County Administrator, the head of the County department, office, or agency ("Department Head") of the Contract Administrator is the designee of the County Administrator, for the purpose of dispute resolution. If the Contract Administrator is the Department Head, then the dispute shall be managed by the County Administrator. The Department Head may, with the Contractor's consent, delegate this responsibility to another person (other than the Contract Administrator). The Contractor waives any dispute or claim not made in writing and received by the Department Head within thirty (30) days of the occurrence giving rise to the dispute or claim. A dispute must be in writing, for specific relief, and any requested relief must be fully supported by affidavit and all relevant calculations, including cost and pricing information, records, and other information. The Contractor may, at the County's option, be made a party to any related dispute involving another Contractor.

9. DOCUMENTS, MATERIALS AND DATA

All documents, materials or data developed as a result of this contract are the County's property, unless specifically provided for in the contract. The County has the right to use and reproduce any documents, materials, and data, including confidential information, used in the performance of, or developed as a result of, this contract. The County may use this information for its own purposes, including reporting to state and federal agencies. The Contractor warrants that it has title to or right of use of all documents, materials or data used or developed in connection with this contract. The Contractor must keep confidential all documents, materials, and data prepared or developed by the Contractor or supplied by the County.

10. DURATION OF OBLIGATION

The Contractor agrees that all of the Contractor's obligations and warranties which, directly or indirectly, are intended by their nature or by implication to survive performance of the contract shall so survive the completion of performance, termination for cause, or the termination for convenience of the contract.

11. ENTIRE AGREEMENT

There are no promises, terms, conditions, or obligations other than those contained within the contract, including any terms, conditions, documents or exhibits thereto, and in these General Terms and Conditions. This contract supersedes all communications, representations, or agreements, either verbal or written, between the parties hereto, with the exception of express warranties given to induce the County to enter into the contract.

12. <u>ETHICS REQUIREMENTS/ POLITICAL CONTRIBUTIONS</u>

The Contractor must comply with the ethics provisions contained in Chapter 29 – Ethics of the Code of Public Local Laws of Kent County.

13. <u>GUARANTEE</u>

A. Contractor guarantees for one (1) year from acceptance, or for such other period of time as may have been expressly stated in the contract or the County's written solicitation, all goods, services, and construction offered, including those used in the course of providing the goods, services, and/or construction. This includes a guarantee that all products offered (or used in the installation of those products) carry a guarantee against any and all defects for such period. The Contractor must correct any and all defects in material and/or workmanship which may appear during the guarantee period, or any

defects that occur within one (1) year of acceptance even if discovered more than one (1) year after acceptance, by repairing (or replacing with new items or new materials, if necessary) any such defect at no cost to the County and to the County's satisfaction;

- B. Should a manufacturer's or service provider's warranty or guarantee exceed the requirements stated above, that guarantee or warranty will be the primary one used in the case of defect. Copies of manufacturer's or service provider's warranties must be provided upon request;
- C. All warranties and guarantees must be in effect from the date of acceptance by the County of the goods or services;
- D. The Contractor guarantees that all work shall be accomplished in a workmanlike manner, and the Contractor must observe and comply with all federal, state, County and local laws, ordinances, and regulations in providing the goods and performing the services listed;
- E. Goods and materials provided under this contract must be of first quality, latest model, and of current manufacture, and must not be of such age or so deteriorated as to impair their usefulness or safety. Items that are used, rebuilt, or demonstrator models are unacceptable, unless specifically requested by the County in the contract documents; and
- F. All goods shall be merchantable and fit for the particular purpose, ordered or purchased, and as the Contractor so represents and warrants.

14. HAZARDOUS AND TOXIC SUBSTANCES

Manufacturers and distributors are required by federal "Hazard Communication" provisions of 29 CFR 1910.1200, and the Maryland "Access to Information About Hazardous and Toxic Substances" Law, to label each hazardous material or chemical container, and to provide Material Safety Data Sheets to the purchaser. The Contractor must comply with these laws and must provide the County with copies of all relevant documents, including Material Safety Data Sheets, prior to performance of services or contemporaneous with delivery of goods.

15. IMMIGRATION REFORM AND CONTROL ACT

The Contractor warrants that both the Contractor and any subcontractor do not and shall not hire, recruit, or refer for a fee, for employment under this contract or any subcontract, an alien while knowing the alien is an unauthorized alien, or any individual without complying with the requirements of the federal Immigration and Nationality laws, including but not limited to any verification and record keeping requirements. The Contractor further assures the County that, in accordance with those laws, it does not and will not discriminate against an individual with respect to hiring, or recruitment or referral for a fee, of the individual for employment or the discharging of the individual from employment because of such individual's national origin or, in the case of a citizen or intending citizen, because of such individual's citizenship status.

16. <u>PROVISIONS</u>

Notwithstanding any provisions to the contrary within any contract terms or conditions supplied by the Contractor, the County's General Terms and Conditions supersede the Contractor's terms and conditions in the event of any inconsistency, unless specifically waived or amended by the County.

In the case of any conflicts or ambiguities determined among the contract documents, such matters shall be resolved in favor of the following priorities:

- A. Any term or condition specifically provided for within a signed agreement or exhibit to a contract, other than terms and conditions provided by the Contractor;
- B. Terms and Conditions specified by the County in any Request For Proposal, Request For Qualifications, Invitation For Bid, or any other solicitation document, specifying with particularity the County's General Terms and Conditions; and
- C. These General Terms and Conditions.

The lack of a specific provision in any of the documents referred to in items 16.A. and 16.B. above shall not operate to create an ambiguity with these General Terms and Conditions.

17. INDEMNIFICATION

The Contractor is responsible for any loss, personal injury, death and any other damage (including incidental and consequential) that may be done or suffered by reason of the Contractor's negligence or failure to perform any contractual obligations. The Contractor must indemnify and save the County harmless from any loss, cost, damage, and other expenses, including attorney's fees and litigation expenses, suffered or incurred due to the Contractor's negligence or failure to perform any of its contractual obligations. If requested by the County, the Contractor must defend the County in any action or suit brought against the County arising out of the Contractor's negligence, errors, acts or omissions under this contract. The negligence of any agent, subcontractor or employee of the Contractor is deemed to be the negligence of the Contractor. For the purposes of this paragraph, County includes its elected officials, employees, agents, boards, and agencies. Any incidental and consequential damages shall be limited to the amount of insurance required by the contractor hereunder.

18. INDEPENDENT CONTRACTOR

If the Contractor is an independent contractor, the Contractor and the Contractor's employees or agents are not agents or employees of the County. Neither these General Terms and Conditions nor the contract are intended to create any partnership, joint venture, agency or other relationship between the County and the Contractor.

19. INFRINGEMENT

The Contractor represents and warrants that there is no copyright or patent infringement with respect to any goods or materials furnished pursuant to the contract. The Contractor shall indemnify and hold harmless the County with respect to cost, expense, damages, and liability arising from or on account of any claim for infringement.

20. INSPECTIONS

The County has the right to monitor, inspect and evaluate or test all supplies, goods, or services called for by the contract at all reasonable places (including the Contractor's place of business) and times (including the period of preparation or manufacture).

21. INSURANCE

Prior to execution of the contract, the Contractor must obtain, at its own cost and expense, and must keep in force and effect during the term of this contract (including all extensions) the insurance specified in the contract. This must include any applicable table or attachment with an insurance company licensed or qualified to do business in the State of Maryland and with an A. M. Best rating of not less than A-. The Contractor must submit a certificate of insurance prior to award of this contract and prior to any contract modification extending the term of the contract, as evidence of compliance with this provision. The County must be named as an additional insured on all liability

policies. Forty-five (45) days written notice to the County of cancellation or material change in any of the policies is required. In no event may the insurance coverage be less than that shown on the applicable table, attachment, or contract provision for required insurance. Subject to applicable law, the County Administrator may waive or modify the requirements of this section 21 in whole or in part.

22. <u>NON-CONVICTION OF BRIBERY</u>

The Contractor hereby declares and affirms that, to its best knowledge, none of its officers, directors, members, partners, or employees directly involved in obtaining contracts has been convicted of bribery, attempted bribery, or conspiracy to bribe under the laws of any state or the federal government.

23. <u>NONDISCRIMINATION IN EMPLOYMENT</u>

The Contractor shall not discriminate in employment, or in the treatment of employees, or discriminate in any manner on the basis of race, color, gender, age, religion, creed, national origin, ancestry, marital status, disability, political affiliation, or lawful sexual orientation and shall follow and obey all applicable State, Federal, and County laws and regulations regarding employment discrimination. The Contractor must bind its subcontractors to the provisions of this section.

24. PAYMENTS

This contract is subject to a non-appropriations clause as provided herein. No payment may be made or is due under this contract unless funds for the payment have been appropriated and encumbered by the County. Under no circumstances will the County pay the Contractor for legal fees. The Contractor must not proceed to perform any work or provide goods, services, or construction prior to receiving written confirmation that the County has appropriated and encumbered funds for the work. If the Contractor fails to obtain this verification from the County prior to performing work, the County has no obligation to pay the Contractor for the work.

If this contract provides for an additional contract term, or for work in any period beyond the end of the County's fiscal year in which the contract is executed, continuation of this contract beyond the end of that fiscal year is contingent upon the subsequent appropriation of funds and encumbrance of those appropriated funds for payments under this contract. If funds are not appropriated and encumbered to support continued performance in a subsequent fiscal period, this contract terminates without further notice from, or cost to, the County. The Contractor acknowledges that the County Commissioners have no obligation to appropriate funds for this contract in subsequent fiscal years. Furthermore, the County has no obligation to encumber funds to this contract in subsequent fiscal years. Accordingly, for each subsequent contract term, the Contractor must take appropriate action to verify that such funds have been appropriated and encumbered. See Annotated Code of Maryland, Article 31, section 3.

25. <u>PERSONAL PROPERTY</u>

All furniture, office equipment, operator equipment, vehicles and other similar types of personal property specified in the contract and purchased with funds provided under the contract become the property of the County upon the termination or expiration of this contract, unless expressly stated otherwise.

26. <u>TERMINATION FOR CAUSE</u>

The County may terminate the contract in whole or in part, and from time to time, whenever the County determines that the Contractor is:

A. Defaulting in performance or is not complying with any provision of this contract;

- B. Failing to make satisfactory progress in the prosecution of the contract; or
- C. Endangering the performance of this contract.

Prior to a termination for cause, the County will send the Contractor written notice specifying the cause. The notice will give the Contractor ten (10) days from the date the notice is issued to cure the default or make progress satisfactory to the County in curing the default, unless a different time is given in the notice. If the County determines that default contributes to the curtailment of an essential service or poses an immediate threat to life, health, or property, the County may terminate the contract immediately upon issuing oral or written notice to the Contractor without any prior notice or opportunity to cure. In addition to any other remedies provided by law or the contract, the Contractor must compensate the County for additional costs incurred by the County to obtain substitute performance. A termination for cause shall be considered a termination for convenience as of the date the Contractor was advised of the termination for cause, if there was, in fact, no cause.

27. <u>TERMINATION FOR CONVENIENCE</u>

This contract may be terminated by the County, in whole or in part, upon written notice to the Contractor, when the County determines termination to be in the County's best interest. The termination is effective ten (10) days after the notice is issued, unless a different time is given in the notice. The County is liable only for payment for acceptable performance prior to the effective date of the termination, and for costs reasonably incurred as of the date of termination, including costs or items acquired by such costs that cannot be economically retained by the Contractor for other or future use of the Contractor.

28. <u>TIME</u>

Time is of the essence in the performance by Contractor of the contract and of all ancillary matters arising therefrom.

29. <u>TITLE</u>

All goods delivered or provided to the County or otherwise pursuant to the contract, and the title thereto, shall be free of any security interest, lien, contract restriction, or other form of encumbrance. Title shall pass to the County at the place of delivery to the County, subject to the County's right to inspect and accept or reject the goods.

30. WORK UNDER THE CONTRACT

Work may not commence under this contract until all conditions for commencement are met, including execution of the contract by both parties, compliance with insurance requirements, and issuance of any required Notice to Proceed.

SECTION E. (SEE NEXT PAGE)

SPECIFICATIONS FOR PROJECT NO. 3734: COURTHOUSE LOBBY ALTERATIONS

Prepared by Crabtree, Rohrbaugh & Associates- Architects (CRA) on July 25, 2024

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VOLUME 2

TECHNICAL SPECIFICATIONS

FOR

Courthouse Lobby Alterations

FOR THE

County of Kent 400 High Street Chestertown, MD 21620



Crabtree, Rohrbaugh & Associates - Architects 100 West Road, Suite 300, Towson, MD 21204 www.cra-architects.com P: 410-528-0272 Maryland • Pennsylvania • Virginia • West Virginia

ARCHITECT'S PROJECT NO. 3734

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SECTION 260553	IDENTIFICATION FOR ELECTRICAL SYSTEMS
SECTION 260926	LIGHTING CONTROL PANELS
SECTION 262726	WIRING DEVICES
SECTION 265119	LED INTERIOR LIGHTING

SECTION 024119 - SELECTIVE DEMOLITION

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 the following:
 - 1. Demolition and removal of selected portions of a building or structure.
 - 2. Demolition and removal of selected site elements.
 - 3. Salvage of existing items to be reused or recycled.
- B. Related Sections include the following:
 - 1. Division 1 Section "Summary of Work" for restrictions on use of the premises and Owneroccupancy requirements,
 - 2. Division 1 Section "Construction Progress Documentation" for Owner occupancy requirements and phasing requirements.
 - 3. Division 1 Section "Cutting and Patching" for cutting and patching procedures.
 - 4. Division 31 Section "Site Clearing" for site clearing and removal of above and below-grade improvements not part of selective demolition.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner to remain Owner's property where noted.
- C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
- E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 PRE-INSTALLATION MEETINGS

- A. Pre-demolition Conference: Conduct conference at Project site to comply with Division 1 Section "Project Meetings".
 - 1. Inspect and discuss condition of construction to be selectively demolished.
 - 2. Review structural load limitations of existing structure.
 - 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
 - 5. Review areas where existing construction is to remain and requires protection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For refrigerant recovery technician.
- B. Schedule of Selective Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
 - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
 - 4. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- C. Pre-demolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Submit before Work begins.
- D. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

E. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

1.7 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.

1.8 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.9 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: Asbestos-containing materials are known to be present in the building. A separate prime contract for Asbestos Abatement is a component of the Work. Asbestos will be abated in phases in accordance with the project phasing plan found in Division 1 Section "Construction Progress Documentation".
 - If suspected hazardous materials are encountered that are not identified as part of the Asbestos Abatement Contract, do not disturb; immediately notify Architect and Owner. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1.10 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties. Notify warrantor before proceeding.

B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

1.11 COORDINATION

A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
- C. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or video.
 - 1. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.

3.2 PREPARATION

A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 - 2. Arrange to shut off utilities with utility companies.
 - 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 4. Disconnect, demolish, and remove plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - c. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - d. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
 - e. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.

3.4 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
 - 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Division 1 Section "Temporary Facilities and Controls."
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

- 1. Strengthen or add new supports when required during progress of selective demolition.
- C. Remove temporary barricades and protections where hazards no longer exist.

3.5 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 - 5. Maintain fire watch during and for at least two hours after flame-cutting operations.
 - 6. Maintain adequate ventilation when using cutting torches.
 - 7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 - 8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 - 9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 - 10. Dispose of demolished items and materials promptly.
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Removed and Salvaged Items:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to Owner's storage area designated by Owner.
 - 5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
 - 1. Clean and repair items to functional condition adequate for intended reuse.

- 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
- 3. Protect items from damage during transport and storage.
- 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition, cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.
- B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.
- C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.
- Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight. Refer to Division 7 Section "Thermoplastic Polyolefin (TPO) Roofing" for new roofing requirements.
 - 1. Remove existing roof membrane, flashings, copings, and roof accessories.
 - 2. Remove existing roofing system down to substrate.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site [and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- B. Burning: Do not burn demolished materials.

3.8 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.9 SELECTIVE DEMOLITION SCHEDULE

- A. Remove: Perform selective demolition as noted on Drawings.
- B. Remove and Salvage: Refer to Selective Demolition Keynote Legend on Drawings.
- C. Remove and Reinstall: Existing date stone and building dedication plaques.

END OF SECTION 024119

SECTION 064023 - INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Interior standing and running trim.
- B. Related Requirements:
 - 1. Division 6 Section "Rough Carpentry" for wood furring, blocking, shims, and hanging strips required for installing woodwork and concealed within other construction before woodwork installation.
 - 2. Division 9 Section "Painting" for shop-finishing requirements of interior architectural woodwork, including stains and transparent finishes.

1.3 DEFINITIONS

A. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items unless concealed within other construction before woodwork installation.

1.4 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections, to ensure that interior architectural woodwork can be supported and installed as indicated.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

- A. Product Data: For each product indicated, including high-pressure decorative laminate and accessories, cabinet and millwork hardware and accessories, and finishing materials and processes.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
 - 1. Show details full size.
 - 2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
- C. Samples for Verification:
 - 1. Miter joints for standing and running trim.
- 1.7 INFORMATIONAL SUBMITTALS
 - A. Qualification Data: For fabricator.
 - B. Product Certificates: For each type of product, signed by product manufacturer.

1.8 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful inservice performance.
- B. Installer Qualifications: Installer who is either employed or approved by the Fabricator.
- C. Quality Standard: AWI labeling and certification for fabrication is not required; however, as a standard of quality the Fabricator and Installer shall comply with AWI's "Architectural Woodwork Quality Standards" for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.
- D. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

1.10 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.
- C. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.11 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Wood Species and Cut for Opaque Finish: Unless otherwise noted, all interior architectural woodwork components for this Project shall consist of Maple, plain sliced.
- 2.2 INTERIOR STANDING AND RUNNING TRIM FOR OPAQUE FINISH
 - A. Architectural Woodwork Standards Grade: Custom.
 - 1. Wood Species: Any closed-grain hardwood, Poplar.
 - 2. Wood Moisture Content: 5 to 10 percent.

2.3 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.

- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.
- C. Adhesives, General: Adhesives shall not contain urea formaldehyde.
- D. Low-Emitting Materials: Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- E. VOC Limits for Installation Adhesives: Installation adhesives shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - 1. Wood Glues: 30 g/L.
 - 2. Multipurpose Construction Adhesives: 70 g/L.
 - 3. Contact Adhesive: 250 g/L.

2.4 FASTENERS AND ANCHORS

- A. Screws: Select material, type, size, and finish required for each use. Comply with FS FF-S-111 for applicable requirements. For metal framing supports, provide screws as recommended by metal framing manufacturer.
- B. Nails: Select material, type, size, and finish required for each use. Comply with FS FF-N-105 for applicable requirements. Provide any type of non-corrosive nail for exterior woodwork.
- C. Anchors: Select material, type, size, and finish required by each substrate for secure anchorage. Provide non-ferrous metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion-resistance. Provide toothed steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts and anchors, as required, to be set into concrete or masonry work for subsequent woodwork anchorage.

2.5 FABRICATION, GENERAL

- A. Interior Woodwork Grade: Unless otherwise indicated, provide Premium-grade interior woodwork complying with referenced quality standard.
- B. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.
- C. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
 - 1. Edges of Solid-Wood (Lumber) Members and Rails: 1/16 inch.
 - 2. Edges of Rails and Similar Members More Than 3/4 Inch Thick: 1/8 inch.

- D. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
 - 1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
 - 2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on Shop Drawings before disassembling for shipment.
- E. Shop-cut openings to maximum extent possible to receive hardware, grommets, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
 - 1. Seal edges of openings in countertops with a coat of varnish.
- F. Where indicated, and whenever possible, install glass, plastic or metal panels, stand-offs, inlays, and similar decorative elements in the shop.
- G. Fabricate countertops to dimensions, profiles, and details indicated. Provide front and end overhang of 1 inch over base cabinets.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas.
- B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

- A. Grade: Install woodwork to comply with requirements for the same grade specified in Part 2 for fabrication of type of woodwork involved.
- B. Assemble woodwork and complete fabrication at Project site to comply with requirements for fabrication in Part 2, to extent that it was not completed in the shop.
- C. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches.

- D. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- E. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation.
 - 1. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.
- F. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible. Do not use pieces less than 36 inches long, except where shorter single-length pieces are necessary. Scarf running joints and stagger in adjacent and related members.
 - 1. Fill gaps, if any, between top of base and wall with plastic wood filler, sand smooth, and finish same as wood base if finished.
 - 2. Install standing and running trim with no more variation from a straight line than 1/8 inch in 96 inches.
- G. Touch up finishing work specified in this Section after installation of woodwork. Fill nail holes with matching filler where exposed.
- H. Refer to Division 9 Sections for final finishing of installed architectural woodwork not indicated to be shop finished.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean woodwork on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 064023

SECTION 079200 - JOINT SEALANTS

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:
 - 1. Interior sealants.
 - 2. Joint accessories.
- B. Related Sections include the following:
 - 1. Division 9 Section "Gypsum Board" for sealing perimeter joints of gypsum board partitions to reduce sound transmission.

1.3 SUBMITTALS

- A. Shop Drawing:
 - 1. Submit a Sealant Schedule, and related details, indicating specific installation and interface between sealants and building materials for each type of joint sealant and joint backing material used in this specification. Use SAME reference designations as indicated in this Specification for preparation of the Joint Sealant Schedule in Part 3.6. Submittals are subject to the requirements of Division 1 Specification Section "Submittals."
- B. Product Data:
 - 1. For each joint-sealant product indicated.
- C. Samples:
 - 1. Submit standard cured color samples and charts for each sealant type illustrating full range of standard and custom colors.
- D. Manufacturer's Certificate:
 - 1. Signed by manufacturers of joint sealants certifying that products furnished comply with requirements and are suitable for the use indicated.
 - 2. For manufacturer's products that include the phrase, "but are not limited to the following," the Contractor shall be responsible to provide <u>certification</u> that the submittal product

complies with the specified product. This certification is subject to the requirements of Division 1 Specification Section "Submittals," Part 1, Definitions.

- E. Qualifications Data:
 - 1. For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified. Provide SWRI (Sealant, Waterproofing and Restoration Institute) Validation Certificate.
- F. Compatibility and Adhesion from sealant manufacturer indicating the following:
 - 1. Building materials forming joint and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
 - 3. Preconstruction Compatibility and Adhesion Field Test for each sealant and building material.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data:
 - 1. Submit recommended inspection intervals.
 - 2. Submit instructions for repairing and replacing failed sealed joints.

1.5 **QUALITY ASSURANCE**

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project. Provide SWRI (Sealant, Waterproofing and Restoration Institute) Validation Certificate.
- B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.
- C. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.
- D. Preinstallation Conference: Conduct conference at Project site.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time and mixing instructions for multicomponent materials.

B. Store and handle materials in compliance with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants or other causes.

1.7 **PROJECT CONDITIONS**

- A. Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.
 - 2. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 deg F.
 - 3. When joint substrates are wet.
- B. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
- C. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.8 WARRANTY

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Installer's Warranty: Written warranty, signed by Installer agreeing to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.
- C. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:
 - 1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
 - 2. Disintegration of joint substrates from natural causes exceeding design specifications.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience for the following sealant types:
 - 1. Multi-component sealants cure by chemical reaction. Cure times are predictable depending on atmospheric temperature. Silicone sealant cure is not affected by temperature, however, frost and moisture at bond line will impair adhesion.
 - 2. Single component sealants cure by reaction with moisture. Cure times will vary depending on atmospheric humidity and temperature.
 - 3. Fast cure (FC) sealants provide lesser cure times than corresponding standard cure products. Longer cure times will permit more accumulation of dust and other air-borne contamination on surface of sealant, potentially causing apparent color change.
 - 4. Sealant Types are M Multi-Component and S Single Component.
 - 5. Sealant Grades are P Pourable or Self-Leveling used for horizontal traffic joints and NS Non-Sag or Gunnable used for vertical and non-traffic joints.
 - 6. Sealant Classes are 25, 50, and 100/50 (extension/compression) representing movement capability in percent of joint width. Joint movement is based on the relative percentage of installed width. Design to a minimum of 4 times anticipated movement to accommodate design tolerances and expected movement based on coefficient of thermal expansion.
 - Sealant Uses are T Traffic, NT Non-Traffic, I Immersion, M Mortar, A Aluminum, and O – Other. Use O includes color anodized aluminum, metals other than aluminum, painted surfaces, brick, stone, tile, and wood for example.
 - 8. Immersion rated sealant applications require primer.
- B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - 1. Architectural Sealants: 250 g/L.
 - 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 - 3. Sealant Primers for Porous Substrates: 775 g/L.
- C. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- D. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food; provide products that comply with 21 CFR 177.2600.
- E. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range of standard and custom colors.

2.2 URETHANE SEALANT TYPES – For exterior or interior use.

- A. U1 Multi-Component, Non-Sag, Urethane: ASTM C920, Type M, Grade NS, Class 50; Uses NT.
 Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Pecora Corporation; Dynatrol II.
 - 2. Polymeric Systems, Inc.; PSI-270.
 - 3. Tremco, Inc.; Dymeric 240 FC.
- B. U2 Multi-Component, Traffic-Grade Urethane: ASTM C920, Type M, Grade NS, Class 50; Uses T, Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Polymeric Systems, Inc.; PSI-270
 - 2. Tremco, Inc.; Dymeric 240 FC.
- C. **U3** Single-Component, Non-Sag Urethane: ASTM C920, Type S, Grade NS, Class 100/50, Uses NT. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Sika Corporation, Construction Products Division; Sikaflex-15LM.
 - 2. Tremco, Inc.; Dymonic 100
- D. **U4** Single-Component, Non-Sag Urethane: ASTM C920, Type S, Grade NS, Class 25, Uses NT. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Pecora Corporation; Dynatrol I-XL.
 - 2. Sika Corporation, Construction Products Division; Sikaflex-1a.
 - 3. Tremco, Inc.; Dymonic or Fulkem 116.
- E. U5 Single-Component, Pourable, Traffic-Grade Urethane: ASTM C920, Type S, Grade P, Class 25, Uses T. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Pecora Corporation; Urexpan NR-201.
 - 2. Tremco, Inc; Vulkem 45SSL.
 - 3. Sika Corporation, Construction Products Division; Sikaflex-1CSL.
- F. **U6** Immersible, Single Component, Pourable, Traffic-Grade Urethane: ASTM C 920, Type S, Grade P, Class 25, Uses T and I. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Sika Corporation, Construction Products Division; Sikaflex-1CSL.
 - 2. Tremco, Inc.; Vulkem 45 SSL.
- G. U7 Immersible, Multicomponent, Pourable, Traffic-Grade, Urethane Joint Sealant: ASTM C920.
 Type M, Grade P, Class 25, for Use T and I. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

- 1. LymTal International, Inc.; Iso-Flex 880GB.
- 2. May National Associates, Inc.; Bondaflex PUR 2 SL.
- 3. Tremco, Inc.; Vulkem 245
- 2.3 SILICONE SEALANT TYPES For exterior or interior use.
 - A. **S1** Single-Component, Non-Staining, Non-Sag, Neutral-Curing Silicone: ASTM C920, Type S, Grade NS, Class 50, Uses NT. Subject to compliance with requirements, products that may be incorporated into the work include, but are not limited to the following:
 - 1. Dow Corning Corporation; 756SMS, 791, 795 or 995.
 - 2. Tremco, Inc.; Spectrem 3.
 - 3. Pecora Corporation; 864, 895 or 898.
 - B. S2 Single Component, Non-Sag, Neutral-Curing Silicone: ASTM C920, Type S, Grade NS, Class 100/50, Uses NT. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Dow Corning Corporation; 790
 - 2. Pecora Corporation; 301NS, 311NS.
 - 3. Tremco, Inc.; Spectrem 1.
 - Single Component, Non-Sag, Neutral-Curing Silicone: ASTM C920, Type S, Grade NS, Class 50, Uses NT. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Dow Corning Corporation; 791, 795 or 995.
 - 2. Pecora Corporation; 864, 895 or 898.
 - 3. Tremco, Inc.; Spectrem 2, Proglaze SSG.
 - D. **S-4** Single Component, Field-Tintable, Non-Sag, Neutral-Curing Silicone: ASTM C920, Type S, Grade NS, Class 50, Uses NT. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Pecora Corporation; 890 FTS.
 - 2. Tremco, Inc.; Spectrem 4TS.
 - E. **S5** Mildew-resistant, Single Component, Acid-Curing Silicone: ASTM C920, Type S, Grade NS, Class 25, uses NT. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:
 - 1. BASF Building Systems; Omniplus
 - 2. Dow Corning Corporation; 786 Mildew Resistant.
 - 3. Tremco, Inc.; Tremsil 200 Sanitary.

2.4 LATEX SEALANT TYPES – For Interior Use Only

- A. **L1** Acrylic Latex or Siliconized Acrylic Latex, ASTM C834, Type OP, Grade NF. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:
 - 1. BASF Building Systems; Sonolac.
 - 2. Pecora Corporation; AC-20+.
 - 3. Tremco, Inc.; Tremflex 834.
- B. L2 Acoustical Joint Sealant for Exposed and Concealed Joints: ASTM C1311 Manufacturer's standard Non-sag, paintable, no staining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Tremco, Inc.; Acoustical Sealant.
 - 2. Pecora Corporation; AC-20 FTR, AIS-919.
 - 3. USG Corporation; SHEETROCK Acoustical Sealant.

2.5 SOLVENT-RELEASE-CURING-JOINT SEALANTS:

- A. **B1** Butyl-Rubber-Based Joint Sealant: ASTM C 1311. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following.
 - 1. Tremco, Inc.; Tremco Butyl Sealant.
 - 2. Bostik, Inc.; Chem-Calk 300.
 - 3. Pecora Corporation; BC-158.
- 2.6 PREFORMED JOINT SEALANTS For exterior or interior applications per manufacturer's standards.
 - A. PF1 Preformed Silicone Joint Sealants: Manufacturer's standard sealant consisting of procured low-modulus silicone extrusion, in sizes to fit joint widths indicated, combined with a neutralcuring silicone sealant for bonding extrusions to substrates. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Dow Corning Corporation; 123 Silicone Seal
 - 2. Pecora Corporation; Sil-Span
 - 3. Tremco, Inc.; Simple Seal.
 - B. PF2 Preformed Foam Joint Sealant: Manufacturer's standard preformed, precompressed, open-cell foam sealant manufactured from urethane foam with minimum density of 10 lb/cu.ft. (160 kg/cu.m) and impregnated with a nondrying, water-repellent agent. Factory produce in precompressed sizes in roll or stick form to fit joint widths indicated; coated on one side with a pressure-sensitive adhesive and covered with protective wrapping. Subject to compliance with

requirements, products that may be incorporated into the Work include, but are not limited to the following:

- 1. Tremco, Inc.; illbruk illmod 600.
- 2. EMSEAL Joint Systems, Ltd.; Emseal 25V.
- 3. School International, Inc.; Sealtite, Sealtite 50N.

2.7 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASATM C 1330, of type indicated below and size and density to control sealant depth and otherwise contribute to producing optimum sealant performance, paired to the sealant type. List the type on the Sealant Schedule.
 - 1. **Type C**: Closed-cell material with a surface skin.
 - 2. Type O: Open-cell material.
 - a. Bostik, Inc.
 - b. Pecora Corporation
 - c. Tremco, Inc.

2.8 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant back materials, free of oil residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 **PREPARATION**

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include, but are not limited to, the following:
 - a. Concrete.
 - b. Masonry.
 - c. Unglazed surfaces of ceramic tile.
 - 3. Remove laitance and form-release agents from concrete.
 - 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous surfaces include, but are not limited to, the following:
 - a. Metal.
 - b. Glass.
 - c. Porcelain enamel.
 - d. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

- C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques to comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
 - 4. Provide flush joint profile where indicated per Figure 8B in ASTM C1193.
 - 5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.
- G. Installation of Preformed Silicone-Sealant System: Comply with the following requirements:
 - 1. Apply masking tape to each side of joint, outside of area to be covered by sealant system.
 - 2. Apply silicone sealant to each side of joint to produce a bead of size complying with preformed silicone-sealant system manufacturer's written instructions and covering a bonding area of not less than 3/8 inch (10 mm). Hold edge of sealant bead ¼ inch (6 mm) inside masking tape.
 - 3. Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
 - 4. Complete installation of sealant system in horizontal joints before installing in vertical joints. Lap vertical joints over horizontal joints. At ends of joints, cut silicone extrusion with a razor knife.

- H. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping. Do not pull or stretch material. Produce seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures, apply heat to sealant in compliance with sealant manufacturer's written instructions.
- 1. Acoustical Sealant Installation: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 **PROTECTION**

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT-SEALANT SCHEDULE

Sealant types should be selected from the available listed products in Part 2 of this specification section. These sealants shall be indicated on the submittal schedule, using the same reference designation as indicated in Part 1.3.A. of this specification section.

- A. Exterior or Interior Sealant Joints
 - 1. Applications:
 - a. Control and expansion joints in cast-in-place concrete.
 - b. Joints between [architectural] [structural] precast concrete units.
 - c. Control and expansion joints in unit masonry.
 - d. Control and expansion joints in stone masonry.
 - e. Butt joints between metal panels.
 - f. Joints between different materials listed above.
 - g. Perimeter joints between materials listed above and frames of doors, windows, storefronts, louvers and similar openings.
 - h. Control and expansion joints in soffits and overhead surfaces.

- 2. Other exterior joints in vertical surfaces and non-traffic horizontal surfaces for which no other sealant is specified
- B. Interior Food Contact Sealant Joints.
 - 1. Applications:
 - a. Joints in kitchen counter tops and work surfaces.
 - b. Joints between food service equipment and surrounding construction.
 - c. Other interior joints where incidental food contact may occur.
- C. Interior Sanitary Sealant Joints.
 - 1. Applications:
 - a. Joints in toilet room and bathroom counter tops.
 - b. Joints between plumbing fixtures and adjacent materials.
 - c. Joints between locker room lockers and adjacent materials.
 - d. Joints between food service equipment and surrounding construction.
 - e. Other interior joints in wet areas where needed to limit mold and mildew growth.
- D. Immersed Sealant Joints.
 - 1. Applications:
 - a. Joints in fountains and water features.
 - b. Joints in swimming pools.
 - c. Joints in vertical and horizontal surfaces of other potable water storage structures.
- E. Metal Lap and Bedding Sealant Joints.
 - 1. Applications:
 - a. Concealed lap and hook joints in sheet metal flashing and trim.
 - b. Bedding joints under metal thresholds and saddles.
 - c. Bedding joints between sheet metal flashing and other materials.
- F. Preformed Joint Sealants:
 - 1. Applications:
 - a. Control and expansion joints in cast-in-place concrete.
 - b. Joints between [architectural] [structural] precast concrete units.
 - c. Control and expansion joints in unit masonry.
 - d. Control and expansion joints in stone masonry.
 - e. Butt joints between metal panels.
 - f. Joints between different materials listed above.
 - g. Perimeter joints between materials listed above and frames of doors, windows, storefronts, louvers and similar openings.
 - h. Control and expansion joints in soffits and overhead surfaces.

- i. Other exterior joints in vertical surfaces and non-traffic horizontal surfaces for which no other sealant is specified.
- j. Joints between EIFS and other materials.
- G. Interior Security Sealants:
 - 1. Applications:
 - a. Control and expansion joints on exposed interior surfaces of floors, walls, etc., and at inmate/secure areas.
 - b. Perimeter joints on exposed interior surfaces of interior and exterior openings, i.e., window and door frames, etc.
 - c. Joints in precast walls, ceilings, and floor joints at inmate/secure areas.
 - d. Perimeter joints between interior wall surfaces and frames of interior doors, windows, storefronts, louvers, and similar openings, and at inmate/secure areas. Refer to Security Sealants paragraph above for additional information.
 - e. Other interior joints in vertical surfaces and non-traffic horizontal surfaces subject to movement for which no other sealant is specified, and at inmate/secure areas.
 - f. Joints between plumbing fixtures and adjacent materials at inmate/secure areas.
 - g. Joints between locker room lockers and adjacent materials at inmate/secure areas.

END OF SECTION 079200

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

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 the following:
 - 1. Non-load-bearing steel framing systems for interior partitions.
 - 2. Suspension systems for interior ceilings and soffits.
 - 3. Grid suspension systems for gypsum board ceilings.
- B. Related Sections include the following:
 - 1. Division 9 Section "Gypsum Board" for gypsum board and related accessories that get installed with non-structural metal framing.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of code-compliance certification for studs and tracks.
- B. Evaluation Reports: For embossed steel studs and tracks, firestop tracks, post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.5 QUALITY ASSURANCE

A. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Steel Stud Manufacturers Association.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate nonload-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated on Drawings, according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.
- C. Horizontal Deflection: For wall assemblies, limited to 1/240 of the wall height based on horizontal loading of 5 lbf/sq. ft.

2.2 FRAMING SYSTEMS

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
 - 1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
 - 2. Protective Coating: ASTM A 653, G40 hot-dip galvanized unless otherwise indicated.
- B. Studs and Tracks: ASTM C 645. Use either steel studs and tracks or embossed steel studs and tracks.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) CEMCO; California Expanded Metal Products Co.
 - 2) Clark Dietrich Building Systems.
 - 3) Jaimes Industries.
 - 4) MarinoWARE.
 - 5) MRI Steel Framing, LLC.
 - 6) Phillips Manufacturing Co.
 - 7) SCAFCO Steel Stud Company.
 - 8) Super Stud Building Products, Inc.
 - 2. Steel Studs and Tracks:
 - a. Minimum Base-Metal Thickness: As required by performance requirements for horizontal deflection specified.
 - b. Depth: As indicated on Drawings.

- 3. Embossed Steel Studs and Tracks: Roll-formed and embossed with surface deformations to stiffen the framing members so that they are structurally equivalent to conventional ASTM C 645 steel studs and tracks.
 - a. Minimum Base-Metal Thickness: As required by performance requirements for horizontal deflection specified.
 - b. Depth: As indicated on Drawings.
- C. Slip-Type Head Joints: Where indicated, provide **one of** the following:
 - 1. Clip System: Clips designed for use in head-of-wall deflection conditions that provide a positive attachment of studs to tracks while allowing 1-1/2-inch minimum vertical movement.
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) ClarkDietrich Building Systems.
 - 2) CEMCO; California Expanded Metal Products Co.
 - 3) Fire Trak Corp.
 - 4) MarinoWARE.
 - 5) MRI Steel Framing, LLC.
 - 6) SCAFCO Steel Stud Company.
 - 7) Super Stud Building Products Inc.
 - 2. Single Long-Leg Track System: ASTM C 645 slotted top deflection track with 2-1/2 inch deep flanges and 1-1/2 inch slots in thickness not less than indicated for studs.
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) ClarkDietrich Building Systems.
 - 2) CEMCO; California Expanded Metal Products Co.
 - 3) MarinoWARE.
 - 4) Metal-Lite.
 - 5) SCAFCO Steel Stud Company.
- D. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. ClarkDietrich Building Systems.
 - b. Jaimes Industries.
 - c. MarinoWARE.
 - d. MRI Steel Framing, LLC.
 - e. SCAFCO Steel Stud Company.

- 2. Minimum Base-Metal Thickness: 0.0179 inch.
- 3. Depth: As indicated on Drawings.
- E. Resilient Furring Channels: 1/2 inch deep, steel sheet members designed to reduce sound transmission.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. ClarkDietrich Building Systems. Basis of Design : RC Deluxe Resilient Channel.
 - b. MarinoWARE.
 - c. MRI Steel Framing, LLC.
 - d. SCAFCO Steel Stud Company.
 - 2. Configuration: Asymmetrical or hat shaped.
- F. Z-Shaped Furring: With slotted or non-slotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, minimum uncoated-metal thickness of 0.0179 inch, and depth required to fit insulation thickness indicated.
 - 1. <u>Manufacturers: Subject to compliance with requirements, available manufacturers</u> offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. <u>ClarkDietrich Building Systems.</u>
 - b. <u>MarinoWARE.</u>
 - c. <u>SCAFCO Steel Stud Company.</u>
 - d. <u>Steel Construction Systems.</u>

2.3 SUSPENSION SYSTEMS

- A. Tie Wire: ASTM A 641, Class 1 zinc coating, soft temper, 0.062-inch diameter wire, or double strand of 0.048-inch diameter wire.
- B. Hanger Attachments to Concrete:
 - 1. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01, AC193, AC58 or AC308 as appropriate for the substrate.
 - a. Uses: Securing hangers to structure.
 - b. Type: Torque-controlled, expansion anchor.
 - c. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.
 - 2. Power-Actuated Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

- C. Wire Hangers: ASTM A 641, Class 1 zinc coating, soft temper, 0.16 inch in diameter.
- D. Carrying Channels (Main Runners): Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.0538 inch and minimum 1/2-inch wide flanges.
 - 1. Depth: 2-1/2 inches.
- E. Furring Channels (Furring Members):
 - 1. Cold-Rolled Channels: 0.0538-inch uncoated-steel thickness, with minimum 1/2-inch wide flanges, 3/4 inch deep.
 - 2. Steel Studs and Tracks: ASTM C 645.
 - a. Minimum Base-Metal Thickness: 0.0179 inch.
 - b. Depth: As indicated on Drawings.
 - 3. Embossed Steel Studs and Tracks: ASTM C 645.
 - a. Minimum Base-Metal Thickness: 0.0147 inch.
 - b. Depth: As indicated on Drawings.
 - 4. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch deep.
 - a. Minimum Base-Metal Thickness: 0.0179 inch.
 - 5. Resilient Furring Channels: 1/2-inch deep members designed to reduce sound transmission.
 - a. Configuration: Asymmetrical or hat shaped.
- F. Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Armstrong World Industries, Inc.
 - b. Chicago Metallic Corporation.
 - c. USG Corporation.

2.4 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
 - 1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide one of the following:

- 1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.
- 2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754.
 - 1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.
- C. Install supplementary framing and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- D. Install bracing at terminations in assemblies.
- E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLING FRAMED ASSEMBLIES

A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

- 1. Single-Layer Application: 16 inches o.c., or as required by horizontal deflection performance requirements indicated.
- 2. Multilayer Application: 16 inches o.c. or as required by horizontal deflection performance requirements indicated.
- 3. Tile Backing Panels: As required by horizontal deflection performance requirements indicated.
- B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- C. Install studs so flanges within framing system point in same direction.
- D. Install tracks at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.
 - 1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
 - 2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb unless otherwise indicated.
 - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
 - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
 - 3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
 - 4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
 - a. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.
 - 5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
- E. Z-Shaped Furring Members:
 - 1. Erect insulation, specified in Division 7 Section "Thermal Insulation," vertically and hold in place with Z-shaped furring members spaced as indicated on Drawings.
 - 2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.

- 3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches from corner and cut insulation to fit.
- F. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.5 INSTALLING CEILING SUSPENSION SYSTEMS

- A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
 - 1. Hangers: 48 inches o.c.
 - 2. Carrying Channels (Main Runners): 48 inches o.c.
 - 3. Furring Channels (Furring Members): 16 inches o.c.
- B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
- C. Suspend hangers from building structure as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
 - a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
 - a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.
 - 3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
 - 4. Do not attach hangers to steel roof deck.
 - 5. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
 - 6. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.
- E. Seismic Bracing: Sway-brace suspension systems with hangers used for support.
- F. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.
- G. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION 092216

SECTION 092613 - GYPSUM VENEER PLASTERING

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 the following:
 - 1. Gypsum veneer plaster and base coat for interior veneer plaster.
- B. Related Sections include the following:
 - 1. Division 9 Section "Gypsum Board"

1.3 SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings:
 - 1. Show locations, fabrication, and installation of control joints, reveals, and trim; include plans, elevations, sections, details of components, and attachments to other Work.
- C. Samples: For the following products:
 - 1. Trim Accessories: Full-size Sample in 10-inch length for each trim accessory.

1.4 QUALITY ASSURANCE

- A. Mockups: Provide a finish mockup for each type and finish of gypsum veneer plaster and substrate to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select representative surfaces and conditions for application of each type of gypsum veneer plaster and substrate.
 - a. Provide mockups in sizes of at least 100 sq. ft. each.
 - b. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
 - 2. Apply gypsum veneer plaster according to requirements for the completed Work, with lighting levels at a minimum equal to permanent lighting and with environmental conditions (heat, humidity level, etc.) appropriate for installation of specified products.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, and bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover, and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C843 requirements or gypsum veneer plaster manufacturer's written recommendations, whichever are more stringent.
- B. Room Temperatures: Maintain not less than 55 deg F or more than 80 deg F for a minimum of seven days before application of gypsum veneer plaster, continuously during application, and after application until veneer plaster is fully dry.
- C. Avoid conditions that result in gypsum veneer plaster drying too rapidly.
 - 1. Distribute heat evenly; prevent concentrated or uneven heat on veneer plaster.
 - 2. Maintain relative humidity levels, for prevailing ambient temperature, that produce normal drying conditions.
 - 3. Ventilate building spaces in a manner that prevents drafts of air from contacting surfaces during veneer plaster application until it is dry.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain gypsum veneer plaster products including base coat for veneer plaster and finish coat from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.

2.3 GYPSUM VENEER PLASTER

- A. Two-Component Gypsum Veneer Plaster: ASTM C587, with separate formulations; one for basecoat application and one for finish-coat application over gypsum substrates.
 - 1. Base Coat: High-strength veneer gypsum basecoat for use in two-coat applications to interior substrates to fill imperfections resulting in even, straight surfaces.

- a. Basis of Design Product: USG Imperial Brand Veneer Basecoat Plaster. Subject to compliance with specified requirements, equal products by alternative manufacturers are also acceptable.
 - 1) Thickness: Approximately 1/16-inch.
 - 2) Compressive Strength: 3,000 psi.
- 2. Finish Coat: Factory-prepared finish plaster for application over properly prepared gypsum basecoat plaster to form a smooth wearing surface. Finish coat application of approximately 1/16-inch thickness, smooth troweled.
 - a. Basis of Design Product: USG Imperial Brand Veneer Finish Plaster. Subject to compliance with specified requirements, equal products by alternative manufacturers are also acceptable.
 - 1) Thickness: 1/16- to 3/32-inch.
 - 2) Compressive Strength: 3,000 psi.
 - 3) Texture: Smooth troweled.

2.4 TRIM ACCESSORIES

- A. Standard Trim: ASTM C1047, provided or approved by manufacturer for use in gypsum veneer plaster applications indicated.
 - 1. Material: Galvanized-steel sheet, aluminum-coated steel sheet, or rolled zinc.
 - 2. Shapes:
 - a. Cornerbead.

2.5 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced product standards and manufacturer's written recommendations.
- B. Bonding Agent: Vinyl acetate homopolymer emulsion complying with ASTM C631 and ASTM C190 used to bond plaster to structurally sound interior surfaces.
 - 1. Basis of Design Product: USG Plaster Bonder. Subject to compliance with specified requirements, equal products by alternative manufacturers are also acceptable.
 - a. Color: Pink.
 - b. Coverage: 300 SF/gal.
 - c. Solids Content: 52%.
- C. Patching Mortar: Dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Masonry Substrates: Verify that mortar joints are struck flush.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Masonry Substrates: Prepare according to gypsum veneer plaster manufacturer's written recommendations and as follows:
 - 1. Clean surfaces to remove dirt, grease, oil, and other foreign matter and deposits that could impair bond with gypsum veneer plaster.
 - 2. Apply bonding agent on dry masonry substrates.

3.3 INSTALLING TRIM ACCESSORIES

- A. General: Attach trim according to manufacturer's written instructions.
- B. Control Joints: Install according to ASTM C844 and in specific locations approved by Architect.
- C. Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners.

3.4 GYPSUM VENEER PLASTERING

- A. Bonding Agent: Apply bonding agent on dry masonry according to gypsum veneer plaster manufacturer's written recommendations.
- B. Gypsum Veneer Plaster Mixing: Mechanically mix gypsum veneer plaster materials to comply with ASTM C843 and with gypsum veneer plaster manufacturer's written recommendations.
- C. Gypsum Veneer Plaster Application: Comply with ASTM C843 and with veneer plaster manufacturer's written recommendations.
 - 1. Two-Component Gypsum Veneer Plaster:
 - a. Base Coat: Hand trowel or machine apply base coat over substrate to a uniform thickness of 1/16 to 3/32 inch. Fill voids and imperfections.
 - b. Finish Coat: Trowel-apply finish-coat plaster over base-coat plaster to a uniform thickness of 1/16 to 3/32 inch.

- 2. Where gypsum veneer plaster abuts metal, including doorframes, windows and other units, groove finish coat to eliminate spalling.
- D. Concealed Surfaces: Do not omit gypsum veneer plaster behind cabinets, furniture, furnishings, and similar removable items.
- E. Gypsum Veneer Plaster Finish: Smooth-troweled finish.

3.5 PROTECTION

A. Protect installed gypsum veneer plaster from damage from weather, condensation, construction, and other causes during remainder of the construction period.

END OF SECTION 092613

SECTION 092900 - GYPSUM BOARD

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 the following:
 - 1. Interior gypsum board.
 - 2. Trims and Accessories.
 - 3. Joint treatment materials.
 - 4. Sound attenuation blankets, acoustical sealants and other auxiliary materials.
- B. Related Sections include the following:
 - 1. Division 4 Section "Unit Masonry (Assemblies)" for gypsum sheathing, and for cavity air barrier installed over gypsum sheathing.
 - 2. Division 5 Section "Cold-Formed Metal Framing" for structural framing and suspension systems that support gypsum board panels.
 - 3. Division 7 Section "Thermal Insulation" for thermal insulation.
 - 4. Division 9 Section "Non-Structural Metal Framing" for non-structural steel framing and suspension systems that support gypsum board panels.

1.3 SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For the following products:
 - 1. Trim Accessories: Full-size Sample in 12-inch-long length for each trim accessory indicated.
- C. Samples for Initial Selection: For each type of trim accessory indicated.

1.4 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. American Gypsum.
 - 2. CertainTeed Corp.
 - 3. Georgia-Pacific Gypsum LLC.
 - 4. National Gypsum Company.
 - 5. USG Corporation.
- B. Regular Gypsum Wallboard: ASTM C1396.
 - 1. Thickness: 5/8 inch.
 - 2. Long Edges: Tapered.
 - 3. Applications General: Offices, conference rooms and similar low impact locations.

- 4. Applications Specific: Base and face layers to multi-layer, low impact, non-fire-rated assemblies, and all wall and bulkhead locations 8'-0" and higher above finished floor.
- C. Gypsum Ceiling Board: ASTM C1396.
 - 1. Thickness: 5/8 inch.
 - 2. Long Edges: Tapered.
 - 3. Applications: Non-fire-rated ceilings locations.
- D. Abuse-Resistant Gypsum Board: ASTM C1396 gypsum board, tested according to ASTM C1629.
 - 1. Core: 5/8-inch, Type X.
 - 2. Surface Abrasion: ASTM D4977, meets or exceeds Level 2 requirements.
 - 3. Indentation: ASTM D5420, meets or exceeds Level 1 requirements.
 - 4. Soft-Body Impact: ASTM E695, meets or exceeds Level 2 requirements.
 - 5. Hard-body Impact: ASTM 1629, meets or exceeds Level 1 requirements.
 - 6. Long Edges: Tapered.
 - 7. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.
 - 8. Applications General: Corridor walls up to 8'-0" (except where wall tile is the finish, use tile backing panels), conference type rooms up to 8'-0", s, and similar locations subject to moderate abuse.
- E. Moisture and Mold-Resistant Gypsum Board: ASTM C1396. With moisture and mold-resistant core and paper surfaces.
 - 1. Core: 5/8 inch, Type X.
 - 2. Long Edges: Tapered.
 - 3. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.
 - 4. Applications General: Wall and ceiling assemblies in toilet rooms, shower rooms, locker rooms and similar type rooms subject to moisture and humidity where the final wall finish is paint.

2.4 TRIMS AND ACCESSORIES

- A. Interior Trim: ASTM C1047.
 - 1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized-steel sheet.
 - 2. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. United States Gypsum Co.
 - b. National Gypsum Co.
 - c. Georgia-Pacific Corp.
 - d. Fry Reglet Corporation.
 - e. Gordon Inc.
 - f. Pittcon Industries.

- 3. Shapes:
 - a. Cornerbead.
 - b. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - c. L-Bead: L-shaped; exposed long flange receives joint compound.
 - d. U-Bead: J-shaped; exposed short flange does not receive joint compound.
 - e. Expansion (control) joint; one-piece, formed with V-shaped slot and removable strip covering slot opening.
- B. Reveals: Where specifically indicated and exposed to view; interior architectural, decorative gypsum board reveal channels and control joints; extruded accessories of profiles and dimensions indicated.
 - 1. Material: Aluminum; alloy and temper with not less than the strength and durability properties of ASTM B221, Alloy 6063-T5.
 - 2. Finish: Provide corrosion-resistant primer compatible with joint compound and finish materials specified. Provide in manufacturer's standard Class I or II clear anodic finish; reveal trim shall be painted where indicated on Drawings.
 - 3. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Fry Reglet Corp.
 - b. Gordon Inc.
 - c. Pittcon Industries.
 - 4. Shapes: Provide the following, where indicated; provide control joints where indicated or as required per standards:
 - a. Standard Reveals: Equal to Fry Reglet Corp. "Channel Screed Reveal;" 1/4-inch width, unless otherwise noted; for use on ceiling and horizontal or vertical (non-control joint) applications.
 - b. Wall-Ceiling Reveals: Equal to Fry Reglet Corp. "F' Reveal;" 1/4-inch width, unless otherwise noted; for horizontal wall-to-ceiling or vertical wall-to-wall applications.
 - c. Control Joints: Equal to Fry Reglet Corp. "2-Piece Control Joint;" 1/4-inch width, unless otherwise noted; for use on ceiling and vertical control joint applications.
 - d. Provide other shapes if specifically indicated on Drawings.

2.5 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C475.
- B. Joint Tape:
 - 1. Interior Gypsum Board: Paper.
 - 2. Exterior Gypsum Soffit Board: Paper.
 - 3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
 - 4. Tile Backing Panels: As recommended by panel manufacturer.

- C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
 - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type or drying-type, all-purpose compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 - 3. Fill Coat: For second coat, use drying-type, all-purpose compound.
 - 4. Finish Coat: For third coat, use drying-type, all-purpose compound.
- D. Joint Compound for Exterior Applications:
 - 1. Exterior Gypsum Soffit Board: Use setting-type taping compound and setting-type, sandable topping compound.
 - 2. Glass-Mat Gypsum Sheathing Board: As recommended by sheathing board manufacturer.
- E. Joint Compound for Tile Backing Panels:
 - 1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.
 - 2. Water-Resistant Gypsum Backing Board: Use setting-type taping compound and setting-type, sandable topping compound.

2.6 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
- C. Steel Drill Screws: ASTM C1002 unless otherwise indicated.
 - 1. Use screws complying with ASTM C954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
 - 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- D. Sound-Attenuation Blankets: ASTM C665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
 - 1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
- E. Acoustical Sealant: Manufacturer's standard non-sag, paintable, non-staining latex sealant complying with ASTM C834. Product effectively reduces airborne sound transmission through

perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90.

- 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Accumetric LLC; "BOSS 826 Acoustical Sound Sealant."
 - b. Franklin International; "Titebond Acoustical Smoke & Sound Sealant."
 - c. Grabber Construction Products; "Acoustical Smoke & Sound Sealant."
 - d. Hilti, Inc.; "CP 506."
 - e. Pecora Corporation; "AIS-919."
 - f. Specified Technologies, Inc.; "Smoke 'N' Sound Acoustical Sealant."
 - g. United States Gypsum Co.; "USG Sheetrock Brand Acoustical Sealant."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- 3.2 APPLYING AND FINISHING PANELS, GENERAL
 - A. Comply with ASTM C840.
 - B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
 - C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
 - D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
 - E. Form control and expansion joints with space between edges of adjoining gypsum panels.
 - F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

- 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
- 2. Fit gypsum panels around ducts, pipes, and conduits.
- 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4 to 3/8-inch wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4 to 1/2-inch wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- I. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C919 and with manufacturer's written instructions for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
- J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.
- 3.3 APPLYING INTERIOR GYPSUM BOARD
 - A. Install interior gypsum board in the following locations:
 - 1. Wallboard Type: As indicated by type above.
 - 2. Type X: Where required for fire-resistance-rated assembly.
 - 3. Ceiling Type: Ceiling surfaces.
 - 4. Abuse-Resistant Type: As indicated by type above.
 - 5. Mold-Resistant Type: As indicated by type above.
 - 6. Flexible Type: Apply in double layer at curved assemblies.
 - 7. Type C: Where required for specific fire-resistance-rated assembly indicated.
 - 8. Glass-Mat Interior Type: As indicated on Drawings.
 - 9. Acoustically Enhanced Type: As indicated on Drawings.
 - B. Single-Layer Application:
 - 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
 - 2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.

- b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
- 3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
- 4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.
- C. Multilayer Application:
 - 1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
 - 2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
 - 3. Fastening Methods: Fasten base layer with screws; fasten face layers with adhesive and supplementary fasteners.
- D. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written instructions and temporarily brace or fasten gypsum panels until fastening adhesive has set.
- E. Curved Surfaces:
 - 1. Install panels horizontally (perpendicular to supports) and unbroken, to extent possible, across curved surface plus 12-inch-long straight sections at ends of curves and tangent to them.
 - 2. For double-layer construction, fasten base layer to studs with screws 16 inches o.c. Center gypsum board face layer over joints in base layer, and fasten to studs with screws spaced 12 inches o.c.

3.4 APPLYING EXTERIOR GYPSUM PANELS

- A. Apply panels perpendicular to supports, with end joints staggered and located over supports.
 - 1. Install with 1/4-inch open space where panels abut other construction or structural penetrations.
 - 2. Fasten with corrosion-resistant screws.

3.5 APPLYING TILE BACKING PANELS

- A. Glass-Mat, Water-Resistant Backing Panels: Comply with manufacturer's written installation instructions and install at locations indicated to receive tile. Install with 1/4 inch gap where panels abut other construction or penetrations.
- B. Water-Resistant Backing Board: Install where indicated with 1/4 inch gap where panels abut other construction or penetrations.
- C. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.6 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints at locations indicated on Drawings, and if not indicated, according to ASTM C840 and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners.
 - 2. LC-Bead: Use at exposed panel edges.
 - 3. L-Bead: Use where required based upon installed condition.
 - 4. U-Bead: Use where required based upon installed condition.
- D. Exterior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners.
 - 2. LC-Bead: Use at exposed panel edges.
 - 3. Curved-Edge Cornerbead: Use at curved openings.

3.7 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:
 - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.

- 2. Level 2: Panels that are substrate for tile.
- 3. Level 3: Only where indicated on Drawings.
- 4. Level 4: At panel surfaces that will be exposed to view in the finished project, unless otherwise indicated.
- 5. Level 5: At panel surfaces that will receive vinyl wall coverings or other similar graphic material finishes.
- E. Glass-Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.
- F. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.

3.8 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 096513 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Thermoplastic-rubber base.
 - 2. Rubber molding accessories.

1.3 ACTION SUBMITTAL

- A. Product Data: For each type of product.
- B. Samples for Initial Selection: Contractor shall provide manufacturer's color PDF images of rubber accessories for review & approval. Actual samples are NOT required unless specifically requested by the architect/interior designer.
- C. Product Schedule: For resilient accessory products. Use same designations indicated on Drawings.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.5 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Coordinate mockups in this Section with mockups specified in other Sections.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.7 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F in spaces to receive resilient products during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

- 2.1 PERFORMANCE REQUIREMENTS
 - A. FloorScore Compliance: Resilient base and stair accessories shall comply with requirements of FloorScore certification.
 - B. Low-Emitting Materials: Flooring system shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.2 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements, the following manufacturers' products may be incorporated into the Work:
 - 1. Basis of Design:
 - a. Tarkett Johnsonite.
 - 2. Approved Manufacturers:
 - a. Roppe Corporation, USA.

2.3 THERMOPLASTIC-RUBBER BASE (RB)

- A. Product Standard: ASTM F1861, Type TP (rubber, thermoplastic).
 - 1. Group: 1 (solid, homogeneous)
- B. Style: B, Cove with top-set toe.
- C. Thickness: 0.125 inch.
- D. Height: 4 inches.
- E. Lengths: Coils in manufacturer's standard length but not less than 96 feet.
- F. Outside Corners: Job-formed.
- G. Inside Corners: Job-formed.
- H. Surface: Smooth.
- I. Colors: As selected by Architect from manufacturer's full range of colors and patterns produced for vinyl wall base complying with requirements indicated.
 - 1. Provide a minimum of (90) color selections.

2.4 RUBBER MOLDING ACCESSORY

- A. Description: Rubber nosing, cove caps, edging, reducers, joiners and transition strips.
- B. Profile and Dimensions: As indicated on drawings.
- C. Locations: Provide rubber molding accessories in areas indicated below:
 - 1. Transition Strips, Reducers and Adaptors.
- D. Colors and Patterns: As selected by Architect from manufacturer's full range of colors.
 - 1. Provide a minimum of (36) color selections.

2.5 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement-based or blended hydraulic-cement-based formulation provided or approved by resilient product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.
 - 1. Adhesives shall have a VOC content of 50 g/L or less
 - 2. Adhesives shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- C. Do not install resilient products until they are the same temperature as the space where they are to be installed.
 - 1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.
- D. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.

- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.
- H. Job-Formed Corners:
 - 1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.
 - a. Form without producing discoloration (whitening) at bends.
 - 2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.
 - a. Miter corners to minimize open joints.

3.4 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.
- 3.5 CLEANING AND PROTECTION
 - A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
 - B. Perform the following operations immediately after completing resilient-product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
 - D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 096513

SECTION 096519 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Luxury Vinyl Tile.
- B. Related Requirements:
 - 1. Division 3 Section "Hydraulic Cement Underlayment" for Self-Leveling Underlayment.
 - 2. Division 9 Section "Resilient Base and Accessories" for resilient accessories installed with resilient tile.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Attendees: The Installer and representatives as well as senior technician of manufacturers and fabricators involved in, or affected by the installation, and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting.
- B. Review methods and procedures related to resilient flooring including, but not limited to, the following:
 - 1. Inspect and discuss condition of substrate and other preparatory work performed by other trades.
 - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Review special designs and patterns.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

- B. Shop Drawings: For each type of floor tile. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
 - 1. Show details of special patterns.
- C. Product Schedule: For floor tile. Use same designations indicated on Drawings.
- D. Samples: Contractor shall provide manufacturer's color PDF images of resilient flooring for review & approval. Actual samples are NOT required unless specifically requested by the architect/interior designer.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Floor Tile: Furnish one box for every 60 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.
 - 1. Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required.
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Coordinate mockups in this Section with mockups specified in other Sections.
 - a. Size: Minimum (1) room for each type, color, and pattern in locations directed by Architect.

- 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
- 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F Store floor tiles on flat surfaces.

1.10 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than
 70 deg F or more than 95 deg F in spaces to receive floor tile during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to traffic for 48 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

2.2 LUXURY VINYL TILE

- A. Product: Subject to compliance with requirements, provide the following:
 - 1. Manufacturer: Shaw Contract.
 - 2. Series: Eon 4112V.

- 3. Tile Standard: ASTM F 1700, Class III, Type B.
- 4. Thickness: 5 mm.
- 5. Wear Layer Thickness: 22 mil.
- 6. Finish: Exoguard.
- 7. Edge: Square.
- 8. Size: 19.70 inches x 19.70 inches.
- 9. Color: As selected by Architect from manufacturer's full range of colors.
- 10. Installation: Ashlar.

2.7 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile, conductivity and substrate conditions indicated unless noted otherwise. Product cannot void any portion of the manufacturer's standard warranty.
 - 1. Adhesives shall comply with the following limits for VOC content:
 - a. Adhesives: 50 g/L or less.
 - 2. Adhesives shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - 3. Provide adhesive for the following substrates:
 - a. Substrates without moisture vapor reduction admixture: Porous Adhesive.
 - b. Substrates with moisture vapor reduction admixture: Non-Porous Adhesive.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Receive Resilient Tile Floor Manufacturer's written approval of substrate required before installation of any tile flooring. The Carpet and Resilient Tile Contractor is responsible for obtaining the Resilient Tile Flooring Manufacturer's written approval of the floor as an acceptable substrate for the installation of manufacturer's tile product specified. If the floor is not acceptable to the manufacturer, the general contractor is responsible for preparing the floor to receive the new tile, as specified in order paragraphs of this specification, including an underlayment or leveling compound where necessary to meet all requirements for a manufacturer's approval of the substrate.

3.2 PREPARATION

- A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 10 pH.
 - 4. Moisture Testing: Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations, but not less stringent than the following:
 - a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
 - b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install floor tiles until they are the same temperature as the space where they are to be installed.
 - 1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
 - 1. Lay tiles in pattern indicated.
- C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
 - 1. Lay tiles with grain running in one direction.
 - 2. Lay tiles in pattern of colors and sizes indicated on Drawings.
 - 3. For all radius cuts, utilize laser or water jet cutting system. Tile shall not be cut in the field.
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- H. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.
- B. Perform the following operations immediately after completing floor tile installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.

- C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover floor tile until Substantial Completion.

END OF SECTION 096519

SECTION 099123 - PAINTING

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 surface preparation and field painting of exposed exterior and interior items and surfaces.
 - 1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.
- B. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will supply a color selection.
 - 1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish.
- C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.
 - 1. Prefinished items include the following factory-finished components:
 - a. Architectural woodwork.
 - b.
 - c. Light fixtures.
 - 2. Concealed surfaces include walls or ceilings in the following generally inaccessible spaces:
 - a. Foundation spaces.
 - b. Furred areas.
 - c. Ceiling plenums.
 - d. Utility tunnels.
 - e. Pipe spaces.
 - f. Duct shafts.
 - 3. Finished metal surfaces include the following:
 - a. Anodized aluminum.
 - b. Stainless steel.
 - c. Chromium plate.
 - d. Copper and copper alloys.

- e. Bronze and brass.
- 4. Operating parts include moving parts of operating equipment and the following:
 - a. Valve and damper operators.
 - b. Linkages.
 - c. Sensing devices.
 - d. Motor and fan shafts.
- 5. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.
- D. Related Requirements:
 - 1. Division 6 Section "Architectural Woodwork" for shop priming interior architectural woodwork.
 - 2. Division 9 Section "Gypsum Board Assemblies" for surface preparation of gypsum board.

1.3 DEFINITIONS

- A. General: Standard coating terms defined in ASTM D 16 apply to this Section.
 - 1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
 - 2. Eggshell refers to low-sheen finish with a gloss range between 20 and 35 when measured at a 60-degree meter.
 - 3. Semigloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter.
 - 4. Full gloss refers to high-sheen finish with a gloss range more than 70 when measured at a 60-degree meter.

1.4 SUBMITTALS

- A. Product Data: For each paint system indicated. Include block fillers and primers.
 - 1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification. Submit in same format as specification.
 - 2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.
 - 3. Certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOC's).
- B. Colors: Match Architect's color selections.
- C. Samples for Verification: For each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.
 - 1. Submit 4 sets of samples of each final color and finish.

- D. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to be demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- E. Certifications:
 - 1. Furnish a letter from the paint manufacturer or their factory representative certifying that the paint system proposed for this project are equal to or better than the specified systems in appearance and performance levels. Submit proof of equivalency for approval including generic type, descriptive information, VOC content, performance data, solids by volume, and recommended film thickness. Submittals not accompanied by this certification will be returned, "REJECTED."
- F. Coating Maintenance Manual: Upon conclusion of the project, the Contractor or paint manufacturer/supplier shall furnish a coating maintenance manual, such as Sherwin-Williams "Custodian Project Color and Product Information" report or equal. Manual shall include an Area Summary with finish schedule, Area Detail designating where each product/color/finish was used, product data pages, Material Safety Data Sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.
- B. Source Limitations: Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.
- C. Benchmark Samples (Mockups): Provide a full-coat benchmark finish sample for each type of coating and substrate required. Comply with procedures specified in PDCA P5. Duplicate finish of approved sample Submittals.
 - 1. Architect will select one room or surface to represent surfaces and conditions for application of each type of coating and substrate.
 - a. Provide mock up of first and second coats of block filler or primer for approval of application.
 - b. Wall Surfaces: Provide samples on at least 100 sq. ft.
 - c. Small Areas and Items: Architect will designate items or areas required.
- D. Apply benchmark samples, according to requirements for the completed Work, after permanent lighting and other environmental services have been activated. Provide required sheen, color, and texture on each surface. Where materials are being applied over previously painted surfaces, apply mock up samples and perform field testing to check for compatibility, adhesion, and film integrity of the new materials to existing painted surfaces. Report in writing any condition that may affect application, appearance, or performance of the specified coating system.

- 1. After finishes are accepted, Architect will use the room or surface to evaluate coating systems of a similar nature.
- 2. Final approval of colors will be from benchmark samples.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
 - 1. Product name or title of material.
 - 2. Product description (generic classification or binder type).
 - 3. Manufacturer's stock number and date of manufacture.
 - 4. Contents by volume, for pigment and vehicle constituents.
 - 5. Thinning instructions.
 - 6. Application instructions.
 - 7. Color name and number.
 - 8. VOC content.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain storage containers in a clean condition, free of foreign materials and residue.
 - 1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily.
- C. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.7 PROJECT CONDITIONS

- A. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F.
- B. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 and 95 deg F.
- C. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
 - 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

1.8 EXTRA MATERIALS

A. Furnish extra paint materials from the same production run as the materials applied and in the quantities described below. Package with protective covering for storage and identify with labels describing contents. Deliver left-over paint materials to Owner.

- 1. Quantity: Furnish Owner with extra paint materials in quantities indicated below:
 - a. Interior: 1 case of each color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, provide products from one of the following manufacturers. Sherwin-Williams is the basis of design and establishes the standard of quality required.
 - B. Manufacturers' Names:
 - 1. Sherwin Williams (SW).
 - 2. Glidden.
 - 3. PPG.
 - 4. Benjamin Moore.

2.2 PAINT MATERIALS, GENERAL

- A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience. Each system should be from the same manufacturer.
- B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
 - 1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.
- C. Colors: Match Architect's samples.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application. Comply with procedures specified in PDCA P4.
 - 1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.

- 2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
 - 1. Notify Architect about anticipated problems when using the materials specified over substrates primed by others.
- C. Where materials are being applied over previously painted surfaces, apply mock up samples and perform field testing to check for compatibility, adhesion, and film integrity of the new materials to existing painted surfaces. Report in writing any condition that may affect application, appearance, or performance of the specified coating system.

3.2 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
- B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning. All surfaces must be clean, dry, and free of all oil, grease, surface contaminants, and substances that could impair adhesion.
 - 1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
 - 2. All previously coated surfaces shall clean, dry, dull, and in sound condition prior to coating. All loose paints (either visible or not) shall be removed to expose a sound surface for repainting. All smooth, glossy surfaces shall be abraded to impart a surface profile that will promote adhesion of the subsequent coating system. A test-patch shall be applied prior to a full installation to assure adequate adhesion will be achieved.
- C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
 - 1. Provide barrier coats over incompatible primers or remove and reprime.
 - Cementitious Materials: Prepare concrete, concrete unit masonry, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
 - a. Use abrasive blast-cleaning methods if recommended by paint manufacturer.

- b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces if moisture content exceeds that permitted in manufacturer's written instructions.
- 3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
 - a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
 - 1) Existing Wood: Scuff-sand/mechanically abrade the existing finish to impart a surface profile followed by thorough cleaning with a commercial cleaner/degreaser to remove all surface contaminants and rinse thoroughly.
 - b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides of wood, including cabinets, counters, cases, and paneling.
 - c. If transparent finish is required, back-prime with spar varnish.
 - d. Back-prime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on back side.
 - e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.
 - f. Touch up bare areas and shop-applied prime coats that have been damaged. Wirebrush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.
- D. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
 - 1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
 - 2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
 - 3. Use only thinners approved by paint manufacturer and only within recommended limits.
- E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

- A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
 - 1. Paint colors, surface treatments, and finishes are indicated in the paint schedules.
 - 2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.

- 3. Provide finish coats that are compatible with primers used.
- 4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, grilles, convector covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
- 5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
- 6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
- 7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
- 8. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
- 9. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.
- 10. Sand lightly between each succeeding enamel or varnish coat.
- B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
 - 1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
 - 2. Omit primer over metal surfaces that have been shop primed and touchup painted.
 - 3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
 - 4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.
- C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
 - 1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
 - 2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
 - 3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.
- D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.
- E. All interior exposed gypsum wallboard and plaster finish, including any bulkheads and soffits shall be painted.
- F. All wood doors, casing and millwork shall be painted.
- G. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.
- H. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
- I. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.
- 3.4 FIELD QUALITY CONTROL
 - A. Owner reserves the right to invoke the following test procedure at any time and as often as Owner deems necessary during the period when paint is being applied:
 - 1. Owner will engage a qualified independent testing agency to sample paint material being used. Samples of material delivered to Project will be taken, identified, sealed, and certified in the presence of Contractor.
 - 2. Testing agency will perform appropriate tests for the following characteristics as required by Owner:
 - a. Quantitative material analysis.
 - b. Abrasion resistance.
 - c. Apparent reflectivity.
 - d. Flexibility.
 - e. Washability.
 - f. Absorption.
 - g. Accelerated weathering.
 - h. Dry opacity.
 - i. Accelerated yellowness.
 - j. Recoating.
 - k. Skinning.
 - I. Color retention.
 - m. Alkali and mildew resistance.
 - 3. Owner may direct Contractor to stop painting if test results show material being used does not comply with specified requirements. Contractor shall remove noncomplying paint from Project site, pay for testing, and repaint surfaces previously coated with the noncomplying paint. If necessary, Contractor may be required to remove noncomplying

paint from previously painted surfaces if, on repainting with specified paint, the two coatings are incompatible.

- B. Pre-installation Meetings:
 - 1. Schedule a conference and inspection to be held on-site before field application of coating systems begins.
 - 2. Conference shall be attended by Contractor, Owner's representative, Engineer, Construction Manager, coating applicators, and a representative of coating material manufacturer.
 - 3. Topics to be discussed at meeting shall include:
 - a. A review of Contract Documents and accepted shop drawings shall be made and deviations or differences shall be resolved.
 - b. Review items such as environmental conditions, surface conditions, surface preparation, application procedures, and protection following application.
 - c. Establish which areas on-site will be available for use as storage areas and working area
 - 4. Pre-construction conference and inspection shall serve to clarify Contract Documents, application requirements and what work should be completed before coating application can begin.
 - 5. Prepare and submit, to parties in attendance, a written report of pre-installation conference report shall be submitted with 3 days following conference.
 - 6. Field Samples:
 - a. Provide a full coating system to the required sheen, color, texture, and recommended coverage rates. Simulate finished lighting conditions for reviewing in-place work.
 - 7. The Architect, Construction Manager or Owners Representative will select one room, area, or combination of areas and surfaces and conditions for each type of coating and substrate to be coated. Apply coatings in this room, area, combination of areas and surfaces according to the schedule, or as specified. After finishes are accepted, this room, area or combination of areas and surfaces will serve as the standard of quality and for evaluation of coating systems of similar nature.
 - 8. A manufacturer's representative shall be available upon request by the General Contractor or Painting subcontractor, to advise applicator on proper application technique and procedures.

3.5 CLEANING

- A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.
 - 1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.6 PROTECTION

- A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.
- B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.
 - 1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.7 INTERIOR PAINT SCHEDULE

- A. Gypsum Board: Provide the following finish systems over interior gypsum board surfaces:
 - 1. Flat Acrylic Finish (Ceiling and Bulkhead Applications): Two finish coats over a primer.
 - a. Primer: SW, ProMar 200 Zero VOC Latex Primer, B28W600.
 - b. Finish Coast: SW, ProMar 200 Zero VOC Latex Flat, B30W2650 series. *Zero VOC, Anti-Microbial, *Product remains Zero VOC when tinted.
 - 2. Low Luster Acrylic-Enamel Finish (Wall Application @ Administration): Two finish coats over a primer.
 - a. Primer: SW, ProMar 200 Zero VOC Latex Primer, B28W600.
 - b. Finish Coats: SW, ProMar 200 Zero VOC Latex Eg-Shel, B20W2650 series. *Zero VOC, Anti-Microbial, *Product remains Zero VOC when tinted.
- B. Previously Painted Gypsum Board: Provide the following finish systems over previously painted interior gypsum board surfaces. *Note: Mock-Up with adhesion test per ASTM-D3359 is required prior to installation of this system.
 - 1. Flat Acrylic Finish (Ceiling & Bulkhead Application): Two finish coats over an adhesion promoting primer.
 - a. Primer: SW, Extreme Bond Interior/Exterior Bonding Primer, B51-150.
 - b. Finish Coats: SW, ProMar 200 Zero VOC Latex Flat, B30W2650 series. *Zero VOC, Anti-Microbial, *Product remains Zero VOC when tinted.
 - 2. Low Luster Acrylic-Enamel Finish (Wall Application @ Administration): Two finish coats over an adhesion promoting primer.
 - a. Primer: SW, Extreme Bond Interior/Exterior Bonding Primer, B51-150.
 - b. Finish Coats: SW, ProMar 200 Zero VOC Latex Eg-Shel, B20W2650 series. *Zero VOC, Anti-Microbial, *Product remains Zero VOC when tinted.
- C. Bare Wood: Provide the following finish systems over bare paneling and/or trim.
 - 1. Semi-Gloss Finish: Two finish coats over a filler.
 - a. Primer: SW PrepRite ProBlock Latex Primer/Sealer, B51-620 series
 - b. Finish Coats: SW, Pro Industrial PreCatalyzed Waterbased Epoxy Semi-Gloss, K46-1150 series.

- D. Previously Painted Wood: Provide the following finish systems over previously painted wood paneling and/or trim.
 - 1. Semi-Gloss Finish: Two finish coats over a filler and an adhesion promoting primer.
 - a. Primer: SW, Extreme Bond Interior/Exterior Bonding Primer, B51-150.
 - b. Finish Coats: SW, Pro Industrial PreCatalyzed Waterbased Epoxy Semi-Gloss, K46-1150 series.
- E. Plaster Latex System: Provide the following finish systems over interior plaster surfaces:
 - 1. Flat Acrylic Finish (Ceiling Application): Two finish coats over a primer.
 - a. Primer: Loxon Concrete & Masonry primer, A24W8300.
 - b. Finish Coats: ProMar 200 Zero VOC Latex Flat, B30W2650 series.
 - 2. Low Luster Acrylic-Enamel Finish (Wall Application): Two finish coats over a primer.
 - a. Primer: Loxon Concrete & Masonry primer, A24W8300.
 - b. Finish Coats: ProMar 200 Zero VOC Latex Eg-Shel, B20W2650 series.
- F. Previously Painted Plaster: Provide the following finish systems over previously painted interior plaster surfaces:
 - 1. Flat Acrylic Finish (Ceiling Application): Two finish coats over an adhesion promoting primer.
 - a. Primer: Extreme Bond Interior/Exterior Bonding Primer, B51-150.
 - b. Finish Coats: ProMar 200 Zero VOC Latex Flat, B30W2650 series.
 - 2. Low Luster Acrylic-Enamel Finish (Wall Application): Two finish coats over an adhesion promoting primer.
 - a. Primer: Extreme Bond Interior/Exterior Bonding Primer, B51-150.
 - b. Finish Coats: ProMar 200 Zero VOC Latex Eg-Shel, B20W2650 series.

END OF SECTION 099123

SECTION 101423 – PANEL SIGNAGE

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:
 - 1. Interior Panel Signs.
- B. Related Requirements:
 - 1. Division 1 Section "Temporary Facilities & Controls" for temporary Project identification signs.
 - 2. Division 10 Section "Dimensional Signage" for cut metal letters.
 - 3. Division 10 Section "Plaques" for cast aluminum building dedication plaque.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of sign specified, including details of construction relative to materials, dimensions of individual components, profiles, and finishes.
- B. Shop Drawings: For panel signs, showing fabrication and erection of signs. Include plans, elevations, and large-scale sections of typical members and other components. Show anchors, layout, reinforcement, accessories, and installation details.
 - 1. Details: Provide message list for each type of sign required, including typestyles, graphic elements, including raised characters and Braille, and layout for each sign at least half size. Include large-scale details of nomenclature, including layout of room names, room numbers and graphic symbols, as indicated. Elevation details shall be consistent with sign type number on Drawings.
 - 2. Floor Plans: Provide floor plans showing locations of each sign, indicating original room name, room number, and sign type.
 - 3. Signage Schedule: Provide signage schedule in an editable version of Microsoft[®] Excel[®] format (.xlsx or .xls) or similar, compatible software. Arrange per building, building floor and building area, in a sequential manner that is consistent with the Drawings. Each room shall consist of a horizontal line of information, which shall intersect with vertical columns, in which applicable information may be input into each cell. Provide the following column heading information, which may be abbreviated as needed, formatted from left to right:
 - a. Original Room Number: As indicated on Contract Drawings.
 - b. Original Room Name: As indicated on Contract Drawings.
 - c. Revised Room Number: Final information to be fabricated; any revisions shall be

input by the Architect.

- d. Revised Room Name: Final information to be fabricated; any revisions shall be input by the Architect.
- e. Sign Type: To cross-reference Shop Drawing elevation details.
- f. Sign Size: To indicate overall sign width and height.
- g. Accessibility: To include International Symbol of Access (ISA).
- h. Miscellaneous: To include, and make reference to, additional graphic symbols, including, but not limited to, directional arrows, stairs, and fire, as well as other signage features, such as paper inserts and sliding vacant/in use types.
- i. Quantity: Indicate number of same panel sign design required for specific room; provide additional lines for rooms that are to have more than one sign, but require different design or sign type.
- j. Remarks: For providing additional notes or remarks; by manufacturer (in black font color), Contractor (in green font color) or Architect (in red font color).
- 4. For signs supported by or anchored to permanent construction, provide setting drawings, templates, and directions for installation of anchor bolts and other anchors to be installed as a unit of Work in other Sections.
- C. Samples for Initial Selection: For each type of sign assembly, exposed component, and exposed finish.
 - 1. Cast Acrylic Sheet: Manufacturer's color Samples consisting of actual sections or chips of material, including the full range of standard colors, patterns and textures available.
 - 2. Panel Signs: (1) Full-size Sample, not less than 12 inches square, including corners, for verification of basic design.
 - 3. Exposed Accessories: Full-size Sample of each accessory type.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and manufacturer.
- B. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For signs to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Sign Fabricator Qualifications: Firm experienced in producing signs similar to those indicated for this Project, with a record of successful in-service performance, and sufficient production capacity to produce sign units required without causing delay in the Work.
- B. Single-Source Responsibility: For each separate sign type required, obtain signs from one source of a single manufacturer.

C. Design Concept: The Drawings indicate profile and dimensional requirements of panel signs. Slight deviations in profiles and dimensions may be approved, as long as such deviations do not drastically change the design concept, as judged by the Architect. The burden of proof of equality is on the Bidder.

1.7 PROJECT CONDITIONS

A. Field Measurements: Whenever possible, and if necessary, take field measurements prior to the preparation of Shop Drawings and fabrication to ensure proper fitting. Show recorded measurements on final Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delay.

1.8 WARRANTY

- A. When warranties are required, verify with Owner's counsel that warranties stated in this article are not less than remedies available to Owner under prevailing local laws.
 - 1. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
 - a. Failures include, but are not limited to, the following:
 - 1) Deterioration of finishes beyond normal weathering.
 - 2) Deterioration of embedded graphic image.
 - 3) Separation or delamination of sheet materials and components.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.2 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering panel signage products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. 4Sign Solutions.
 - 2. iSigns Inc.
 - 3. Best Manufacturing.
 - 4. Bayuk Graphics.
- 2.2 FRAMED PANEL SIGNS
 - A. Cast Acrylic Sheet: ASTM D 4802; non-extruded, non-continuous-cast polymethyl methacrylate monomer (PMMA) or extruded polyvinyl chloride (PVC)-acrylic alloy sheet, Type UVF (UV filtering); in sizes and thicknesses indicated, with a minimum flexural strength of

16,000 psi when tested according to ASTM D 790, with a minimum allowable continuous service temperature of 176 deg F, and of the following general types:

- 1. Opaque Sheet: Where sheet material is indicated as "opaque," provide colored, solid acrylic sheet in colors and finishes as selected from the manufacturer's full range of standard colors and textures.
- 2. Colored Coatings: Use colored coatings, including inks and paints for copy and background colors that are recommended by acrylic manufacturer for optimum adherence to acrylic surface and are non-fading for the application intended.
- B. Fasteners: Use concealed fasteners fabricated from metals that are not corrosive to and compatible with the sign material and mounting surface.
- C. Framed Panel Signs: Comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction.
 - 1. Construction: Fabricate smooth, flush panel surfaces, capable of remaining flat with no noticeable distortions, while subjected to installed environmental conditions, within a tolerance of plus or minus 1/16 inch, measured diagonally.
 - 2. Laminated Sign Panels: Permanently laminate face panels to backing sheets of material and thickness indicated using the manufacturer's standard process.
 - 3. Engraved Copy: Machine-engrave letters, numbers, symbols, and other graphic devices into sign panel on the face indicated to produce precisely formed copy, incised to uniform depth. Use high-speed cutters mechanically linked to master templates in a pantographic system or equivalent process capable of producing characters of the style indicated with sharply-formed edges.
 - a. Copy Depth: Character, graphic and Braille copy shall be raised 1/32 inch, unless otherwise indicated.
 - b. Lettering Style: Upper- and lower-case letters; as selected by Architect from manufacturer's full range of standard typefaces.
 - 4. Characters and Graphics: Unless otherwise indicated, fabricate signs with 1-inch-high room numbers and 3/4-inch-high room identification lettering. Standard grade Braille shall be located 1/2 inch below copy.
 - a. Accessibility Standards: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 for signs. All signage shall comply with accessibility requirements, including International Symbol of Access, Braille, and provisions for mounting.
 - b. Final room numbering and verbiage designations for all signs shall be approved by Owner prior to fabrication.
 - 5. Edge Condition: Square, non-beveled.
 - 6. Edge Color: Same as background.
 - 7. Frame Material: Plastic
 - 8. Corner Condition: Square, non-rounded.
 - 9. Sign Types: Refer to drawings.
 - 10. Extra Signs: Provide an additional quantity of (1) 8"x8".

- D. Graphic Content and Style: Provide sign copy that complies with the requirements indicated for size, style, spacing, content, position, material, finishes, and colors of letters, numbers, and other graphic devices.
 - 1. Signs shall consist of internationally-adopted graphic silhouette symbols indicating entrances to male, female, gender-neutral, and family restrooms, as well as handicapped-accessibility, where occurs.
 - 2. Provide signs at the entrances of all non-accessible restrooms that graphically indicate the directions to the nearest handicapped-accessible restrooms.

2.3 FINISHES

- A. Colors and Surface Textures: For exposed sign material that requires selection of materials with integral or applied colors, surface textures or other characteristics related to appearance, provide colors as selected by the Architect from the manufacturer's full range of standard colors and textures.
 - 1. Manufacturer shall offer no less than (25) colors.

2.4 ACCESSORIES

- A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signs, noncorrosive and compatible with each material joined. Use concealed fasteners and anchors unless indicated to be exposed.
- B. Adhesive: As recommended by sign manufacturer.
- C. Two-Face Tape: Manufacturer's standard high-bond, foam-core tape, 0.045 inch thick, with adhesive on both sides.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of signage work.
- B. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.
- C. Verify that anchor inserts are correctly sized and located to accommodate signs.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Locate sign units and accessories where indicated, using mounting methods of the type described and in compliance with the manufacturer's instructions.
 - 1. Install signs level, plumb, and at the height indicated, with sign surfaces free from distortion or other defects in appearance. All signs shall be mounted per accessibility standards, as required by the authorities having jurisdiction.
 - 2. Install signs so they do not protrude or obstruct according to the accessibility standard.
 - 3. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
 - 4. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.
- B. Accessible Signage: Install in locations on walls as indicated on Drawings and according to the accessibility standard.
- C. Mounting Methods: Attach panel signs to surfaces, as follows:
 - 1. Interior Surfaces: Use one of the following methods, as applicable:
 - a. Vinyl-covered or Rough Surfaces: Clean bond-breaking materials from substrate surface and remove loose debris. Apply linear beads or spots of high-bond adhesive symmetrically to back of sign and of suitable quantity to support weight of sign after cure without slippage. Keep adhesive away from edges to prevent adhesive extrusion as sign is applied and to prevent visibility of cured adhesive at sign edges. Place sign in position, and push to engage adhesive. Temporarily support sign in position until adhesive fully sets.
 - b. Smooth Surfaces: Clean bond-breaking materials from substrate surface and remove loose debris. Apply two-face tape strips symmetrically to back of sign and of suitable quantity to support weight of sign without slippage. Add silicone sealant as needed. Keep strips away from edges to prevent visibility at sign edges. Place sign in position, and push to engage tape adhesive.
- D. Signs Mounted on Glass: Provide opaque sheet matching sign material and finish onto opposite side of glass to conceal back of sign.

3.3 CLEANING AND PROTECTION

- A. Remove protective coverings and strippable films as signs are installed. After installation, clean soiled sign surfaces according to the manufacturer's instructions. Protect units from damage until substantial completion.
- B. Touch up minor nicks and abrasions; otherwise, remove and replaced damaged or deformed signs that do not comply with requirements.

END OF SECTION 101423

VOLUME 3

TECHNICAL SPECIFICATIONS

FOR

Courthouse Lobby Alterations

FOR THE

County of Kent 400 High Street Chestertown, MD 21620



Crabtree, Rohrbaugh & Associates - Architects 100 West Road, Suite 300, Towson, MD 21204 www.cra-architects.com P: 410-528-0272 Maryland • Pennsylvania • Virginia • West Virginia

ARCHITECT'S PROJECT NO.3734

SECTION 260501- GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 GENERAL

- A. Provide all labor, materials, equipment and services necessary for and incidental to the complete installation and operation of all electrical work.
- B. All work under this Division is subject to the General Conditions and Special Requirements for the entire contract.
- C. Unless otherwise specified, all shop drawings and submissions required under Division 26 shall be made to, and acceptances and approvals made by, the ENGINEER.
- D. Conform to the requirements of all rules, regulations, and codes of local, state, and federal authorities having jurisdiction. Conform to the National Electrical Code and all NECA National Electrical Installation Standards (NEIS).
- E. Perform the work in a first-class, substantial, and workmanlike manner. Any materials installed which do not present an orderly and neat workmanlike appearance shall be removed and replaced when so directed by the Engineer, at the Contractor's expense.
- F. Coordinate the work of all trades.
- G. Arrange conduit, wiring, equipment, and other work generally as shown, providing proper clearances and access. Carefully examine all contract drawings and fit the work in each location without substantial alteration. Where departures are proposed because of field conditions or other causes, prepare and submit detailed drawings for approval in accordance with "Submittals" specified below. The right is reserved to make reasonable changes in location of equipment, conduit, and wiring up to the time of rough-in or fabrication.
- H. The contract drawings are generally diagrammatic and all offsets, bends, fittings, and accessories are not necessarily shown. Provide all such items as may be required to fit the work to the conditions.
- Be responsible for all construction means, methods, techniques, procedures, and phasing sequences used in the work. Furnish all tools, equipment and materials necessary to properly perform the work in a first class, substantial, and workmanlike manner, in accordance with the full intent and meaning of the Contract Documents.
- J. The Contractor shall provide other work and services not otherwise included in the Contract Documents that are customarily forwarded in accordance with generally-accepted construction practices.

1.2 PERMITS, INSPECTIONS, AND FEES:

- A. The Contractor shall obtain and pay for all charges and fees, and deliver all permits, licenses, certificates of inspection, etc., required by the authorities having jurisdiction. Deliver inspection, approval, and other certificates to the Owner prior to final acceptance of the work.
- B. File necessary plans, prepare documents, give proper notices, and obtain necessary approvals.
- C. Permits and fees shall comply with the General Requirements of the Specification.
- D. The Owner will pay for the building permit.
- E. Notify Inspection Authorities to schedule inspections of work. All work shall be subject to field inspections.
- F. Notify Architect in advance of scheduled inspections.
- G. An electrical foreman, superintendent or other supervisor shall be in attendance for all scheduled inspections.
- H. The Contractor shall provide an electrical certificate from an independent electrical inspection agency approved by the Owner and the State Fire Marshal. The Contractor shall submit certificate prior to final payment invoice. The Contractor shall pay all fees, including filing fees.

1.3 ELECTRICAL WORK UNDER OTHER DIVISIONS:

- A. Architectural Equipment: In general, any electrically operated or controlled equipment furnished under architectural divisions shall be supplied with control wiring, transformers, contacts, etc. Contractor shall provide power circuits to such equipment and install all electrical control equipment related thereto.
- B. Carefully review the contract documents and coordinate the electrical work under the various Divisions.

1.4 CONTRACTOR QUALIFICATION:

- A. Any Contractor performing work under this Division shall be fully qualified and acceptable to the Engineer. Submit the following evidence for approval:
 - 1. A list of not less than five (5) comparable projects that the Contractor completed.
 - 2. Letters of reference from not less than three (3) registered professional engineers, contractors, or building owners, explaining Contractor proficiency, quality of work, or other attribute on projects of similar size or substance.
 - 3. Local or State license.
 - 4. Membership in trade or professional organization where required.
 - 5. Copy of Master Electrician's License.

- B. Contractor is any individual, partnership, corporation, or firm performing work by Contract or subcontract on this project.
- C. Acceptance of a subcontractor will not relieve the Contractor of any contractual requirements or his responsibility to supervise and coordinate the various trades.
- D. Supervisory Qualifications: The electrical work on the project shall be under the direct supervision of a licensed Master Electrician.
- E. Qualifications of Installers:
 - 1. For the actual fabrication, installation, and testing of the work, the Contractor shall use only thoroughly trained and experienced personnel who are completely familiar with the requirements of this work and with the installation recommendations of the manufacturers of the specified items.
 - 2. The Electrical Installer shall utilize a full-time project foreman in charge of all electrical work. This person shall be fully qualified and experienced in such work and shall be available, on site, at all times during Construction. All problems, questions, coordination, etc., relating to electrical work shall take place through this person to the Architect.
- 1.5 FIRE SAFE MATERIALS:
 - A. Unless otherwise indicated, materials and equipment shall conform to UL, NFPA, or ASTM Standards for Fire Safety with Smoke and Fire Hazard Rating not exceeding flame spread of 25 and smoke developed of 50.

1.6 REFERENCED STANDARDS, CODES, ORDINANCES AND SPECIFICATIONS

A. Specifications, Codes and Standards listed below are included as part of this specification, latest edition.

ADA	Americans with Disabilities Act
ANSI	American National Standards Institute
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
IBC	International Building Code
САВО	Council of American Building Officials

FM	Factory Mutual
IEEE	Institute of Electrical and Electronics Engineers
MOSHA	Maryland Occupational Safety & Health Administration
NEC	National Electrical Code
NECA	National Electrical Contractors Association
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
OSHA	Occupational Safety & Health Administration
UL	Underwriters Laboratories

- B. All electrical equipment and materials shall comply with the Codes and Standards listed in the latest edition of IEEE Standard 241, *Electric Power Systems in Commercial Buildings*, Chapter 1, Section 1.6, entitled "Codes and Standards".
- C. Comply with all Codes applicable to the work:
 - 1. Bidders shall inform themselves of all local and state codes and regulations.
 - 2. In case of conflict between Contract Documents and governing Codes, the most stringent shall take precedence. Where, in any specific case, different sections of any applicable codes or when Drawings and Specifications specify different materials, methods of Construction, or other requirements, the most restrictive shall govern.
 - 3. Where Contract Documents exceed minimum Code requirements, and are permitted under the Code, the Contract Documents take precedence and shall govern.
 - 4. No extra payment will be allowed for work or changes required by local Code enforcement authorities.
- D. Underwriters Laboratories Labels shall apply to all materials and devices, etc., except specified items not covered by existing UL Standards.
- E. Conflicts with applicable regulations:
 - 1. Resolve at Contractor's expense.
 - 2. Prepare and submit details of alternate construction:
 - a. Acceptable solution of conflict.
 - b. List of substitute materials:

For approval of inspecting authorities. For approval of Engineer. F. Comply with all NECA's National Electrical Installation Standards (NEIS), including NECA 1-2000 "Standard Practices for Good Workmanship in Electrical Contracting".

1.7 INTERPRETATION OF DOCUMENTS

- A. Any discrepancies between Drawings, Specifications, Drawings and Specifications, or within Drawing and Specifications shall be promptly brought to the attention of the Owner during the bidding period. No allowance shall subsequently be made to the Contractor by reason of his failure to have brought said discrepancies to the attention of the Owner during the bidding period or of any error on the Contractor's part.
- B. The locations of products shown on Drawings are approximate. The Contractor shall place the devices to eliminate all interference with above-ceiling ducts, piping, etc. Where any doubt exists, the exact location shall be determined by the Owner and Architect.
- C. All general trades and existing conditions shall be checked before installing any outlets, power wiring, etc.
- D. Equipment sizes shown on the Drawings are estimated. Before installing any wire or conduit, the Contractor shall obtain the exact equipment requirements and install wire, conduit, or other item of the correct size for the equipment actually installed. However, wire and conduit sizes shown on the Drawings shall be taken as a minimum and shall not be reduced without written approval from the Architect/Engineer.
- E. Where variances occur between the drawings and specifications or within either document itself, the item or arrangement of better quality, greater quality, or higher cost shall be included in the Contract Price. The Engineer will decide on the item and manner in which the work shall be installed.
- F. Contract Drawings are generally diagrammatic and all offsets, fittings, transitions, and accessories are not necessarily shown. Furnish and install all such items as may be required to fit the work to the conditions encountered. Arrange conduits, equipment, and other work generally as shown on the Contract Drawings, providing proper clearance and access. Where departures are proposed because of field conditions or other causes, prepare and submit detailed Shop Drawings for approval in accordance with "submittals" specified below. The right is reserved to make reasonable changes in location of equipment, piping, and ductwork, up to the time of rough-in or fabrication.
- G. Work not specifically outlined, but reasonably incidental to the completion of the work, shall be included without additional compensation from the Owner.

1.8 CUTTING AND PATCHING

A. The cutting of walls, floors, partitions, etc., for the passage and/or accommodation of conduits, etc., the closing of superfluous openings and the removal of all debris caused by said work under this contract shall be performed by and at the expense of the Electrical Contractor.

- B. No cutting of any structure or finishes shall be done until the condition requiring such cutting has been examined and approved by the Architect.
- C. All surfaces disturbed as a result of such cutting shall be restored under this division to match original work and all materials used for any patching, mending or finishing must conform to the class of materials originally installed.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. Material and equipment installed as a part of the permanent installation shall be new, unless otherwise indicated or specified, and shall be approved by the Underwriters' Laboratories, Inc., for installation in each particular case where standards have been established.
- B. Where material or equipment is identified by proprietary name, model number, and/or manufacturer, furnish the named item or equivalent thereof, subject to acceptance.
- C. Material submissions shall conform to requirements outlined in SUBMITTALS, REVIEW, AND ACCEPTANCE.
- D. The suitability of named item only has been verified. Where more than one Manufacturer is named, only the first named Manufacturer has been verified as suitable alternate. Manufacturers and items other than the first named shall be equal or better in quality and performance to that of specified items, and must be suitable for available space, required arrangement, and application. Submit all data necessary to determine suitability of alternate manufacturers for review. Provide a list company proposed and specified products and performance on the first page of the submittal. Failure to clearly identify differences will result in the submittal being returned as "Revise and Resubmit". The Contractor, by providing other than the first named Manufacturer, assumes responsibility for all necessary adjustments and modifications necessary for a satisfactory installation.
- E. The Contractor shall only submit those manufacturers indicated in the Specification. Proposed manufacturers other than those indicated will not be considered unless the specific item indicates "or as approved equal". Submit all data necessary to determine suitability of substituted items for approval. Failure to do so will result in a "Revise and Resubmit" response.
- F. All items of equipment furnished shall have a service record of at least five (5) years.

PART 3 - EXECUTION

3.1 EXAMINATION OF SITE, SURVEYS, AND MEASUREMENTS:

- A. Examine the site, determine all conditions and circumstances under which the work must be performed, and make all necessary allowances for same. No additional cost to the Owner shall be permitted for Contractor's failure to do so.
- B. Examine the site and observe the conditions under which the work will be done or other circumstances which will affect the contemplated work. No allowance will be made subsequently in this connection for any error or negligence on the Contractor's part.
- C. The Contractor shall base all measurements, both horizontal and vertical, from established benchmarks. All work shall agree with these established lines and levels. Verify all measurements at the site and check the correctness of same as related to the work.
- D. Any discovery of discrepancy between actual measurements and those indicated which prevents following good practice or the intent of the Drawings and Specifications shall be brought to the attention of the Owner's Representative. Work shall not proceed until receiving instructions from the Owner's Representative.
- E. The Contractor shall follow Drawings in laying out the work and check Drawings of other trades to verify spaces in which work will be installed. Maintain maximum headroom and space conditions at all points. Where headroom or space conditions appear inadequate, the Owner's Representative shall be notified before proceeding with the installation.
- F. To prevent conflict with the work of other trades and for proper execution of the work, the Contractor, as directed by the Architect/Engineer, shall make the necessary modifications in the layout as needed, at no extra charge to the Owner.
- G. The Contractor shall be solely responsible for the proper arrangement of his conduit and equipment.
- H. The Engineer shall make all final decisions as to any conditions that require the changing of any work.
- I. The Contractor shall have competent supervision on the site at all times to lay out, check, coordinate, and supervise the installation of all electrical work and be responsible for the accuracy thereof. He shall plan the installation of all electrical work, giving consideration to the work of other trades, to prevent interference.
- J. The Contractor shall determine the location, size, etc., of all chases, sleeve openings, etc., required for the proper installation of the electrical work and see that such are provided. All chases, sleeves, openings, etc., shall be set prior to erection of new work to prevent delay in the progress of other work or trades.
- K. Conditions and/or situations that prevent the proper installation of any equipment or item where shown on the Drawings shall be called to the attention of the Engineer for instructions.

- L. The Contractor shall have equipment shipped or fabricated in sections of suitable size for entering the building and being removed from the finished building in the future, if necessary.
- M. The Contractor shall fully investigate all peculiarities and space limitations for all materials and equipment.
- N. Outlet, pull, and junction boxes and other appliances that require operation, examination, adjustment, servicing or maintenance shall be readily accessible.
- O. The Contractor shall take all field measurements necessary for this work and shall assume responsibility for their accuracy.
- P. The Contractor shall coordinate the electrical work with all other sub-contractors. All work shall be so arranged that there will be no delay in the proper installation and completion of any part or parts of electrical equipment. All electrical work shall be installed in proper sequence with other trades without any unnecessary delay.
- Q. The Drawings are to some extent diagrammatic and indicate the general arrangement of the equipment, the runs of conduit, and the manner of connection.
- R. The Contractor shall confer with all sub-contractors engaged in the construction of the project, regarding the work that may, in any way, affect his installation. Whenever interference occurs, before installing any of the work in question, the Contractor shall consult with all sub-contractors and shall come to an agreement with them as to the exact location and level of his conduit parts of his equipment.
- S. The Contractor shall be responsible for determining exact property lines and area of work. The Contractor shall not install any equipment or conduits outside of the property lines and/or area of work without written direction from the Owner. Any work indicated diagrammatically on the Contract Documents to be installed beyond the property lines and/or area of work shall be verified with the Owner prior to installation.

3.2 GENERAL RESPONSIBILITIES:

- A. The Contractor shall be responsible for systems and related damages possible, and shall hold harmless the Owner, the Architect and his consultants from malfunction of systems and equipment installed under this Contract as defined by the applicable state laws pertaining to real property for the period of time as defined by such laws.
- B. It is the intent of these Specifications to fully cover without exception all required labor and materials so that the finished work will be delivered to the Owner in a complete and satisfactory working installation. Excavation, wiring, distribution, etc., shall be performed in compliance with the Contract Documents.
- C. Work not specifically outlined, but reasonably incidental to the completion of the work, shall be included without additional compensation from the Owner.

D. Conflicting points in the Specifications or on the Drawings shall be called to the attention of the Architect prior to the execution of the Contract.

3.3 STORAGE AND PROTECTION OF EQUIPMENT

- A. <u>All</u> electrical equipment to be used in the construction shall be properly stored and protected against the elements. All equipment shall be stored under cover, and shall not be stored at the construction site on the ground, in mud, water, snow, rain, sleet or dust. Large diameter cables may be stored on reels with weatherproof materials. Such weatherproof materials shall be heavy-duty, securely fastened and made impervious to the elements.
- B. Conventional electrical construction materials such as building wire, outlet and junction boxes, wiring devices, conduit, lighting fixtures, fittings, etc., shall be stored in construction buildings, covered trailers or portable covered warehouses. Any equipment subject to damage or corrosion from excessive moisture shall be stored in dry, heated areas. Any equipment containing plastic or material subject to damage caused by excessive heat or sunlight shall be stored to prevent such damage. This includes plastic ducts and lenses.
- C. All gear and equipment delivered to the construction site after the building is under cover shall be protected as described above and in addition shall be provided with auxiliary heat to prevent condensation damage. The gear shall also be protected against damage caused by installation of any building systems and equipment; or damage caused by carelessness of workmen who are installing equipment connected to or adjacent to the above electrical equipment.
- D. Equipment damaged as a result of the above conditions shall be properly repaired at the Contractor's expense or shall be replaced at the Contractor's expense, if, in the opinion of the Engineer the equipment has been damaged to such an extent it cannot operate properly after repairs are made.
- E. All electrical enclosures exposed to construction damages such as paint spots, spackling or plaster spatter, grout splashes, waterproofing compound, tar spots or runs and pipe covering compound splashes, shall be completely covered and protected against damage.
- F. In the event leakage into the building of any foreign material or fluid occurs or may occur, the Contractor shall take all steps as described above to protect any and all equipment.
- G. After connections to electrical equipment are complete and the equipment is ready for operation, all construction debris shall be removed from all enclosures. Such debris includes dust, dirt, wire clippings, tape and insulation removed in order to make the connection.

3.4 ELECTRICAL INSTALLATIONS

A. General: Sequence, coordinate, and integrate the various elements of electrical systems, materials, and equipment. Comply with the following requirements:

- 1. Coordinate electrical systems, equipment, materials, and installation with landscape/irrigation contractor(s).
- 2. Verify all dimensions by field measurements.
- 3. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Engineer.
- 4. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components where installed exposed in finished spaces.
- 5. Install electrical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations. All equipment and disconnects shall maintain proper working space to conform to NEC.
- 6. Install systems, materials, and equipment giving right-of-way priority to systems that require installation at a specified slope.
- 7. Arrange for chases, slots and openings in other building components during progress of construction, to allow for electrical installation.
- 8. Space, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the work.

3.5 SUPERVISION AND COORDINATION:

- A. Provide complete supervision, direction, scheduling and coordination of all work under the contract, including that of subcontractors, using full attention and the best skill. Be responsible for all work and make all subcontractors, suppliers and manufacturers fully aware of all requirements of the contract.
- B. Coordinate the rough-in of all work performed under Mechanical & Electrical Divisions.
- C. The Contractor shall coordinate all electrical rough-ins with approved shop drawings and coordination drawings. Any rough-in installed without complete coordination shall be at the Contractor's risk and expense.
- D. Coordinate the installation of all necessary rough-in of work, sleeves, anchors and supports for conduit, wiring, and other work performed under Divisions Mechanical and Electrical Divisions.
- E. Coordinate the spacing and arrangement of lighting fixtures, diffusers, grilles and access panels in ceilings to establish a symmetrical pattern.
- F. Where a discrepancy exists within the Specifications or drawings or between the Specifications and Drawings, the more stringent (or costly) requirement shall apply until a clarification can be obtained from the Engineer. Failure to clarify such discrepancies with the Engineer will not relieve the Contractor of the responsibility of conforming to the requirements of the Contract.

- G. Failure of the Contractor to obtain a full and complete set of Contract Documents (either before or after bidding) will not relieve the Contractor of the responsibility of complying with the intent of the Contract Documents.
- H. The Contractor shall fully coordinate the electrical connections to all equipment prior to installations, with the approved Shop Drawings and the trades involved. Coordination shall include voltage, phases, quantity and size of wiring, device sizes, terminations, rough-in work, and other coordination for a complete installation.
- I. Coordinate Division 26 work with all trades.
- J. Install work with proper clearances and access. Carefully examine all contract drawings and fit the work in each location without substantial alteration. Where departures are proposed or required, submit detailed drawings for acceptance. The right is reserved to make reasonable changes in location of equipment, conduit and wiring up to the time of rough-in or fabrication.
- K. Coordinate light switch locations with door swings prior to rough-in. No switches permitted behind doors.
- L. Coordinate electrical work with architectural items and equipment.
- M. It shall be the responsibility of the Contractor to obtain complete instructions for connections.

3.6 GUARANTEE:

- A. Guarantee obligations shall be as hereinbefore specified in the GENERAL AND SPECIAL CONDITIONS of these specifications, except as follows:
 - Guarantee the complete electrical system free from all mechanical and electrical defects for the period of two (2) years beginning from the day of substantial completion of the work by the Architect. Refer to the Alternates specification section for additional years of guarantee. In all cases (base bid or alternates) specific equipment or materials warranties shall be guaranteed as stated hereinafter or as indicated on the drawings.
 - 2. Also, during the guarantee period, be responsible for the proper adjustments of all systems, equipment and apparatus installed by the Contractor and do all work necessary to ensure efficient and proper functioning of the systems and equipment.
 - 3. Upon receipt of notice from the Owner of failure of any part of the electrical installation during the guarantee period, new replacement parts shall be furnished and installed promptly at no cost.
 - 4. Warranty From the Manufacturer: Contractor shall obtain all warranty papers and records from the Original Equipment Manufacturer according to their warranty policy and deliver the same to the Owner. Contractor shall fulfill all the Original Manufacturer's requirements to validate the warranty as offered by the Original Equipment Manufacturer.

- B. Provide 24-hour service for any and all warranty problems experience in the operation of the equipment provided.
- C. Any equipment or system in need of warranty work whether during regular hours or on an emergency basis, shall be immediately serviced and repaired. The warranty work and guarantee shall include all parts and labor and shall be furnished at no cost to the Owner.
- D. The Contractor shall guarantee to make good any and all defects in his work, exclusive of lamps, which may develop due to defective workmanship or materials, within three years from the date of final acceptance of the work by the Owner.
- E. In addition to the warranty and correction of work obligations contained in the General and supplementary Conditions, correct the work of the system as embraced by the Specification, free from Mechanical and Electrical defects for the warranty period beginning from the day of acceptance of the building by the Architect for the beneficial use of the Owner.
- F. During the warranty period, take responsibility for the proper adjustments of systems, equipment and apparatus installed and perform work necessary to ensure the efficient and proper functioning of the systems and equipment.
- G. Certain items of equipment hereinafter specified shall be guaranteed for a longer time than the general warranty period. These guarantees shall be strictly adhered to and the Contractor shall be responsible for service or replacement required in connection with guarantee of these items. These guarantees shall commence on the same date as the final acceptance by the Architect.
- H. Submission of a bid proposal for this Project warrants that the Contractor has reviewed the Contract Documents and has found them free from ambiguities and sufficient for the construction and proper operation of systems installed for this project. If discrepancies are found, have them clarified by Addendum.
- I. It is possible that certain areas of the building or certain systems will be accepted at a time different than as specified. The date of acceptance by the Architect for beneficial use of the Owner for these building areas or systems will be adjusted accordingly.

3.7 SCHEDULING OF WORK:

- A. The Contractor shall not be permitted to do any work in any area of any occupied building during normal hours, except in areas specifically assigned.
- B. Coordination of work by the Contractor is essential such that power outages are kept to a minimum in quantity and duration. All required outages shall be approved by the Owner for optimum time scheduling. Written notice of not less than 15 calendar days shall precede all power outages. Utility disruptions during normal school hours are prohibited.
- 3.8 TEMPORARY FACILITIES:

- A. General: Refer to the Division 1 Sections for general requirements on temporary facilities.
- B. The Contractor's attention is directed to the Occupational Safety and Health Act, Americans with Disabilities Act and NEC requirements for electrical work on construction sites.
- C. The Contractor shall pay for all material and labor to provide and maintain temporary service.
- D. The Contractor shall obtain and shall pay for temporary electrical service for construction power.
- E. Remove all temporary power installations and connections after permanent power is established and/or prior to completion of the project.
- F. Contractor responsible for any and all temporary utility power connection fees.

3.9 DEMONSTRATION:

A. As a part of this contract, the Contractor shall provide for the services of equipment manufacturers or their established representatives to demonstrate to selected maintenance personnel the correct operation, safety and maintenance of all electrical equipment under this contract.

3.10 PAINTING AND FINISHES:

- A. Provide protective finishes on all materials and equipment. Use coated or corrosion-resistant materials, hardware and fittings throughout the work. Paint bare, untreated ferrous surfaces with rust-inhibiting paint. All exterior components including supports, hangers, nuts, bolts, washers, vibration isolators, etc., shall be galvanized or stainless steel.
- B. Clean surfaces prior to application of coatings, paint, or other finishes.
- C. Provide factory-applied finishes where specified. Unless otherwise indicated factory-applied paints shall be baked enamel with proper pre-treatment.
- D. Protect all finishes and restore any finishes damaged as a result of work under Division 26 to their original condition.
- E. The preceding requirements apply to all work, whether exposed or concealed.
- F. Remove all construction marking and writing from exposed equipment, conduit, and building surfaces. Do not paint manufacturer's labels or tags.
- G. All exposed conduit, etc., shall be painted, except in electrical rooms, mechanical rooms, storage rooms, and crawl spaces. Colors shall be selected by the Architect and conform to ANSI Standards.
- H. Submit color of factory-finished equipment for approval prior to ordering.

3.11 PROTECTION OF WORK:

- A. Protect work, material and equipment from weather and construction operations before and after installation. Properly store and handle all materials and equipment.
- B. Cover temporary openings in conduit and equipment to prevent the entrance of water, dirt, debris, or other foreign matter.
- C. Cover or otherwise protect all finishes.
- D. Replace damaged materials, devices, finishes and equipment.

3.12 OPERATION OF EQUIPMENT:

- A. Clean all systems and equipment prior to initial operation for testing, retesting, or other purposes. Set, adjust, and test all equipment in accordance with manufacturer's instructions. Do not operate equipment unless all proper safety devices or controls are operational. Provide all maintenance and service for equipment that is authorized for operation during construction.
- B. Where specified, or otherwise required, provide the services of the manufacturer's factory-trained servicemen or technicians to start up the equipment.
- C. Do not use electrical systems for temporary services during construction unless authorized in writing by the Owner. Where such authorization is granted, temporary use of equipment shall in <u>no way</u> limit or otherwise affect warranties or guaranty period of the work.
- D. Upon completion of work, clean and restore all equipment to new conditions; replace expendable items such as filters.

3.13 TESTING AND ADJUSTMENT

- A. Perform all tests which are specified or required to demonstrate that the work is installed and operating properly. Where formal tests are required, give proper notices and perform all necessary preliminary tests to assure that the work is complete and ready for final test.
- B. Adjust all systems, equipment and controls to operate in a safe, efficient and stable manner.
- C. On all circuits, 600 volts or less, provide circuits that are free from ground faults, short circuits and open circuits.
- D. Other tests of a specific nature for special equipment shall be as specified under the respective equipment.
- 3.14 RECORD DRAWINGS AND SPECIFICATIONS:
 - A. Upon completion of the Electrical installations, the Contractor shall deliver to the Engineer one complete set of prints of the Electrical Contract Drawings which shall be legibly marked in red

pencil to show all Addenda, approved Shop Drawings, Change Orders, changes and departures of the installation as compared with the original design. They shall be suitable for use in preparation of Record Drawings. Provide electronic copies of each.

B. The Contractor shall provide a record specification including all Addenda and other modifications. Record substantial variations in actual work performed. Identify all substitutions.

END OF SECTION 260501

SECTION 260505 - ELECTRICAL DEMOLITION FOR REMODELING

PART 1 - GENERAL

1.1 SCOPE

- A. Electrical demolition shall be carried out per the Contract Documents. In addition to work indicated on the Drawings, remove all unused conduit and wiring previously abandoned above ceiling, and provide proper support for all existing / new low voltage wiring above the ceilings per NEC. Wiring shall not be laying directly upon the ceiling systems.
- B. Provide all cutting and patching for electrical construction.
- C. Provide temporary service and provisions to maintain existing systems.

PART 2 - PRODUCTS

- 2.1 MATERIALS AND EQUIPMENT
 - A. Materials and equipment for patching and extending work: As specified in individual sections.
- 2.2 FIELD SERVICES AND SURVEYS
 - A. The Contractor shall examine the site, determine all conditions and circumstances and gather all data and information required for the work.
 - B. The Contractor shall survey all new and existing wiring, circuitry, cabling, equipment and devices. Data gathering shall include, but not be limited to, equipment nameplate information, ratings, voltage, wiring configurations, conductor lengths, conductor routing, conductor sizes, equipment connections, and other information as required to maintain existing systems.
 - C. The Contractor shall provide complete field investigations to determine existing and new conductor, cable, and conduit routing, points of connections, and tracing of existing systems.
 - D. The Contractor shall assume that all information shall be obtained from field surveys and not from Owner's records. If Owner's records are made available to the Contractor, for information only, the Contractor shall verify the Owner's Records with the existing conditions.
 - E. Field investigations include, but are not limited to, performing surveys, opening of equipment enclosures, and other work as required to maintain existing systems.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Demolition Drawings are based on casual field observation and existing record documents. Report discrepancies to the Engineer before disturbing existing installation.
- B. Beginning of demolition means installer accepts existing conditions.

3.2 PREPARATION

- A. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.
- B. Coordinate utility service outages with the Owner. Also, coordinate utility service outages with Utility Company.

3.3 CONNECTIONS AND ALTERATIONS TO EXISTING SYSTEMS

- A. Keep all existing electrical systems in operation during the progress of the work. Provide temporary electrical connections to systems of equipment, etc., where necessary to maintain continuous operation until the new systems and equipment are ready for operation.
- B. When existing electrical work is removed, remove all conduit, ducts, supports, etc. to a point below the finished floors or behind finished walls and cap. Such points shall be far enough behind finished surfaces to allow for the installation of the normal thickness of finished material.
- C. When the work specified hereunder connects to any existing equipment, conduit, wiring, etc., perform all necessary alterations, cuttings, fittings, etc., of the existing work as may be necessary or required to make satisfactory connections between the new and existing work and leave the complete work in a finished and workmanlike condition.
- D. When the work specified under other divisions necessitates relocation of existing equipment, conduits, wiring, etc., perform all work and make all necessary changes to existing work as may be required to leave the completed work in a finished and workmanlike condition.
- E. Contractor shall be responsible for removing and replacing existing ceiling tile within the lay-in ceiling areas as required. Contractor shall provide all necessary cutting and fitting of bushed holes for cable passage through tiles. Any tiles damaged during the Contract shall be replaced with like kind at no cost to the Owner.
- F. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations. In particular, all security and life safety systems must be maintained in operation at all times as required by the Owner. This includes security, safety lighting, and fire alarm.
- G. Existing Electrical Service: Maintain existing system in service. Disable system only to make switchovers and connections. Obtain written permission from Owner at least 15 days before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area. The Contractor shall be responsible for ma

intaining electrical service to all areas of the building during construction. The Contractor shall provide temporary power and lighting for areas of the building that are under construction and shall maintain power for all systems in areas of he building not under construction. The contractor shall be responsible for the relocation of all electrical equipment and its associated wiring as required by construction phasing.

- H. Emergency Power: The Contractor shall provide temporary emergency lighting along paths of egress in completed areas through use of the existing emergency power system or temporary battery pack fixtures as required by NFPA and the local authority having jurisdiction. Outages required for relocation and/or extension of the existing electrical systems shall be kept to a minimum duration, performed while building is not occupied and scheduled in advance with the Owner. The Contractor shall fully examine the existing systems, determine all existing conditions and circumstances under which the work shall be performed and make all allowances for same. No additional cost to the Owner shall be permitted for the Contractors' failure to do so.
- I. The Contractor shall trace all circuits and controls to be disconnected to ensure that vital services to other areas are not interrupted.

3.4 PROTECTION

- A. Provide protection for all existing and new cabling. Provide inner duct, conduit or other suitable means of protection to prevent damage to cables located in renovated areas.
- B. Damage to wiring, cabling or equipment shall be repaired by skilled mechanics for the trade involved at no additional contract amount.
- C. Fixtures, materials and equipment shall be protected at all times. The Contractor shall make good any damage caused either directly or indirectly by his workmen. Conduit openings shall e closed with caps or plugs during installation. Fixtures and equipment shall be tightly covered and protected against dirt, water and chemical or other injury. At the completion of all work, the fixtures, materials and equipment shall be thoroughly cleaned and turned over in a condition satisfactory to the Owner.
- D. Damage: Where wiring, raceways, lighting fixtures, devices or equipment to remain is inadvertently damaged or disturbed, cut out and remove damaged section and provide new of equal or capacity or quality.

3.5 ELECTRICAL DEMOLITION

- A. Remove from the premises and dispose of all existing wiring, conduit, material, fixtures, devices, equipment, etc., not required for re-use or re-installation.
- B. Deliver on the premises where directed existing material and equipment which is removed and is desired by the Owner or is indicated to remain the property of the Owner.

- C. All other equipment and materials which are removed shall become the property of the Contractor and shall be removed by him from the premises.
- D. Where electrical equipment is removed, also remove all wiring back to source panelboard or switch or to last remaining device on the same circuit. All conduit, hangers, supports, etc., shall also be removed unless otherwise noted. Such conduit may remain to be reused for new work provided said conduit is of the proper size and type as that specified and, in a condition, acceptable to Engineer and Owner.
- E. Any conduit abandoned in concrete slabs, walls, or other inaccessible locations shall be left empty except for a nylon pull wire. Ends shall be capped with push plugs for future use.
- F. Where an existing system is indicated to be removed, the Contractor shall provide complete removal of entire system including all wiring, conduit, and connected/associated fixtures and devices. The system shall be removed in its entirety unless otherwise noted.

3.6 EXISTING CONDUIT WORK

- A. Remove all abandoned raceway, including abandoned raceway above accessible ceiling finishes. Cut raceway flush with walls and floors, and patch surfaces. Remove conduit back to point of penetration/exposure.
- B. Remove concealed abandoned raceway to its source.
- C. Abandoned Work: buried electrical work abandoned in place, shall be cut out approximately 2 inches beyond the face of adjacent construction, capped and the adjacent surface patched to match the existing finish.
- D. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if raceway servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.
- E. Remove all abandoned wiring from exiting conduits and ductbanks.
- F. Contractor shall provide all cutting and patching required to connect to and extend existing conduits, wiring, circuits, etc.
- G. Clean and repair existing raceway and boxes that remain or are to be reinstalled.
- H. Remove all abandoned wiring from existing conduits and ductbanks. Abandoned wiring that cannot be removed shall be tagged at each end as "Abandoned".
- I. Contractor shall provide all cutting and patching required to connect to and extend existing conduits, wiring, circuits, etc.

3.7 CLEANING AND REPAIR

- A. Remove all abandoned and unused wire and cable, including abandoned wire and cable above accessible ceiling finishes. Patch surfaces where removed cables pass through building finishes. Remove abandoned and unused cabling and wiring back to the source.
- B. Disconnect abandoned circuits and remove circuit wire and cable. Remove abandoned boxes if wire and cable servicing them is abandoned and removed. Provide blank cover for abandoned boxes that are not removed.
- C. Ensure access to existing wiring connections which remain active and which require access. Modify installation or provide access panel as appropriate.
- D. Extend existing circuits using materials and methods compatible with existing electrical installations or as specified.
- E. Clean and repair existing wire and cable that remain or is to be reinstalled.
- F. Provide supports for all wiring and cabling to remain as required by the NEC.
- G. Contractor shall provide field services for tracing out of all existing circuits to be maintained. Contractor shall locate, trace and label, all existing circuit being reused.
- 3.8 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK
 - A. Demolish and extend existing electrical work to meet all requirements of these specifications.
 - B. If certain raceways and boxes are abandoned but not scheduled for removal, those items must be shown on the As-Built Drawings.
 - C. Remove, relocated, and extend existing installations to accommodate new construction.
 - D. Remove abandoned wiring to source of supply.
- 3.9 CLEANING AND REPAIR
 - A. Clean and repair existing equipment and materials that remain or are to be reused.
 - B. Panelboards: Provide typed circuit directory showing revised circuiting arrangement.
 - C. Provide new labels on all existing electrical equipment being re-used.

END OF SECTION 260505

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- 1.2 SUMMARY
 - A. Section Includes:
 - 1. Copper building wire rated 600 V or less.
 - 2. Metal-clad cable, Type MC, rated 600 V or less.
 - 3. Metal-clad cable, Type MC Luminary Cable, rated 600 V or less.
 - 4. Connectors, splices, and terminations rated 600 V and less.
 - B. Related Requirements:
 - 1. Section 260533 "Raceways and Boxes for Electrical Systems"

1.3 DEFINITIONS

A. RoHS: Restriction of Hazardous Substances.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Data: For each type of product.
- B. Product Schedule: Indicate type, use, location and termination locations.

1.5 QUALITY ASSURANCE

- A. Electrical devices, accessories and components; are certified by a testing agency approved by the local authority having jurisdiction, and are listed and labeled per NFPA 70 Article 100.
- B. Installation shall comply with applicable nation, state and local electrical codes and NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Alpha Wire Company.
 - 2. American Bare Conductor.
 - 3. Belden Inc.
 - 4. Cerro Wire LLC.
 - 5. Southwire Company.
 - 6. WESCO.

2.2 COPPER BUILDING WIRE

- A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.
- B. Standards:
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
 - 2. RoHS compliant.
 - 3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."
- C. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.
- D. Conductor Insulation:
 - 1. Type NM: Comply with UL 83 and UL 719.
 - 2. Type USE-2and Type SE: Comply with UL 854.
 - 3. Type THHN and Type THWN-2: Comply with UL 83.
 - 4. Type XHHW-2: Comply with UL 44.

2.3 METAL-CLAD CABLE, TYPE MC

- A. Description: A factory assembly of one or more current-carrying insulated conductors in an overall metallic sheath.
- B. Standards:

- 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- 2. Comply with UL 1569.
- 3. RoHS compliant.
- 4. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."
- C. Circuits:
 - 1. Single circuit.
 - 2. Power-Limited Fire-Alarm Circuits: Comply with UL 1424.
- D. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.
- E. Ground Conductor: Insulated.
- F. Conductor Insulation:
 - 1. Type TFN/THHN/THWN-2: Comply with UL 83.
- G. Armor: Steel; interlocked.
- H. Jacket: PVC applied over armor.
- 2.4 METAL-CLAD CABLE, TYPE MC, MC LUMINARY CABLE
 - A. Description: A factory assembly of one or more current-carrying insulated conductors in an overall metallic sheath.
 - B. Standards:
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
 - 2. Comply with UL 1569.
 - 3. RoHS compliant.
 - 4. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."
 - C. Circuits:
 - 1. Single circuit.
 - D. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.
 - E. Ground Conductor: Insulated.

- F. Conductor Insulation:
 - 1. Type THHN: No. 10 and No. 12 AWG; power conductors.
 - 2. Type TFN: No. 16 AWG twisted pair; control conductors
- G. Armor: Steel; interlocked.
- H. Jacket: PVC applied over armor.

2.5 CONNECTORS AND SPLICES

- A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- B. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:
 - 1. 3M Electrical Products.
 - 2. AFC Cable Systems; a part of Atkore International.
 - 3. Gardner Bender.
 - 4. Hubbell Power Systems, Inc.
 - 5. Ideal Industries, Inc.
 - 6. O-Z/Gedney; a brand of Emerson Industrial Automation.
 - 7. TE Connectivity Ltd.
 - 8. Thomas & Betts Corporation; A Member of the ABB Group.
- C. Connectors:
 - 1. Jacketed Cable Connectors: For steel and aluminum jacketed cables, zinc die-cast with compression fittings, designed to connect conductors specified in this Section.
 - 2. Split Bolt & Set Screw Connectors: Not Acceptable.
 - 3. Spring Wire Connectors: Solderless spring type pressure connector with insulating covers for copper wire splices and taps. Use for conductor sizes 10 AWG and smaller.
 - 4. Solderless Pressure Connectors: High copper alloy terminal. May be used only for cable termination to equipment pads or terminals. Not approved for splicing.
 - 5. All wire connectors used in underground or exterior pull boxes shall be gel-filled twist connectors or a connector designed for damp and wet locations.
 - 6. Compression (crimp) Connectors: Long barrel; seamless, tin-plated electrolytic high conductivity copper tubing, internally beveled barrel ends. Connector shall be clearly marked with the wire size and type and proper number and location of crimps. Mechanical Connectors: Bolted type tin-plated; high conductivity copper alloy; spacer between conductors; beveled cable entrances.
 - 7. Heat shrinkable tubing shall meet the requirements of ANSI C119.1-1986 for buried connections to 90°C and shall be material flame-retarded per IEEE 383 "Vertical Tray Flame Test". Motor connection kits shall consist of heat-shrinkable, polymeric insulating

material over the connection area and a high dielectric strength mastic to seal the ends against ingress of moisture and contamination. Motor connection kits shall accommodate a range of cable sizes for both inline and stub-type configurations. Connection kits shall be independent of cable manufacturer's tolerances

- D. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.
 - 1. Material: Copper.
 - 2. Type: Two hole with standard barrels.
 - 3. Termination: Compression.
- E. Wire Connectors:
 - 1. Wire nuts installed in wet locations, exterior, etc., shall be self-contain, waterproof and corrosion-proof units incorporating prefilled silicone grease to block out moisture and air.
 - 2. Connectors shall be UL listed appropriately sized according to manufacturer's recommendations for the suitable wire sizes and voltage ratings.
 - 3. Connectors' body shall have a color-coded outer shell.

PART 3 - EXECUTION

- 3.1 CONDUCTOR MATERIAL APPLICATIONS
 - A. Feeders: Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
 - B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
 - C. Power-Limited Fire Alarm and Control: Solid for No. 12 AWG and smaller.
- 3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS
 - A. Service Entrance: Type THHN/THWN-2, single conductors in raceway.
 - B. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway.
 - C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces: Type THHN/THWN-2, single conductors in raceway.
 - D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.
 - E. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type Metal-Clad Cabling (MC Cabling).
- F. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.
- G. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.
- H. Type MC Luminary Cable may be used in short lengths (6-foot maximum) for final connections to lighting fixtures and may be used between light fixtures for 0-10V control.
- I. Class I Control Circuits: Type THHN-THWN, in raceway.
- J. Class II Control Circuits: Type THHN-THWN, in raceway.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values. Lubricant shall be water based, no Yellow 77.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- F. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."
- G. Branch circuits of 120V, wire size shall be as follows:
 - 1. Homerun from panelboard to first outlet: size as indicated on E0.1 "20 Ampere Circuits" Chart.
 - 2. From first outlet to other outlets: No. 12.

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

- B. Make splices, terminations, and taps that are compatible with conductor material.
- C. Splices shall be done in junction boxes and/or outlet boxes only.
 - 1. Conductors No. 10 and smaller, use wire connectors.
 - 2. Conductors No. 8 and larger, shall be of the type indented into the conductor by means of a hand or hydraulic pressure tool.
- D. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches (150 mm) of slack.

3.5 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.7 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 078413 "Penetration Firestopping."

END OF SECTION 260519

SECTION 260526- GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes grounding and bonding systems and equipment.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- 1.3 INFORMATIONAL SUBMITTALS
 - A. Coordination Drawings: Plans showing dimensioned as-built locations of grounding features specified in "Field Quality Control" Article.
 - B. Qualification Data: For testing agency and testing agency's field supervisor.
 - C. Field quality-control reports.
- 1.4 CLOSEOUT SUBMITTALS
 - A. Operation and maintenance data.
 - 1. Plans showing as-built, dimensioned locations of grounding features specified in "Field Quality Control" Article, including the following:
 - a. Test wells.
 - b. Ground rods.
 - c. Ground rings.
 - d. Grounding arrangements and connections for separately derived systems.
 - Instructions for periodic testing and inspection of grounding features at test wells ground rings grounding connections for separately derived systems based on NETA MTS NFPA 70B.
 - a. Tests shall determine if ground-resistance or impedance values remain within specified maximums, and instructions shall recommend corrective action if values do not.
 - b. Include recommended testing intervals.

1.5 QUALITY ASSURANCE

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

- 1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association to supervise on-site testing specified in Part 3.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

2.2 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Burndy; Part of Hubbell Electrical Systems.
 - 2. Dossert; AFL Telecommunications LLC.
 - 3. ERICO International Corporation.
 - 4. Fushi Copperweld Inc.
 - 5. Galvan Industries, Inc.; Electrical Products Division, LLC.
 - 6. Harger Lightning & Grounding.
 - 7. ILSCO.
 - 8. O-Z/Gedney; a brand of Emerson Industrial Automation.
 - 9. Robbins Lightning, Inc.
 - 10. SIEMENS Industry, Inc.; Energy Management Division.

2.3 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
 - 1. Solid Conductors: ASTM B 3.
 - 2. Stranded Conductors: ASTM B 8.
 - 3. Tinned Conductors: ASTM B 33.
 - 4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch (6 mm) in diameter.
 - 5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.

- 6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.
- 7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.
- C. Grounding Bus: Predrilled rectangular bars of annealed copper, 1/4 by 4 inches (6.3 by 100 mm) in cross section, with 9/32-inch (7.14-mm) holes spaced 1-1/8 inches (28 mm) apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V and shall be Lexan or PVC, impulse tested at 5000 V.

2.4 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
- C. Bus-Bar Connectors: Compression type, copper or copper alloy, with two wire terminals.
- D. Beam Clamps: Mechanical type, terminal, ground wire access from four directions, with dual, tin-plated or silicon bronze bolts.
- E. Cable-to-Cable Connectors: Compression type, copper or copper alloy.
- F. Cable Tray Ground Clamp: Mechanical type, zinc-plated malleable iron.
- G. Conduit Hubs: Mechanical type, terminal with threaded hub.
- H. Ground Rod Clamps: Mechanical type, copper or copper alloy, terminal with hex head bolt.
- I. Lay-in Lug Connector: Mechanical type, copper rated for direct burial terminal with set screw.
- J. Service Post Connectors: Mechanical type, bronze alloy terminal, in short- and long-stud lengths, capable of single and double conductor connections.
- K. Signal Reference Grid Clamp: Mechanical type, stamped-steel terminal with hex head screw.
- L. Straps: Solid copper, copper lugs. Rated for 600 A.
- M. Tower Ground Clamps: Mechanical type, copper or copper alloy, terminal one two-piece clamp.
- N. U-Bolt Clamps: Mechanical type, copper or copper alloy, terminal listed for direct burial.
- O. Water Pipe Clamps:
 - 1. Mechanical type, two pieces with stainless-steel bolts.

- a. Material: Die-cast zinc alloy.
- b. Listed for direct burial.
- 2. U-bolt type with malleable-iron clamp and copper ground connector rated for direct burial.

2.5 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel, sectional type; 3/4 inch by 10 feet (19 mm by 3 m).
- B. Ground Plates: 1/4 inch (6 mm) thick, hot-dip galvanized.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 10 AWG and smaller, and stranded conductors for No. 8 AWG and larger unless otherwise indicated.
- B. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 4/0 AWG minimum.
 - 1. Bury at least 24 inches (600 mm) below grade.
- C. Grounding Bus: Install in electrical equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
 - 1. Install bus horizontally, on insulated spacers 2 inches (50 mm) minimum from wall, 6 inches (150 mm) above finished floor unless otherwise indicated.
 - 2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down; connect to horizontal bus.
- D. Conductor Terminations and Connections:
 - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
 - 2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
 - 3. Connections to Ground Rods at Test Wells: Bolted connectors.
 - 4. Connections to Structural Steel: Welded connectors.

3.2 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
 - 1. Feeders and branch circuits.
 - 2. Lighting circuits.
 - 3. Receptacle circuits.

- 4. Single-phase motor and appliance branch circuits.
- 5. Three-phase motor and appliance branch circuits.
- 6. Flexible raceway runs.
- 7. Armored and metal-clad cable runs.
- C. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to ductmounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.
- D. Signal and Communication Equipment: For telephone, alarm, voice and data, and other communication equipment, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
 - 1. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-2-by-24-inch (6-by-50-by-600-mm) grounding bus.
 - 2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

3.3 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Rods: Drive rods until tops are 2 inches (50 mm) below finished floor or final grade unless otherwise indicated.
 - 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
- C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
 - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 - 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
 - 3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.
- D. Grounding and Bonding for Piping:
 - 1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect

grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.

- 2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
- 3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections with the assistance of a factory-authorized service representative.
- B. Tests and Inspections:
 - 1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
 - 2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
 - 3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, at ground test wells, and at individual ground rods. Make tests at ground rods before any conductors are connected.
 - a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Perform tests by fall-of-potential method according to IEEE 81.
 - 4. Prepare dimensioned Drawings locating each test well, ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.
- C. Grounding system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.
- E. Report measured ground resistances that exceed the following values:
 - 1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
 - 2. Power Distribution Units or Panelboards Serving Electronic Equipment: 3 ohm(s).
 - 3. Substations and Pad-Mounted Equipment: 5 ohms.
 - 4. Manhole Grounds: 10 ohms.
- F. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 260526

SECTION 260529- HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Hangers and supports for electrical equipment and systems.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For fabrication and installation details for electrical hangers and support systems.
- 1.3 INFORMATIONAL SUBMITTALS
 - A. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, and coordinated with each other, using input from installers of the items involved:
 - B. Seismic Qualification Certificates: For hangers and supports for electrical equipment and systems, accessories, and components, from manufacturer.
 - C. Welding certificates.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Comply with MFMA-4 factory-fabricated components for field assembly.
 - 1. Manufacturers: Subject to compliance with requirements, provide slotted metal angle and U-channel systems by one of the following:
 - a. Thomas & Betts Corporation; Kindorf
 - b. Unistrut; Diversified Products
 - c. Power-Strut.
 - 2. Manufacturers: Subject to compliance with requirements, provide conduit sealing bushings and accessories by one of the following:
 - a. Bridgeport Fittings

- b. GS Metals, Corporation
- c. O-Z / Gedney
- d. Raco, Inc.
- 3. Material: Pre-galvanized steel.
- 4. Channel Width: 1-1/4 inches (31.75 mm).
- 5. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
- 6. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
- Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
- 8. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- 9. Channel Dimensions: Selected for applicable load criteria.
- B. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- C. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be made of malleable iron.
- D. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
 - 1. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel stainless steel, for use in hardened portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Caddy Fasteners; Eric Products
 - 2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - 3) Wej-It Fastening Systems
 - 2. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
 - 3. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
 - 4. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
 - 5. Toggle Bolts: All-steel springhead type.
 - 6. Hanger Rods: Threaded steel.

7. Powder actuated fasteners and drive pin type fasteners are not acceptable.

2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials: Comply with requirements in Section 055000 "Metal Fabrications" for steel shapes and plates.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems unless requirements in this Section are stricter.
- B. Comply with requirements for raceways and boxes specified in Section 260533 "Raceways and Boxes for Electrical Systems."
- C. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMTs, IMCs, and RMCs as required by NFPA 70. Minimum rod size shall be 1/4 inch (6 mm) in diameter.
- D. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
 - 1. Secure raceways and cables to these supports with two-bolt conduit clamps.
- E. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch (38-mm) and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.
- B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb (90 kg).
- C. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements.

- D. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.
- 3.3 PAINTING
 - A. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.
 - B. Touch Up: Clean welds and abraded areas of shop paint. Paint exposed areas after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA1.
 - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils (0.05 mm).

END OF SECTION 260529

SECTION 260533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Metal conduits, tubing, and fittings.
 - 2. Nonmetal conduits, tubing, and fittings.
 - 3. Metal wireways and auxiliary gutters.
 - 4. Nonmetal wireways and auxiliary gutters.
 - 5. Surface raceways.
 - 6. Boxes, enclosures, and cabinets.
 - 7. Handholes and boxes for exterior underground cabling.

1.2 ACTION SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

1.3 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:
 - 1. Structural members in paths of conduit groups with common supports.
 - 2. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.
- B. Seismic Qualification Certificates: For enclosures, cabinets, and conduit racks and their mounting provisions, including those for internal components, from manufacturer.

PART 2 - PRODUCTS

2.1 METAL CONDUITS, TUBING, AND FITTINGS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include the following:
 - 1. AFC Cable Systems, Inc.
 - 2. Allied Tube & Conduit; a Tyco International Ltd. Co.
 - 3. Appleton
 - 4. Cooper Course-Hinds
 - 5. O-Z Gedney; a unit of General Signal.

- 6. Spring City
- 7. Thomas & Betts
- 8. Wheatland Tube Company.
- B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. GRC: Comply with ANSI C80.1 and UL 6.
- D. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.
 - 1. Comply with NEMA RN 1.
 - 2. Coating Thickness: 0.040 inch (1 mm), minimum.
- E. EMT: Comply with ANSI C80.3 and UL 797.
- F. FMC: Comply with UL 1; zinc-coated steel.
- G. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.
- H. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
 - 1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and NFPA 70.
 - 2. Fittings for EMT:
 - a. Material: Steel.
 - b. Type: Compression type.
 - 3. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
 - 4. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch (1 mm), with overlapping sleeves protecting threaded joints.
- I. Joint Compound for IMC, GRC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS, TUBING, AND FITTINGS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Allied Tube & Conduit
 - 2. Arnco
 - 3. Beck Manufacturing
 - 4. CANTEX Inc.
 - 5. CertainTeed Corp.; Pipe & Plastics Group.
 - 6. Carlon

- B. Listing and Labeling: Nonmetallic conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. ENT: Comply with NEMA TC 13 and UL 1653.
- D. RNC: Type EPC-40-PVC complying with NEMA TC 2 and UL 651 unless otherwise indicated.
- E. LFNC: Comply with UL 1660.
- F. Fittings for ENT and RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.
- G. Fittings for LFNC: Comply with UL 514B.
- 2.3 BOXES, ENCLOSURES, AND CABINETS
 - A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
 - 2. EGS/Appleton Electric.
 - 3. Erickson Electrical Equipment Company.
 - 4. Hoffman.
 - 5. Hubbell Incorporated; Killark Electric Manufacturing Co. Division.
 - 6. O-Z/Gedney; a unit of General Signal.
 - 7. RACO; a Hubbell Company.
 - 8. Robroy Industries, Inc.; Enclosure Division.
 - 9. Scott Fetzer Co.; Adalet Division.
 - 10. Spring City Electrical Manufacturing Company.
 - 11. Thomas & Betts Corporation.
 - 12. Walker Systems, Inc.; Wiremold Company (The).
 - 13. Woodhead, Daniel Company; Woodhead Industries, Inc. Subsidiary.
 - B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
 - C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
 - D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, aluminum, Type FD, with gasketed cover.
 - E. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.
 - F. Metal Floor Boxes:
 - 1. Material: Cast metal.
 - 2. Type: Fully adjustable.
 - 3. Shape: Rectangular.

- 4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- G. Nonmetallic Floor Boxes: Nonadjustable, round.
 - 1. Listing and Labeling: Nonmetallic floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- H. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb (23 kg).
 Outlet boxes designed for attachment of luminaires weighing more than 50 lb (23 kg) shall be listed and marked for the maximum allowable weight.
- I. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- J. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum with gasketed cover.
- K. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- L. Device Box Dimensions: 4 inches square by 2-1/8 inches deep (100 mm square by 60 mm deep) 4 inches by 2-1/8 inches by 2-1/8 inches deep (100 mm by 60 mm deep).
- M. Gangable boxes are allowed.
- N. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1 with continuous-hinge cover with flush latch unless otherwise indicated.
 - 1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
 - 2. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.
- O. Cabinets:
 - 1. NEMA 250, Type 1 galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
 - 2. Hinged door in front cover with flush latch and concealed hinge.
 - 3. Key latch to match panelboards.
 - 4. Metal barriers to separate wiring of different systems and voltage.
 - 5. Accessory feet where required for freestanding equipment.
 - 6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.4 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

- A. General Requirements for Handholes and Boxes:
 - 1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.

- 2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.
- C. Polymer Concrete Handholes and Boxes with Polymer Concrete Cover: Molded of sand and aggregate, bound together with a polymer resin, and reinforced with steel or fiberglass or a combination of the two.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
 - a. Armorcast Products Company.
 - b. Carson Industries LLC.
 - c. CDR Systems Corporation.
 - d. NewBasis.
 - 2. Standard: Comply with SCTE 77.
 - 3. Configuration: Designed for flush burial with closed bottom unless otherwise indicated.
 - 4. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
 - 5. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
 - 6. Cover Legend: Molded lettering, "ELECTRIC.".
 - 7. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
- D. Fiberglass Handholes and Boxes: Molded of fiberglass-reinforced polyester resin, with frame and covers of polymer concrete.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
 - a. Armorcast Products Company.
 - b. Carson Industries LLC.
 - c. Christy Concrete Products.
 - d. Synertech Moulded Products, Inc.; a division of Oldcastle Precast.
 - 2. Standard: Comply with SCTE 77.
 - 3. Configuration: Designed for flush burial with closed bottom unless otherwise indicated.
 - 4. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
 - 5. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
 - 6. Cover Legend: Molded lettering, "ELECTRIC." "Telephone".
 - 7. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
 - 1. Exposed Conduit: GRC.
 - 2. Concealed Conduit, Aboveground: GRC.
 - 3. Underground Conduit: RNC, Type EPC-40-PVC direct buried unless otherwise noted.
 - 4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
 - 5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R
- B. Indoors: Apply raceway products as specified below unless otherwise indicated.
 - 1. Exposed, Not Subject to Physical Damage: EMT.
 - 2. Exposed, Not Subject to Severe Physical Damage: EMT.
 - 3. Exposed and Subject to Severe Physical Damage: GRC Raceway locations include the following:
 - a. Loading dock.
 - b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
 - c. Mechanical rooms.
 - d. Boiler rooms.
 - 4. Concealed in Ceilings and Interior Walls and Partitions: MC Cable. (Exception, Corridor ceilings shall be in EMT Conduit, upon transition to Classrooms, MC Cable may be used above Classroom Ceilings.)
 - 5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
 - 6. Damp or Wet Locations: GRC.
 - 7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.
- C. Minimum Raceway Size: 3/4-inch (21-mm) trade size.
- D. Aluminum conduit is prohibited.
- E. Raceway Fittings: Compatible with raceways and suitable for use and location.
 - 1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
 - 2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
 - 3. EMT: Use compression type, steel fittings. Comply with NEMA FB 2.10.
 - 4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

- F. Do not install aluminum boxes, or fittings in contact with concrete or earth.
- G. Install surface raceways only where indicated on Drawings.
- H. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F (49 deg C).

3.2 INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
- B. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Comply with requirements in Division 26 Section "Hangers and Supports for Electrical Systems" for hangers and supports.
- D. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- E. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches (300 mm) of changes in direction.
- F. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
- G. Support conduit within 12 inches ((300 mm)) of enclosures to which attached.
- H. Raceways Embedded in Slabs:
 - 1. Run conduit larger than 1-inch (27-mm) trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot (3-m) intervals.
 - 2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
 - 3. Arrange raceways to keep a minimum of 2 inches (50 mm) of concrete cover in all directions.
 - 4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.
 - 5. Change from RNC, Type EPC-40-PVC to GRC before rising above floor, including into wall cavity.
- I. Stub-ups to Above Recessed Ceilings:
 - 1. Use EMT, IMC, or RMC for raceways.
 - 2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

- J. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- K. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.
- L. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
- M. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch (35-mm) trade size and insulated throat metal bushings on 1-1/2-inch (41-mm) trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
- N. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300-mm) of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
- O. Surface Raceways:
 - 1. Install surface raceway with a minimum 2-inch (50-mm) radius control at bend points.
 - 2. Secure surface raceway with two hole straps at intervals not exceeding 32 inches (813-mm) and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.
- P. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces.
- Q. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
 - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 - 2. Where an underground service raceway enters a building or structure.
 - 3. Where otherwise required by NFPA 70.
- R. Expansion-Deflection Fittings: Provide an expansion/deflection fitting in each concealed or exposed electrical run crossing a building expansion joint. Fittings shall be complete with bronze end couplings, neoprene sleeve, tinned copper braid integral bonding jumper and stainless steel bands. Expansion/deflection fittings shall be suitable for the size and type of conduit run they connect. Bonding jumper shall comply with NEC and UL requirements.

- 1. Expansion/deflection fitting shall accommodate the following movements without collapsing or fracturing the conduit and damaging the wires it contains:
 - a. Axial expansion or contraction up to 3/4-inch.
 - b. Angular misalignment of the axes of the conduits up to 30 degrees in all directions.
 - c. Parallel misalignment of the axes of the conduits up to 3/4-inch in all directions.
- 2. Expansion/Deflection fitting shall be OZ/Gedney Type DX or approved equal by Crouse Hinds (Type XD).
- S. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches (1830 mm) of flexible conduit for recessed and semi recessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
 - 1. Use LFMC in damp or wet locations subject to severe physical damage.
 - 2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.
- T. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to top of box unless otherwise indicated.
- U. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between the box and cover plate or the supported equipment and box.
- V. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- W. Locate boxes so that cover or plate will not span different building finishes.
- X. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
- Y. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.
- Z. Set metal floor boxes level and flush with finished floor surface.
- AA. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

- A. Direct-Buried Conduit:
 - 1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in Division 31 Section "Earth Moving" for pipe less than 6 inches (150 mm) in nominal diameter.
 - 2. Install backfill as specified in Section 312000 "Earth Moving."
 - 3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and

contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches (300 mm) of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Division 31 Section "Earth Moving."

- 4. Install manufactured duct elbows for stub-up at poles and equipment and at building entrances through floor unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
- 5. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.
 - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches (75 mm) of concrete for a minimum of 12 inches (300 mm) on each side of the coupling.
 - b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches (1500 mm) from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.
- 6. Underground Warning Tape: Comply with requirements in Section 260553 "Identification for Electrical Systems."

3.4 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

- A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.
- B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2inch (12.5-mm) sieve to No. 4 (4.75-mm) sieve and compacted to same density as adjacent undisturbed earth.
- C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch (25 mm) above finished grade.
- D. Install handholes with bottom below frost line below grade.
- E. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.
- F. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables, but short enough to preserve adequate working clearances in the enclosure.
- G. Field-cut openings for ducts and conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

- H. For enclosures installed in asphalt paving and subject to occasional, nondeliberate, heavy-vehicle loading, form and pour a concrete ring encircling, and in contact with, enclosure and with top surface screeded to top of box cover frame. Bottom of ring shall rest on compacted earth.
 - 1. Concrete: 3000 psi (20 kPa), 28-day strength, complying with Division 03 Section "Cast-in-Place Concrete," with a troweled finish.
 - 2. Dimensions: 10 inches wide by 12 inches deep (250 mm wide by 300 mm deep).
- 3.5 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS
 - A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Division 26 Section "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."
- 3.6 FIRESTOPPING
 - A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Division 7 Section "Penetration Firestopping."
- 3.7 PROTECTION
 - A. Protect coatings, finishes, and cabinets from damage and deterioration.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - 2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.
- 3.8 GROUNDING
 - A. Ground underground ducts and utility structures according to Division 26 Section "Grounding."
- 3.9 FIELD QUALITY CONTROL
 - A. Perform the following tests and inspections and prepare test reports:
 - 1. Demonstrate capability and compliance with requirements on completion of installation of underground ducts and utility structures.
 - 2. Pull aluminum or wood test mandrel through duct to prove joint integrity and test for out-ofround duct. Provide mandrel equal to 80 percent fill of duct. If obstructions are indicated, remove obstructions and retest.
 - 3. Test manhole and handhole grounding to ensure electrical continuity of grounding and bonding connections. Measure and report ground resistance as specified in Division 26 Section "Grounding."
 - B. Correct deficiencies and retest as specified above to demonstrate compliance.

3.10 CLEANING

- A. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of ducts. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.
- B. Clean internal surfaces of manholes, including sump. Remove foreign material.

END OF SECTION 260533

SECTION 260544 - SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
 - 2. Sleeve-seal systems.
 - 3. Sleeve-seal fittings.
 - 4. Grout.
 - 5. Silicone sealants.
- B. Related Requirements:
 - 1. Section 078413 "Penetration Firestopping" for penetration firestopping installed in fireresistance-rated walls, horizontal assemblies, and smoke barriers, with and without penetrating items.

PART 2 - PRODUCTS

2.1 SLEEVES

- A. Wall Sleeves:
 - 1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
 - 2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
- B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.
- C. Sleeves for Rectangular Openings:
 - 1. Material: Galvanized sheet steel.
 - 2. Minimum Metal Thickness:

- a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and with no side larger than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
- For sleeve cross-section rectangle perimeter 50 inches (1270 mm) or more and one or more sides larger than 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

2.2 SLEEVE-SEAL SYSTEMS

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Advance Products & Systems, Inc.
 - b. CALPICO, Inc.
 - c. Metraflex Company (The).
 - d. Pipeline Seal and Insulator, Inc.
 - 2. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
 - 3. Pressure Plates: Carbon steel.
 - 4. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, of length required to secure pressure plates to sealing elements.

2.3 SLEEVE-SEAL FITTINGS

- A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. HOLDRITE.
- 2.4 GROUT
 - A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-firerated walls or floors.

- B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- C. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

2.5 SILICONE SEALANTS

- A. 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 that are not fire rated.
- B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

- A. Comply with NECA 1.
- B. Comply with NEMA VE 2 for cable tray and cable penetrations.
- C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:
 - 1. Interior Penetrations of Non-Fire-Rated Walls and Floors:
 - a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Section 079200 "Joint Sealants."
 - b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.
 - 2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
 - 3. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed or unless seismic criteria require different clearance.

- 4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
- 5. Install sleeves for floor penetrations. Extend sleeves installed in floors 3 inches (76.2 mm) above finished floor level. Install sleeves during erection of floors.
- D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:
 - 1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
 - 2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.
- E. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.
- F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- G. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between raceway or cable and sleeve for installing sleeve-seal system.

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.
- B. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.3 SLEEVE-SEAL-FITTING INSTALLATION

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION 260544

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Color and legend requirements for raceways, conductors, and warning labels and signs.
 - 2. Labels.
 - 3. Bands and tubes.
 - 4. Tapes and stencils.
 - 5. Tags.
 - 6. Signs.
 - 7. Cable ties.
 - 8. Paint for identification.
 - 9. Fasteners for labels and signs.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Delegated-Design Submittal: For arc-flash hazard study.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Comply with ASME A13.1 and IEEE C2.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.

- E. Comply with NFPA 70E and Section 260574 "Overcurrent Protective Device Arc-Flash Study" requirements for arc-flash warning labels.
- F. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.
- G. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 COLOR AND LEGEND REQUIREMENTS

- A. Raceways and Cables Carrying Circuits at 600 V or Less:
 - 1. Black letters on an orange field.
 - 2. Legend: Indicate voltage and system or service type.
- B. Color-Coding for Phase- and Voltage-Level Identification, 600 V or Less: Use colors listed below for ungrounded service feeder and branch-circuit conductors.
 - 1. Color shall be factory applied.
 - 2. Colors for 208/120-V Circuits:
 - a. Phase A: Black.
 - b. Phase B: Red.
 - c. Phase C: Blue.
 - d. Neutral: White.
 - 3. Colors for 480/277-V Circuits:
 - a. Phase A: Brown.
 - b. Phase B: Orange.
 - c. Phase C: Yellow.
 - d. Neutral: Gray.
 - 4. Color for Equipment Grounds: Green.
 - 5. Colors for Isolated Grounds: Green with white stripe.
- C. Warning Label Colors:
 - 1. Identify system voltage with black letters on an orange background.
- D. Warning labels and signs shall include, but are not limited to, the following legends:
 - 1. Multiple Power Source Warning: "DANGER ELECTRICAL SHOCK HAZARD EQUIPMENT HAS MULTIPLE POWER SOURCES."

2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES (915 MM)."

2.3 LABELS

- A. Snap-around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeves, with diameters sized to suit diameter and that stay in place by gripping action.
 - 1. Manufacturers:
 - a. Brady Corporation.
 - b. Hellermann Tyton.
 - c. Marking Services, Inc.
 - d. Panduit Corp.
 - e. Seton Identification Products.
- B. Self-Adhesive Labels: Vinyl, thermal, transfer-printed, 3 mil (0.08 mm) thick, multicolor, weather and UV resistant, pressure-sensitive adhesive labels, configured for intended use and location.
 - 1. Manufacturers:
 - a. Brady Corporation.
 - b. Hellermann Tyton.
 - c. Marking Services, Inc.
 - d. Panduit Corp.
 - e. Seton Identification Products.

2.4 BANDS AND TUBES

- A. Snap-around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2 inches (50 mm) long, with diameters sized to suit diameter and that stay in place by gripping action.
 - 1. Manufacturers:
 - a. Brady Corporation.
 - b. Hellermann Tyton.
 - c. Marking Services, Inc.
 - d. Panduit Corp.

2.5 TAPES AND STENCILS

A. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

- 1. Manufacturers:
 - a. Carlton Industries, LP
 - b. Champion America
 - c. Hellermann Tyton
 - d. Ideal Industries, Inc.
 - e. Marking Services, Inc.
 - f. Panduit Corp.
- B. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide; compounded for outdoor use.
 - 1. Manufacturers:

c.

- a. Brady Corporation.
- b. Carlton Industries, LP
 - Emedeo Marking Services, Inc.
- C. Floor Marking Tape: 2-inch- (50-mm-) wide, 5-mil (0.125-mm) pressure-sensitive vinyl tape, with yellow and black stripes and clear vinyl overlay.
 - 1. Manufacturers:
 - a. Carlton Industries, LP
 - b. Seton Identification Products.
- D. Detectable Underground-Line Warning Tape:
 - 1. Manufacturers:
 - a. Brady Corporation.
 - b. Ideal Industries, Inc.
 - c. LEM Products, Inc.
 - d. Marking Services, Inc.
 - e. Reef Industries, Inc.
 - f. Seton Identification Products.
 - 2. Tape:
 - a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
 - b. Printing on tape shall be permanent and shall not be damaged by burial operations.
 - c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.

- 3. Color and Printing:
 - a. Comply with ANSI Z535.1, ANSI Z535.2, ANSI Z535.3, ANSI Z535.4, and ANSI Z535.5.
 - b. Inscriptions for Red-Colored Tapes: "ELECTRIC LINE, HIGH VOLTAGE".
 - c. Inscriptions for Orange-Colored Tapes: "TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE".
- E. Stenciled Legend: In nonfading, waterproof, black ink or paint. Minimum letter height shall be 1 inch (25 mm).
- 2.6 SIGNS
 - A. Baked-Enamel Signs:
 - 1. Manufacturers:
 - a. Carlton Industries, LP
 - b. Champion America
 - c. Emedco
 - d. Marking Services, Inc.
 - 2. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
 - 3. 1/4-inch (6.4-mm) grommets in corners for mounting.
 - 4. Nominal Size: 7 by 10 inches (180 by 250 mm).
 - B. Metal-Backed Butyrate Signs:
 - 1. Manufacturers:
 - a. Carlton Industries, LP
 - b. Champion America
 - c. Emedco
 - d. Marking Services, Inc.
 - 2. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs, with 0.0396-inch (1-mm) galvanized-steel backing, punched and drilled for fasteners, and with colors, legend, and size required for application.
 - 3. 1/4-inch (6.4-mm) grommets in corners for mounting.
 - 4. Nominal Size: 10 by 14 inches (250 by 360 mm).
 - C. Laminated Acrylic or Melamine Plastic Signs:
 - 1. Manufacturers:
 - a. Carlton Industries, LP

- b. Champion America
- c. Emedco
- d. Marking Services, Inc.
- 2. Engraved legend.
- 3. Thickness:
 - a. For signs up to 20 sq. in. (129 sq. cm), minimum 1/16 inch (1.6 mm) thick).
 - b. For signs larger than 20 sq. in. (129 sq. cm), 1/8 inch (3.2 mm) thick.
 - c. Engraved legend with white letters on a black background.
 - d. Punched or drilled for mechanical fasteners with 1/4-inch (6.4-mm) grommets in corners for mounting.
 - e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.7 CABLE TIES

- 1. Manufacturers:
 - a. Hellerman Tyton
 - b. Ideal Industries, Inc.
 - c. Marking Services, Inc.
 - d. Panduit Corp.
- B. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.
 - 1. Minimum Width: 3/16 inch (5 mm).
 - 2. Tensile Strength at 73 Deg F (23 Deg C) according to ASTM D 638: 12,000 psi (82.7 MPa).
 - 3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
 - 4. Color: Black, except where used for color-coding.
- C. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, selfextinguishing, one piece, self-locking, and Type 6/6 nylon.
 - 1. Minimum Width: 3/16 inch (5 mm).
 - 2. Tensile Strength at 73 Deg F (23 Deg C) according to ASTM D 638: 12,000 psi (82.7 MPa).
 - 3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
 - 4. Color: Black.
- D. Plenum-Rated Cable Ties: Self-extinguishing, UV stabilized, one piece, and self-locking.
 - 1. Minimum Width: 3/16 inch (5 mm).
 - 2. Tensile Strength at 73 Deg F (23 Deg C) according to ASTM D 638: 7000 psi (48.2 MPa).
 - 3. UL 94 Flame Rating: 94V-0.
 - 4. Temperature Range: Minus 50 to plus 284 deg F (Minus 46 to plus 140 deg C).
 - 5. Color: Black.
2.8 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.
- B. Install identifying devices before installing acoustical ceilings and similar concealment.
- C. Verify identity of each item before installing identification products.
- D. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.
- E. Apply identification devices to surfaces that require finish after completing finish work.
- F. Install signs with approved legend to facilitate proper identification, operation, and maintenance of electrical systems and connected items.
- G. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.
- H. System Identification for Raceways and Cables under 600 V: Identification shall completely encircle cable or conduit. Place identification of two-color markings in contact, side by side.
 - 1. Secure tight to surface of conductor, cable, or raceway.
- I. System Identification for Raceways and Cables over 600 V: Identification shall completely encircle cable or conduit. Place adjacent identification of two-color markings in contact, side by side.
 - 1. Secure tight to surface of conductor, cable, or raceway.

- J. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
- K. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch- (10-mm-) high letters for emergency instructions at equipment used for power transfer, emergency power.
- L. Elevated Components: Increase sizes of labels, signs, and letters to those appropriate for viewing from the floor.
- M. Snap-around Labels: Secure tight to surface at a location with high visibility and accessibility.
- N. Self-Adhesive Labels:
 - 1. On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual.
 - Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on 1-1/2-inch- (38-mm-) high label; where two lines of text are required, use labels 2 inches (50 mm) high.
- O. Snap-around Color-Coding Bands: Secure tight to surface at a location with high visibility and accessibility.
- P. Marker Tapes: Secure tight to surface at a location with high visibility and accessibility.
- Q. Self-Adhesive Vinyl Tape: Secure tight to surface at a location with high visibility and accessibility.
 - 1. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches (150 mm) where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding.
- R. Floor Marking Tape: Apply stripes to finished surfaces following manufacturer's written instructions.
- S. Underground Line Warning Tape:
 - 1. During backfilling of trenches, install continuous underground-line warning tape directly above cable or raceway at 6 to 8 inches (150 to 200 mm) below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches (400 mm) overall.
 - 2. Limit use of underground-line warning tape to direct-buried cables.
 - 3. Install underground-line warning tape for direct-buried cables and cables in raceways.
- T. Baked-Enamel Signs:
 - 1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.

- 2. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on minimum 1-1/2-inch- (38-mm-) high sign; where two lines of text are required, use signs minimum 2 inches (50 mm) high.
- U. Metal-Backed Butyrate Signs:
 - 1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
 - 2. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on minimum 1-1/2-inch- (38-mm-) high sign; where two lines of text are required, use signs minimum 2 inches (50 mm) high.
- V. Laminated Acrylic or Melamine Plastic Signs:
 - 1. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
 - 2. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on minimum 1-1/2-inch- (38-mm-) high sign; where two lines of text are required, use signs minimum 2 inches (50 mm) high.
- W. Cable Ties: General purpose, for attaching tags, except as listed below:
 - 1. Outdoors: UV-stabilized nylon.
 - 2. In Spaces Handling Environmental Air: Plenum rated.

3.2 IDENTIFICATION SCHEDULE

- A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.
- B. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.
- C. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits, More Than 20 A and 120 V to Ground: Identify with snap-around labels applied in bands.
 - 1. Locate identification label at 10 foot (3-m) maximum intervals.
- D. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use self-adhesive wraparound labels to identify the phase.
 - 1. Locate identification at changes in direction, at penetrations of walls and floors, at 50-foot (15-m) maximum intervals in straight runs, and at 25-foot (7.6-m) maximum intervals in congested areas.

- E. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use self-adhesive wraparound labels with the conductor or cable designation, origin, and destination.
- F. Control-Circuit Conductor Termination Identification: For identification at terminations, provide selfadhesive wraparound labels with the conductor designation.
- G. Auxiliary Electrical Systems Conductor Identification: Self-adhesive vinyl tape that is uniform and consistent with system used by manufacturer for factory-installed connections.
 - 1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
- H. Locations of Underground Lines: Underground-line warning tape for power, lighting, communication, and control wiring and optical-fiber cable.
- I. Workspace Indication: Apply floor marking tape to finished surfaces. Show working clearances in the direction of access to live parts. Workspace shall comply with NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.
- J. Instructional Signs: Self-adhesive labels, including the color code for grounded and ungrounded conductors.
- K. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Baked-enamel warning signs.
 - 1. Apply to exterior of door, cover, or other access.
 - 2. For equipment with multiple power or control sources, apply to door or cover of equipment, including, but not limited to, the following:
 - a. Power-transfer switches.
 - b. Controls with external control power connections.
- L. Arc Flash Warning Labeling: Self-adhesive labels.
- M. Operating Instruction Signs: Laminated acrylic or melamine plastic signs.
- N. Emergency Operating Instruction Signs: Laminated acrylic or melamine plastic signs with white legend on a red background with minimum 3/8-inch- (10-mm-) high letters for emergency instructions at equipment used for power transfer and emergency power.
- O. Equipment Identification Labels:
 - 1. Indoor Equipment: Laminated acrylic or melamine plastic sign.
 - 2. Outdoor Equipment: Laminated acrylic or melamine sign.

END OF SECTION 260553

SECTION 260926 - LIGHTING CONTROL PANELS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Distributed Digital Lighting Control System, including:
 - 1. Digital Lighting
 - 2. Relay Panels
 - 3. Emergency Lighting Control
- B. Related Requirements:
 - 1. Section 262726 "Wiring Devices" for wall-box dimmers, non-networkable wall-switch occupancy sensors, and manual light switches.
 - 2. Section 260923 "Lighting Control Devices" for occupancy/vacancy sensors used in conjunction with the lighting control system.

1.2 REFERENCES

- 1. NFPA 70 National Electrical Code; National Fire Protection Association
- 2. NEMA National Electrical Manufacturers Association
- 3. FCC Emissions Standards
- 4. UL Underwriters Laboratories, Inc.
- 5. UL 2043 Standard for Fire Test for Heat and Visible Smoke Release for Discrete Products Installed in Air-Handling Spaces.
- 6. UL 20 General Use Switches, Plug Load Controls

1.3 DESIGN/PERFORMANCE REQUIRMENTS

- A. Digital Lighting Management System shall accommodate the square-footage coverage requirements for each area controlled, utilizing room controllers, digital occupancy sensors, switches, daylighting sensors and accessories that suit the required lighting and electrical system parameters.
- B. System shall conform to requirements of NFPA 70.
- C. System shall comply with FCC emission standards specified in part 15, sub-part J for commercial and residential application.
- D. System shall be listed under UL sections 916 and/or 508.

1.4 ALTERNATE MANUFACTURERS:

A. Refer to specification section 265119 - 1.3.

1.5 ACTION SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Catalog sheets and specifications
 - 2. Ratings, configurations, standard wiring diagrams, dimensions, colors, service condition requirements, and installed features.
 - 3. Storage and handling requirements and recommendations
 - 4. Installation instructions.
- B. Shop Drawings: Wiring diagrams for the various components of the System specified including:
 - 1. Composite wiring and/or schematic diagram of each control circuit as proposed to be installed.
 - 2. Show location of all devices, including at minimum sensors, load controllers, and switches/dimmers for each area of reflected ceiling plans.
 - 3. Provide room/area details including products and sequence of operation for each room or area. Illustrate typical acceptable room/area connection topologies.
 - 4. Low Voltage Control Stations each button shall be engraved. Submit button labeling forms for each space and for each button configuration variation. Forms shall be provided to Architect for Ownership review and approval.
- C. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

1.6 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual installed locations and settings for lighting control devices.
- B. Operation and Maintenance Manual:
 - 1. Include approved Shop Drawings and Product Data.
 - 2. Include Sequence of Operation, identifying operation for each room or space.
 - 3. Include manufacturer's maintenance information.
 - 4. Operation and Maintenance Data: Include detailed information on device programming and setup.
 - 5. Include startup and test reports.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing of centralized and distributed lighting control systems with a minimum of 10 years documented experience.

- B. Installer Qualifications: Company certified by the manufacturer and specializing in installation of lighting control products with minimum three years documented experience.
- C. System Components: Demonstrate that individual components have undergone quality control and testing prior to shipping.

1.8 PRE-INSTALLATION MEETINGS

- A. Convene minimum two weeks prior to commencing Work of this section. Meeting to be attended by Owner, Architect (remote web based acceptable), Contractor, System installer, Factory authorized manufacturer's representative, and representative of all trades related to the system installation.
- B. Review installation procedures and coordination required with related Work and the following:
 - 1. Confirm the location and mounting of <u>all</u> devices, with special attention to placement of switches, dimmers, and any sensors.
 - 2. Review the specifications for low voltage control wiring and termination.
 - 3. Discuss the functionality and configuration of all products, including sequences of operation, per design requirements.
 - 4. Discuss requirements for integration with other trades
- C. Inspect and make notes of job conditions prior to installation:
 - 1. Record minutes of the conference and provide copies to all parties present.
 - 2. Identify all outstanding issues in writing designating the responsible party for follow-up action and the timetable for completion.
 - 3. Installation shall not begin until all outstanding issues are resolved to the satisfaction of the Architect.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Store products in a clean, dry space in original manufacturer's packaging in accordance with manufacturer's written instructions until ready for installation.

1.10 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Do not install equipment until following conditions can be maintained in spaces to receive equipment:
 - 1. Ambient temperature: 32 to 104 degrees F (0 to 40 degrees C).

2. Relative humidity: Maximum 90 percent, non-condensing.

1.11 WARRANTY

A. Manufacturer's Warranty: Manufacturer shall provide a 5-year limited warranty on products within this installation, except where otherwise noted, and consisting of a one-for-one device replacement

1.12 ADDITIONAL MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. No additional materials required for attic stock.

PART 2 - **PRODUCTS**

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide <u>Wattstopper/Legrand</u>; no substitutions

2.2 DISTRIBUTED DIGITAL LIGHTING CONTROL SYSTEM

- A. Equipment required: Lighting Control and Automation system as defined under this section covers the following equipment.
 - 1. Digital Lighting Management (DLM) local network: Free topology, plug-in wiring system (Cat 5e) for power and data to room devices.
 - 2. Digital Occupancy Sensors: Self-configuring, digitally addressable, calibrated occupancy sensors with LCD display and two-way active infrared (IR) communications.
 - 3. Digital Switches: Self-configuring, digitally addressable pushbutton on/off, dimming, and scene switches with two-way active infrared (IR) communications.
 - 4. Handheld remotes for personal control: On/Off, dimming and scene remotes for control using infrared (IR) communications. Remote may be configured in the field to control selected loads or scenes without special tools.
 - 5. Digital Daylighting Sensors: Single-zone open loop daylighting sensors with two-way active infrared (IR) communications for daylight harvesting using switching, bi-level, tri-level or dimming control.
 - 6. Digital Lighting Management Relay Panel and Zone Controller: Provides up to 8, 24, or 48 mechanically latching relays. Relays include a manual override and a single push-on connector for easy installation or removal from the panel. Panel accepts program changes from handheld configuration tool for date and time, location, holidays, event scheduling, button binding and group programming.

- 7. Emergency Lighting Control Unit (ELCU): Allows a standard lighting control device to control emergency lighting in conjunction with normal lighting in any area within a building.
- B. Local Network LMRJ-Series: DLM local network is a free topology lighting control physical connection and communication protocol designed to control a small area of a building.
 - 1. Features of the DLM local network include:
 - a. Plug n' Go automatic configuration and binding of occupancy sensors, switches and lighting loads to the most energy-efficient sequence of operation based upon the device attached.
 - b. Simple replacement of any device in the local DLM network with a standard off the shelf unit without requiring significant commissioning, configuration or setup.
 - c. Push n' Learn configuration to change the automatic configuration, including binding and load parameters without tools, using only the buttons on the digital devices in the local network.
 - d. Two-way infrared communications for control by handheld remotes, and configuration by a handheld tool including adjusting load parameters, sensor configuration and binding, within a line of sight of up to 30 feet from a sensor, wall switch or IR receiver.
 - 2. Digital room devices connect to the local network using pre-terminated Cat 5e cables with RJ-45 connectors, which provide both data and power to room devices. Systems that utilize RJ-45 patch cords but do not provide serial communication data from individual end devices are not acceptable.
 - 3. If manufacturer's pre-terminated Cat5e cables are not used for the installation each cable must be individually tested and observed by authorized service representative following installation.

2.3 DIGITAL LOAD CONTROLLERS (ROOM CONTROLLERS)

- A. Digital Load Controllers: Digital controllers for lighting zones, fixtures and/or plug loads automatically bind room loads to the connected control devices in the space without commissioning or the use of any tools. Provide controllers to match the room lighting and plug load control requirements. Controllers are simple to install, and do not have dip switches/potentiometers, or require special configuration for standard Plug n' Go applications. Control units include the following features:
 - 1. Automatic room configuration to the most energy-efficient sequence of operation based upon the devices in the room
 - 2. Simple replacement using the default automatic configuration capabilities, a room controller may be replaced with an off-the-shelf device.
 - 3. Multiple room controllers connection together in a local network must automatically arbitrate with each other, without requiring any configuration or setup, so that individual load numbers are assigned starting with load 1 to a maximum of 64, assigned based on each controller's device ID's from highest to lowest.
 - 4. Device Status LEDs to indicate:

- a. Data transmission.
- b. Device has power.
- c. Status for each load.
- d. Configuration status.
- 5. Quick installation features including
 - a. Standard junction box mounting.
 - b. Quick low-voltage connection using standard RJ-45 patch cable.
- 6. Based on individual configuration, each load shall be capable of the following behavior on power up following the loss of normal power.
 - a. Turn on to 100 percent.
 - b. Turn off.
 - c. Turn on to last level.
- 7. Each load shall be configurable to operate in the following sequences based on occupancy:
 - a. Auto-On/Auto-Off (Follow on and off)
 - b. Manual-On/Auto-Off (Follow off only)
- 8. Polarity of each load output shall be reversible, via digital configuration, so that on is off and off is on.
- 9. UL 2043 plenum rated.
- 10. Manual override and LED indication for each load.
- 11. Zero cross circuitry for each load.
- 12. All digital parameter data programmed into an individual room controller or plug load controller shall be retained in non-volatile FLASH memory within the controller itself. Memory shall have an expected life of no less than 10 years.
- 13. Dimming Room Controllers shall share the following features:
 - a. Fade rates for dimming loads shall be specific to bound switch buttons, and the load shall maintain a default value for any bound buttons that do not specify a unique value.
 - b. The following dimming attributes may be changed or selected using a wireless configuration tool:
 - 1) Establish preset level for each load from 0-100 percent.
 - 2) Set high and low trim for each load.
 - c. Override button for each load provides the following functions:
 - 1) Press and release for on/off control.
 - 2) Press and hold for dimming control.

- d. Each dimming output channel shall have an independently configurable minimum and maximum calibration trim level to set the dimming range to match the true dynamic range of the connected driver. LED level indicators on bound dimming switches shall utilize this new maximum and minimum trim.
- e. Each dimming output channel shall have an independently configurable minimum and maximum trim level to set the dynamic range of the output within the new 0-100 percent dimming range defined by the minimum and maximum calibration trim.
- f. Calibration and trim levels must be set per output channel. Devices that set calibration or trim levels per controller (as opposed to per load) are not acceptable.
- g. All configuration shall be digital. Devices that set calibration or trim levels per output channel via trim pots or dip-switches are not acceptable.

2.4 DIGITAL DAYLIGHTING SENSORS

- A. Digital daylighting sensors shall work with load controllers and relay panels to provide automatic switching, bi-level, or tri-level or dimming daylight harvesting capabilities for any load type connected to the controller or panel. Daylighting sensors shall be interchangeable without the need for rewiring.
 - 1. Closed loop sensors measure the ambient light in the space and control a single lighting zone.
 - 2. Open loop sensors measure incoming daylight in the space, and are capable of controlling up to three lighting zones.
 - 3. Dual loop sensors measure both ambient and incoming daylight in the space to insure that proper light levels are maintained as changes to reflective materials are made in a single zone

2.5 LMZC ZONE CONTROLLER

- A. Hardware: Provide LMCP lighting control panels in the locations and capacities as indicated on the Drawing and schedules. Each panel shall be of modular construction and consist of the following components:
 - 1. Enclosure/Tub shall be NEMA 1, sized to accept an interior with 1 8 relays, 1 24 relays and 6 four-pole contactors, or 1 48 relays and 6 four-pole contactors.
 - 2. Cover shall be configured for surface or flush wall mounting of the panel as indicated on the plans. LMCP panel cover shall have a hinged and lockable door with restricted access to line voltage section of the panel.
 - 3. Interior assembly shall be supplied as a factory assembled component specifically designed and listed for field installation. Interior construction shall provide total isolation of high voltage (Class 1) wiring from low voltage (Class 2) wiring within the assembled panel. Interior assembly shall include intelligence boards, power supply, DIN rails for mounting optional Class 2 control devices, and individually replaceable latching type relays. Panel interiors shall include the following features:

- a. Removeable, plug-in terminal blocks with connections for all low voltage terminations.
- b. Individual terminal block, override pushbutton, and LED status light for each relay.
- c. Direct wired switch inputs associated with each relay shall support 2-wire momentary switches only.
- d. Digital inputs (four RJ-45 jacks) shall support 1-, 2-, 3-, 4-, and 8-button digital switches; digital IO modules capable of receiving 0-5V or 0-10V analog photocell inputs; digital IO modules capable of receiving momentary or maintained contact closure inputs or analog sensor inputs; digital daylighting sensors; and digital occupancy sensors. Inputs are divided into two separate digital networks, each capable of supplying 250mA to connected devices.
- e. True relay state shall be indicated by the on-board LED and shall be available to external control devices and systems via BACnet.
- f. Automatically sequenced operation of relays to reduce impact on the electrical distribution system when large loads are controlled simultaneously.
- g. Group and pattern control of relays shall be provided through a simple keypad interface from a handheld IR programmer. Any set of relays can be associated with a group for direct on/off control or pattern (scene) control via a simple programming sequence using the relay override pushbuttons and LED displays for groups 1-8 or a handheld IR programmer for groups 1-99.
- h. Relay group status for shall be provided through LED indicators for groups 1-8 and via BACnet for groups 1-99. A solid LED indicates that the last group action called for an ON state and relays in the group are on or in a mixed state.
- 4. Single-pole latching relays with modular plug-in design. Relays shall provide the following ratings and features:
 - a. Electrical:
 - 1) 30 amp ballast at 277V
 - 2) 20amp tungsten at 120V
 - 3) 1.5 HP motor at 120V
 - 4) 14,000 amp short circuit current rating (SCCR) at 347V
 - b. Mechanical:
 - 1) 30 amp ballast at 277V
 - 2) 20amp tungsten at 120V
 - 3) 1.5 HP motor at 120V
 - 4) 14,000 amp short circuit current rating (SCCR) at 347V
- 5. Isolated low voltage contacts provide for true relay status feedback and pilot light indication.
- 6. Power supply shall be a multi-voltage transformer assembly with rated power to supply all electronics, occupancy sensors, switches, pilot lights, and photocells as necessary to

meet the project requirements. Power supply to have internal over-current protection with automatic reset and metal oxide varistor protection.

- 7. Where indicated, lighting control panels designated for control of emergency lighting shall be provided with factory installed provision for automatic by pass of relays controlling emergency circuits upon loss of normal power. Panels shall be properly listed and labeled for use on emergency lighting circuits and shall meet the requirements of UL924 and NFPA 70 Article 700. All emergency fixtures being dimmed under normal power shall go to full brightness.
- 8. Integral system clock shall provide scheduling capabilities for panel-only projects without DLM segment networks or BAS control.
 - Each panel shall include digital clock capability able to issue system wide automation commands to up to 11 other panels for a total of 12 networked lighting control panels. Clock shall provide capability for up to 254 independent schedule events per panel for each of the ninety-nine system wide channel groups.
 - b. Clock capability of each panel shall support the time-based energy saving requirements of applicable local energy codes.
 - c. Clock module shall provide astronomic capabilities, time delays, blink warning, daylight savings, and holiday functions and will include a battery back up for clock function and program retention in non-volatile FLASH memory. Clocks that require multiple events to meet local code lighting shut off requirements shall not be allowed.
 - d. Clock capability of each panel shall operate on a basis of ON/OFF or Normal Hours/After Hours messages to automation groups that implement pre-configured control scenarios. Scenarios shall include:
 - 1) Scheduled ON / OFF
 - 2) Manual ON / Scheduled OFF
 - 3) Astro ON / OFF (or Photo ON / OFF)
 - 4) Astro and Schedule ON / OFF (or Photo and Schedule ON / OFF)
 - e. User interface shall be portable IR handheld remote control capable of programming any panel in the system
 - f. Clock capability of each panel shall employ non-volatile memory and shall retain user programming and time for a minimum of 10 years.
 - g. Schedules programmed into the clock of any one panel shall be capable of executing panel local schedule or Dark/Light (photocell or Astro) events for that panel in the event that global network communication is lost. Lighting control panels that are not capable of executing events independently of the global network shall not be acceptable.
- 9. Lighting control panel can operate as a stand-alone system, or can support schedule, group, and photocell control functions, as configured in a Segment Manager controller, via a segment network connection.
- 10. Lighting control panel shall support digital communications to facilitate the extension of control to include interoperation with building automation systems and other intelligent

field devices. Digital communications shall be RS485 MS/TP-based using the BACnet protocol.

- a. Panel shall have provision for an individual BACnet device ID and shall support the full 222 range (0 4,193,304). The device ID description property shall be writable via the network to allow unique identification of the lighting control panel on the network.
- b. Panel shall support MS/TP MAC addresses in the range of 0 127 and baud rates of 9600k, 38400k, 76800k, and 115.2k bits per second.
- c. Lighting control relays shall be controllable as binary output objects in the instance range of 1 64. The state of each relay shall be readable and writable by the BAS via the object present value property.
- d. Lighting control relays shall report their true on/off state as binary input objects in the instance range of 1 64.
- e. The 99 group Normal Hours/After Hours control objects associated with the panel shall be represented by binary value objects in the instance range of 201 299. The occupancy state of each channel group shall be readable and writable by the BAS via the object present value property. Commanding 1 to a channel group will put all relays associated with the channel into the normal hours mode. Commanding 0 or NULL shall put the relays into the after hours mode.
- f. Setup and commissioning of panel shall not require manufacturer-specific software or a computer. All configuration of the lighting control panel shall be performed using standard BACnet objects or via the handheld IR programming remote. Provide BACnet objects for panel setup and control as follows:
 - 1) Binary output objects in the instance range of 1 64 (one per relay) for on/off control of relays.
 - 2) Binary value objects in the instance range of 1 99 (one per channel) for normal hours/after hours schedule control.
 - 3) Binary input objects in the instance range of 1 64 (one per relay) for reading true on/off state of the relays.
 - 4) Analog value objects in the instance range of 101 199 (one per channel group) shall assign a blink warn time value to each channel. A value of 5 shall activate the blink warn feature for the channel and set a 5-minute grace-time period. A value of 250 shall activate the sweep feature for the channel and enable the use of sweep type automatic wall switches.
- 11. In addition to the LMCP Relay Panels, an LMZC Zone Controller panel shall be available for zero-relay applications. The panel is designed for applications where LMFC-011 Fixture Controllers or other distributed load controllers are used to switch and/or dim the controlled loads. Key similarities to and differences from the LMCP panel design shall include:
 - a. Use the same intelligence board as the LMCP relay panel.
 - b. Shall not include relay driver boards or relays.
 - c. Have a removable interior section to facilitate installation, and a Tub/Cover. Cover is for surface mounting applications only.
 - d. Tub shall have two interior KOs to allow installation of LMPB-100 Power Boosters. Each installed Power Booster can provide an additional 150 mA for either of the two available DLM local networks provided by the LMZC.

- e. All programming and networking (whether DLM Local Network and/or Segment Network) capabilities in the LMZC Zone Controller shall be similar to capabilities for LMCP relay panels, except for functions designed for panel-mounted HDR relays.
- 12. To aid in project start up, if LMFC Fixture Controllers are connected to an LMZC Zone Controller, Plug n' Go automatic configuration will establish a unique sequence of operation so that all LMFC-controlled fixtures will turn on to 50 percent output when any digital occupancy sensor detects motion.
- B. User Interface: Each lighting control panel system shall be supplied with at least one handheld configuration tool. As a remote programming interface, the configuration tool shall allow setup, configuration, and diagnostics of the panel without the need for software or connection of a computer. User interface shall have the following panel-specific functions as a minimum:
 - 1. Button binding of digital switches to groups shall be accessible via the handheld IR remote and accomplished from the digital switch station.
 - 2. Programming of panel location information shall be accomplished by the handheld IR remote and include at a minimum LAT, LON, DST zone, and an approximate city/state location.

2.6 EMERGENCY LIGHTING CONTROL DEVICES

1. Not required on project, emergency battery packs only.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Do not begin installation until measurements have been verified and work areas have been properly prepared.
- B. If preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Verify that required pre-installation meeting specified in Part 1 of this specification has been completed, recorded meeting minutes have been distributed and all outstanding issues noted have been resolved prior to the start of installation.

3.2 INSTALLATION

- A. Install system in accordance with the approved system shop drawings and manufacturer's instructions.
- B. Install all room/area devices using manufacturer's factory-tested Cat 5e cable with pre-terminated RJ-45 connectors.

- 1. If fixtures have internal DLM Control Modules, ensure that they are also connected with Cat 5e cable.
- 2. Low voltage wiring topology must comply with manufacturer's specifications.
- C. All line voltage connections shall be tagged to indicate circuit and switched legs.
- D. Test all devices to ensure proper communication.
- E. Calibrate all sensor time delays and sensitivity to guarantee proper detection of occupants and energy savings. Adjust time delay so that controlled area remains lighted while occupied.
- F. Provide written or computer-generated documentation on the configuration of the system including room by room description including:
 - 1. Sensor parameters, time delays, sensitivities, and daylighting setpoints.
 - 2. Sequence of operation, (e.g. manual ON, Auto OFF. etc.)
 - 3. Load Parameters (e.g. blink warning, etc.)
- G. Post start-up tuning Adjust sensor time delays and sensitivities to meet the Owner's requirements 30 days from beneficial occupancy. Provide a detailed report to the Architect / Owner of post start-up activity.
- H. Tighten all panel Class I conductors from both circuit breaker and to loads to torque ratings as marked on enclosure UL label.
- I. All Class II cabling shall enter enclosures from within low-voltage wiring areas and shall remain within those areas. No Class I conductors shall enter a low-voltage area.
- J. Run separate neutrals for any phase dimmed branch load circuit. Different types of dimming loads shall have separate neutral.
- K. Verify all non-panel-based lighting loads to be free from short circuits prior to connection to room controllers.

3.3 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing. Notify Architect, Lighting Designer and Manufacturer in writing a minimum of 3 weeks prior to system start-up and testing.
- B. Tests and Inspections: Manufacturer's service representative shall perform the following inspections and prepare reports.
 - 1. Verify Class I and II wiring connections are terminated properly by validating system performance.
 - 2. Set IP addresses and other network settings of system front end hardware per facilities IT instructions.

- 3. Verify / complete task programming for all switches, dimmers, time clocks, and sensors.
- 4. Verify that the control of each space complies with the Sequence of Operation.
- 5. Correct any system issues and retest.
- C. Provide a report in table format with drawings, or using a software file that can be opened in the manufacturer's system software including each room or space that has lighting control installed. Indicate the following:
 - 1. Date of test or inspection.
 - 2. Loads per space, or Fixture Address identification.
 - 3. Quantity and Type of each device installed
 - 4. Reports providing each device's settings.

3.4 DEMONSTRATE AND TRAINING

- A. Before Substantial Completion, arrange and provide two separate training session (min. of 4 hours each) for Owner instruction period to designated Owner personnel. Set-up, starting of the lighting control system and Owner instruction includes:
 - 1. Confirmation of entire system operation and communication to each device.
 - 2. Confirmation of operation of individual relays, switches, and sensors.
 - 3. Confirmation of system Programming, photocell settings, override settings, etc.
 - 4. Provide training to cover installation, programming, operation, and troubleshooting of the lighting control system.

3.5 PRODUCT SUPPORT AND SERVICE

A. Factory telephone support shall be available at no cost to the Owner following acceptance. Factory assistance shall consist of assistance in solving application issues pertaining to the control equipment.

END OF SECTION 260926

SECTION 262726 - WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Standard-grade receptacles, 125 V, 20 A.
 - 2. GFCI receptacles, 125 V, 20 A.
 - 3. Cord and plug sets.
 - 4. Toggle switches, 120/277 V, 20 A.
 - 5. Wall plates.

1.3 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. GFCI: Ground-fault circuit interrupter.
- C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.
- D. RFI: Radio-frequency interference.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.
- C. Samples: One for each type of device and wall plate specified, in each color specified.

1.5 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packinglabel warnings and instruction manuals that include labeling conditions.

PART 2 - PRODUCTS

2.1 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- B. Comply with NFPA 70.
- C. RoHS compliant.
- D. Comply with NEMA WD 1.
- E. Devices for Owner-Furnished Equipment:
 - 1. Receptacles: Match plug configurations.
 - 2. Cord and Plug Sets: Match equipment requirements.
- F. Finish Color:
 - 1. Wiring Devices Connected to Normal Power System: As selected by Architect unless otherwise indicated or required by NFPA 70 or device listing.
 - 2. Wiring Devices Connected to Emergency Electrical System: RED.
- G. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 MANUFACTURERS:

- A. Basis-of-Design Product: Subject to compliance with requirements, provide <u>Pass &</u> <u>Seymour/Legrand (Pass & Seymour)</u>; or a comparable product by one of the following:
 - 1. Cooper Industries/Cooper Wiring Devices.
 - 2. Hubbell Incorporated; Wiring Device-Kellems.
 - 3. Leviton Manufacturing Co., Inc.

2.3 RECEPTACLES, 125 V, 20 A

A. Duplex Receptacles, 125 V, 20 A; comply with UL 498, NEMA WD 1 and NEMA WD 6 configurations:

- 1. Convenience: 5362
- 2. Tamper-Resistant: TR5362
- 3. Tamper-Resistant USB: TR5362USB
 - a. Two (2) USB ports,
 - b. Minimum Charging Output: 3.1A.
- 4. Tamper-Resistant GFCI: 2097TR
 - a. Comply with UL 943, Class A
 - b. Integral self-testing with power denial technology
 - c. Minimum automatic self-test every: 3 seconds
 - d. Indicator light that is lighted when device is tripped.
- 5. Tamper- and Weather-Resistant GFCI: 2097TRWR
 - a. Weatherproof cover: WIUC20FRED.

2.4 TWIST-LOCKING RECEPTACLES

- A. Twist-Lock, Single Receptacles, 125 V, 20 A:
 - 1. Configuration: NEMA WD 6, Configuration L5-20R.
 - 2. Standards: Comply with UL 498.

2.5 TOGGLE SWITCHES, 120/277 V, 20 A

- A. Switches, 120/277V, 20A; comply with UL 20 and NEMA WD 1:
 - 1. Single-Pole: PS20AC1
 - 2. Three-Way: PS20AC3
 - 3. Four-Way: PS20AC4
 - 4. Key-Operated Single-Pole: PS20AC1-L
 - 5. Key-Operated Three-Way: PS20AC3-L
 - 6. Key-Operated Four Way: PS20AC4-L

2.6 WALL PLATES

- A. Single Source: Obtain wall plates from same manufacturer of wiring devices.
- B. Single and combination types shall match corresponding wiring devices.
 - 1. Plate-Securing Screws: Metal with head color to match plate finish.

- 2. Material for Finished Spaces: 0.035-inch- (1-mm-) thick, satin-finished, Type 302 stainless steel.
- 3. Material for Unfinished Spaces: Galvanized steel.
- 4. Material for Damp Locations: Thermoplastic with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.
- C. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, thermoplastic with lockable cover.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.
- B. Coordination with Other Trades:
 - 1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes, and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
 - 2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
 - 3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
 - 4. Install wiring devices after all wall preparation, including painting, is complete.
- C. Conductors:
 - 1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
 - 2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
 - 3. The length of free conductors at outlets for devices shall comply with NFPA 70, Article 300, without pigtails.
- D. Device Installation:
 - 1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
 - 2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
 - 3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.

- 4. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
- 5. Use a torque screwdriver when a torque is recommended or required by manufacturer.
- 6. Tighten unused terminal screws on the device.
- 7. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.
- E. Receptacle Orientation:
 - 1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the left.
- F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.
- G. Dimmers:
 - 1. Install dimmers within terms of their listing.
 - 2. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device, listing conditions in the written instructions.
- H. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

3.2 GFCI RECEPTACLES

A. Install non-feed-through GFCI receptacles where protection of downstream receptacles is not required.

3.3 IDENTIFICATION

- A. Comply with Section 260553 "Identification for Electrical Systems."
- B. Identify each receptacle with panelboard identification and circuit number. Use hot, stamped, or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.
- C. Essential Electrical System: Mark receptacles supplied from the essential electrical system to allow easy identification using a self-adhesive label.

3.4 FIELD QUALITY CONTROL

A. Test Instruments: Use instruments that comply with UL 1436.

- B. Test Instrument for Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.
- C. Perform the following tests and inspections:
 - 1. Test Instruments: Use instruments that comply with UL 1436.
 - 2. Test Instrument for Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.
- D. Tests for Receptacles:
 - 1. Line Voltage: Acceptable range is 105 to 132 V.
 - 2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
 - 3. Ground Impedance: Values of up to 2 ohms are acceptable.
 - 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
 - 5. Using the test plug, verify that the device and its outlet box are securely mounted.
 - 6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault-current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.
- E. Wiring device will be considered defective if it does not pass tests and inspections.
- F. Prepare test and inspection reports.

END OF SECTION 262726

SECTION 265119 - LED INTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interior solid-state luminaires that use LED technology.
 - 2. Lighting fixture supports.
- B. Related Requirements:
 - 1. Section 260923 "Lighting Control Devices" for automatic control of lighting, including time switches, photoelectric relays, occupancy sensors, and multipole lighting relays and contactors.
 - 2. Section 260926 "Lighting Control Panels" for panelboards used for lighting control.

1.2 DEFINITIONS

- A. CCT: Correlated color temperature.
- B. CRI: Color Rendering Index.
- C. Fixture: See "Luminaire."
- D. IP: International Protection or Ingress Protection Rating.
- E. LED: Light-emitting diode.
- F. Lumen: Measured output of lamp and luminaire, or both.
- G. Luminaire: Complete lighting unit, including lamp, reflector, power supply/driver and housing.
- H. Delivered Lumen: Measured light output exiting luminaire after all lensing reflector housing, etc.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product, arranged by designation.
- B. Shop Drawings: For nonstandard or custom luminaires.
 - 1. Include plans, elevations, sections, and mounting and attachment details.

- 2. Factory drawings for each variation of recessed and suspended linear lighting systems including lengths that are integral to continuous run with emergency functions in them. Submit factory drawing indicating which room each run is intended for.
- 3. Include details of luminaire assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
- 4. Include diagrams for power, signal, and control wiring.
- C. Alternate Manufacturers:
 - 1. Provide one luminaire for each alternate manufacturer of product not listed in light fixture schedule. Sample luminaire shall be the specified color temperature, lumen output, correct size (i.e. 2x2 or 2x4), plug and cord installed on luminaire. Paint chip samples for non-standard colors shall be provided to Architect in size and quantity as required by Architect. Provision of sample does not imply approval of luminaire. All samples must be delivered (assembled and in working order) for inspection 10 working days prior to bid with 5 working days review period allocated to design team. Each sample shall have factory label with date of manufacturing and shall have been fabricated within 6 months of bid date.
 - 2. Where material or equipment is identified by proprietary name, model number and/or manufacturer, furnish named item, or its equal of manufacturer indicated in this specification and as on Light Fixture Schedule. Alternate Manufacturers (other than first named or indicated as the basis of design) shall be equal or better in quality and performance and must be suitable for available space, required arrangement, and application. Submit all data necessary to determine suitability of alternate manufacturers for review.
 - 3. The suitability of named item only has been verified. Where more than one Manufacturer is named, only the first named Manufacturer has been verified as suitable. Manufacturers and items other than first named shall be equal or better in quality and performance to that of specified items, and must be suitable for available space, required arrangement and application.
 - 4. For each alternate manufacturer proposed by the Contractor, the Contractor shall clearly identify all differences (i.e., paragraph-by-paragraph, performance differences, physical differences, etc.) from the specified item, changes in Contract cost, benefits to the Owner and a brief description why the substitution is being proposed.
- D. Product Schedule: For luminaires and lamps. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale and coordinated with each other, using input from installers of the items involved.
- B. Seismic Qualification Certificates: For luminaires, accessories, and components, from manufacturer.

C. Product Certificates: For each type of luminaire.

1.5 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.6 WARRANTY

- A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
- B. Warranty Period: Five year(s) from date of Substantial Completion.

1.7 ADDITIONAL MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Drivers: Provide 1 additional driver for each type of Luminaire on project.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Luminaires shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
- B. Seismic Performance: Luminaires and lamps shall be labeled vibration and shock resistant.
 - 1. The term "withstand" means "the luminaire will remain in place without separation of any parts when subjected to the seismic forces specified and the luminaire will be fully operational during and after the seismic event."

2.2 LUMINAIRE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. NRTL Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by an NRTL.
- C. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.

- D. Recessed Fixtures: Comply with NEMA LE 4.
- E. CRI minimum of 80. CCT of 4000 Kelvin. unless otherwise noted on light fixture schedule.
- F. Rated lamp life of 50,000 hours minimum at L70.
- G. Dimmable from 100 percent to 10 percent of maximum light output minimum, flicker free and no cut outs (unless otherwise specifically noted in light fixture schedule for lower dimming range). All dimming controls shall be coordinated and confirmed with each light fixture manufacturer dimming driver prior to rough-in and confirmation indicated at shop drawing level in writing.
- H. Internal driver. Bottom and/or room accessible when located in hard ceilings. No remote drivers unless specifically called for in light fixture schedule. All remote driver locations shall be submitted to architect for review and final approval prior to rough-in. Reverify all remote driver distances from luminaire with manufacturer recommendations and adjust wire size as required for normal operation.
- I. Nominal Operating Voltage: 120 V ac through 277 V ac (universal voltage) 12 V dc 24 V dc.
- J. Housings:
 - 1. Extruded-aluminum housing and heat sink.
 - 2. Anodized powder-coat painted finishes. Finish per Architect.
 - 3. <u>All parts painted after fabrication</u> (room side and ceiling side, entire fixture assembly).
- K. Refer to <u>all</u> Light Fixture Schedule General Notes.

2.3 EDGE LIT FLAT PANEL RECESSED TROFFERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Refer to Light Fixture Schedule for approved manufacturers.
- B. Minimum and/or Maximum lumens shall be per light fixture schedule.
- C. With integral mounting provisions.
- D. Bottom/Room side access.
- E. 0 10V dimmable with isolated lead wires.
- F. <u>All parts and pieces painted after fabrication</u> (room side and ceiling side, entire fixture assembly).
- G. Spring loaded cam latch style for doors.

2.4 DOWNLIGHT AND DRUM STYLE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Refer to Light Fixture Schedule for approved manufacturers.
- B. Minimum lumens shall be per light fixture schedule. Minimum allowable efficacy of 68 lumens per watt.
- C. Universal mounting bracket.
- D. Integral junction box with conduit fittings.
- E. 0 10V dimmable with isolated lead wires.
- F. Aluminum heat sink.
- G. Self-flanged.
- H. Gloves or other protective items shall be used when interacting with the reflector system. No finger prints, dirt, or oils shall be visible. Any indication of these shall require replacement of reflector system at no cost to manufacturer or owner.

2.5 MATERIALS

- A. Metal Parts:
 - 1. Free of burrs and sharp corners and edges.
 - 2. Sheet metal components shall be steel unless otherwise indicated.
 - 3. Form and support to prevent warping and sagging
- B. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.
- C. Diffusers, and Globes:
 - 1. Acrylic: One hundred percent virgin acrylic plastic, with high resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
 - 2. Glass: Annealed crystal glass unless otherwise indicated.
 - 3. Lens Thickness: At least 0.125 inch (3.175 mm) minimum unless otherwise indicated.

2.6 METAL FINISHES

A. Variations in finishes are unacceptable in the same piece. Variations in finishes of adjoining components are acceptable if they are within the range of approved Samples and if they can be and are assembled or installed to minimize contrast.

2.7 LUMINAIRE SUPPORT COMPONENTS

- A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.
- B. Single-Stem Hangers: 1/2-inch (13-mm) steel tubing with swivel ball fittings and ceiling canopy. Finish same as luminaire.
- C. Wires: ASTM A 641/A 641 M, Class 3, soft temper, zinc-coated steel, 12 gage (2.68 mm).
- D. Rod Hangers: 3/16-inch (5-mm) minimum diameter, cadmium-plated, threaded steel rod.
- E. Hook Hangers: Integrated assembly matched to luminaire, line voltage, and equipment with threaded attachment, cord, and locking-type plug.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1.
- B. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.
- C. Install lamps in each luminaire.
- D. Supports: Sized and rated for luminaire weight.
- E. Flush-Mounted Luminaire Support: Secured to outlet box.
- F. Wall-Mounted Luminaire Support:
 - 1. Attached to structural members in walls Attached to a minimum 20 gauge backing plate attached to wall structural members Attached using through bolts and backing plates on either side of wall.
 - 2. Do not attach luminaires directly to gypsum board.
- G. Ceiling-Mounted Luminaire Support:
 - 1. Ceiling mount with two 5/32-inch- (4-mm-) diameter aircraft cable supports adjustable to 120 inches (6 m) in length.

- 2. Ceiling mount with pendant mount four-point pendant mount with 5/32-inch- (4-mm-) diameter aircraft cable supports adjustable to 120 inches (6 m) in length.
- 3. Ceiling mount with hook mount.
- H. Suspended Luminaire Support:
 - 1. Pendants and Rods: Where longer than 48 inches (1200 mm), brace to limit swinging.
 - 2. Stem-Mounted, Single-Unit Luminaires: Suspend with twin-stem hangers. Support with approved outlet box and accessories that hold stem and provide damping of luminaire oscillations. Support outlet box vertically to building structure using approved devices.
 - 3. Continuous Rows of Luminaires: Use tubing or stem for wiring at one point and wire support for suspension for each unit length of luminaire chassis, including one at each end.
 - 4. Do not use ceiling grid as support for pendant luminaires. Connect support wires or rods to building structure.
- I. Ceiling-Grid-Mounted Luminaires:
 - 1. Secure to any required outlet box.
 - 2. Secure luminaire using approved fasteners in a minimum of four locations, spaced near corners of luminaire.
- J. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables" for wiring connections.
- K. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- L. Emergency light fixtures shall be labeled "EM" and be visible from floor. Provide Phenolic labeling on ceiling grid at fixture with black letting and white background (verify location of name plate for fixtures that are wall mounted). Verify all labeling types, styles, lettering with Owner representative.

3.2 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
 - 2. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to generator power and retransfer too normal.
- B. Luminaire will be considered defective if it does not pass operation tests and inspections.
- C. Prepare test and inspection reports.

END OF SECTION 265119

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RABTREE, ROHRBAUGH & ASSOCIATES

CRA PROJECT No. 3734 THE COUNTY OF KENT

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BID DOCUMENTS

APPLICABLE BUILDING CODE(5): MARYLAND BUILDING REHABILITATION CODE, COMAR 05.16.01 MARYLAND BUIDLING PERFORMANCE STANDARDS, COMAR 05.02.07 INTERNATIONAL BUIDLING CODE/2021 (IBC) NATIONAL ELECTRICAL CODE/2021 MARYLAND FIRE PREVENTION CODE, COMAR 29.06.01-29.06.16 NFPA 101 LIFE SAFETY CODE 2021 MARYLAND ACCESSIBILITY CODE, COMAR09.12.53 ICC ANSI 117.1 2017 ACCESSIBILITY STANDARD 2010 ADA STANDARD 2010 ADA STANDARD INTERNATIONAL EXISTING BUILDING CODE/2021 (IEBC) ALTERATION LEVEL II PROJECT CONSISTS OF ALTERATION TO EXISTING ENTRANCE VESTIBULE AND INSTALLATION OF NEW SECURITY FEATURES. NO CHANGE TO EXISTING STRUCTURE OR OCCUPANCY LEVEL IN THE BUILDING COURTHOUSE LOBBY ALTERATION THE COUNTY OF KENT 403 N. CROSS STREET CHESTERNOWN, MD 21620 BUILDING CONSTRUCTION TYPE: ASSUMED VB ALTERATIONS/FRAMING TO MATCH OR EXCEED EXISTING CONSTRUCTION MATERIALS







GYPSUM	1 WALL BOARD LOCATION SCHEDULE
ABUSE RESISTANT GYPSUM BOARD	 ALL CORRIDOR WALLS UP TO 8'-0" (EXCEPT AS NOTED IN SPECIFICATIONS) ALL CLASSROOMS, SGI'S, AND OTHER EDUCATIONAL SPACES EXPOSED LAYER AT MULTIPLE LAYERS OF GYPSUM WALL BOARD WHERE NOTED IN SPECIFICATIONS
GYPSIIM WALL BOARD	 ALL OFFICES, CONFERENCE ROOMS AND SIMILAR LOW IMPACT LOCATIONS ALL OFFICES, CONFERENCE ROOMS AND SIMILAR LOW IMPACT
GYPSUM WALL BOARD	 ALL APPLICATIONS 8'-0" AND HIGHER ABOVE FINISH FLOOR ALL MULTIPLE LAYER WALLS, EXCEPT THE EXPOSED LAYER WHERE NOTED IN SPECIFICATIONS
MOLD & MOISTURE RESISTANT GYPSUM BOARD	 PAINTED WALLS & CEILINGS IN TOILET ROOMS, LOCKER ROOMS & SHOWERS
CEMENTITIOUS BACKER UNIT	 AT WALLS SURROUNDING SHOWERS AND TUBS SCHEDULED TO RECEIVE PORCELAIN OR CERAMIC TILE AT WALLS SCHEDULED TO RECEIVE PORCELAIN OR CERAMIC TILE

SENERAL INFORMATION	COVER SHEET	SHEET NAME	

ARCHITECTURAL A1.1 OVERALL FIRST FLOOR PLAN

ELECTRICAL E-1 PARTIAL ELECTRICAL FIRST FLOOR PLAN

DRAWING

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	MANUFACTURER	MODEL	VOLTS	MAX. ALLOCATED WATTAGE	LAMPS	MOUNTING
FION LISTED, 90+ CRI MIN.	VISA LIGHTING	CM1731.L30K.MVOLT.[premium finish].x.x SERIES	120 V	27.0 W	LED, 3000k, ~1900lms	CEILING, SURFACE AT EXISTING LOCATIONS.
AL LITHIUM-ION BATTERY,	EMERGI-LITE	EL-2RHL SERIES	120 V	11.0 W	LED, 9.6v, 5.4w 550lms PER HEAD	WALL, SURFACE AT 7'-6" A.F.F. OR AT EXISTING LOCATION.
3LE), 80+ CRI MIN., LIGHT AND HEMMED, POST	LSI	SFP22.LED.FS.UNV.DIM.[4000K].x SERIES	277 V	30.0 W	LED, 4000k, ~37001ms DELIVERED	CEILING, RECESSED
FION LISTED, 90+ CRI MIN.	VISA LIGHTING	CM1733.L30K.MVOLT.[premium finish].x.x SERIES	120 V	54.0 W	LED, 3000k, ~4300lms	
HED ALUM. FACE AND	EMERGI-LITE	BA.TXN.1.R SERIES		5.0 W	LED	UNIVERSAL. AT EXISTING LOCATION.

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TO BE REMOVED.

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GENERAL NOTES:

- <u>.</u> COORDINATE MOUNTING HEIGHTS OF ALL DEVICES WITH A ELEVATIONS AND CASEWORK DRAWINGS. HE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC IN NATURE AND AS SUCH SHALL NOT BE SCALED. EFER TO THE ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS OF DEVICES AND EQUIPMENT AND IMENSIONAL INFORMATION PRIOR TO ROUGH-IN. COORDINATE LOCATIONS OF MECHANICAL INDUMENT WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN OF SERVICE EQUIPMENT AND HE ELECTRICAL CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE DRAWINGS OF ALL OTHER VADES ON THE PROJECT. ELECTRICAL OR SYSTEMS CONNECTIONS INDICATED ON ARCHITECTURAL ECHANICAL, CIVIL, STRUCTURAL, KITCHEN AND ALL OTHER DRAWINGS WHICH ARE PART OF THIS ROJECT, SHALL BE CONSIDERED A PART OF THIS CONTRACT AND SHALL BE PROVIDED BY THE ECTRICAL CONTRACTOR AT NO EXTRA COST TO THE OWNER. ITECTU AL PLANS, SECTIONS
- Ω DINATE WALLS THAT ARE TO REMAIN AND NEW WALLS WITH AR CHITECTURAL PLANS
- o RING AND CONDUIT SIZES INDICATED IN PANEL SCHEDULES ARE MINIMUM ONLY. CONTRACTOR ALL BE RESPONSIBLE FOR DETERMINING EXACT WIRING AND CONDUIT SIZES. CONTRACTOR SHALL OVIDE SPLICE BLOCKS AND REDUCING PINS AS REQUIRED TO TERMINATE WIRING AND MAKE FINAL INNECTIONS.
- TRICAL BOXES IN FIRE RATED PARTITIONS SHALL NOT EXCEED 16 SQUARE INCHES IN AREA (IF), SHALL BE MADE OF STEEL, AND SHALL BE SUCH THAT THE CUMULATIVE AREA OF BOX OUTS" IN THE FIREWALL DOES NOT EXCEED 100 SQUARE INCHES PER 100 SQUARE FEET OF WALL V. ELECTRICAL BOXES ON OPPOSITE SIDES OF THE SAME FIREWALL SHALL BE SEPARATED BY A ZONTAL AND VERTICAL DISTANCE OF NOT LESS THAN 24 INCHES. THE ELECTRICAL CONTRACTOR L MAKE MINOR ADJUSTMENTS, AS NECESSARY, TO ELECTRICAL BOX LOCATIONS TO ENSURE PLIANCE WITH THIS REQUIREMENT SINCE BOX LOCATIONS ARE TYPICALLY NOT DIMENSIONED ON DRAWINGS. CONSULT ARCHITECT IF CLARIFICATION IS REQUIRED.
- 7 CONDUIT SHALL BE CONCEALED IN WALLS, FLOORS, ABOVE CEILING OR THROUGH MILLWORK. AT S CONDUIT ROUTING IS SHOWN FOR CLARITY AND IN NO WAY PROVIDES THE CONTRACTOR IY TO NOT PROVIDE CONCEALED CONDUIT AT ANY POINT OTHER POINT NOT SHOWN IN THE DING. REFER TO SPECIFICATIONS FOR CONDUIT AND WIRING REQUIREMENTS BASED ON ICATION.
- E CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT ROUTING OF WIRING AND NDUITS AND SHALL BE RESPONSIBLE FOR SIZING ALL BRANCH CIRCUIT WIRING TO LIMIT VOLTAGE OP TO 3%. CONTRACTOR SHALL SIZE CONDUIT TO ACCOMMODATE WIRING PER NEC. 20 AMPERE CUITS SHALL BE SIZED AS FOLLOWS:

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		20 AMPERE (CIRCUITS	
120 V(OLT	277 V(OLT	
WIRING LENGTH	WIRING SIZE	WIRING LENGTH	WIRING SIZE	SILE
0' - 60'	#12	0 '- 130'	#12	3/4"
60' - 100'	#10	130' - 210'	#10	3/4"
100' - 150'	#8	210' - 340'	#8	3/4"
150' - 240'	#6	340' - 540'	#6	3/4"
OVER 240'	#4	OVER 540'	#4	1"
<u>NOTE:</u>				

BRANCH CIRCUITS IN PANELBOARDS WITH 200% RATED NEUTRAL BUS AND ALL DIMMED LIGHTING CIRCUITS & ECM MOTORS SHALL HAVE DEDICATED NEUTRAL CONDUCTORS.

DEMOLITION NOTES:

- DEMOLITION DRAWING IS DIAGRAMMATIC IN NATURE; NO ATTEMPT HAS BEEN MADE TO SHOW ALL EXISTING ELECTRICAL WORK IN AREAS INDICATED TO BE RENOVATED. ALL EXISTING ELECTRICAL WORK IS TO BE REMOVED UNLESS OTHERWISE NOTED. WHEN AN ITEM IS INDICATED TO BE REMOVED, REMOVE ALL ASSOCIATED ELECTRICAL WORK BACK TO POINT OF SOURCE.
- WHERE WORK PASSES THROUGH THE RENOVATION AREA TO SERVE OTHER PORTIONS OF THE BUILDING, OR WORK IN THE RENOVATION AREA INDICATED TO REMAIN, IT SHALL BE SUITABLY RELOCATED AND THE SYSTEMS RESTORED TO NORMAL. COORDINATE ANY OUTAGES WITH OW DAYS IN ADVANCE.
- CATED TO REMAIN SHALL BE SUITABLY PROTECTED AGAINST DAMA
- DISPOSE OF ALL PCB CONTAINING FLUORESCENT AND HID BALLASTS IN ACCORDANCE WITH EPA, DOT, STATE AND LOCAL REGULATIONS. IF THE PCP CONTENT IS NOT STATED ON THE BALLAST LABE THE BALLAST LABEL SHALL BE HANDLED AS A PCB BALLAST. DISPOSE OF ALL FLUORESCENT, INCANDESCENT AND HID LAMPS IN ACCORDANCE WITH EPA, DOT, STATE AND LOCAL REGULATIONS
- COORDINATE ALL DEMOLITION AND CONSTRUCTION ACTIVITIES WITH THE OWNER TO MINIMIZE DISRUPTION OF THE NORMAL DAILY FUNCTIONING OF THE OWNERS OCCUPIED AREAS.

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- EFER TO ARCHITECTURAL FLOOR PLANS FOR EXISTING WALLS. ALL NEW DEVICES LOCATED ON XISTING WALLS SHALL BE FISHED TO BE INSTALLED CONCEALED AND FLUSH TO THE WALL; IF ISHING CANNOT OCCUR, PROVIDE APPROPRIATE SERIES WIREMOLD TO SURFACE MOUNTED EVICES.
- ALL REMOVED DEVICE WALL PENETRATIONS SHALL BE PATCHED AND PAINTED TO MATCH EXISTING WALL COLOR OR WALL COLOR PER ARCHITECT'S DIRECTION. WHEN A RECEPTACLE SHOWN TO BE DEMOLISHED INTERRUPTS AN ETR CI SHALL RE-ROUTE WIRING AS REQUIRED TO KEEP CIRCUIT IN USE. UIT, CON



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ALL CEILING MOUNTED DEVICES

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LOBBY A101

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LOBBY A102

FIRST FLOOR PLAN - LIGHTING

