Hudsonville Public Schools

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File/Name *Description*

Section

Section 27 41 16 – Multimedia System - Drawings

Section 27 51 16 – Public Address System - Drawings

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Section 28 23 00 – Video Monitoring System - Drawings

NOTE:

Other coordination drawings may be obtained from the Owner's Construction Manager or may be reviewed on site at the field office at the worksite. Such drawings may include electrical plans, reflected ceiling plans or other plans as may be updated due to issuance of bulletins or field changes.

END OF SECTION

SECTION 00 11 16
INVITATION TO BID

PART 1 - GENERAL

1.01 WORK INCLUDED: NEW BUILDING TECHNOLOGY SYSTEMS

A. Hudsonville Public Schools (Owner) is seeking bids for purchase and installation of new classroom multimedia, public address, clock, and video monitoring systems and associated equipment and installation. Proposed systems shall be configured and installed as described herein.

B. Project: New 5th-6th Grade and Forest Grove Elementary Technology Systems

C. Owner: Hudsonville Public Schools
3886 Van Buren
Hudsonville, MI 49426

D. Designer: Communications by Design, Inc.

E. Sites of Work:

1. The 5/6 Building at Georgetown
8175h Avenue
Hudsonville, MI 49426

2. Forest Grove Elementary School
1645 32nd Ave.
Hudsonville, Michigan 49426

1.02 GENERAL DESCRIPTION OF PROJECT SEQUENCE

A. Sequences and dates specified herein are for information only and indicate the plan and intent of the Owner. Actual dates shall be established based on final award of project.

B. Sequence of operations shall be established by the Contractor within the guidelines established by the Owner as required to meet schedules.

C. Schedule:

1. Request for Bid Distributed: December 28th, 2022

2. Pre-Bid Meeting: January 10th at 4:00 PM

3. Intent to Bids Due: January 17th at 5:00 PM

4. Question and Clarification Deadline: January 16th at 5:00 PM

5. Public Bids Due: January 26th at 4:00 PM

1.03 TYPES OF BIDS

A. Bids shall be submitted in total and with required detail for each item bid and as is required herein and include all portions of the work identified for the individual bid package as specified herein. Bids shall be made on unaltered bid forms as included herein. Bidder shall fill in all blank spaces and the bid shall be signed by a legal officer or agent authorized to bind the bidder to a contract.

1.04 PRE-BID CONFERENCE

A. A pre-bid conference will be held. A discussion of the project and review of bid documents will be followed by a site review and an opportunity to ask questions. Attendance is highly encouraged for all contractors interested in bidding on any components or portions of this project. Attendance at the pre-bid conference will be a factor considered during evaluation of bids.

B. Time: January 10th at 4:00 PM

C. Hudsonville Public Schools
3835 Baldwin St
Hudsonville, MI 49426

D. Any drawings identified in the table of contents herein will be distributed and reviewed at this conference.

E. Physical building inspections of sites of work will be provided for at this time.

1.05 TIME AND PLACE OF BID RECEPTION

A. Physically sealed bids for the base bid work will be received at the district office and read aloud at a public opening. Bids arriving after the appointed time as determined by the Owner's representative conducting the public opening, shall be returned unopened. Bids will be accepted beginning forty-eight (48) hours prior to the appointed opening time provided they are in sealed packages and addressed as specified herein.

B. Bid Receipt Deadline: January 26th at 4:00 PM

C. Bid Opening Location: Hudsonville Public Schools
3886 Van Buren
Hudsonville, MI 49426

D. Faxed or electronically delivered bids will not be accepted.

1.06 EXAMINATION AND PROCUREMENT OF DOCUMENTS

A. Specifications and any relevant Drawings may be obtained from the Technology Designer. Contractors may obtain copies by documented request to Communications by Design, Attn: Rebecca Szilagy. Requests may be made by:

1. Writing – 4101 Sparks Drive Grand Rapids, Michigan 49546

2. Email – rszilagy@cbdconsulting.com

1.07 BID SECURITY

A. Bid security equal to five percent (5%) of the total bid amount, must accompany each base bid in accordance with the Instruction to Bidders.

B. Bid security shall be either a Bid Bond issued by a company licensed in the State of Michigan to furnish bid security or Certified Check made payable to the Owner.

1.08 OWNER'S RIGHT TO REJECT BIDS

A. The Owner reserves the right to reject any and/or all bids. The Owner reserves the right to accept a bid, or portion thereof by issuance of a valid purchase order within ninety (90) calendar days following the bid opening. No bids may be withdrawn during this time without the specific approval of the Owner.

B. Withdrawal of any Bids after the opening time without specific approval by Owner may result in forfeiture of required bid security by Bidder.

1.09 DEFINITIONS

A. "Owner" is intended to mean Hudsonville Public Schools, a general powers school district.

B. For purposes of this project, the terms "Architect", "Engineer" and "Designer" are used synonymously to refer to Communications by Design, Inc., a Michigan Corporation.

C. The term "Bidder" refers to any organization properly and accurately submitting a complete "Intent to Bid Form" prior to the required time specified herein and subsequently properly submitting completed set of bid documents as specified herein.

D. The term “Contractor” herein is a reference to the firm(s) eventually selected by the Owner to provide the intended system(s), or any portion thereof, and fulfill the terms of the contract.

E. The term Contract is a reference to the collective set of documents, drawings, diagrams, Owner’s Purchase Order, Addenda, and all other materials as provided for herein defining arrangement between Owner and Contractor.

F. The term Addenda (or Addendum) are that portion of the Contract consisting of modifications, amendments, deletions, or substitutions to the contract documents issued prior to the execution of the Contract.

END OF SECTION

SECTION 00 40 00
BID FORMS

Intent to Bid Form

Complete and submit the following form if you have interest or intend to submit a Bid for this project. Unaltered and completed forms must be received on or before 5:00 PM on January 17, 2023. Only bidders returning a completed "Intent to Bid Form" will be notified of required addenda.

Company Information

Name: _____

Address Line1: _____

Address Line2: _____

City, State and Zip Code _____

Primary Contact Information

Name: _____

Phone No.: _____

Fax. No.: _____

E-Mail Address: _____

Portions of the bid for which you will be responding:

- ☐ Section 27 41 16 - Multimedia Systems
- ☐ Section 27 51 16 - Public Address System
- ☐ Section 27 53 13 - Clock System
- ☐ Section 28 23 00 - Video Monitoring System

Submit unaltered and completed form to:

Rebecca Szilagy
Communications by Design, Inc.
rszilagy@cbdconsulting.com

SEALED BID LABEL

Separate, or fold over, the label on the line below, and affix to the exterior of sealed container so information is clearly visible for Bid Submission. Ensure label is attached in a manner to prevent accidental removal or defacement. Label shall serve as sole identification for sealed bid at submission.

BID TO: Hudsonville Public Schools
Attention: Mr. Patrick Briggs
3886 Van Buren
Hudsonville, MI 49426

BID FROM: _____

_____

_____

PROJECT: New Building Technology Systems
TECHNOLOGY BID #2738

INCLUDING ADDENDA: Addendum No._____Dated_____
Addendum No._____Dated_____

DUE: January 26, 2023

BID FORM

BID TO: Hudsonville Public Schools
Attention: Mr. Patrick Briggs
3886 Van Buren
Hudsonville, MI 49426

BID FROM: _____

_____

_____

PROJECT: New Building Technology Systems
TECHNOLOGY BID #2738

The undersigned, having familiarized themselves with all local conditions affecting the cost of work, and having examined the site and all applicable Bidding Documents herein, and herein referenced, including, but not limited to, all addenda issued thereto, hereby propose to furnish all labor, material, equipment, applicable taxes and services required for proper completion of each of the following categories of this project for the sum of:

Bid Category _____ Title_____

_____Dollars ($_____).
Said amount written above constituting the Base Bid

Bid Category _____ Title_____

_____Dollars ($_____).
Said amount written above constituting the Base Bid

Bid Category _____ Title_____

_____Dollars ($_____).
Said amount written above constituting the Base Bid

Bid Category _____ Title_____

_____Dollars ($_____).
Said amount written above constituting the Base Bid

Bid Category _____ Title_____

_____Dollars ($_____).
Said amount written above constituting the Base Bid

TAXES:
Bid sum includes all applicable taxes.

ALLOWANCES:
Base bid includes all applicable allowance cost(s) as set forth herein.

COST OF BONDS:
Bid sum includes cost of furnishing a Performance Bond and Labor and Material Payment Bond, each in the amount of one hundred percent (100%) of the bid.

ACKNOWLEDGEMENT OF ADDENDA:
The following addenda have been received, are hereby acknowledged, and their execution is included in both base bid and alternate bids herein.

Addendum No._____Dated_____ Addendum No._____Dated_____

Addendum No._____Dated_____ Addendum No._____Dated_____

ALTERNATES:
Based bid amount may be increased or decreased in accordance with each of the following alternate bids as may be selected, following procedures stated herein. Voluntary Alternates shown below are identified and described in detail on appropriate attachment(s) as referenced herein.

Alternate A: Classroom 3 Year Warranty_____

Alternate B _____

Alternate C _____

Alternate D _____

Alternate E _____

Alternate F _____

Alternate G _____

PRINCIPAL SUBCONTRACTORS
As required herein, the following Subcontractors are proposed to be used for this project:

Legal Name:_____Work Proposed_____

Legal Name:_____Work Proposed_____

Legal Name:_____Work Proposed_____

BID SECURITY:
Accompanying this Bid, as required herein, is a bid security in the form of Certified Check/Cashier's Check/Bidder's Bond in the amount of:

_____ Dollars ($_____),
payable to the Owner, which it is agreed, shall be retained as liquidated damages, not as a penalty, by the Owner, if the undersigned fails to execute the Contract in conformity with the form of Contract incorporated and referenced herein and fails to furnish specified bonds within ten (10) days after date of issuance of a Letter of Intent to the undersigned.

If awarded the Contract, the undersigned agrees to commence work within ten (10) calendar days after date of issuance of a Purchase Order, which shall be considered as the notice to proceed, and agrees to complete the work in accordance with the schedule herein.

FAMILIAL DISCLOSURE:
Accompanying this Bid, as required herein, is a legally executed and notarized Michigan Familial Disclosure Statement.

EXCEPTIONS:
Bidder takes no exception to terms, conditions, specifications and/or any other requirements herein unless expressly noted, and specifically identified as provided for herein on unaltered Contract Exception form accompanying this Bid.

SIGNATORY AUTHORITY:
The undersigned certifies they are an authorized agent of the bidding entity, and legally able to bind the bidding entity to the terms, conditions and responsibilities of this, and all referenced bid documents. Furthermore, the undersigned acknowledges an understanding that non-compliance of this authority or any other bidding requirements may result in forfeiture of bid security, dismissal of consideration of bid submitted, and/or personal liability against the signatory.

AGREEMENT:

The undersigned agree(s) to provide the post-bid information required within ten (10) days after notification of a Letter of Intent and to execute an agreement for work covered by this Bid on the Owner's standard Purchase Order for which terms and conditions are expanded to include all Bidding Documents and subsequent addenda issued thereto.

In submitting this bid, it is understood that the Owner reserves the right to reject any or all bids. It is further agreed that this bid is binding for a period of Ninety (90) days from the opening thereof.

Respectfully submitted,

Date: _____

Firm Name: _____

By: _____

Signed: _____

Title: _____

Official Address: _____

_____

Telephone Number: _____

Fax Number: _____

Primary Contact Email Address: _____

(If Corporation, affix Seal)

Michigan Familial Relationship Disclosure Statement

In accordance with Section 1267 of Michigan Revised School Code this sworn and notarized statement of an authorized representative, discloses any familial relationship between the owner and/or any employee of the Bidder, and any member of the project Owner's governing Board(s) or Superintendent(s).

If any conflict of interest is discovered subsequent to submission of bid, written disclosure shall be submitted to the project Owner within seven (7) days of discovery. The project Owner reserves the right to immediately terminate any contract with Bidder upon notification of a conflict of interest. Upon such termination, the project Owner shall compensate Bidder only for the value of any goods or services provided to the Owner prior to such termination as determined by Designer.

(Check only one Box Below)

☐ It is hereby acknowledged and certified by Bidder that no familial relationship exists between the owner or any employee of the Bidder and any member of the project Owner's governing Board(s) or Superintendent(s).

☐ A familial relationship exists between the owner or an employee of the Bidder and a member of the project Owner's governing Board(s) or Superintendent(s). The person(s) and the relationship(s) are as follows:

Bidder	***Board or Superintendent***
_____	_____
_____	_____
_____	_____
_____	_____

Bidder Authorized Representative:

Bidder: _____

Representative's Signature: _____

Print or Type Name: _____

Representative's Title: _____

Subscribed and sworn this _____ day of _____, 2023.

In the County of _____ State of _____

By _____ Seal or Stamp:
Notary Public Signature

My commission expires on: _____

IRAN LINKED BUSINESS AFFIDAVIT

All Bids shall be accompanied by a sworn statement disclosing any Iran Linked Business relationship that exists within the owners, including its officers, directors, and employees.

The undersigned, owner or authorized officer of _____ (bidder), pursuant to Michigan Public Act No. 517 of 2012, the "Iran Linked Business" requirement provided in the Hudsonville Public Schools Proposals hereby represents and warrants that the bidder, including its officers, directors and employees, is not an "Iran Linked Business" within the meaning of the applicable Public Act, and that in the event bidder is awarded a contract as a result of this RFB, the bidder will not become an "Iran Linked Business" at any time during the course of performing under the contract. The bidder further acknowledges that any person who is found to have submitted a false certification is responsible for a civil penalty of not more than $250,000.00 or 2 times the amount of the contract or proposed contract for which the false certification was made, whichever is greater, the cost of the District investigation, and reasonable attorney fees, in addition to the fine. Moreover, any person who submitted a false certification shall be ineligible to bid on future Requests for Bids for three (3) years from the date that it is determined that the person has submitted the false certification.

There is not an "Iran Linked Business" that exists within the bidder and/or owner, officers, directors and employees.

Bidder:

_____
[Company Name]

_____
[Signature]

_____
[Title]

Notary:

This instrument was acknowledged before me, a Notary Public in and for

_____ County, on this

_____ day of _____, 20_____.

_____
[Notary Public Signature]

My Commission expires: _____

Acting in the County of: _____

REFERENCES

Customer name: _____
Address: _____
City/State/Zip: _____
Contact name: _____
Contact title: _____
Phone: _____
E-mail: _____
Scope of project: _____
_____
_____
Date of completion: _____

Customer name: _____
Address: _____
City/State/Zip: _____
Contact name: _____
Contact title: _____
Phone: _____
E-mail: _____
Scope of project: _____
_____
_____
Date of completion: _____

Customer name: _____
Address: _____
City/State/Zip: _____
Contact name: _____
Contact title: _____
Phone: _____
E-mail: _____
Scope of project: _____
_____
_____
Date of completion: _____

CONTRACT EXCEPTIONS

Check one Box

☐ Bidder takes no exception to, and agrees to comply with all sections, terms, conditions and/or requirements of the Contract Documents.

☐ Bidder proposes the following exceptions to the Contract Documents:

Paragraph Number	***Explanation***

NOTE:
Exception(s) to any bid sections, terms, conditions and/or requirements deemed excessive for any reason by the Owner and/or Designer may result in disqualification of Bid.

SCHEDULE OF VALUES/BID FORM

(Bidder may submit version of only this form with slight variation. All information in this form is required for each division/category of work being bid. Submit a completed separate form for each division/category of work clearly delineating on the form the division/category of work for that form. Form submitted must materially match below both in content and format. Electronic version of this form for each project section/division/category being bid is required with bid package as Microsoft Excel compatible spreadsheet on a USB drive. Failure to provide appropriate and complete SCHEDULE OF VALUES for each division/category of work, as determined by the Owner and/or Designer, may result in disqualification of Bid.)

Bidder: ____ Bid Division: ______

ID	***Qty***	***Part Number***	***Mfg and Description***	***Unit Cost***	***Unit Labor Cost***	***Total Proposed Cost***
			PROJECT MANAGEMENT			
			TRAINING			
			BONDS AND INSURANCE			
			GRAND TOTAL (Must match base bid)			

SCHEDULE OF VALUES/BID FORM

(Bidder may submit version of only this form with slight variation. All information in this form is required for each division/category of work being bid. Submit a completed separate form for each division/category of work clearly delineating on the form the division/category of work for that form. Form submitted must materially match below both in content and format. Electronic version of this form for each project section/division/category being bid is required with bid package as Microsoft Excel compatible spreadsheet on a USB drive. Failure to provide appropriate and complete SCHEDULE OF VALUES for each division/category of work, as determined by the Owner and/or Designer, may result in disqualification of Bid.)

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ID	***Qty***	***Part Number***	***Mfg and Description***	***Unit Cost***	***Unit Labor Cost***	***Total Proposed Cost***
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Bidder: ____ Bid Division: ______

ID	***Qty***	***Part Number***	***Mfg and Description***	***Unit Cost***	***Unit Labor Cost***	***Total Proposed Cost***
			PROJECT MANAGEMENT			
			TRAINING			
			BONDS AND INSURANCE			
			GRAND TOTAL (Must match base bid)			

SCHEDULE OF VALUES/BID FORM

(Bidder may submit version of only <u>this</u> form with slight variation. All information in this form is required for each division/category of work being bid. Submit a completed separate form for each division/category of work clearly delineating on the form the division/category of work for that form. Form submitted must materially match below both in content and format. Electronic version of this form for each project section/division/category being bid is required with bid package as <u>Microsoft Excel</u> compatible spreadsheet on a USB drive. Failure to provide appropriate and complete SCHEDULE OF VALUES for each division/category of work, as determined by the Owner and/or Designer, may result in disqualification of Bid.)

Bidder: ____ Bid Division: ______

ID	***Qty***	***Part Number***	***Mfg and Description***	***Unit Cost***	***Unit Labor Cost***	***Total Proposed Cost***
			PROJECT MANAGEMENT			
			TRAINING			
			BONDS AND INSURANCE			
			GRAND TOTAL (Must match base bid)			

END OF SECTION

SECTION 00 21 13
INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL

1.01 OWNERSHIP

A. Bidders prepare and provide bids without any cost to the Owner and/or Designer. Once opened, bids become the sole property of the Owner. Bidders have no claim to, or ownership of bids opened. Bids become subject to all legal statutes including, if applicable, United States and Michigan Freedom of Information Acts and related laws.

1.02 COMPLIANCE

A. This document establishes the primary system(s) design configuration. The Bidder's bid response shall include all services, supplies, components, and equipment required to provide a complete turnkey system(s) which meets or exceeds all specifications for each given bid item being proposed.

B. Owner prefers to enter into a contract with a single bidder for all materials for completion of this project but shall consider combinations of portions of bids from various bidders. The Owner reserves the right to award portions of the project to multiple bidders who will be required to cooperate with one another in order to complete the work.

C. By their response, Bidders agree to comply with all sections, terms, conditions and/or requirements of the contract documents except as expressly noted, and specifically identified by paragraph number on the unaltered Contract Exceptions Bid Form. Exceptions to any bid sections, terms, conditions and/or requirements deemed excessive by the Owner and/or Bid Coordinator may disqualify Bid.

D. In compliance with the Freedom of Information Act (FOIA), the Owner shall make bid documents available for public review after issuance of purchase order to the successful bidder/s.

E. In connection with the execution of this Contract, Contractor and any Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, age, or national origin.

F. Negligence in preparation, improper preparation, errors in, or omissions from Bids shall not relieve Bidder from fulfillment of any and all obligations and requirements of the Contract Documents.

G. All Bid documents and worksheets must be completed in detail and submitted together on time.

H. All documents constituting the entire present agreement shall be construed in accordance with and governed by the laws of the State of Michigan.

I. Designer shall have authority for interpretation of Contract Documents. In the event terms, provisions or any other portion of the Contract Documents is/are in dispute, Designer shall have full and final authority to interpret the Contract Documents, and such interpretation shall be final and binding.

J. In the event of a conflict between any terms or conditions in any of the documents comprising the entire present Agreement, the terms and conditions set forth in this document shall take precedence.

1.03 NOTICE AND RESPONSE

A. Upon notification of Bidder being considered as a finalist, the Bidder shall provide to the Owner and Designer, within 48 hours, a current "Dunn and Bradstreet Supplier Evaluation Report" and other documentation as may be required of finalists herein and as requested by Owner and/or Bid Coordinator.

B. Bidder shall provide timely response to all requests from Designer and/or Owner regarding clarification and/or elaboration concerning, but not limited to its Bid as may be deemed relevant by the Owner and/or Designer.

1.04 PROTECTION AND SAFETY

A. Contractor shall continuously maintain adequate protection of all Work from damage and shall protect the Owner's property from injury or loss arising in connection with the execution of the Contract. Contractor shall make good any such damage, injury or loss, except such as may be directly caused by agents or employees of the Owner. The Contractor shall adequately protect adjacent property as required by law, by the Contract Documents, or as otherwise required, to cause no damage to them during the execution of the Contract. This requirement shall also apply to structures above and below ground as conditions of the site require.

B. Contractor shall be solely responsible for, and have control over means, methods, techniques, sequences, and procedures for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the contract. Contractor shall take all necessary precautions for the safety of employees and visitors on the site of the Project and shall comply with applicable provisions of federal, state, and municipal safety laws and building codes to prevent accidents or injury to persons on, about, or adjacent to the premises where the Work is being performed. Contractor shall erect and properly maintain at all times, as required by the conditions and

progress of the Work, all necessary safeguards for the protection of workers and the community.

C. Contractor shall vigorously defend any and all suits that may be brought against the Owner by any person and/or entity, whether in the employ of the Contractor or not, for damage to property, and/or injury or death to persons alleged or claimed to have been caused by or through the performance of work.

1.05 DRAWINGS DIAGRAMS AND ILLUSTRATIONS

A. Drawings, Diagrams, and Illustrations are diagrammatic in nature and indicate general arrangement and nature of systems and work included.

B. Floor plan drawings are provided to assist the contractor in preparing documentation and reports as required herein.

PART 2 - MATERIALS

2.01 VOLUNTARY ALTERNATES AND SUBSTITUTION OF SPECIFIED PRODUCTS

A. This Request for Bid describes a particular implementation. All Bids must provide pricing on the "base bid" as described herein. Voluntary alternatives providing comparable functionality with significant cost reduction and/or performance enhancement may be proposed. Voluntary alternatives are encouraged but must be identified as "Voluntary Alternates" and detailed on unaltered Bid Forms contained herein. Voluntary Alternates may be further detailed and/or explained in attachments to the unaltered Bid Forms contained herein. Exceptions to the Request for Bid specifications must be clearly noted and explained for each Voluntary Alternate proposed.

B. No substitutions of specified products may be made without specific prior authorization by Designer and Owner. Individual bid divisions herein contain particular information related to acceptable manufacturer and product requirements.

C. Trade-in, equipment/license exchanges or other return allowances may be provided as a voluntary alternate. Trade-in, exchange, or other return equipment allowances shall not be included in base bid amount.

PART 3 - EXECUTION

3.01 EXAMINATION OF DOCUMENTS AND SITE

A. Bidders shall carefully examine the Contract Documents and the construction site to obtain first-hand knowledge of existing conditions and requirements. No plea of ignorance of conditions that exist, or any other relevant matter

concerning work to be performed in the execution of work will be accepted as justification for failure to fulfill every detail of all requirements as described herein.

3.02 QUESTIONS, INTERPRETATIONS, AND ADDENDA

A. Any bidder finding discrepancies between Drawings, Specifications, and/or Bid Documents, or be in doubt as to the exact meaning of any provision or detail shall notify the Designer at once, and before the deadline for Questions and Clarifications. The Designer may then, at their option, issue Addenda clarifying same. The Designer is not responsible for oral instructions, or Bidder's/Contractor's misinterpretations of Drawings, Specifications, and/or Bid Documents.

B. The Designer reserves the right to issue Addenda at any time up to thirty-six (36) hours prior to the scheduled bid opening. All such addenda shall become, upon issuance, an inseparable part of the Specification/Contract Documents. Each bidder shall incorporate within their bid all costs for items listed in any/all Addenda and shall acknowledge receipt and identifying number of each Addendum on the Bid Form and on the outside of the sealed bid container.

C. Addenda will be forwarded to each bidder who has received a copy of the Bidding Documents and has submitted "Intent to Bid Form".

3.03 BID SECURITY, BONDS, AND INSURANCE

A. Bid Security, Performance and Payment Bonds are required on this project.

1. Bid security equal to five percent (5%) of the bid amount must accompany each bid in accordance with the Instruction to Bidders.

a. Bid security shall be either a Bid Bond issued by a company licensed in the State of Michigan to furnish bid security or Certified Check made payable to the Owner.

B. The selected Contractor will be required to provide a performance bond and a payment bond each in an amount equal to one hundred percent (100%) of the bid amount including any accepted alternates at the Owner's discretion.

1. The surety of the performance bond shall remain in effect until all acceptances and final contract close-out requirements herein have been executed by the Owner.

C. Contractor shall provide, prior to beginning any work at the sites, certificate of insurance for delivery to Owner indicating all required insurance coverage is in force.

1. Workers' Compensation and Employer's Liability Insurance

    a. Coverage A – Statutory

    b. Coverage B - $1,000,000 Per Accident

2. Broad Form Comprehensive General Liability Insurance (including – Premises, Elevators, Contractor's Protective Liability, Contractual, Products & Completed Operations – including Broad Form Extensions).

    a. Each Occurrence - $1,000,000

    b. General Aggregate - $2,000,000

    c. Products & Completed Operation Aggregate - $2,000,000

    d. Personal Injury & Advertising Injury - $1,000,000

    e. Fire Legal - $100,000

3. Sub-contractors Operations, Products – Completed Operations and Contractual Liabilities, plus such excess coverage as may be appropriate for the limits listed.

4. Comprehensive Automobile Liability Insurance (owned, hired, and non-owned automobiles).

    a. Bodily - $1,000,000 each Person and $1,000,000 each Occurrence

    b. Property Damage - $1,000,000

5. Furnish Owner with Contingent Liability Insurance Policy with coverage and liability limits the same as for Public Liability Insurance specified herein. Designate on policy as assured, only the Owner.

6. Furnish Owner with Contingent Property Damage Insurance Policy with coverage and liability limits the same as for Property Damage specified herein. Designate on policy as assured, only the Owner.

7. Policies shall include notification clause requiring ninety (90) days written notice to Owner in the event of policy cancellation, expiration, non-renewal, coverage reduction or other material change.

8. Contractor shall not commence work under the Contract until after all insurance required herein has been obtained and certificates for such are approved by Owner.

D. All such bonds and/or insurance shall be issued by surety licensed by the State of Michigan and acceptable to the Owner.

1. Insurance certificate(s) shall be signed by insurance agent licensed in the state of Michigan or a representative of the insurance company.

E. Contractor agrees to indemnify and hold harmless the Owner and Designer, including their agents and employees, from and against all claims, damages, losses and expenses, including, but not limited to, attorney fees arising out of, or resulting from the performance of the work to the fullest extent allowed by law on a comparison basis of fault.

3.04 MODIFICATION AND WITHDRAWL

A. Bids may be withdrawn and/or changed any time prior to the deadline for submission of bids. Bids may not be withdrawn or changed thereafter and shall be deemed a form offer continuing for ninety (90) calendar days. Bids receive after the deadline for submission will be returned unopened at the Owner's discretion.

B. Withdrawal of any Bid after the opening time without specific approval by Owner may result in forfeiture of required bid security by Bidder.

3.05 CODES, ORDINANCES, REGULATIONS AND RELATED

A. All labor and materials shall be furnished and installed in strict accordance with the latest applicable codes, ordinances and regulations of any governing body having jurisdiction over this project.

B. In the event the quality of labor and materials required by the Drawings and Specifications herein exceeds requirements of current applicable codes, ordinances and regulations, the Drawings and Specifications shall take precedence.

C. In the event the quality of labor and materials required by current applicable codes, ordinances and regulations having jurisdiction over this project exceeds that of the Drawings and Specifications herein, the applicable codes, ordinances and regulations shall take precedence.

D. The Contractor shall give all notices and comply with all codes, laws, ordinances, rules, and regulations of any authority having jurisdiction, which bears on the performance of its work. This compliance includes, but is not limited to, the Michigan School Safety Initiative (PA129, PA130, PA131 and PA138) if applicable to work being performed.

E. The Contractor shall pay for all licenses, permits, taxes, and fees required for this project; and shall comply with all federal, state, local and Owner's codes, laws, ordinances, regulations and other requirements applicable to the work specified at no additional cost to the Owner. Contractor shall submit copies of all approved certificates and approvals to the Owner upon receipt.

3.06 SUB-CONTRACTOR AND MATERIAL SUPPLIER

A. The successful Bidder shall submit to the Owner and Designer a complete list of all sub-contractors and all material suppliers proposed to engage on the work. Sub-contracts shall not be awarded until after they have been approved by the Designer and Owner.

B. Finalist bidders may be required to submit additional details related to sub-contractors and suppliers within forty-eight (48) hours after the bid opening.

C. Names of any principal sub-contractors must be listed on the Bid Form.

D. All contracts made by the successful Bidder with Subcontractors shall be covered by the terms and conditions herein. The successful Bidder shall see to it that Subcontractors are fully informed in regard to these terms and conditions and shall bind all subcontractors to the same terms and conditions. Failure to do so will absolve the Owner from any liability for additional cost due to subcontractor claims for additional cost, time, or any claim(s) for additional cost by subcontractor(s).

3.07 BID RESPONSE FORMAT

A. Bidder shall provide complete Bid copies in two formats as described herein.

1. One (1) Hard copy format responses shall be in a bound tabulated format. Each response shall have tab indicators for each section.

2. One (1) Electronic copy format responses shall be submitted on a USB Drive, readable by a standard Microsoft Windows 11 workstation. Electronic media shall contain separate folders to organize response documentation as described herein. Files submitted electronically shall be ***Adobe Acrobat*** "PDF" format (SCHEDULE OF VALUES is additionally required to be on the disk in the appropriate folder as a Microsoft Excel compatible spreadsheet and as described herein).

B. All Bid Response formats shall be clearly externally marked to include, but not be limited to:

1. Bidder identification.

2. Project Owner identification.

3. Project name.

4. Bid submission date.

C. Bid Responses shall include an index containing copies/PDF of a complete index of documents comprising Bid Response. Responses shall include, but not be limited to the following tabbed/folder sections:

1. Section 1 – Forms, which shall contain copies/PDF files of all required and completed bid forms.

   a. BID FORM

   b. Michigan Familial Relationship Disclosure Statement

   c. REFERENCES

   d. CONTRACT EXCEPTIONS

   e. SCHEDULE(s) OF VALUES

   f. BID BOND

2. Section 2 – Overview, which shall contain copies/PDF files of cover letter and/or executive overview.

3. Section 3 – Submittals, which shall contain copies/PDF files of all required and voluntary submittals.

4. Section 4 – Appendices, which shall contain copies/PDF files of other reference materials Bidder wishes to or is required to submit.

3.08 AWARD OF CONTRACT

A. The material proposed to be used for the completion of work, and the competency, solvency and responsibility of bidders will receive due consideration before award of contract. In the reception of bids for this work, the Owner incurs no obligation to accept the lowest, or any bid submitted. The right to accept or reject any and all bids or portion thereof is reserved by the Owner. The Owner reserves the right to require testimonial, accounting or legal documents pertaining to the solvency of a Contractor, or any other decision factor the Owner deems appropriate, prior to award of contract.

B. Owner reserves the right to select individual components from schedule of values independent of installation as may be determined in Owners best interest. Selected bidder may be required to install selected components provided by others.

C. Issuance of a Purchase Order by Owner in response to a valid bid shall be a Notice to Proceed, and shall become part of, but not limited to, all terms, conditions, and requirements herein. Notice to Proceed shall have the full effect of contract award, and shall make all terms, conditions, requirements,

and responsibilities of Bidder binding upon issuance. Notice to Proceed, once issued, shall become an inseparable part of the contract documents herein, and constitute both Bidder and Owner's acceptance of contract.

3.09 TIME, SCHEDULES, PROJECT MANAGEMENT, MEETINGS AND PLANS

A. Time is of the essence on this project. Award of contracts for this project will be contingent on the bidder's agreement to complete the work on or before the contract completion date stated herein.

B. All Contractors will commence work in such a manner and at such a time as to expeditiously interface with the work of other Contractors and will pursue the project diligently to completion. All Contractors will work in a cooperative manner with Owner and other Contractors.

C. Contractor shall appoint an overall Project Manager acceptable to Owner, with skills and experience deemed appropriate by the Owner for the scope and size of the project. Project Manager shall be responsible for the scheduling of all Contractor resources and attending all project meetings. Upon notification of Bidder being considered a finalist, the Bidder shall submit professional resume of proposed Project Manager within forty-eight (48) hours.

1. Project meetings shall be conducted at Owner's selected and identified location weekly and at Owner's and/or Designer's discretion.

2. Within five (5) days of Notice to Proceed (issuance of a Purchase Order by the Owner), Contractor's Project Manager shall provide to the Owner a critical flow path in the form of a "Gantt Chart" (or equivalent) indicating the proposed sequence of events and approximate beginning and completion dates in accordance with, compliance to, and coordinated with requirements herein.

3. Changes of the Project Manager during the project shall not be acceptable without prior written approval from the Owner.

4. It is the responsibility of the Contractor's Project Manager to schedule work, work out issues, ensure that all required products and services are delivered according to schedule and attend to any other matters required by the Owner in the interest of professional and timely completion of the project.

5. The appointed Project Manager, or a designee acceptable to the Owner, shall be in attendance of all project meetings throughout the term of the project. Failure to do so may be considered a material breach of contract.

6. After a ten (10) business day notice, the Owner reserves the right to request a new Project Manager, when it appears that, in the Owner's sole

discretion, the Project Manager is not fulfilling the full responsibilities of the position. Failure by Contractor to provide adequate Project Manager meeting requirements of the Owner, may result in Contract termination.

3.10 CHANGES IN THE WORK

A. No changes in work with the effect of either increasing or decreasing in the project value shall be made without specific and prior authorization by the Owner and Designer.

B. Owner, without invalidating the contract and without notice to any surety, may at any time order extra work or make changes by altering, adding to or deducting from the work, the Contract Sum being adjusted accordingly. All such work shall be authorized by a written Change Order approved by Owner and Contract Designer. Upon receipt of such an order Contractor shall promptly proceed with the work involved. All such work shall be executed under the conditions of the original Contract. Owner authorized change order(s) may be issued at any time prior to Contract close out.

C. When so directed, Contractor shall promptly submit an itemized estimate and a unit price for performing or deleting such extra or changed work as may be contemplated. Any extensions or reductions of the contract time associated with extra or changed work shall be identified at the time Contractor submits such documentation.

D. At the Owner's discretion, adjustments in the Contract Sum shall be determined by one or more of the following methods:

1. By mutual acceptance of a lump sum cost, including overhead and profit, itemized and supported by sufficient substantiating data to permit evaluation.

2. By unit prices stated in the Contract Documents including, but not limited to, Schedule of Values.

3. By unit prices mutually agreed upon.

3.11 PAYMENT REQUESTS AND PAYMENTS

A. Contractor's invoices shall be submitted monthly in correlation with the Project Schedule indicating percentage of work completed.

B. All contract and change order invoices shall be sent directly to Contract Designer.

C. A 10% retainage shall be held back on all payment requests, including, but not limited to hardware, software, change orders and services, until final

completion and close out of the project or project phase as determined by Owner and Designer.

D. Contractors are required to submit all invoices on approved AIA Payment Request Forms or other billing format pre-approved by Contract Designer. Each AIA Payment Request Form shall be accompanied by a properly completed, executed, and notarized Waiver of Lien which shall be in a format and contain verbiage approved by Owner.

E. The Contract Designer and Owner shall process payment requests on a monthly schedule and in accordance with their respective established processes and procedures. Payments will be made by the Owner based only on AIA Request Forms having been previously certified, audited and approved by Contract Designer and accompanied by acceptable Waiver of Lien.

END OF SECTION

SECTION 00 65 00
CONTRACT CLOSE OUT

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Provide an orderly and efficient transfer of the completed work to Owner.

B. Details affecting work of this Section includes but is not limited to all other Sections herein and all related Contract Documents.

C. Activities relative to Contract close-out are described in, but not limited to, this and other Sections of this document.

1.02 SUBSTANTIAL COMPLETION

A. "Substantial Completion" shall be defined as:

1. All responsibilities of Contractor for all provisions and requirements of all divisions and sections of complete Contract herein, and as amended, are properly and fully completed, or properly, accurately and acceptably provisioned for.

2. All systems, equipment, facilities, services, programming and/or components required by all divisions and sections of complete Contract are fully operational, acceptable, and useful to the Owner for their intended purposes.

B. Prior to requesting inspection by Designer to certify Substantial Completion, Contractor shall use adequate means to assure the Work is completed in accordance with the specified requirements and is ready for such inspection.

PART 2 - MATERIALS

2.01 NOT USED FOR THIS SECTION

PART 3 - EXECUTION

3.01 PROCEDURES

A. Contractor shall submit a written request to Designer indicating they have achieved Substantial Completion of Work.

B. Within a reasonable time after receipt of the request, Designer will inspect Work to determine status of completion.

C. Should Designer determine the Work is not substantially complete:

1. Designer promptly will so notify Contractor, in writing giving reasons therefore and providing sufficient details to allow Contractor to make corrective actions.

2. Contractor shall then expeditiously remedy the deficiencies and notify Designer in writing when ready for re-inspection.

3. Designer will re-inspect the Work.

4. Excessive re-inspections of Work may result in fees being assessed Contractor.

D. Should Designer concur the Work is substantially complete:

1. Designer will prepare a letter of Substantial Completion.

2. Designer will submit the letter to Owner and Contractor.

3. Contract shall be deemed “Closed Out” for retainage purposes.

4. Final Acceptance of the system shall be deemed complete.

END OF SECTION

SECTION 27 41 16
MULTIMEDIA SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION OF PROJECT

A. Work described in this specification section pertains to new classroom multimedia infrastructure and instructional equipment for Hudsonville Public Schools' new elementary school.

B. Contractors shall propose Systems and/or components to be deployed using standard procedures and technology components and as specified herein. The system components shall be installed and connected to the owner's existing physical infrastructure and as specified herein.

C. Contractor shall advise, coordinate, and work cooperatively with Owner representatives or owner's designee related to any configuration changes required and/or proposed for Owner's existing physical infrastructure.

D. Contractor shall work collaboratively with Owner and Designer. Work shall include but not be limited to installation of supplied equipment, removal of existing equipment and full operational capacity of system as specified herein.

E. The Contractor shall design, engineer, configure, supply, connect, test, document, train Owner representatives and warrant a fully operational and compliant system and/or component connection to the system complete and with full functionality as specified herein.

F. Contractor shall provide all transportation and delivery services in a timely manner to individual work location(s) at each site of work in preparation for installation activity.

G. Contractor shall coordinate their installation with other contractors, Designer and the Owner as is appropriate.

1.02 WARRANTY

A. Complete installation shall be free from defect and/or failure for a period of warranty. Any replacement, upgrade, or fix, including labor for any non-conforming or non-operational part of the system shall be fixed and/or replaced at no cost to the Owner.

B. Manufacturer's warranty shall be provided for all components of the system.

1. Any documents and/or submittals required by individual manufacturers for compliance with the standard and/or applicable extended warranty programs shall be provided and submitted for approval by the Contractor.

2. Contractor shall submit all documents, apply for warranty or extended warranty certification, and provide a Certificate of Warranty or Extended Warranty as may be applicable from the manufacturer prior to project closeout.

3. Standard manufacturer warranty duration and terms shall be identified for each component with bid.

4. REQUIRED ALTERNATE: Standard manufacturer warranty duration and terms shall be identified for each component with bid as well as additional fee required for warranty duration election of each of the following terms:

    a. Three (3) year parts and labor warranty.

C. On site services provided under the warranty shall be performed by personnel or representatives of manufacturer of individual components and/or appropriately trained and certified Contractor representatives as herein defined and located within physical proximity to provide response levels deemed acceptable to Owner.

D. Contractor shall provide the following response times for all malfunctioning equipment:

1. Twenty-four (24) hours or less for matters that render twenty percent (20%) or more of the system unable to maintain normal functionality.

2. Two (2) business days for matters not meeting the above criteria.

3. Response time shall be measured from the time Contractor is notified by Owner to the time work is begun to resolve the matter.

E. Bidder shall provide current annual maintenance contract pricing, terms and conditions for recommended maintenance programs for all equipment following the specified and included warranty periods as a Voluntary Alternate. This information will be considered by Owner and Designer as part of the bid evaluation process.

F. System Warranty shall commence on date of substantial completion as certified by Designer and provided for herein. Delivery to work site of materials, physical removal from packaging, issuance of Contractor documents including, but not limited to invoices and/or packing slips, or any event or documentation, not specifically provided for herein, shall have no effect on Warranty or System Acceptance by Owner and/or Designer.

1.03 SUBMITTALS

A. Submittals shall consist of, but not be limited to, technical cut sheets and detailed information pamphlets on all components of the system to be installed. All cut sheets and submittals shall be distinctly marked to highlight the actual part number of the item being submitted for approval with Bid Proposals.

B. Shop drawings, data sheets and diagrams shall be submitted by Bidder for approval by Designer with Bid Proposals.

   1. Shop drawings, data sheets and diagrams shall show all data relating to structural, electrical, wiring, cross connect, interconnect, equipment arrangement/layout, and any other information deemed significant by the Designer.

   2. No work constituting final installation shall be commenced until after approval of shop drawings, data sheets and diagrams by Designer.

C. Contractor shall provide proof of manufacturer support by photocopy of certification and letter of support from major component manufacturers for this specific project with Bid Proposals.

D. Equipment or material installed for this project that do not have an approved submittal associated with it, will be removed, and replaced with acceptable equipment or material as defined by the Designer. All replacement costs including, but not limited to material and labor, shall be the sole responsibility of the Contractor.

   1. The Owner and/or Designer may notify Contractor of any offending situations under this provision allowing Contractor up to forty-eight (48) hours to correct the situation prior to taking other corrective action.

   2. The Owner reserves the right to replace unapproved materials and deduct the costs of doing so as defined herein from any amounts that may be due or become due Contractor.

E. The Contractor shall submit within ten (10) calendar days after the Notice to Proceed, a schedule that reflects the sequence of activities of the contractor's approach to the execution of and completion of the work. The schedule shall be broken into work areas to provide for a clear identification of the planned progress of the work. Included in the schedule will be a list of tasks with list of deliverables and the percentage of work completed. This schedule shall coincide with progress payments applications dates and projected amounts. All durations shown will be in working days. Applications that generate Microsoft Project compatible files shall be management tools of choice. The timeframe described in the Contractor's Schedule shall represent the Contractor's plan for organizing, directing, managing, controlling, staffing,

and executing the work required by the Contract Documents. The district will rely on such schedules to coordinate and otherwise plan the work of the District, other separate contractors, or the District's routine daily work.

1.04 REFERENCE SPECIFICATIONS

A. All work, products, and materials shall conform with the following standards as applicable for the intended use:

1. EIA/TIA Commercial and Administration Standards

2. NEC

3. IEEE 802

4. IETF RFCs

5. FCC – All Applicable Rules and Regulations

6. UL

7. MIOSHA Safety Standards

1.05 CONTRACTOR

A. The Contractor shall accept complete responsibility for the installation, certification and support of the system and/or components as required herein. Contractor shall be an authorized vendor of all major components.

B. All work shall be performed and supervised by Project Managers, Engineers and/or Technicians who are qualified to install specified equipment and perform related tests as recommended by the manufacturer and in accordance with the manufacturer’s best practices and methods and as required herein.

C. Project Managers, Engineers and Technicians employed on this project shall be properly and fully trained and qualified by the manufacturer on the installation and testing of the equipment and systems to be installed.

D. The Contractor shall have a proven track record in comparable system supply, configuration, and installation. This must be shown by the inclusion of references of at least three (3) projects involving the supply and/or installation of similar systems completed by the Contractor in the prior two (2) years with the sealed Bid Proposal as provided herein.

PART 2 - PRODUCTS

2.01 Acceptable Manufacturers

A. Acceptable manufacturers have been provided to comply with a standard for individual components associated with the specified system. Indicated components include particular models and makes currently installed and/or preferred by Owner.

B. Any system bid shall be based only on acceptable manufacturer's components.

2.02 Supply most current version of all products provided.

A. Manufacturer shall have five (5) years of experience and history manufacturing similar products to those specified.

B. Proposed components shall have been field tested and proven in actual use.

C. Prior and/or old versions of products, unless specifically approved and documented by Designer and/or Owner shall not be acceptable.

D. In cases where a newer version of hardware or software is available at the time of installation, Contractor shall request clarification from Designer on which version is to be used.

2.03 Furnish only new, first class quality materials and equipment.

2.04 STANDARD VIDEO PROJECTORS

A. Standard video projectors shall be provided and installed in each location as indicated in on drawings.

B. Acceptable Manufacturer:

1. EPSON

    a. PowerLite L520W

C. Projectors shall meet or exceed the following minimum output, port availability and other standards:

1. 5000 ANSI Lumens

2. WXGA resolution

    a. 1280 x 800

3. Vertical: ±30 degrees; Horizontal: ±30 degrees

4. Two (2) HDMI Inputs

D. In the event of a power failure, system shall automatically re-initialize and "become active" to the last configuration in use with no human intervention.

E. All other features currently a part of the manufacturer's latest commercial release.

2.05 PROJECTOR CEILING PLATES AND MOUNTING BRACKETS

A. Projector Ceiling Plates and Projector Mounting Brackets shall be provided and installed in each location as indicated in drawings.

B. Acceptable Manufacturers:

1. CHIEF

2. PEERLESS

a. CMJ500

b. PRG-UNV

C. All projector mounts shall be firmly and securely mounted to finished ceiling, or other surfaces as required and/or specified herein to maximize coverage and minimize tampering potential.

D. Mounts shall be located in coordination with display boards and/or screens and projectors by others to provide a minimum of 96% coverage for the horizontal viewing area of installed display boards and/or screens with no optical distortion.

E. Projector mounts shall be complete and safely accommodate particular and specific mounting conditions for standard projectors.

F. All work shall conform to manufacturers best practices recommendations.

G. Where standard mounting in drop ceilings is not possible or acceptable to Owner, provide alternative and compliant mounting hardware and installation consistent with other specified materials.

H. Contractor shall supply and install new projector downpipes in each location as indicated on drawings

2.06 POLE MOUNTED EQUIPMENT SHELF

A. Pole mounted equipment shelves shall be provided and installed at each location receiving a new standard video projector as indicated on drawings.

B. Acceptable Manufacturers:

1. EXTRON

    a. PMK 155

2. Or Equivalent

2.07 MULTIMEDIA INFRASTRUCTURE CABLE

A. All cable shall be factory manufactured with terminations and connector assemblies fully attached and integral to the cable to industry published quality standards and meet performance requirements specified herein.

B. Infrastructure cable to connect projector to a teacher station wall plate shall be provided.

C. Acceptable Cable:

1. HDBaseT Digital Video Cable shall be of commercial first-class quality manufacture and meet or exceed the following requirements:

    a. Cable shall meet or exceed Category 6 certification.

    b. Cable shall be constructed of solid 23 AWG conductors.

    c. Cable shall be shielded.

    d. All terminations and connector assemblies shall be shielded.

2. USB-C extension cable shall be of commercial first-class quality manufacture and meet or exceed the following requirements:

    a. Cable shall meet or exceed Category 6 certification

3. Audio cable shall be of commercial first-class quality manufacture and meet or exceed the following requirements:

    a. Two conductor shielded cable with drain wire.

D. HDBaseT Digital Video Cable shall be constructed using 23 AWG solid conductors and of a high-quality construction method for minimal loss characteristics, to maintain quality high resolution video image and include support for 1080p video resolution for the installed distance plus a fifteen (15) foot extension for device attachment.

E. All cables originating from wall plate connectors shall terminate in a service loop eight (8) feet in length at projector location.

F. Cable shall terminate in the following connector gender:

1. HDBaseT Digital Video (Category 6 STP)

    a. Category 6 Male Shielded Modular Plug, 8 Pin, RJ45

    b. Terminate into an active HDBaseT transmitter wall plate at Teacher Station and include an HDMI Type A 19 pin plug connector to teacher's PC.

    c. Terminate into an active HDBaseT receiver at Projector location.

G. Projector Location Wall Plate

1. Wall plate provided shall be:

    a. Constructed of commercial grade stainless steel

    b. 1-gang, Split

    c. Pass-Through Rubber Grommet, minimum 1" diameter

2. Wall plate shall be provided at each location indicated on drawings as Projector.

H. Teacher Station Wall Plate shall be provided.

I. EPSON Projector Remote input/switcher device.

1. Remote input/switcher device shall be mounted at the wall box available above the input plate.

2. Power for the device shall be routed to the projector receptacle and extended through the raceway.

3. Low voltage power shall be routed in the raceway with the transformer for the device located with other materials at the projector and the AC power plugged into the projector outlet.

2.08 MULTIMEDIA CONNECTION BUNDLES

A. Fully assembled infrastructure cable bundles shall be provided and installed in all locations.

B. Acceptable Manufacturer

1. Cable shall be of commercial first-class quality manufacture.

C. All Cable shall be fifteen feet (15') in length and terminate in the following connector genders:

1. HDMI High-Speed Patch Cable (M/M).

2. Classroom Multimedia Workstation USB-C Category 6 Patch Cable (M/M).

3. 3.5mm Audio Cable M/M

4. A single F6 Woven Wrap-Around Braided Sleeving to contain and protect all associated cable secure with Velcro straps.

    a. Velcro straps shall be trimmed and flush with sleeving material.

    b. Velcro straps shall be loose enough for cable movement.

    c. Coordinate all color selections with Owner and Designer.

    d. Braided sleeving should be cut and sealed cleanly using a hot knife or similar tool.

2.09 PROJECTION SCREENS (

A. Projection Screens shall be provided and installed in all locations where a projector is indicated on drawings.

A. Acceptable Manufacturers (in alphabetical order):

1. DALITE

    a. Model B

2. DRAPER

B. Projection Screens shall meet or exceed the following minimum standards:

1. Viewing surface of 96” in width.

2. Controlled screen return (CSR).

3. Matte white viewing surface with black masking borders.

4. Constructed of flame retardant and mildew resistant fabric.

5. Neutral color painted 21-gauge steel case.

6. 4’ pull cord securely fastened to bottom of screen.

7. Screens shall be wall mounted at locations indicated by Owner with approved permanent wall L-brackets capable of supporting screen and reasonably expected forces in classroom environment.

8. In locations where wall mounted is not acceptable, coordinate ceiling mounted screens with Owner and Designer.

    a.

2.10 DOCUMENT CAMERA

A. A Document Camera shall be provided and installed in locations where a projector is indicated in classroom spaces on drawings.

B. Acceptable Manufacturers

1. Aveer

    a. M11-8M

C. Document Camera shall provide for both HDMI connectivity to projector and USB-C connection to workstation.

D. All features currently a part of the manufacturer's latest commercial release shall be included.

2.11 VOICE AMPLIFICATION EQUIPMENT

A. Voice Amplification Systems shall be provided and installed in locations where a projector is indicated in classroom spaces on drawings.

B. Acceptable Manufacturers

1. LIGHTSPEED

    a. 975 Access

C. Voice Amplification systems shall meet or exceed the following minimum standards:

1. DECT (1.9 GHz) communication for complete classroom coverage of two (2) microphones simultaneously.

2. Two (2) highly durable, rechargeable, battery powered, tamper resistant, impact resistant, lanyard based pendant microphones.

    a. Lightspeed volume control Flexmikes

D. Voice Amplification systems shall include four (4) DRQ speakers (or equal) in each space containing an appropriate ceiling. Where lay-in ceilings are not installed, contractor shall provide WMQ (or equal) speakers.

1. Speakers shall be installed professionally following all manufacturer installation recommendations and industry best practices.

2. All cable shall be routed in support (D-rings, S-hooks, bridle rings, etc.). Cable supported by the ceiling grid or directly by structural members will be acceptable. No exposed cable shall be visible. Any cable that would be exposed shall be protected in appropriate raceway material approved by designer.

E. In the event of a power failure, system shall automatically re-initialize and "become active" to the last configuration in use with no human intervention.

F. Contractor shall provide one (1) audio cable to connect input port on amplifier to 3.5mm jack at Teacher Station (TS) for auxiliary device connection at the instructor's discretion.

G. Contractor shall provide one (1) audio cable for connectivity from audio output of projector to amplifier to support a fully functional and compliant system.

H. Contractor shall supply all mounting hardware and materials to securely mount the audio amplifier on the top of the projector wall mount.

2.12 WIRELESS PRESENTATION

A. The Owner will provide and install the wireless presentation systems Apple TV casting devices in locations as indicated in with every projector and display as indicated on drawings.

B. REQUIRED ALTERNATE: Bidders shall provide required alternate pricing for the Vivi casting devices as alternates to Apple TV. Contractor to provide installation and configuration of these devices as part of the alternate.

C. VOLUNTARY ALTERNATE: Bidders are encouraged to provide voluntary alternate pricing for the Airtame and AireServer Connect 2 as alternates to Apple TV.

D. Wireless presentation device shall allow teacher and student devices to present to the interactive projector without the use of any AV cables or dongles attached to their devices. Device shall be compatible with, Windows, Mac, Chrome, iOS, and Android.

E. In the event of a power failure, system shall automatically re-initialize and "become active" to the last configuration in use with no human intervention.

F. Contractor shall provide one (1) HDMI cable and one (1) Category 6 UTP network patch cable for connectivity of wireless presentation device to support a fully functional and compliant system.

1. HDMI to projector

2. UTP to Owner provided data drop near projector

G. Contractor shall supply all mounting hardware, integration components and labor and materials to securely mount all components and insure compliant, fully functional, first-class operation.

2.13 AUDIO SPEAKERS

A. Four (4) classroom speakers shall be installed in/on finished ceiling surfaces in each room as indicated in classrooms with a projector.

B. Acceptable Manufacturer:

1. LIGHTSPEED

C. Where classroom speakers are to be installed in drop ceilings, they shall be near flush mount and cleanly cut into available tiles for optimal and uniform audio fill of the relevant classroom space. Speakers shall meet or exceed the following minimum standard requirements:

1. 6” driver; 1” horn per speaker

2. Frequency response: 40 Hz – 20 kHz

3. Impedance of 8 Ohms

4. Power handling of 30 watts

5. Speakers shall be mounted in fully enclosed, acoustically appropriate, metallic back boxes and fully supported by appropriate tile bridges.

D. Where flush mounting is not possible or practical, Contractor shall install surface mounted speakers meeting or exceeding all requirements above.

E. Where specific speaker location is in question, obtain Owner approval prior to any final installation activity.

F. All speakers shall include attractive finished white grill.

G. All speaker wire shall be 16 AWG high quality cable.

H. All speaker cable shall be connected to audio amplifier at the projector location.

2.14 SPECIAL CONFIGURATION SPACES

A. SPECIAL CONFIGURATION A –
OFFICE / SMALL COLLABORATION DISPLAY

1. Each space indicated shall be equipped with a SAMSUNG QET Series 55”, 65”, 75”, 86” display (or equal LG or Panasonic) per location marked on the drawing and include, but not be limited to:

    a. Each display shall be mounted using a Peerless ST650 SmartMount Universal Tilt Mount (or equal).

    b. Contractor shall provide HDMI cables connecting the display to a wall outlet in an input box and raceway (empty dual gang input box and raceway provided by others). All connectors, face plates and materials for a fully compliant, first class, functioning system shall remain the responsibility of the contractor.

    c. Integrated wireless presentation Apple TV with each display configuration. Apple TV network connections are provided by others. However, the contractor shall remain responsible for full configuration of the Apple TV, including, but not limited to network parameters for a fully compliant, first class, functioning system.

    d. When indicated where two displays exist in the same area, displays should be able to mirror or operate independently of one another.

2. Contractor shall supply all mounting hardware, integration components and labor and materials to securely mount all components and insure compliant, fully functional, first-class operation.

B. SPECIAL CONFIGURATION B –
INTERACTIVE DISPLAY STATION

1. Each space indicated shall be equipped with a Clevertouch Impact Max Interactive Display. Display must include, but not be limited to:

    a. Adjustable Mobile Stand Mix with the BalanceBox 400 height adjustable mount system

    b. Universal laptop/keyboard tray 481A73

    c. Logitech K400 Plus Wireless Keyboard Device

2. Contractor shall supply all mounting hardware, integration components and labor and materials to securely mount all components and insure compliant, fully functional, first-class operation.

2.15 ALLOWANCES

A. Contractor shall include allowances for equipment and/or other contract service reimbursements as required below in base bid lump sum amount(s). Equipment and/or contract services shall be provided and sourced at Owner's discretion and convenience with full cooperation by Contractor and paid for from successful bidder's contract in the amount(s) provided for herein. Any allowance amount proving to be excessive for the intended equipment and/or contract services shall be credited to the Owner against contract payment requests.

1. Allowance shall be made in the amount of $6,000 for additional technology program items associated with collaboration spaces.

2. Allowance shall be made in the amount of $14,000 for contract services related to supply, installation, and connection of contingency upgrades.

PART 3 - EXECUTION

3.01 PREPARATION

A. Contractor shall conduct detailed walk-through examination with Designer, Construction Manager and Owner verifying equipment and material locations as well as mounting and placement requirements prior to commencement of other installation activities.

B. Contractor shall completely cooperate with Owner's Construction Manager for all site access, site safety and related matters. Contractor shall obtain current drawings, specifications and plans from Owner's Construction Manager and make field adjustments as required to correctly and reasonably coordinate with other trades. Contractor will attend all CM field coordination and schedule meetings and cooperate with project timelines as directed.

C. Contractor shall ensure all submittals and have been provided to, and approval has been obtained from Designer and Owner prior to commencement of any final installation activities. Submittals shall include, but not be limited to:

1. Shop drawings, data sheets and system diagrams including specific cable connectors and types proposed to be installed.

2. Asset tag format, composition, attachment method and location on each serialized component being provided.

3. Firmware configuration template to be used for each component provided.

4. Written installation, coordination, and test procedure to be followed by installing technicians and engineers.

5. Final documentation template.

3.02 INSTALLATION

A. Contractor shall be familiar with the environment where work will be done as specified herein and make every reasonable effort to minimize interference with Owner's or other contractor's activities.

   1. Appendices depicting general ceiling conditions for areas of buildings are included herein. Contractors shall field verify specific room conditions.

B. Work Areas shall be cleaned at the end of each day. All debris shall be cleared, removed, and disposed of off premise. All equipment and tools shall be removed from common areas and stored in approved, secure storage locations.

   1. Owner shall not be responsible for disposal or transportation of any packaging materials or other waste items.

   2. Owner's waste containers including site dumpsters shall not be used for material disposal.

C. All equipment and materials shall be installed in a neat and workmanlike manner. Best practices installation principles shall be used throughout the project.

D. The Contractor shall furnish, set in place, and install all equipment necessary for a fully compliant and operational system as specified herein. The installation process includes, but is not limited to the following:

   1. Inventory receipt of all components and equipment.

   2. Storage of all equipment and components until such time those items are installed according to the specifications.

   3. Transport equipment to the Owner's installation location(s).

   4. Assemble, install, configure, and test all equipment and components, maintaining accurate inventory records and status documents and discarding packaging.

   5. Collect all information necessary to accurately program all system devices to the Owner's intended use and need.

   6. Label with asset tags and other markings provided by Owner all system devices as may be appropriate and required by Owner and Designer.

   7. Work shall be performed to meet local codes and industry standards including proper grounding and bonding of installed equipment. Work

shall conform to “best practices” observed by industry professional installers and as required by Owner and Designer.

8. Work shall include careful coordination and cooperation with others to ensure a timely, cost effective and proper installation for Owner’s intended application. Such efforts shall include, but not be limited to, coordinating, and cooperating with other contractors, Owner, Designer and Engineer.

9. Where cables are to be routed through or on a finished wall, standard connectors must be used at the wall location to terminate call cables. All wall plates shall be stainless steel. Plastic or nylon plates shall not be acceptable. Cables routed out of a wall box on a finished wall without proper standard connection termination shall not be acceptable.

10. All cables shall be proper and adequately supported using hooks or rings no more than eight feet (6’) apart. Cables supported by structural steel, ceiling grid or hanger wires will not be acceptable. All cable routing shall be neat and orderly.

11. All cable connecting components mounted in/on Technology Cart, shall have adequate cable slack to provide for full system inspection and or service without the removal (intentional or inadvertent) of connecting cables, including items that will be placed on the keyboard tray of equipment carts.

12. Label all cable connections for intuitive user access and as directed by Owner and Designer.

13. Work may include extending cables from installed equipment, and as required and/or specified herein, to Owner identified connection outlets.

    a. Work includes supply, connection, and testing of any such cables.

    b. Work includes neatly routing all cables and securing cables with Velcro straps as may be reasonably required to keep cables in position during normal operating, service, and inspection operations.

    c. Cables for some devices may be routed in air plenum spaces, above finished ceilings, or in other ways require special care and suitable tools to complete. Where air plenum status is in question and/or may change, plenum rated cable shall be used.

E. All installation and configuration activity shall fully comply with both the manufacturer's recommended procedures as well as industry best practices.

F. VIDEO PROJECTORS

1. Install, configure, and test approved firmware configuration template including, but not limited to:

    a. Power on Image.

    b. Lamp setting.

    c. Firmware based Device ID (Including parameters such as: TCP/IP settings, Host Name, etc.).

    d. Default port selection.

2. Neatly configure all cables as directed by Owner.

3. Attach projector to mount using projector security mounting plate provided by others.

4. Connect AC power using cord provided to projector.

5. Align projector with screen.

6. Set keystone adjustment(s) as required.

7. Zoom and focus projector as required.

8. Properly and completely secure all adjustment points.

9. Provide for low voltage power from projector electrical outlet to the remote input/switcher mounted above the input plate. Securely mount transformer with the projector.

10. Coordinate with Owner and Designer markerboard location adjustments.

11. Remove and dispose of all excess materials, and packaging as directed by Owner.

G. DOCUMENT CAMERAS

1. Develop with Owner and Designer an approved firmware configuration template for all physical and programmatic settings available on the product.

2. Install, configure, and test approved firmware configuration template in all spaces as indicated on schedules herein.

H. WIRELESS PRESENTATION DEVICES

1. Develop with Owner and Designer an approved firmware configuration template for all physical and programmatic settings available on the product.

2. Install, configure, and test approved firmware configuration template in all spaces as indicated on schedules herein.

I. VOICE AMPLIFICATION SYSTEM

1. Connect all audio input and output device cables.

2. Secure mounting location with mounting screws or Velcro pads to eliminate involuntary equipment movement.

3. Neatly route all cabling and secure slack.

4. Adjust balance levels for standard configuration.

5. Verify target volume level in space with sound meter and record level at installation.

J. It shall be the responsibility of the Contractor to repair or replace any damage done to the structure of finishes in the building by the Contractor. If in the course of work, Contractor damages, marks, or misplaces any surfaces or access plates/panels the Contractor shall repair and/or replace the surface, plate, or panel to the original condition.

1. Repairs shall include, but not be limited to patching and painting.

2. Final determination as to the damage condition and/or repair/replacement fitness of any surface, plate or panel shall be the sole responsibility of the Designer.

3. The building and work area shall be returned to its original condition prior to final sign-off of the project.

K. Following installation and system “turn-up”, but prior to final acceptance of the system, Contractor shall conduct follow-up interviews with Owner identified administrators and staff to review system functionality, suitability and confirm feature and program fitness for Owner applications.

1. Follow-up interviews shall be fully documented by Contractor and submitted to Owner for approval.

L. All cable and device labels shall match existing standard.

3.03 TESTING

A. In an effort to ensure a smooth “turn-up” of the new system Contractor shall submit to a thorough testing process as defined herein prior to cut-over.

B. Prior to requesting testing by Designer, the Contractor shall use adequate means to assure the Work is completed in accordance with the specified requirements, meets the owner’s specific application requirements and is ready for functionality and integrity testing.

C. Testing Procedures

1. Prior to system “turn-up”, Contractor shall submit a written request and proposed test plan to Designer indicating they have completed full and final configuration of the system and are ready to have system integrity and functionality tested.

2. Within reasonable time after receipt of request, Designer will accept or revise the proposed test plan, provide a test schedule and coordinate testing date(s) with Owner and Contractor.

3. Should Designer determine the Work is not acceptably configured or not of adequate integrity:

a. Designer promptly will so notify Contractor, giving reasons therefore and providing sufficient details to allow Contractor to make corrective actions.

b. Contractor shall then expeditiously remedy the deficiencies and notify Designer in writing when ready for re-testing.

c. Designer will schedule re-test of the Work.

d. Excessive re-testing of Work may result in fees being assessed Contractor.

4. Should Designer and Owner concur the Work is configured properly, and system integrity is as required:

a. Designer will review Contractors detailed “turn-up” plan, and upon finding it acceptable issue a memorandum of Testing Completion to Owner and Contractor after which system “turn-up” can proceed.

3.04 DOCUMENTATION

A. Contractor shall, throughout the completion of the project, provide Owner a file storage system that shall include all necessary equipment, including if reasonably required, file drawers, folders, dividers, etcetera, to contain all as-built drawings, owner’s manuals of all equipment installed, warranty and maintenance information and other information the Contractor, Designer

and/or Owner deem necessary. Documentation shall also be provided in a digital format in file formats and on media as specified by Owner and/or Designer.

B. Contractor shall be responsible for providing thorough, timely documentation on all hardware, software. Documentation shall include, but not be limited to:

1. Equipment description.
2. Equipment make.
3. Model number.
4. Software release.
5. Date installed.
6. Location installed.
7. Manufacturer's warranty.
8. Maintenance contract terms.
9. Verification of maintenance contract engagement.
10. Telephone numbers for service and support.
11. Detailed technical support and service procedure instructions.
12. All product (hardware and software) manuals and manufacturer supplied documentation, including, but not limited to owner manuals, system administrator manuals and configuration guides. Where number of duplicate copies for particular manual or documentation item could be reasonably considered excessive, Contractor shall request direction from Owner and Designer.
13. Photocopy of original invoice listing make and model for all components and equipment from individual manufacturer(s), distribution source(s), or authorized agent(s) to establish manufacturer warranty start date for potential use after end of contract warranty provisions.
14. CAD or Visio as built drawings/diagrams for each building.
15. System Configuration Report.
16. Complete inventory of installed hardware and system software including, but not be limited to, model numbers, Ethernet MAC address, serial numbers, physical installation location and software options.

3.05 TRAINING

A. No training shall be conducted prior to training outline and/or syllabus being approved by Owner, Instructional or overview activities conducted without prior content approval with not be deemed contract training, and Contractor shall remain responsible for delivery of approved training.

B. Contractor shall provide training for the Owner designated system administrator(s). Training shall be a minimum of one (1), one (1) hour session in length, at the convenience of the Owner personnel, and of sufficient duration to satisfactorily complete training on all system administration functions including, but not limited to:

1. Basic trouble shooting of the installed system and components including diagnostic and problem resolution actions.

2. System back-up and restore functions and procedures for all system parameters and configurations.

3. Device additions moves and changes as well as reconfiguration.

4. Review of system alerts, logs and monitoring of configuration parameters including, but not limited to and system configuration changes.

C. Contractor shall provide end user training for classroom instructors district wide via the development of video training segments to be posted on an internal website for distribution. Training shall be available prior to substantial completion. End user video training segments shall include, but not limited to the following:

1. System power up and power down.

2. Source selection.

3. Volume control.

4. Voice amplification use.

5. Document camera operation.

6. System care and classroom maintenance best practices.

7. Equipment cart relocation and adjustments.

8. Screen operation and care.

9. Problem reporting.

3.06 SCHEDULE, MEETINGS AND PLANS

A. Schedule

1. Contractor Chosen: Week of February 6, 2023

2. Work Commences: As soon as possible

3. Substantial Completion: July 1, 2023

4. Project Close-out: August 1, 2023

B. Planned sequence of operations shall be established by the Contractor within the guidelines established by the Owner, as required herein and as required to meet schedules.

C. All work shall be coordinated with Owner's construction manager on site.

D. Project progress meetings shall be held, but not limited to, weekly at a site and time identified as convenient for Owner and as required herein. Meetings will be attended as required herein.

END OF SECTION

SECTION 27 51 16
PUBLIC ADDRESS SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION OF PROJECT

A. Work described in this specification section pertains to Public Address and Intercom System expansion for Hudsonville Public Schools. Work shall include, but not be limited to, head-end equipment, cabling, ceiling and/or wall speakers, interface units and all other components and services required for a full and operational system.

B. Owner desires to add to systems currently in operation and serving indicated locations on drawings.

C. The Contractor shall design, engineer, configure, supply, connect, test, document, and warrant a fully operational and compliant system, complete and with full functionality as specified herein.

D. Contractor shall coordinate their installation with other communication systems, contractors, Designer, and the Owner as is appropriate.

1.02 WARRANTY

A. Complete installation shall be fully functional and free from defect and/or failure for a period of three (3) years. Any replacement, upgrade, or fix, including labor for any non-conforming or non-operational part of the system shall be fixed and/or replaced at no cost to the Owner.

1. Owner shall be provided full operation of system functions and features during the complete warranty period incurring absolutely no costs during that time.

B. Manufacturer’s warranty shall be provided for all components of the system.

1. Any paperwork and/or submittals required by individual manufacturers for compliance with the standard and/or applicable extended warranty programs shall be provided and submitted for approval by the Contractor.

2. Contractor shall submit all paperwork, apply for warranty or extended warranty certification, and provide a Certificate of Warranty or Extended Warranty as may be applicable from the manufacturer prior to project closeout.

C. On site services provided under the warranty shall be performed by personnel or representatives of Contractor as herein defined and located within physical proximity to provide response levels deemed acceptable to Owner.

D. Contractor shall provide the following response times for all malfunctioning equipment:

1. Four (4) hours or less for matters that render twenty percent (20%) or more of the system users unable to maintain normal productivity.

2. Two (2) business days for matters not meeting the above criteria.

3. Response time shall be measured from the time Contractor is notified by Owner to the time work is begun to resolve the matter.

E. Bidder shall provide current monthly maintenance/service contract pricing for recommended programs for all equipment following the specified and included period as additional information. This information will be considered by Owner and Designer as part of the bid evaluation process.

F. System Warranty shall commence on date of substantial completion as certified by Designer and provided for herein. Delivery to work site of materials, connection of circuits, turn-up of system, physical removal from packaging, issuance of Contractor documents including, but not limited to invoices and/or packing slips, or any event or documentation, not specifically provided for herein, shall have no effect on Warranty or System Acceptance by Owner and/or Designer.

1.03 STORAGE OF MATERIALS

A. All materials shall be secured when not in use by the Contractor.

B. It shall be the Contractor's responsibility to secure all equipment including material to be installed as part of the contract. No changes shall be made to the contract due to loss or theft of equipment and/or materials not officially accepted by the Owner.

C. Formal receipt of the materials shall not be completed by the Owner until completion of project closeout. The Contractor shall be responsible for all equipment until time of closeout as provided for herein.

1.04 SUBMITTALS

A. Submittals shall consist of, but not be limited to, technical cut sheets and detailed information pamphlets on all components of the system to be installed. All cut sheets and submittals shall be distinctly marked to highlight the actual part number of the item being submitted for approval with Bid Proposals.

B. Shop drawings and diagrams shall be submitted by Bidder for approval by Designer with Bid Proposals.

1. Shop drawings and diagrams shall show all data relating to structural, electrical, wiring, cross connect, interconnect, equipment arrangement/layout, and any other information deemed significant by the Designer.

2. No work constituting final installation shall be commenced until after approval of shop drawings by Designer.

C. Contractor shall provide proof of manufacturer support by photocopy of certification and letter of support from major component manufacturers for this specific project with Bid Proposals.

D. Equipment or material installed for this project that does not have an approved submittal associated with it, will be removed, and replaced with acceptable equipment or material as defined by the Designer. All replacement costs including, but not limited to material and labor, shall be the sole responsibility of the Contractor.

1. The Owner and/or Designer may notify Contractor of any offending situations under this provision allowing Contractor up to forty-eight (48) hours to correct the situation prior to taking other corrective action.

2. The Owner reserves the right to replace unapproved materials and deduct the costs of doing so as defined herein from any amounts that may be due or become due Contractor.

E. The Contractor shall submit within five (5) calendar days after the Notice to Proceed, a schedule that reflects the sequence of activities of the contractor's approach to the execution of and completion of the work. The schedule shall be broken into work areas to provide for a clear identification of the planned progress of the work. Included in the schedule will be a list of tasks with list of deliverables and the percentage of work completed. This schedule shall coincide with progress payments applications dates and projected amounts. All durations shown will be in working days. The timeframe described in the Contractor's Schedule shall represent the Contractor's plan for organizing, directing, managing, controlling, staffing and executing the work required by the Contract Documents. Owner will rely on such schedules to coordinate and otherwise plan related work of Owner personnel, other separate contractors, or the Owner’s routine daily work.

1.05 REFERENCE SPECIFICATIONS

A. All work, products, and materials shall conform with the following standards as applicable for the intended use:

1. EIA/TIA Commercial and Administration Standards

2. NEC

3. IEEE 802

4. IETF RFCs

5. FCC Emissions Ratings

6. UL

7. MOSHA Safety Standards

1.06 CONTRACTOR

A. The Contractor shall accept complete responsibility for the installation, certification, and support of the system. Contractor shall be an authorized vendor of all major components.

B. All work shall be performed and supervised by Project Managers, Engineers and/or Technicians who are qualified to install Voice Communication System and perform related tests as recommended by the manufacturer and in accordance with the manufacturer's best practices and methods.

C. Project Managers, Engineers and Technicians employed on this project shall be properly and fully trained and qualified by the manufacturer on the installation and testing of the equipment and systems to be installed.

D. The Contractor shall have a proven track record in Public Address System configuration and installation. This must be shown by the inclusion of references of at least three (3) projects involving the installation of similar systems completed by the Contractor in the prior two (2) years on unaltered forms with the sealed Bid Proposal as provided herein.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturer of major components of the included Public Address / Intercom system shall be known and leading entity in the relevant communications field, and shall have been designing, manufacturing, and installing similar systems for a period of no less than three (3) years.

1. Acceptable Manufacturers

a. Advanced Network Devices

b. Or Equivalent

2.02 Supply most current version of all products provided.

A. Prior and/or old versions of products, unless specifically approved and documented by Designer and/or Owner shall not be acceptable.

B. In cases where a newer version of hardware or software is available at the time of installation, Contractor shall request clarification from Designer on which version is to be used.

2.03 Furnish only new, first class quality materials and equipment.

2.04 PUBLIC ADDRESS AND INTERCOM SYSTEM HEAD END

A. Contractor shall supply, install, and configure all necessary materials for a fully IP PoE Paging/Intercom system. System shall fully integrate new speakers and intercom devices as specified herein for a fully working and compliant system.

B. System shall be Advanced Network Device

C. System shall reside on a Contractor provided server that shall be installed in the building MDF.

D. System shall provide for, but not be limited to the following:

1. Building wide paging

2. Individual classroom intercom initiated from the classroom, or from the office.

3. Program bells and alerts for normal school operation, configurable by simple calendar-based user interface.

4. Individual volume control of each IP speaker.

5. Full SIP compliance for communication between devices.

6. All other features and functions that are part of the manufacturer's current release of the product offering.

E. The Owner has preference for software licensing based on a persistent or perpetual model. Monthly or annual subscription licensing will not be as favorably considered as the preferred model.

2.05 COMMON INTERIOR SPEAKERS

A. One (1) Common Interior Speaker (one way audio) shall be installed in/on finished ceiling surfaces in corridor as indicated on drawings.

B. Contractor shall provide and install PoE Speakers as indicated herein: (Indicated on Drawings as S1)

1. IPSCM-RMe

2. Or Approved Equivalent

C. Final speaker placement shall be adjusted as needed for appropriate audio intelligibility, volume levels and ceiling obstructions and/or conditions and shall remain the responsibility of the contractor.

D. Speakers shall provide balanced intelligible sound that is free of distortion, free from noise and evenly dispersed.

E. 2'x2' lay in speaker with 8" cone speaker complete and assembled shall be installed.

1. Capable of >96 dB at 4'.

2. Frequency range is 45-18,000Hz.

F. All speakers shall be field firmware changeable to support multiple other SIP based software systems.

G. Any speaker baffles shall be installed with hardware matching the color of the baffle. Baffle color shall match finished ceiling color.

1. All baffles shall be flush against the ceiling and enclosures shall be fully supported. All speakers shall include a back-box.

H. All devices shall be mounted square and plumb and as recommended by the manufacturer and required by Owner and Architect.

I. Each speaker shall be connected to central equipment PoE+ compliant cabling provided by Others and provide for system wide broadcast and/or zone-specific broadcast.

J. Each speaker shall be volume adjustable at installation to accommodate specific acoustical properties of the intended coverage area.

K. Where 2x2 lay-in speaker installation is not possible contractor shall supply appropriate and compatible speakers:

1. Where ceilings are open IPSWS-SM or equal shall be used

2. Where ceilings are hard-lid Valcom IPSCM-RMe or equal shall be used complete with backbox and all supporting components as recommended by manufacturer.

L. Coordinate final placement of speakers with Designer and/or Architect.

1. Area of coverage will be such that calls will be clearly audible in the operating area and surrounding space.

M. System shall produce audio at a peak level of approximately eighty-five (85) dBA at probable listener's positions.

2.06 CLASSROOM INTERCOM STATIONS

A. Classroom Intercom Stations shall be provided in each room as indicated on drawings. Speakers shall be integrated in ceiling spaces near the center of the space, and call switches shall be installed in/on wall surfaces in classrooms and/or other instructional areas as indicated.

B. Contractor shall provide and install PoE Speakers as indicated herein:

1. Advanced Network Devices

a. IPSCM

2. Or Approved Equivalent.

C. Speakers shall provide balanced intelligible sound that is free of distortion, free from noise and evenly dispersed.

D. Internal microphones shall provide for adequate audio pick-up from anywhere in the room and internally mitigate feedback.

E. 2'x2' lay in speaker with 8" cone speaker complete assembled to a metal baffle and internal microphone shall be installed.

1. Capable of >96 dB at 4'.

2. Frequency range is 45-18,000Hz.

F. All speakers shall be field firmware changeable to support multiple other SIP based software systems.

G. Contractor shall provide and install Call-In Switches in classrooms and/or other instructional areas as indicated herein.

H. All devices shall be mounted square and plumb and as recommended by the manufacturer and required by Owner and Architect.

I. Each speaker shall be connected to central equipment PoE+ compliant cabling provided by Others and provide for system wide broadcast and/or zone-specific broadcast.

1. Contractor shall connect each call-in switch to it's associated speaker(s) providing all necessary cabling and providing for all cable support.

Cabling supported by structure or laying on finished surfaces shall not be accepted.

J. Each speaker shall be volume adjustable at installation to accommodate specific acoustical properties of the intended coverage area.

K. Where 2x2 lay-in speaker installation is not possible contractor shall supply appropriate and compatible speakers: (Indicated on Drawings as S5 and S6)

1. Where ceilings are open IPSWS-SM or equal shall be used

L. Coordinate final placement of speakers with Designer and/or Architect.

1. Area of coverage will be such that calls will be clearly audible in the operating area and surrounding space.

M. System shall produce audio at a peak level of approximately eighty-five (85) dBA at probable listener's positions.

2.07 COMPONENT INTERCONNECTION

A. All wiring not installed in conduit shall be plenum type cable and shall be so identified with continuous marking.

B. No wiring installed shall be visible unless specifically and individually approved by Owner and Designer. All wire that traverses open areas shall be installed in metal raceway of appropriate size for the number of wires installed plus twenty percent more.

1. All metal raceway shall be ordered in standard colors to as closely match the environment in which it is being installed as possible.

2. Metal raceway shall be carefully and neatly installed, to meet manufacturer recommendations and standards for professional installation.

3. Sharp edges, gaps in the covering or corners or other unprofessional workmanship characteristics of installation will not be acceptable.

C. Wiring color shall remain the same throughout the system. Colors used for coding shall be as directed by the system manufacturer, Owner, and Architect.

D. Wire shall be copper.

2.08 ALLOWANCES

A. Contractor shall include allowances for equipment and/or other contract service reimbursements as required below in base bid lump sum amount(s). Equipment and/or contract services shall be provided and sourced at Owner's discretion and convenience with full cooperation by Contractor and paid for

from successful bidder's contract in the amount(s) provided for herein. Any allowance amount proving to be excessive for the intended equipment and/or contract services shall be credited to the Owner against contract payment requests.

1. Allowance shall be made in the amount of $10,000 for contract services related to supply, installation, and connection of contingency upgrades.

PART 3 - EXECUTION

3.01 PREPARATION

A. Contractor shall conduct detailed walk-through examination with Designer and Owner verifying equipment and material locations as well as mounting and placement requirements prior to commencement of other installation activities.

B. Contractor shall ensure all submittals and shop drawings have been provided to, and approval has been obtained from Designer prior to commencement of any final installation activities.

3.02 INSTALLATION

A. Contractor shall be familiar with the environment where work will be done as specified herein.

B. Work Areas shall be cleaned at the end of each day. All debris shall be cleared, removed, and disposed of in an approved container for the site. All equipment and tools shall be removed from common areas and stored in approved, secure storage locations. Any work that may impede the general use of the space and cannot be removed shall be flagged and cordoned off by the Contractor prior to their departure.

C. All equipment and materials shall be installed in a neat and workmanlike manner. Best practices installation principles shall be used throughout the project.

D. The Contractor shall furnish, set in place, and install all equipment necessary for a fully compliant and operational system as specified herein. The installation process includes, but is not limited to the following:

1. Inventory receipt of all components and equipment.

2. Storage of all equipment and components until such time those items are installed according to the specifications.

3. Transport equipment to the Owner's installation location(s).

4. Assemble, install, configure, and test all equipment and components, maintaining accurate inventory records and status documents and discarding packaging.

5. Collect all information necessary to accurately program all sets and/or system devices to the Owner's intended use and need.

6. Complete end user and system administrator training programs as specified herein.

7. Work shall be performed to meet local codes and industry standards, including, but not limited to:

    a. Adequate gas tube protection for outside plant cable connections.

    b. Grounding and Bonding.

8. Work includes extending cable bundles, as required, to Owner identified equipment installation locations at all locations.

9. Owner will provide contractor with permanent asset tags for each system component that exceeds $100.00 in value. Equipment installed in wiring closets will have district asset tags installed in a prominent location. Assets installed in public areas, such as staff desktop devices, will have asset tags installed in discreet but consistent area of each asset.

    a. Asset number, device/component description, serial number, make, model, part-number, site, room number/name and any other critical asset information shall be recorded for Owner.

E. It shall be the responsibility of the Contractor to repair or replace any damage done to the structure of finishes in the building by the Contractor. If in the course of work, Contractor damages, marks, or misplaces any surfaces or access plates/panels the Contractor shall repair and/or replace the surface, plate, or panel to the original condition.

    1. Final determination as to the damage condition and/or repair/replacement fitness of any surface, plate or panel shall be the sole responsibility of the Designer.

    2. The building and work area shall be returned to its original condition prior to final sign-off of the project.

F. Following installation and prior to final acceptance of the system, Contractor shall conduct follow-up interviews with Owner identified administrators and staff to review system functionality, suitability and confirm feature and program fitness for Owner applications.

1. Follow-up interviews shall be fully documented by Contractor and submitted to Owner for approval.

G. Contractor shall collect, consolidate and otherwise prepare for shipping or disposal Owner's existing telecommunications system components, including, but not limited to stations, processors, cards, options, and application servers in a manner acceptable to, and consistent with, Owner's intended disposition of the items.

3.03 TESTING

A. In an effort to ensure a smooth "turn-up" of the new system Contractor shall submit to a thorough testing process as defined herein prior to cut-over. Testing shall include, but not be limited to the following:

B. Prior to requesting testing by Designer, the Contractor shall use adequate means to assure the Work is completed in accordance with the specified requirements, meets the owner's specific application requirements and is ready for functionality and integrity testing.

C. PROCEDURES

1. Prior to system "turn-up", Contractor shall submit a written request to Designer indicating they have completed full and final configuration of the system and are ready to have system integrity and functionality tested.

2. Within reasonable time after receipt of request, Designer will provide a test schedule and coordinate testing date(s) with Owner and Contractor.

3. Should Designer determine the Work is not acceptably configured or not of adequate integrity:

   a. Designer promptly will so notify Contractor, giving reasons therefore and providing sufficient details to allow Contractor to make corrective actions.

   b. Contractor shall then expeditiously remedy the deficiencies and notify Designer in writing when ready for re-testing.

   c. Designer will schedule re-test of the Work.

   d. Excessive re-testing of Work may result in fees being assessed Contractor.

4. Should Designer and Owner concur the Work is configured properly, and system integrity is as required:

a. Designer will review Contractors detailed cut-over plan, and upon finding it acceptable issue a memorandum of Testing Completion to Owner and Contractor after which system cut-over can proceed.

3.04 DOCUMENTATION

A. Contractor shall, throughout the completion of the project, provide Owner a file storage system that shall include all necessary equipment (file drawers, folders, dividers, etc.), to contain all as-built drawings, owner's manuals of all equipment installed, warranty and maintenance information and other information the Contractor, Designer and/or Owner deem necessary.

B. Contractor shall be responsible for providing thorough, timely documentation on all hardware, software. Documentation shall include, but not be limited to:

1. Equipment description.
2. Equipment make.
3. Model number.
4. Software release.
5. Date installed.
6. Manufacturer's warranty.
7. Maintenance contract terms.
8. Verification of maintenance contract engagement.
9. Telephone numbers for service and support.
10. Detailed technical support and service procedure instructions.
11. All product (hardware and software) manuals and manufacturer supplied documentation, including, but not limited to owner manuals, system administrator manuals and configuration guides. Where number of duplicate copies for particular manual or documentation item could be reasonably considered excessive, Contractor shall request direction from Owner and Designer.
12. Photocopy of original invoice listing make and model for all components and equipment from individual manufacturer(s), distribution source(s), or authorized agent(s) to establish manufacturer warranty start date for potential use after end of contract warranty provisions.
13. CAD as built drawings for each building.

3.05 TRAINING

A. No training shall be conducted prior to training outline and/or syllabus being approved by Owner. Instructional or overview activities conducted without prior content approval with not be deemed contract training, and Contractor shall remain responsible for delivery of approved training.

B. Contractor shall provide training for the Owner designated system administrator(s). Training shall be a minimum of one (1), one (1) hour session in length, at the convenience of the Owner personnel, and of sufficient duration to satisfactorily complete training on all system administration functions including, but not limited to:

1. Basic trouble shooting of the installed system and components including diagnostic and problem resolution actions.

2. System back-up and restore functions and procedures for all system parameters and configurations.

3. Device additions moves and changes as well as reconfiguration.

4. Review of system alerts, logs and monitoring of configuration parameters including, but not limited to and system configuration changes.

5. System power-up and power down process.

6. Recording and playing pre-recorded content.

7. System update process

8. System maintenance procedures.

9. Problem reporting.

C. Contractor shall provide in-person end user training for building office staff. Training shall be available at substantial completion. Training shall include, but not limited to the following:

1. System functionality overview.

2. Bell schedule programming and changes.

3. Paging zone controls.

4. Intercom function use incoming and outgoing.

5. System operation best practices.

6. Building wide all page.

7. Recording and playing pre-recorded content.

8. Problem reporting.

3.06 SCHEDULE, MEETINGS AND PLANS

A. Schedule

1. Contractor Chosen: Week of February 6, 2023

2. Work Commences: As soon as possible

3. Substantial Completion: July 1, 2023

4. Project Close-out: August 1, 2023

B. Planned sequence of operations shall be established by the Contractor within the guidelines established by the Owner, as required herein and as required to meet schedules.

C. All work shall be coordinated with Owner's construction manager on site.

D. Project progress meetings shall be held, but not limited to, weekly at a site and time identified as convenient for Owner and as required herein. Meetings will be attended as required herein.

END OF SECTION

SECTION 27 53 13
CLOCK SYSTEM

PART 0 - GENERAL

1.01 DESCRIPTION OF PROJECT

A. Work described in this specification section specification section pertains to Clock System expansion for Hudsonville Public Schools. Work shall include, but not be limited to, head-end equipment, cabling, single and dual sided wall clocks, and all other components and services required for a full and operational system.

B. Contractor shall advise, coordinate, and work cooperatively with Owner representatives and/or owner's designee related to any installation or special security provisions.

C. The Contractor shall design, engineer, configure, supply, connect, test, document, train Owner representatives and warrant a fully operational and compliant system, complete and with full functionality as specified herein.

D. Contractor shall coordinate their installation with other contractors, Designer and the Owner as is appropriate.

E. Clocks will act as the paging/intercom unit in locations where a clock is indicated, and a public address speaker is not indicated. Contractor to integrate clock into public address system and configure for public address and two-way communication.

F. Contractor is responsible for all cabling to the clocks at Forest Groves Elementary School. Contractor shall install necessary equipment and cabling for a complete turnkey installation

1.02 WARRANTY

A. Complete installation shall be free from defect and/or failure for a period of one (1) year. Any replacement, upgrade, or fix, including labor for any non-conforming or non-operational part of the system shall be fixed and/or replaced at no cost to the Owner.

B. Manufacturer's warranty shall be provided for all components of the system.

1. Any documents and/or submittals required by individual manufacturers for compliance with the standard and/or applicable extended warranty programs shall be provided and submitted for approval by the Contractor.

2. Contractor shall submit all documents, apply for warranty or extended warranty certification, and provide a Certificate of Warranty or Extended Warranty as may be applicable from the manufacturer prior to project closeout.

C. On site services provided under the warranty shall be performed by personnel or representatives of Contractor as herein defined and located within physical proximity to provide response levels deemed acceptable to Owner.

D. Contractor shall provide the following response times for all malfunctioning equipment:

1. Eight (8) hours or less for matters that render twenty percent (20%) or more of the system unable to maintain normal functionality.

2. Two (2) business days for matters not meeting the above criteria.

3. Response time shall be measured from the time Contractor is notified by Owner to the time work is begun to resolve the matter.

E. Bidder shall provide current annual maintenance contract pricing for recommended maintenance programs for all equipment following the specified and included one (1) year period as a Voluntary Alternate. This information will be considered by Owner and Designer as part of the bid evaluation process.

F. System Warranty shall commence on date of substantial completion as certified by Designer and provided for herein. Delivery to work site of materials, physical removal from packaging, issuance of Contractor documents including, but not limited to invoices and/or packing slips, or any event or documentation, not specifically provided for herein, shall have no effect on Warranty or System Acceptance by Owner and/or Designer.

1.03 STORAGE OF MATERIALS

A. All materials shall be secured when not in use by the Contractor.

B. It shall be the Contractor's responsibility to secure all equipment including material to be installed as part of the contract. No changes shall be made to the contract due to loss or theft of equipment and/or materials not officially accepted by the Owner.

C. Formal receipt of the materials shall not be completed by the Owner until completion of project closeout. The Contractor shall be responsible for all equipment until time of closeout as provided for herein.

1.04 SUBMITTALS

A. Submittals shall consist of, but not be limited to, technical cut sheets and detailed information pamphlets on all components of the system to be installed. All cut sheets and submittals shall be distinctly marked to highlight the actual part number of the item being submitted for approval with Bid Proposals.

B. Shop drawings and diagrams shall be submitted by Bidder for approval by Designer with Bid Proposals.

    1. Shop drawings and diagrams shall show all data relating to structural, electrical, wiring, cross connect, interconnect, equipment arrangement/layout, and any other information deemed significant by the Designer.

    2. No work constituting final installation shall be commenced until after approval of shop drawings by Designer.

C. Contractor shall provide proof of manufacturer support by photocopy of certification and letter of support from major component manufacturers for this specific project with Bid Proposals.

D. Equipment or material installed for this project that does not have an approved submittal associated with it, will be removed, and replaced with acceptable equipment or material as defined by the Designer. All replacement costs including, but not limited to material and labor, shall be the sole responsibility of the Contractor.

    1. The Owner and/or Designer may notify Contractor of any offending situations under this provision allowing Contractor up to forty-eight (48) hours to correct the situation prior to taking other corrective action.

    2. The Owner reserves the right to replace unapproved materials and deduct the costs of doing so as defined herein from any amounts that may be due or become due Contractor.

E. The Contractor shall submit within ten (10) calendar days after the Notice to Proceed, a schedule that reflects the sequence of activities of the contractor's approach to the execution of and completion of the work. The schedule shall be broken into work areas to provide for a clear identification of the planned progress of the work. Included in the schedule will be a list of tasks with list of deliverables and the percentage of work completed. This schedule shall coincide with progress payments applications dates and projected amounts. All durations shown will be in working days. Microsoft Project is the software of choice for this schedule. The timeframe described in the Contractor's Schedule shall represent the Contractor's plan for organizing, directing, managing, controlling, staffing, and executing the work required by the Contract Documents. Owner will rely on such schedules to coordinate and

otherwise plan related work of Owner personnel, other separate contractors, or the Owner's routine daily work.

1.05 REFERENCE SPECIFICATIONS

A. All work, products, and materials shall conform with the following standards as applicable for the intended use:

1. IEEE

2. EIA/TIA Commercial and Administration Standards

3. NEC

4. FCC – All Applicable Rules and Regulations

5. UL

6. MOSHA Safety Standards

1.06 CONTRACTOR

A. The Contractor shall accept complete responsibility for the installation, certification, and support of the system. Contractor shall be an authorized vendor of all major components.

B. All work shall be performed and supervised by Project Managers, Engineers and/or Technicians who are qualified to install system and perform related tests as recommended by the manufacturer and in accordance with the manufacturer's best practices and methods.

C. Project Managers, Engineers and Technicians employed on this project shall be properly and fully trained and qualified by the manufacturer on the installation and testing of the equipment and systems to be installed.

D. The Contractor shall have a proven track record in security system configuration and installation. This must be shown by the inclusion of references of at least three (3) projects involving the installation of similar systems completed by the Contractor in the prior two (2) years on unaltered forms with the sealed Bid Proposal as provided herein. Bid Proposal Form(s) may be duplicated as required in order to provide adequate space to list required number of reference installations for each division Bidder is responding to.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers:

1. Advanced Network Devices

2. Or Equal

2.02 Supply most current version of all products provided.

A. Manufacturer shall have five (5) years of experience and history manufacturing similar products to those specified.

B. Proposed components shall have been field tested and proven in actual use.

C. Prior and/or old versions of products, unless specifically approved and documented by Designer and/or Owner shall not be acceptable.

D. In cases where a newer version of hardware or software is available at the time of installation, Contractor shall request clarification from Designer on which version is to be used.

2.03 Furnish only new, first class quality materials and equipment.

2.04 In the event of a power failure, complete system shall automatically re-initialize and "become active" to the last configuration in use with no human intervention.

2.05 Contractor shall be responsible for final and working system. Use of existing components and materials provided by others during new construction shall be integral to system configuration and cost-effective installation. Bidders are encouraged to use all compatible and working components in system solution. See schedule(s) and reference files for additional detail.

2.06 CLOCK SYSTEM

A. Contractor shall supply, install, and configure all necessary materials to install a fully compliant simple PoE Clock System attached to NTP server as directed by Owner to fully integrate new clock devices as specified herein.

2.07 SINGLE SIDED CLOCK

A. Single sided factory assembled digital clocks shall be provided and installed in classrooms and/or other instructional areas as indicated in associated drawings. (C1 on drawings)

B. Clocks shall meet or exceed the following:

1. Advanced Network Devices or equal.

a. IPCSHD-MD

2. Or Approved Equivalent

2.08 DOUBLE SIDED CLOCK

A. Double sided factory assembled digital clocks shall be provided and installed on wall surfaces in corridor and as indicated in associated drawings. (C2 on drawings)

B. Clocks shall meet or exceed the following:

1. Advanced Network Devices

a. IPCSHD-DS-MB

2. Or Approved Equivalent

2.09 LARGE IP SIGNBOARD

A. Large IP signboard assembled digital clock shall be provided and installed on wall surfaces in gymnasium and as indicated in associated drawings. (C3 on drawings)

B. Clocks shall meet or exceed the following:

1. Advanced Network Devices

a. IPSIGNL-RWB

b. Or approved Equivalent

PART 3 - EXECUTION

3.01 PREPARATION

A. Contractor shall conduct detailed walk-through examination with Designer and Owner verifying equipment and material locations as well as mounting and placement requirements prior to commencement of other installation activities.

B. Contractor shall ensure all submittals and shop drawings have been provided to, and approval has been obtained from Designer prior to commencement of any final installation activities.

3.02 INSTALLATION

A. Contractor shall be familiar with the environment where work will be done as specified herein and make every reasonable effort to minimize interference with Owner’s or other contractor’s activities.

B. Work Areas shall be cleaned at the end of each day. All debris shall be cleared, removed, and disposed of in an approved container for the site. All

equipment and tools shall be removed from common areas and stored in approved, secure storage locations. Any work that may impede the general use of the space and/or other contractor's work and cannot be removed shall be flagged and cordoned off by the Contractor prior to their departure.

C. All equipment and materials shall be installed in a neat and workmanlike manner. Best practices installation principles shall be used throughout the project.

D. The Contractor shall furnish, set in place, and install all equipment necessary for a fully compliant and operational system as specified herein. The installation process includes, but is not limited to the following:

    1. Inventory receipt of all components and equipment.

    2. Storage of all equipment and components until such time those items are installed according to the specifications.

    3. Transport equipment to the Owner's installation location(s).

    4. Assemble, install, configure, and test all equipment and components, maintaining accurate inventory records and status documents and discarding packaging.

    5. Collect all information necessary to accurately program all system devices to the Owner's intended use and need.

    6. Label all system devices as may be appropriate and required by Owner and Designer.

    7. Complete end user and system administrator training programs as specified herein.

    8. Work shall be performed to meet local codes and industry standards including proper grounding and bonding of installed equipment.

E. It shall be the responsibility of the Contractor to repair or replace any damage done to the structure of finishes in the building by the Contractor. If in the course of work, Contractor damages, marks, or misplaces any surfaces or access plates/panels the Contractor shall repair and/or replace the surface, plate or panel to the original condition.

    1. Final determination as to the damage condition and/or repair/replacement fitness of any surface, plate or panel shall be the sole responsibility of the Designer.

    2. The building and work area shall be returned to its original condition prior to final sign-off of the project.

F. Following installation and system “turn-up”, but prior to final acceptance of the system, Contractor shall conduct follow-up interviews with Owner identified administrators and staff to review system functionality, suitability and confirm feature and program fitness for Owner applications.

1. Follow-up interviews shall be fully documented by Contractor and submitted to Owner for approval.

3.03 TESTING

A. In an effort to ensure a smooth “turn-up” of the new system Contractor shall submit to a thorough testing process as defined herein prior to cut-over.

B. Prior to requesting testing by Designer, the Contractor shall use adequate means to assure the Work is completed in accordance with the specified requirements, meets the owner’s specific application requirements and is ready for functionality and integrity testing.

C. Testing Procedures

1. Prior to system “turn-up”, Contractor shall submit a written request to Designer indicating they have completed full and final configuration of the system and are ready to have system integrity and functionality tested.

2. Within reasonable time after receipt of request, Designer will provide a test schedule and coordinate testing date(s) with Owner and Contractor.

3. Should Designer determine the Work is not acceptably configured or not of adequate integrity:

a. Designer promptly will so notify Contractor, giving reasons therefore and providing sufficient details to allow Contractor to make corrective actions.

b. Contractor shall then expeditiously remedy the deficiencies and notify Designer in writing when ready for re-testing.

c. Designer will schedule re-test of the Work.

d. Excessive re-testing of Work may result in fees being assessed Contractor.

4. Should Designer and Owner concur the Work is configured properly, and system integrity is as required:

a. Designer will review Contractors detailed “turn-up” plan, and upon finding it acceptable issue a memorandum of Testing Completion to Owner and Contractor after which system “turn-up” can proceed.

3.04 DOCUMENTATION

A. Contractor shall, throughout the completion of the project, provide Owner a file storage system that shall include all necessary equipment, including if reasonably required, file drawers, folders, dividers, etcetera, to contain all as-built drawings, owner's manuals of all equipment installed, warranty and maintenance information and other information the Contractor, Designer and/or Owner deem necessary. Documentation shall also be provided in a digital format in file formats and on media as specified by Owner and/or Designer.

B. Contractor shall be responsible for providing thorough, timely documentation on all hardware, software. Documentation shall include, but not be limited to:

1. Equipment description.
2. Equipment make.
3. Model number.
4. Software release.
5. Date installed.
6. Manufacturer's warranty.
7. Maintenance contract terms.
8. Verification of maintenance contract engagement.
9. Telephone numbers for service and support.
10. Detailed technical support and service procedure instructions.
11. All product (hardware and software) manuals and manufacturer supplied documentation, including, but not limited to owner manuals, system administrator manuals and configuration guides. Where number of duplicate copies for particular manual or documentation item could be reasonably considered excessive, Contractor shall request direction from Owner and Designer.
12. Photocopy of original invoice listing make and model for all components and equipment from individual manufacturer(s), distribution source(s), or authorized agent(s) to establish manufacturer warranty start date for potential use after end of contract warranty provisions.
13. As built drawings for each building.

14. System Configuration Report.

15. Complete inventory of installed hardware and system software. Hardware inventory shall include, but not be limited to, model numbers, serial

3.05 TRAINING

A. Not used.

3.06 SCHEDULE, MEETINGS AND PLANS

A. Schedule

1. Contractor Chosen: Week of February 6, 2023

2. Work Commences: As soon as possible

3. Substantial Completion: July 1, 2023

4. Project Close-out: August 1, 2023

B. Planned sequence of operations shall be established by the Contractor within the guidelines established by the Owner, as required herein and as required to meet schedules.

C. All work shall be coordinated with Owner's construction manager on site.

D. Project progress meetings shall be held, but not limited to, weekly at a site and time identified as convenient for Owner and as required herein. Meetings will be attended as required herein.

END OF SECTION

SECTION 28 20 00
VIDEO MONITORING SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION OF PROJECT

A. Work described in this specification section pertains to a Video Monitoring System upgrade for Hudsonville Public Schools.

B. Contractor shall propose a System to be deployed using IEEE Ethernet technology. The system components shall be installed and connected to the owner's Ethernet infrastructure and as specified herein. System shall be of a "network" architecture using Ethernet cameras and centrally located Ethernet server(s).

    1. Owner will provide adequate IEEE 802.3at 10/100/1000 Ethernet switch ports for the number of devices specified herein on existing Cisco switch infrastructure.

C. The centralized server recording equipment shall be installed in the Owner's existing district administration building Main Distribution Frame (MDF) and as required.

D. Contractor shall advise, coordinate and work cooperatively with Owner representatives or owner's designee related to any configuration changes required and/or proposed for Owner's existing Ethernet infrastructure (VLAN configuration, QoS mapping, routing, Firewall security provisions etc.).

E. The Contractor shall design, engineer, configure, supply, connect, test, document, train Owner representatives and warrant a fully operational and compliant network video monitoring system, complete and with full functionality as specified herein.

F. Contractor shall coordinate their installation with other contractors, Designer and the Owner as is appropriate.

1.02 WARRANTY

A. Complete installation shall be free from defect and/or failure for a period of Three (3) years. Any replacement, upgrade or fix, including labor for any non-conforming or non-operational part of the system shall be fixed and/or replaced at no cost to the Owner.

B. Manufacturer's warranty shall be provided for all components of the system.

1. System integrator or local vendor warranty, without underlying manufacturer's warranty/extended warranty will not be considered an acceptable base bid.

2. Any documents and/or submittals required by individual manufacturers for compliance with the standard and/or applicable extended warranty programs shall be provided and submitted for approval by the Contractor.

3. Contractor shall submit all documents, apply for warranty or extended warranty certification, and provide a Certificate of Warranty or Extended Warranty as may be applicable from the manufacturer prior to project closeout.

C. On site services provided under the warranty shall be performed by personnel or representatives of Contractor as herein defined and located within physical proximity to provide response levels deemed acceptable to Owner and without additional charge for any offending components.

D. Contractor shall provide the following response times for all malfunctioning equipment:

1. Twenty-four (24) hours or less for matters that render twenty percent (20%) or more of the system unable to maintain normal functionality.

2. Two (2) business days for matters not meeting the above criteria.

3. Response time shall be measured from the time Contractor is notified by Owner to the time work is begun to resolve the matter.

E. System Warranty shall commence on date of acceptance by Owner. Delivery to work site of materials, physical removal from packaging, issuance of Contractor documents including, but not limited to invoices and/or packing slips, or any event or documentation, not specifically provided for herein, shall have no effect on Warranty or System Acceptance by Owner and/or Designer.

F. Bidder shall provide current annual maintenance contract pricing for recommended maintenance programs for all equipment following the specified and included period as an alternate. This information will be considered by Owner and Designer as part of the bid evaluation process.

1.03 STORAGE OF MATERIALS

A. All materials shall be secured when not in use by the Contractor.

B. It shall be the Contractor's responsibility to secure all equipment including material to be installed as part of the contract. No changes shall be made to the

contract due to loss or theft of equipment and/or materials not officially accepted by the Owner.

C. Formal receipt of the materials shall not be completed by the Owner until completion of project closeout. The Contractor shall be responsible for all equipment until time of closeout as provided for herein.

1.04 SUBMITTALS

A. Submittals shall consist of, but not be limited to, technical cut sheets and detailed information pamphlets on all components of the system to be installed. All cut sheets and submittals shall be distinctly marked to highlight the actual part number of the item being submitted for approval with Bid.

B. Shop drawings and diagrams shall be submitted by Bidder for approval by Designer with Bid.

1. Shop drawings and diagrams shall show all data relating to structural, electrical, wiring, cross connect, interconnect, equipment arrangement/layout, and any other information deemed significant by the Designer.

2. No work constituting final installation shall be commenced until after approval of shop drawings by Designer.

C. Contractor shall provide proof of manufacturer support by photocopy of certification and letter of support from major component manufacturers for this specific project with Bid.

D. Equipment or material installed for this project that does not have an approved submittal associated with it, will be removed and replaced with acceptable equipment or material as defined by the Designer. All replacement costs including, but not limited to material and labor, shall be the sole responsibility of the Contractor.

1. The Owner and/or Designer may notify Contractor of any offending situations under this provision allowing Contractor up to forty-eight (48) hours to correct the situation prior to taking other corrective action.

2. The Owner reserves the right to replace unapproved materials and deduct the costs of doing so as defined herein from any amounts that may be due, or become due Contractor.

E. The Contractor shall submit within ten (10) calendar days after the Notice to Proceed, a schedule that reflects the sequence of activities of the contractor's approach to the execution of and completion of the work. The schedule shall be broken into work areas to provide for a clear identification of the planned progress of the work. Included in the schedule will be a list of tasks with list

of deliverables and the percentage of work completed. This schedule shall coincide with progress payments applications dates and projected amounts. All durations shown will be in working days. Microsoft Project is the software of choice for this schedule. The timeframe described in the Contractor's Schedule shall represent the Contractor's plan for organizing, directing, managing, controlling, staffing and executing the work required by the Contract Documents. Owner will rely on such schedules to coordinate and otherwise plan related work of Owner personnel, other separate contractors, or the Owner's routine daily work.

1.05 REFERENCE SPECIFICATIONS

A. All work, products, and materials shall conform with the following standards as applicable for the intended use:

1. EIA/TIA Commercial and Administration Standards
2. NEC
3. IEEE 802
4. IETF RFCs
5. FCC – All Applicable Rules and Regulations
6. UL
7. MOSHA Safety Standards

1.06 CONTRACTOR

A. The Contractor shall accept complete responsibility for the installation, certification and support of the system. Contractor shall be an authorized vendor of all major components.

B. All work shall be performed and supervised by Project Managers, Engineers and/or Technicians who are qualified to install system and perform related tests as recommended by the manufacturer and in accordance with the manufacturer's best practices and methods.

C. Project Managers, Engineers and Technicians employed on this project shall be properly and fully trained and qualified by the manufacturer on the installation and testing of the equipment and systems to be installed.

D. The Contractor shall have a proven track record in video monitoring system configuration and installation. This must be shown by the inclusion of references of at least three (3) projects involving the installation of similar systems completed by the Contractor in the prior two (2) years on unaltered

forms with the sealed Bid as provided herein. Bid Form(s) may be duplicated as required in order to provide adequate space to list required number of reference installations for each division Bidder is responding to.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers (In alphabetical order):

1. Exacqvision

2. Or Equivalent

2.02 Supply most current version of all products provided.

A. Manufacturer shall have five (5) years of experience and history manufacturing similar products to those specified.

B. Proposed components shall have been field tested and proven in actual use.

C. Prior and/or old versions of products, unless specifically approved and documented by Designer and/or Owner shall not be acceptable.

D. In cases where a newer version of hardware or software is available at the time of installation, Contractor shall request clarification from Designer on which version is to be used.

2.03 Furnish only new, first-class quality materials and equipment.

2.04 System shall be comprised of fully interoperable components including, but not limited to, camera licenses (which shall be installed on Owner's existing centrally located servers), Ethernet attached cameras, camera mounting brackets and housings, patch cords and all other necessary components integrated into a common working system.

2.05 CENTRAL VIDEO MONITORING CONTROL SOFTWARE

A. Central control software has been provided by others and is installed on standard servers provided by Owner. Servers are, and expected to remain located in the district head end. Contractor shall ensure that cameras and supporting units provided integrate into a common system using the existing Owner provided control software as indicated herein, and that Owner objectives for focal points and video motion are recorded as required by Owner.

2.06 CAMERAS

A. Ethernet cameras shall be provided as indicated herein. Cameras shall meet or exceed the following specified capabilities:

    a. Mounting conditions are indicated on the drawings.

2. Interior Single Lens 2MP Network Camera (SC1)

    a. Axis P3265-LV

    b. Or Equivalent

3. Interior single lens 5MP Network Camera (SC2)

    a. Axis P3267-LV

    b. Or Equivalent

4. Interior dual lens (2) 2MP Network Camera (SC3)

    a. Axis P4705-PLVE

    b. Or Equivalent

5. Interior/Exterior Mutli-Lens 8MP Network Camera (SC4)

    a. Axis P3807-PVE

    b. Or Equivalent

6. Interior/Exterior multi-lens Network Camera (SC5)

    a. AXIS M3058-PLVE Network Camera

    b. Or Equivalent

7. Exterior multi-lens Network Camera (SC6)

    a. Axis P3719-PLE

    b. Or Equivalent

B. Ethernet cameras shall properly and acceptably communicate over, and attach to, Owner's standard Ethernet communications network provided by others and be powered by use of IEEE 802.3at compliance.

C. Cameras shall conform to and/or support the following certifications, features, standards and/or protocols:

1. Secure network access incorporating user ID and password protection

2. NTP

3. SNMP

4. FCC Part 15 Subpart B Class B

5. Underwriters Laboratories Listed

D. IEEE 802.3 (Ethernet) UTP eight (8) pin modular connector.

E. Each camera shall be provided with an appropriate license for operation with the Central Video Monitoring and Control Software system and include the warranty provisions for continual operation and support for the period described herein.

F. All cameras and/or camera enclosures shall be firmly and securely mounted to finished ceiling, wall, or other surfaces as required and/or specified herein to maximize coverage and minimize tampering potential. Bidder shall provide, in base bid, all mounting materials and labor to comply with mounting conditions documented herein.

2.07 VOLUNTARY ALTERNATE – HANWA OR AVIGILON CAMERAS

A. Bidders are encouraged to provide voluntary alternate pricing for Hanwa Techwin and/or Avigilon cameras as alternates to Axis. Alternate cameras shall meet or exceed all camera requirement as specified herein and meet or exceed all features of the specified Axis model for each configuration.

2.08 ALLOWANCES

A. Contractor shall include allowances for equipment and/or other contract service reimbursements as required below in base bid lump sum amount(s). Equipment and/or contract services shall be provided and sourced at Owner's discretion and convenience with full cooperation by Contractor, and paid for from successful bidder's contract in the amount(s) provided for herein. Any allowance amount proving to be excessive for the intended equipment and/or contract services shall be credited to the Owner against contract payment requests.

1. Allowance shall be made in the amount of $10,000 for contract services related to renovation and configuration of necessary infrastructure upgrades at the Owner's sole discretion.

PART 3 - EXECUTION

3.01 PREPARATION

A. Contractor shall conduct detailed walk-through examination with Designer, Construction Manager and Owner verifying equipment and material locations as well as mounting, view and placement requirements prior to commencement of other installation activities.

B. Owner and Designer shall approve a written final installation plan provided by Contractor prior to commencement of installation activity.

C. Contractor shall ensure all submittals and shop drawings have been provided to, and approval has been obtained from Designer prior to commencement of any final installation activities.

3.02 INSTALLATION

A. Contractor shall be familiar with the environment where work will be done as specified herein and make every reasonable effort to minimize interference with Owner's or other contractor's activities.

B. Work Areas shall be cleaned at the end of each day. All debris shall be cleared, removed and disposed of in an approved container for the site. All equipment and tools shall be removed from common areas and stored in approved, secure storage locations. Any work that may impede the general use of the space and/or other contractor's work and cannot be removed shall be flagged and cordoned off by the Contractor prior to their departure.

C. All equipment and materials shall be installed in a neat and workmanlike manner. Best practices installation principles shall be used throughout the project.

D. The Contractor shall furnish, set in place, and install all equipment necessary for a fully compliant and operational system as specified herein. The installation process includes, but is not limited to the following:

1. Inventory receipt of all components and equipment.

2. Storage of all equipment and components until such time those items are installed according to the specifications.

3. Transport equipment to the Owner's installation location(s).

4. Assemble, install, configure and test all equipment and components, maintaining accurate inventory records and status documents and discarding packaging.

5. Carefully aim and focus each system camera to meet Owner's required views and focal points.

6. Collect all information necessary to accurately program all system devices to the Owner's intended use and need.

7. Label all system devices as may be appropriate and required by Owner and Designer.

    a. Owner will provide appropriate asset tags for all cameras in the project. Contractor shall ensure the tags are permanently affixed to the cameras in/on locations coordinated with the Owner. Tag numbers along with other inventory records for the installation shall be documented as specified herein.

8. Complete end user and system administrator training programs as specified herein.

9. Work shall be performed to meet local codes and industry standards including proper grounding and bonding of installed equipment.

10. Work includes extending Ethernet from installed equipment, as required, to Owner identified connection outlets at all locations.

    a. Work includes supply and connection of Category 6 Ethernet patch cables. Cables for some cameras may be in air plenum spaces, above finished ceilings, or in other ways require special care and suitable tools to complete.

    b. Patch cables at camera location shall not exceed twenty-five (25) feet in length.

    c. Patch cables at wire closets for cross connection to Owner's existing Ethernet switching infrastructure shall not be excessive in length, but be installed and routed to efficiently reach each connection point with reasonable and adequate slack for efficient "clean" access and ongoing maintenance.

    d. Contractor shall cross connect and report back switch port locations back to Owner for programming as necessary.

    e. Patch cables color shall be green in color.

11. Camera mounting and penetrations:

    a. Where cameras will be mounted on interior or exterior walls, Video Monitoring Contractor shall be responsible for making final penetration to extend existing data cabling or data cabling provided by Others.

b. In locations where new data cabling will be provided, low voltage cabling contractor shall be responsible for installing cabling to adjacent area for connection to camera device.

c. Where penetrations are made through fire rated walls, Contractor shall be responsible for supplying appropriate fire stop material.

E. Additional and Specific Requirements:

1. Contractor shall install all new cameras in locations indicated on appendices and detailed in related installation sections herein, and/or as directed by Owner and Designer. New equipment shall be installed and mounted to facilitate desired views and focal points.

2. Contractor shall use care and employ best industry practices to ensure mounting of new equipment is professional and appropriate.

3. Contractor shall use care and employ best industry practices to ensure installation of Owner provided repair materials, which may include, but not be limited to, ceiling tiles/pads, block/brick filler, and paint professionally and appropriately restores the surface and location vacated by prior equipment to the best possible condition.

4. Contractor shall supply and install stainless steel faceplates in all abandoned wall locations.

5. All cabling shall be removed to source including all accessories, housings, brackets and connectors.

F. It shall be the responsibility of the Contractor to repair or replace any damage done to the structure of finishes in the building by the Contractor. If in the course of work, Contractor damages, marks or misplaces any surfaces or access plates/panels the Contractor shall repair and/or replace the surface, plate or panel to the original condition.

1. Final determination as to the damage condition and/or repair/replacement fitness of any surface, plate or panel shall be the sole responsibility of the Designer.

2. The building and work area shall be returned to its original condition prior to final sign off of the project.

G. Following installation and system “turn-up”, but prior to final acceptance of the system, Contractor shall conduct follow-up interviews with Owner identified administrators and staff to review system functionality, suitability and confirm feature and program fitness for Owner applications.

1. Follow-up interviews shall be fully documented by Contractor and submitted to Owner for approval.

3.03 TESTING

A. In an effort to ensure a smooth "turn-up" of the new system Contractor shall submit to a thorough testing process as defined herein prior to cut-over.

B. Prior to requesting testing by Designer, the Contractor shall use adequate means to assure the Work is completed in accordance with the specified requirements, meets the owner's specific application requirements and is ready for functionality and integrity testing.

C. Testing Procedures

1. Prior to system "turn-up", Contractor shall submit a written request to Designer indicating they have completed full and final configuration of the system, and are ready to have system integrity and functionality tested.

2. Within reasonable time after receipt of request, Designer will provide a test schedule and coordinate testing date(s) with Owner and Contractor.

3. Should Designer determine the Work is not acceptably configured or not of adequate integrity:

a. Designer promptly will so notify Contractor, giving reasons therefore and providing sufficient details to allow Contractor to make corrective actions.

b. Contractor shall then expeditiously remedy the deficiencies and notify Designer in writing when ready for re-testing.

c. Designer will schedule re-test of the Work.

d. Excessive re-testing of Work may result in fees being assessed Contractor.

4. Should Designer and Owner concur the Work is configured properly and system integrity is as required:

a. Designer will review Contractors detailed "turn-up" plan, and upon finding it acceptable issue a memorandum of Testing Completion to Owner and Contractor after which system "turn-up" can proceed.

3.04 DOCUMENTATION

A. Contractor shall, throughout the completion of the project, provide Owner a file storage system that shall include all necessary equipment, including if reasonably required, file drawers, folders, dividers, etcetera, to contain all as-built drawings, Owner manuals of all equipment installed, warranty and maintenance information and other information the Contractor, Designer and/or Owner deem necessary. Documentation shall also be provided in a digital format in file formats and on media as specified by Owner and/or Designer.

B. Contractor shall be responsible for providing thorough, timely documentation on all hardware, software. Documentation shall include, but not be limited to:

1. Equipment description.
2. Equipment make.
3. Model number.
4. Serial Number
5. MAC Address
6. Asset Tag Number
7. Software release.
8. Date installed.
9. Manufacturer's warranty.
10. Maintenance contract terms.
11. Verification of maintenance contract engagement.
12. Telephone numbers for service and support.
13. Detailed technical support and service procedure instructions.
14. All product (hardware and software) manuals and manufacturer supplied documentation, including, but not limited to owner manuals, system administrator manuals and configuration guides. Where number of duplicate copies for particular manual or documentation item could be reasonably considered excessive, Contractor shall request direction from Owner and Designer.
15. Photocopy of original invoice listing make and model for all components and equipment from individual manufacturer(s), distribution source(s), or authorized agent(s) to establish manufacturer

warranty start date for potential use after end of contract warranty provisions.

16. CAD as built drawings for each building.

17. System Configuration Report.

18. Complete inventory of installed hardware and system software.

3.05 TRAINING

A. Training shall be conducted at the Owner's discretion and at times and places convenient to Owner personnel. Prior to any training being conducted, Contractor shall provide Owner and Designer with detailed training syllabus and schedule for proposed training event. Compliant syllabus and schedule shall be provided at least ninety-six 96 hours in advance. Owner reserves the right to postpone training if syllabus and/or schedule submitted are deemed inadequate. Training shall not be conducted until such time a syllabus and schedule submitted by Contractor are found to be acceptable to Owner.

B. Contractor shall provide User/Operator Level Training for the Owner designated system operator(s). Owner shall designate up to four (4) operators to be trained. Training shall be a minimum of one (1), two (2) hour sessions in length, at the convenience of the Owner personnel, and of sufficient duration to satisfactorily complete training on all system administration functions including, but not limited to:

1. View live video from camera(s) identified to be of interest.

2. View stored video from camera(s) identified to be of interest, from a range of time in history.

3. Zoom stored video to better identify or better review visual details of portions of video of interest.

4. Review historical video to watch a historical event such as damage to property after normal hours of operation.

C. Contractor shall provide physical on-site training for the Owner designated system administrator(s). Owner shall designate up to Four (4) system administrators to be trained. Training shall be a minimum of one (1), four (4) hour session(s) in length, at the convenience of the Owner personnel, and of sufficient duration to satisfactorily complete training on all system administration functions including, but not limited to:

1. Add, remove and reconfigure cameras on system.

2. Basic configuration and system administration of the installed system

3. Basic trouble shooting of the installed system and components including diagnostic and problem resolution actions.

4. System back-up and restore functions and procedures for all system parameters and configurations.

5. Review of system alerts, logs and monitoring of configuration parameters including, but not limited to, configuration changes and device status.

6. System database updates and maintenance.

7. Review standard system reports

3.06 SCHEDULE, MEETINGS AND PLANS

A. Schedule

1. Contractor Chosen: Week of February 6, 2023

2. Work Commences: As soon as possible

3. Substantial Completion: July 1, 2023

4. Project Close-out: August 1, 2023

B. Planned sequence of operations shall be established by the Contractor within the guidelines established by the Owner, as required herein and as required to meet schedules.

C. All work shall be coordinated with Owner's construction manager on site.

D. Project progress meetings shall be held, but not limited to, weekly at a site and time identified as convenient for Owner and as required herein. Meetings will be attended as required herein.

END OF SECTION

ELECTRICAL ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
BKR	BREAKER
BOB	BOTTOM OF BOX
BOS	BOTTOM OF STRUCTURE
BP	BREAKER PANEL
BLDG	BUILDING
CAP	CAPACITY
CLG	CEILING
CKT	CIRCUIT
CB	CIRCUIT BREAKER
C	CONDUIT
COMM	COMMUNICATIONS
CONN	CONNECTION
CONST	CONSTRUCTION
CONTR	CONTRACT (OR)
CLL	CONTRACT LIMIT LINE
CT	CURRENT TRANSFORMER
E.C.	ELECTRICAL CONTRACTOR
EHD	ELECTRIC HAND DRYER
ELEC	ELECTRIC (AL)
EWC	ELECTRIC WATER COOLER
EM	EMERGENCY
ENT	ENTRANCE
EQ	EQUAL
EQUIP	EQUIPMENT
EST	ESTIMATE
EF	EXHAUST FAN
ETR	EXISTING TO REMAIN
EX	EXISTING
F	FLUSH
FA	FIRE ALARM
FSE	FOOD SERVICE EQUIPMENT
FP	FIRE PROOF / FIRE PROTECTION
FLR	FLOOR
FLUOR	FLUORESCENT
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GRD	GROUND
HORIZ	HORIZONTAL
HTR	HEATER
HTG	HEATING
H/V	HEATING / VENTILATING
HVAC	HEATING, VENTILATING, AIR CONDITIONING
HOA	HAND-OFF-AUTOMATIC
HP	HEAT PUMP
INTLK	INTERLOCK
JCT	JUNCTION
JB	JUNCTION BOX
KW	KILOWATT
KWH	KILOWATT HOUR
KO	KNOCK-OUT
LBL	LABEL
LT	LIGHT
LC	LIGHT CONTROL
LCM	LIGHTING CONTROL MODULE
LCN	LIGHTING CONTROL NARRATIVE
LTG	LIGHTING
MAX	MAXIMUM
MCC	MOTOR CONTROL CENTER
MIN	MINIMUM
MRS	MOTORIZED ROLLER SHADE
NEC	NATIONAL ELECTRIC CODE
NEG	NEGATIVE (-)
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
N/A	NOT APPLICABLE
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
PC	PHOTO CELL
POS	POSITIVE (+)
PWR	POWER
P & L	POWER & LIGHTING
S	SURFACE
S.S.D.	SUPPLIED BY OTHERS
SP	SINGLE POLE
SPD	SURGE PROTECTION DEVICE
SPKR	SPEAKER
SPEC	SPECIFICATION
SUB	SUBSTITUTE
SWBD	SWITCHBOARD
TEL	TELEPHONE
TSTAT	THERMOSTAT
XFMR	TRANSFORMER
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORIES
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
W	WITH
W/O	WITHOUT
WL	WET LOCATION
WP	WEATHER PROOF

MAXIMUM CONDUCTOR LENGTHS FOR TYPICAL BRANCH CIRCUITS

FEET ONE-WAY BASED ON SINGLE PHASE, 20A CIRCUIT, 75% LOAD, 100% P.F., IN STEEL CONDUIT, 3% VOLTAGE DROP

CIRCUIT VOLTAGE	CONDUCTOR SIZE				
	#12 AWG	#10 AWG	#8 AWG	#6 AWG	#4 AWG
120	60	100	159	245	385
208	100	170	265	425	670
277	135	230	355	565	890
480	240	400	615	980	

FEET ONE-WAY BASED ON SINGLE PHASE, 30A CIRCUIT, 75% LOAD, 100% P.F., IN STEEL CONDUIT, 3% VOLTAGE DROP

CIRCUIT VOLTAGE	CONDUCTOR SIZE			
	#10 AWG	#8 AWG	#6 AWG	#4 AWG
120	60	100	159	245
208	100	170	265	425
277	135	230	355	565
480	240	400	615	980

FEET ONE-WAY BASED ON THREE PHASE, 20A CIRCUIT, 75% LOAD, 100% P.F., IN STEEL CONDUIT, 3% VOLTAGE DROP

CIRCUIT VOLTAGE	CONDUCTOR SIZE				
	#12 AWG	#10 AWG	#8 AWG	#6 AWG	#4 AWG
208	120	200	305	490	775
480	275	460	710	1,130	

FEET ONE-WAY BASED ON THREE PHASE, 30A CIRCUIT, 75% LOAD, 100% P.F., IN STEEL CONDUIT, 3% VOLTAGE DROP

CIRCUIT VOLTAGE	CONDUCTOR SIZE			
	#10 AWG	#8 AWG	#6 AWG	#4 AWG
208	120	200	305	490
480	275	460	710	1,130

COMMUNICATIONS SYMBOL LEGEND

- COMMUNICATIONS OUTLET ROUGH-IN
- COMMUNICATIONS OUTLET, ONE DATA ACTIVATION
- COMMUNICATIONS OUTLET, CEILING MOUNTED
- COMMUNICATIONS OUTLET, FLOOR MOUNTED
- CEILING MOUNTED VIDEO PROJECTOR
- COMMUNICATIONS EQUIPMENT RACK, FLOOR MOUNTED
- COMMUNICATIONS EQUIPMENT RACK, WALL MOUNTED
- CONDUIT SLEEVE FOR COMMUNICATIONS CABLING, 2" TYP, UNLESS NOTED OTHERWISE
- LOUDSPEAKER, CEILING MOUNTED, DEVICE FURNISHED AND INSTALLED BY OWNER'S TECHNOLOGY CONTRACTOR
- LOUDSPEAKER, WALL MOUNTED, DEVICE FURNISHED AND INSTALLED BY OWNER'S TECHNOLOGY CONTRACTOR
- INTERCOM SYSTEM CALL STATION BUTTON
- VOLUME CONTROL FOR AUDIO SYSTEM, PAGING, OR INTERCOM LOUDSPEAKERS
- SECONDARY CLOCK, CEILING MOUNTED, DEVICE FURNISHED AND INSTALLED BY OWNER'S TECHNOLOGY CONTRACTOR
- SECONDARY CLOCK, WALL-MOUNTED, DEVICE FURNISHED AND INSTALLED BY OWNER'S TECHNOLOGY CONTRACTOR

NOTE: NOT ALL SYMBOLS ARE NECESSARILY USED

ELECTRONIC SAFETY / SECURITY SYMBOL LEGEND

- DOOR CONTACT
- ELECTRONIC LATCH
- ELECTRONIC STRIKE
- PUSH BUTTON FOR DOOR LOCK
- WALL-MOUNTED SURVEILLANCE CAMERA COMMUNICATIONS ROUGH-IN
- CEILING-MOUNTED SURVEILLANCE CAMERA COMMUNICATIONS ROUGH-IN
- CARD READER
- ACCESS CONTROL DOOR TAG, REFER TO HARDWARE SCHEDULE(S) IN SPECIFICATION 08 71 00 AND/OR 28 13 00 FOR DETAILS.
- ACCESS CONTROL SYSTEM EQUIPMENT

NOTE: NOT ALL SYMBOLS ARE NECESSARILY USED

POWER SYMBOL LEGEND

- THREE PHASE MOTOR CONNECTION, 5 HORSE POWER
- SINGLE PHASE MOTOR CONNECTION, 1/2 HORSE POWER
- SAFETY SWITCH DISCONNECTING MEANS, NOT FUSIBLE
- SAFETY SWITCH DISCONNECTING MEANS, FUSIBLE
- COMBINATION MOTOR STARTER AND FUSIBLE DISCONNECTING MEANS
- VARIABLE FREQUENCY DRIVE WITH INTEGRAL DISCONNECTING MEANS
- MOTOR STARTER
- BOX-COVER FUSIBLE DISCONNECT SWITCH
- MANUAL MOTOR CONTROLLER
- POWER SWITCH, REFER TO LIGHTING SYMBOL LEGEND FOR SIMILAR SWITCH TYPES
- DIRECT ELECTRICAL CONNECTION
- SINGLE RECEPTACLE
- SINGLE RECEPTACLE, FLOOR-MOUNTED
- DUPLEX RECEPTACLE
- WHERE "WL" IS NOTED PROVIDE WHILE-IN-USE WET LOCATION COVER AND WEATHER RESISTANT DUPLEX RECEPTACLE.
- SURFACE-MOUNTED RECEPTACLE
- "T" TAG ON DEVICE INDICATES REPLACEMENT OF DEVICE USING EXISTING ROUGH-IN
- DUPLEX RECEPTACLE, CEILING-MOUNTED
- DUPLEX RECEPTACLE, FLOOR-MOUNTED
- DUPLEX STANDBY POWER RECEPTACLE
- DUPLEX SPLIT WIRED RECEPTACLE
- DUPLEX GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE
- QUADRUPLEX RECEPTACLE
- QUADRUPLEX RECEPTACLE, CEILING-MOUNTED
- QUADRUPLEX RECEPTACLE, FLOOR-MOUNTED
- MULTI-PHASE RECEPTACLE, SEE PLAN FOR TYPE
- MULTI-PHASE RECEPTACLE, FLOOR-MOUNTED
- SURFACE RACEWAY SYSTEM
- AUTOMATIC TRANSFER SWITCH
- SWITCHBOARD
- PANELBOARD
- TRANSFORMER
- MOTOR CONTROL CENTER
- EMERGENCY STOP STATION, REFER TO DETAIL FOR REQUIREMENTS.
- AUTOMATIC DOOR OPERATOR PUSH-BUTTON
- ON/OFF PUSH-BUTTON
- THREE-FUNCTION PUSH BUTTON
- FLOORBOX, TYPE 1
- JUNCTION BOX
- METER
- THERMOSTAT ROUGH-IN
- RELAY
- ENCLOSED CONTROL CONTACTOR

NOTE: NOT ALL SYMBOLS ARE NECESSARILY USED

LIGHTING SYMBOL LEGEND

- SINGLE POLE LIGHT SWITCH
- DOUBLE POLE LIGHT SWITCH
- THREE-WAY LIGHT SWITCH
- FOUR-WAY LIGHT SWITCH
- SINGLE POLE LIGHT SWITCH WITH INTEGRAL OCCUPANCY SENSOR
- OCCUPANCY SENSOR DIMMER
- WALL-BOX DIMMER SWITCH
- THREE-WAY DIMMER SWITCH
- ELECTRONIC INTERVAL TIMER SWITCH
- LIGHT SWITCH WITH PILOT LIGHT
- LIGHTING CONTROL SYSTEM, REFER TO LIGHTING CONTROL SWITCH SCHEDULE AND SPECIFICATIONS FOR DETAILS.
- DOUBLE THROW (MAINTAINED) LIGHT SWITCH
- KEY-OPERATED LIGHT SWITCH - (SUFFIX DESIGNATION | BLANK: SINGLE POLE, 2: DOUBLE POLE, 3: THREE-WAY, 4: FOUR-WAY)
- LOCKING SWITCH - (SUFFIX DESIGNATION | BLANK: SINGLE POLE, 2: DOUBLE POLE, 3: THREE-WAY, 4: FOUR-WAY)
- TOUCHSCREEN PANEL
- CIRCUIT NUMBER FOR LIGHT FIXTURES WITH INDICATED SPACE
- WALL-MOUNTED LIGHTING FIXTURE, TYPE 'A'
- RECESSED LIGHTING FIXTURE, TYPE 'A'
- SURFACE-MOUNTED LIGHTING FIXTURE, TYPE 'A'
- TRACK LIGHTING
- SINGLE FACE EXIT SIGN, TYPE "X1" IN SCHEDULE UNLESS OTHERWISE NOTED. SHADING INDICATES FACE ORIENTATION
- DOUBLE FACE EXIT SIGN, TYPE "X2" IN SCHEDULE UNLESS OTHERWISE NOTED. SHADING INDICATES FACE ORIENTATION
- WALL-MOUNTED EXIT SIGN
- EMERGENCY LIGHT FIXTURE DESIGNATION
- EMERGENCY LIGHTING AUTOMATIC LOAD CONTROL RELAY
- LIGHTING CONTROL RELAY
- LIGHTING CONTROL ENCLOSED CONTACTOR
- TRUE SWITCH
- LIGHTING CONTROL MODULE
- EMERGENCY LIGHTING INVERTER, TYPE 1
- WALL-MOUNTED OCCUPANCY SENSOR
- CEILING-MOUNTED OCCUPANCY SENSOR
- WALL-MOUNTED PHOTOCELL FOR ON/OFF CONTROL
- CEILING-MOUNTED PHOTOCELL FOR ON/OFF CONTROL
- WALL-MOUNTED PHOTOSENSOR FOR DAYLIGHT HARVESTING DIMMING CONTROL
- CEILING-MOUNTED PHOTOSENSOR FOR DAYLIGHT HARVESTING DIMMING CONTROL
- POLE-MOUNTED SITE/AREA FIXTURE
- SELF-CONTAINED EMERGENCY LIGHTING UNIT

NOTE: NOT ALL SYMBOLS ARE NECESSARILY USED

FIRE ALARM SYMBOL LEGEND

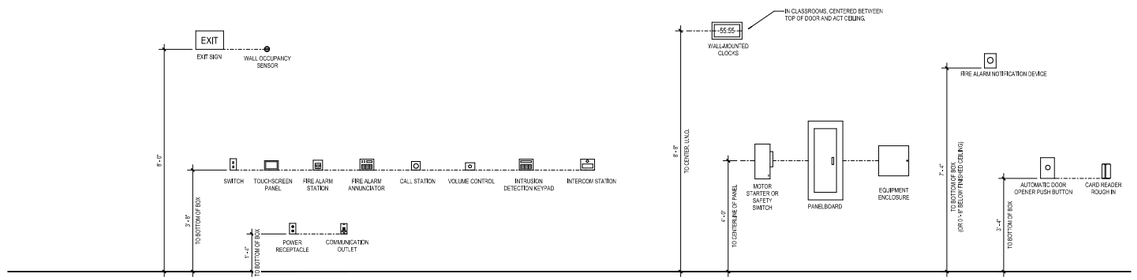
- MANUAL PULL STATION
- AUDIBLE NOTIFICATION APPLIANCE, WALL-MOUNTED
- VISUAL NOTIFICATION APPLIANCE, WALL-MOUNTED
- AUDIBLE/VISUAL NOTIFICATION APPLIANCE, WALL-MOUNTED
- AUDIBLE NOTIFICATION APPLIANCE, CEILING-MOUNTED
- AUDIBLE/VISUAL NOTIFICATION APPLIANCE, CEILING-MOUNTED
- VISUAL NOTIFICATION APPLIANCE, CEILING-MOUNTED
- WHERE "WG/PC" IS NOTED, PROVIDE LISTED WIRE GUARD OR PROTECTIVE POLYCARBONATE COVER FOR NOTIFICATION DEVICE.
- WHERE "WL" IS NOTED, PROVIDE LISTED WET-LOCATION NOTIFICATION DEVICE, SUITABLE FOR INDOOR OR OUTDOOR USE.
- SMOKE DETECTOR
- HEAT DETECTOR
- DUCT SMOKE DETECTOR
- SMOKE DAMPER OPERATOR MOTOR
- FIRE PROTECTION FLOW SWITCH
- FIRE PROTECTION TAMPER SWITCH
- ELECTROMAGNETIC DOOR HOLD-OPEN DEVICE
- ADDRESSABLE RELAY FOR FIRE ALARM CONTROL
- PRESSURE SWITCH
- CARBON MONOXIDE DETECTOR
- NOTIFICATION APPLIANCE CONTROL PANEL
- FIRE ALARM REMOTE ANNUNCIATOR
- FIRE ALARM CONTROL PANEL
- KEYED TEST SWITCH AND REMOTE INDICATOR FOR DUCT SMOKE DETECTOR
- FIRE PROTECTION OR ALARM BELL

NOTE: NOT ALL SYMBOLS ARE NECESSARILY USED

ELECTRICAL GENERAL NOTES

1. ALL WORK SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE AS AMENDED AND ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION WHERE THE WORK IS PERFORMED.
2. ALL "LOW-VOLTAGE" CONTROLS, COMMUNICATIONS, AND SAFETY/SECURITY CABLING MAY BE INSTALLED WITHOUT CONDUIT, RACEWAY, OR CABLE TRAY ONLY WHERE CONCEALED ABOVE A SUSPENDED CEILING SYSTEM AND ACCESSIBLE FOR FUTURE MAINTENANCE; OTHERWISE, ALL CABLING (INCLUDING BUT NOT LIMITED TO CABLES ASSOCIATED WITH SYSTEMS SUCH AS ARCHITECTURAL EQUIPMENT, BUILDING ENERGY MANAGEMENT, TEMPERATURE CONTROLS, LIGHTING CONTROLS, COMMUNICATIONS NETWORKS, TELEPHONE, AUDIO-VIDEO, INTERCOM, PAGING, CLOCK, SURVEILLANCE, ACCESS CONTROL, FIRE ALARM, ETC.) SHALL BE INSTALLED IN AN APPROVED CONDUIT, RACEWAY SYSTEM, AND/OR CABLE TRAY UNLESS OTHERWISE NOTED. IN EXPOSED STRUCTURE CEILING AREAS, CONCEALED INSTALLATION OF CABLES IN RACEWAYS SHALL BE REQUIRED FOR AESTHETIC REASONS. REFER TO REFLECTED CEILING PLANS FOR LOCATIONS. THIS APPLIES TO ALL TRADES AND WORK CATEGORIES. EXCEPTIONS:
   A. DEDICATED MECHANICAL AND/OR ELECTRICAL ROOMS ABOVE EACH APP.
   B. DEDICATED TELECOMMUNICATIONS ROOMS
3. "LOW-VOLTAGE" CONTROLS, COMMUNICATIONS, AND SAFETY/SECURITY CABLING SHALL NOT BE PAINTED. PAINTING CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARY PROTECTION OF ANY EXISTING CABLING PRIOR TO PAINTING EXISTING AREAS. CONTRACTORS INSTALLING CABLING WHERE APPROVED FOR EXPOSED INSTALLATION SHALL INSTALL CABLES AFTER PAINTING HAS BEEN COMPLETED OR PROVIDE TEMPORARY PROTECTION OF CABLES UNTIL PAINTING HAS BEEN COMPLETED. PAINTED CABLES SHALL BE REPLACED AT THE EXPENSE OF THE NEGLIGENT CONTRACTOR.
4. METAL CLAD CABLE MAY BE USED FOR FIXTURE WHIPS IN LENGTHS OF 6 FEET OR LESS ABOVE AN ACCESSIBLE SUSPENDED CEILING SYSTEM ONLY, OTHERWISE METAL CLAD OR OTHER FLEXIBLE CABLE TYPES SHALL NOT BE USED UNLESS SPECIFICALLY AUTHORIZED BY THE ENGINEER (IT IS THE INTENT OF THESE CONTRACT DOCUMENTS THAT ALL INSTALLED BRANCH CIRCUITS CONSIST OF SEPARATE RACEWAY AND CONDUCTORS ALLOWING REMOVAL AND REPLACEMENT OF WIRING AS REQUIRED FOR FUTURE UPGRADES). REFER TO SPECIFICATIONS FOR EXCEPTIONS.
5. CIRCUIT WIRING FOR ARTICLE 700 EMERGENCY SYSTEMS AND ARTICLE 708 CRITICAL OPERATIONS POWER SYSTEMS SHALL BE INSTALLED IN SEPARATE CONDUIT/RACEWAYS AND BE KEPT ENTIRELY INDEPENDENT OF ALL OTHER WIRING AND EQUIPMENT PER NEC REQUIREMENTS.
6. ALL FEEDERS AND BRANCH CIRCUITS SHALL CONTAIN AN EQUIPMENT GROUNDING CONDUCTOR SIZED ACCORDING TO THE NEC RACEWAYS INCLUDING CONDUITS, BOXES, WIREWAYS, ETC. SHALL NOT BE CONSIDERED AN ACCEPTABLE GROUND.
7. CONDUITS AND CABLING SHALL NOT BE INSTALLED WITHIN 4" OF ROOF DECK, EXCEPT AS NECESSARY TO SERVE ROOF-MOUNTED ITEMS AND ONLY WHEN THE CONDUIT OR CABLE IS ROUTED VERTICALLY TO SUCH EQUIPMENT FROM BELOW.
8. SUPPLEMENTAL METAL FRAMING SHALL BE PROVIDED FOR SUSPENSION POINTS OF ALL ITEMS LOCATED BETWEEN OVERHEAD STRUCTURAL MEMBERS (JOISTS, TRUSSES, BEAMS, ETC.) IN OPEN ASSEMBLE STRUCTURE CEILING AREAS. METAL FRAMING SHALL SPAN ACROSS THE TOP CHORD OR FLANGE OF THE STRUCTURAL MEMBERS FOR BOTH STRUCTURAL AND AESTHETIC PURPOSES. SPECIFIC EXCEPTIONS SHALL BE COORDINATED IN WRITING WITH THE ARCHITECT/ENGINEER.
9. CONDUIT INSTALLED WITHIN INACCESSIBLE CONSTRUCTION SHALL BE 3/4" MINIMUM SIZE.
10. FEEDERS SHOWN ON DRAWINGS ARE SCHEMATIC ONLY. CONDUIT RUNS SHALL COMPLY WITH CONDUIT SPECIFICATIONS AND CONTAIN BENDS THAT ARE NO GREATER THAN 90 DEGREES. CONDUITS INSTALLED ABOVE GRADE SHALL BE RUN PARALLEL TO, OR PERPENDICULAR WITH, BUILDING STEEL AND/OR ARCHITECTURAL LINES.
11. CONTRACTOR(S) SHALL VERIFY COLOR FINISH OF WIRING DEVICES, DEVICE FACEPLATES, SURFACE RACEWAY SYSTEMS, AND/OR MULTI-OUTLET ASSEMBLIES WITH ARCHITECT/ENGINEER IF NOT EXPLICITLY SPECIFIED.
12. ELECTRICAL CONTRACTOR SHALL REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR ADDITIONAL LIGHTING FIXTURE INFORMATION AND MOUNTING LOCATIONS.
13. ELECTRICAL CONTRACTOR SHALL ADJUST LIGHTING FIXTURE LOCATIONS IN MECHANICAL ROOMS TO ACCOMMODATE MECHANICAL EQUIPMENT AND FIELD CONDITIONS.
14. CONTRACTOR(S) SHALL BE RESPONSIBLE TO REVIEW INTERIOR ELEVATION SHEETS FOR PLACEMENT OF DEVICE BOXES. COORDINATE LOCATIONS SO TV-AT NO DEVICES ARE INSTALLED BEHIND CASEWORK, MILLWORK, VISUAL DISPLAY BOARDS, MIRRORS, CUSTOM GRAPHICS, SIGNAGE, ETC.
15. ELECTRICAL CONTRACTOR SHALL REVIEW TOILET EQUIPMENT SHOP DRAWINGS AND ARCHITECTURAL DETAILS/ELEVATIONS FOR CORRECT DEVICE ROUGH-IN LOCATION OF HAND DRYERS.
16. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH PLUMBING CONTRACTOR AND THE ELECTRIC WATER COOLER / BOTTLE FILLER SHOP DRAWINGS FOR MOUNTING HEIGHT AND CONNECTION METHOD OF PLUMBING EQUIPMENT POWER CONNECTIONS. WHERE ACCESSIBLE GFCI PROTECTION SHALL BE PROVIDED FOR THE BRANCH CIRCUIT(S) SUPPLYING ALL SUCH UNITS PER NEC REQUIREMENTS.
17. REFER TO MECHANICAL EQUIPMENT SCHEDULE FOR DETAILED INFORMATION REGARDING EQUIPMENT AND CONTROL. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING AND PROVIDING ITEMS AS SPECIFICALLY LISTED AND ASSIGNED ON MECHANICAL EQUIPMENT SCHEDULE SUCH AS DISCONNECT SWITCHES, VARIABLE FREQUENCY DRIVES, STARTERS, TIMERS, SWITCHES, ETC.
18. ELECTRICAL CONTRACTOR SHALL CONFIRM THE LOCATION OF THE EXHAUST FANS LISTED IN THE MECHANICAL EQUIPMENT SCHEDULES BY REFERRING TO MECHANICAL/HVAC PLANS.
19. REFER TO ROOF PLANS FOR EXACT LOCATIONS OF ROOF-TOP MECHANICAL EQUIPMENT.
20. CABINET HEATERS: MAY HAVE LINE VOLTAGE THERMOSTATS SUPPLIED BY MECHANICAL CONTRACTOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR. REFER TO MECHANICAL EQUIPMENT SCHEDULE.
21. DIVISION 26 CONTRACTOR SHALL PROVIDE CONDUIT SLEEVES WITH APPROPRIATE BUSHINGS FOR CONTROLS AND ELECTRONIC SAFETY/SECURITY CABLING THROUGH WALLS AND FLOORS. SLEEVE SIZES SHALL BE COORDINATED WITH CABLING REQUIREMENTS.
22. SECTION 27 05 28 CONTRACTOR SHALL PROVIDE CONDUIT SLEEVES WITH APPROPRIATE BUSHINGS FOR COMMUNICATIONS CABLING THROUGH WALLS AND FLOORS. SLEEVE SIZE SHALL BE 2" MIN. UNLESS NOTED OTHERWISE.
23. PROVIDE DIRECT CONNECTIONS FROM LOCAL RECEPTACLE CIRCUIT TO ACCESS CONTROL SYSTEM AND DOOR HARDWARE POWER SUPPLIES WHERE REQUIRED FOR DOOR LOCK DEVICES, CONTROLLERS, ETC. REFER TO DOOR HARDWARE SCHEDULE AND ACCESS CONTROL SYSTEM SCHEDULE IN RESPECTIVE SPECIFICATIONS FOR QUANTITIES AND LOCATIONS.

Section 27 51 16 - Public Address System



NOTE: ALL HEIGHTS ARE AS SHOWN UNLESS NOTED OTHERWISE.

TYPICAL MOUNTING HEIGHTS FOR WALL DEVICES, EQUIPMENT, & FIXTURES

NOT TO SCALE

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NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES

10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001

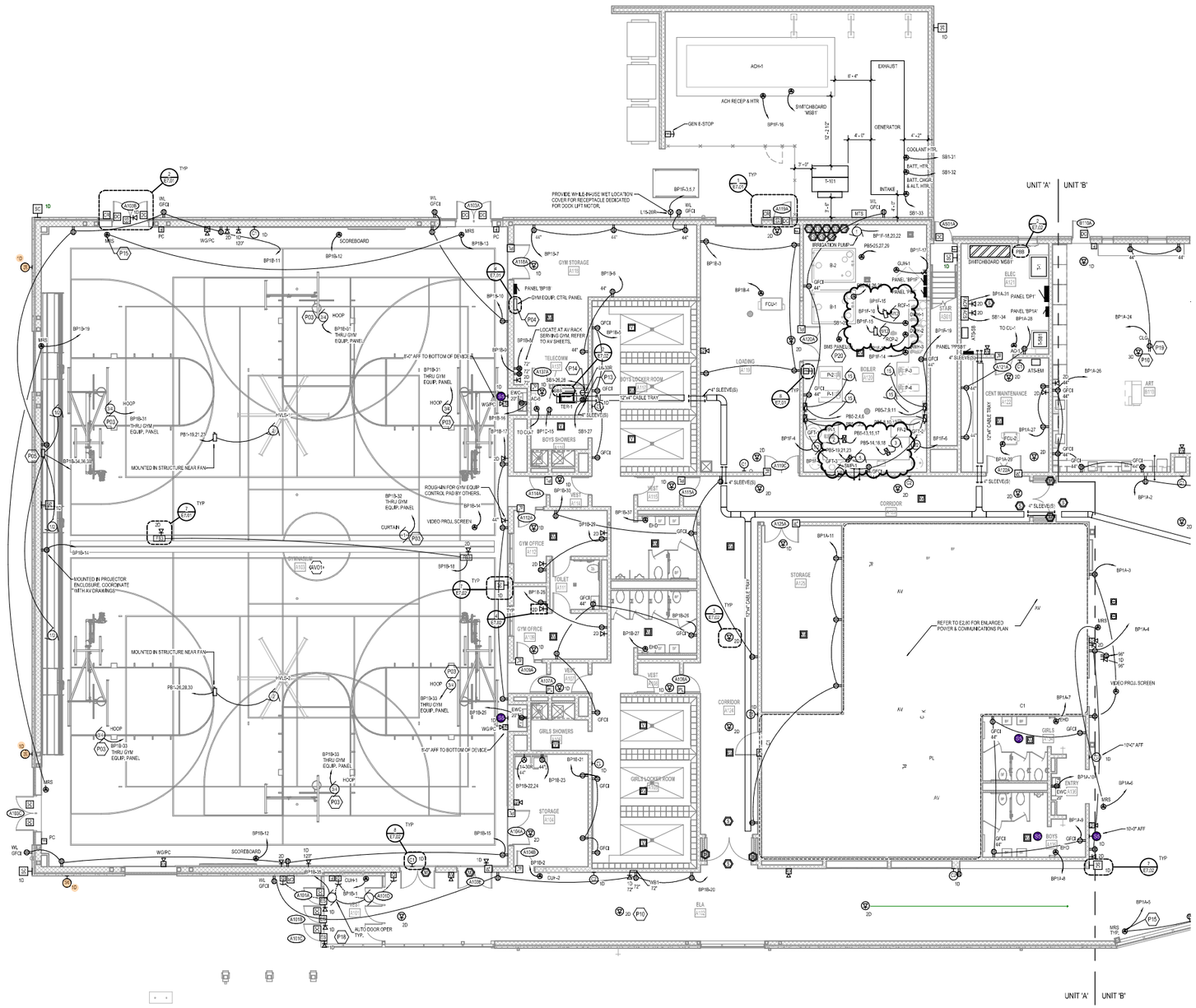
DRAWN JFB

REVIEWED AAB

PROJECT NO. 5-5065

ELECTRICAL SYMBOL LEGENDS & GENERAL NOTES

E0.01



UNIT 'A' FIRST FLOOR POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20A/1P BRANCH CIRCUIT (WITH BREAKER LOCKING MECHANISM) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT), TERMINATED W/ BOX-COVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES, AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE. INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT. REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.6
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

ELECTRICAL KEYNOTES

AV01	REFER TO AV DRAWINGS FOR ADDITIONAL SCOPE. COORDINATE ALL ROUGH-IN LOCATIONS WITH AV DRAWINGS.
P03	E.C. SHALL PROVIDE AND INSTALL 4" SQUARE JUNCTION BOX WITHIN 3'-0" OF WINCH LOCATION FOR TWIST-LOCK RECEPTACLE. TWIST LOCK RECEPTACLE AND COVER PROVIDED BY EQUIPMENT PROVIDER. (1) HOOK-UP REQUIRED PER DEVICE. REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR FURTHER DETAILS.
P04	8-RELAY GYM EQUIPMENT CONTROL PANEL REQUIRED TO SUPPORT (6) HOOP WINCH MOTORS AND (1) DIVIDER CURTAIN MOTOR. USE (1) RELAY PER DEVICE. POWER EACH PANEL WITH (2) 120V SINGLE PHSE CIRCUITS AS INDICATED IN PANEL SCHEDULE. REFER TO MANUFACTURER INSTRUCTIONS FOR FURTHER DETAILS.
P05	E.C. SHALL PROVIDE AND INSTALL NON-FUSIBLE SAFETY SWITCHES FOR BLEACHER MOTOR. JUNCTION BOX SHALL BE MOUNTED AT 5'-0" AFF. COORDINATE LOCATION WITH EQUIPMENT PROVIDER. REFER TO BLEACHER DETAILS ON ARCHITECTURE SHEETS FOR FURTHER DETAILS.
P10	ALL LOW VOLTAGE CABLING TO BE IN CONDUIT IN SPACES WITH EXPOSED CEILINGS. PRIOR TO INSTALL, COORDINATE EXACT LOCATION OF NETWORK ACTIVATIONS WITH OWNER'S TECHNOLOGY CONTRACTOR (FOR ACCESS POINTS, SECURITY CAMERAS, AV EQUIPMENT, ETC.). TERMINATE CABLING IN SURFACE MOUNT BOX WITH MODULAR CONNECTOR INSIDE JUNCITON BOX, PROVIDE BLANK FACEPLATE FOR UNUSED LOCATIONS. TYPICAL FOR ALL.
P13	RECEPTACLES ON STANDBY POWER SHALL BE YELLOW. TYPICAL FOR ALL.
P14	INSTALL L6-30R RECEPTACLE INSIDE 4-POST RACK FOR UPS. UPS PROVIDED BY OWNER.
P15	MOTORIZED ROLLER SHADES IN THIS SPACE TO BE CONTROLLED BY AV SYSTEM. REFER TO AV DRAWINGS FOR MORE INFORMATION.
P18	ALL ACCESS CONTROL CONDUITS TO NEAREST CABLE TRAY. TERMINATE CABLING IN JUNTION BOX RECESSED ABOVE DOOR IN MASONRY WALL, OR JUNCTION BOX SURFACE MOUNTED TO STRUCTURE WHERE CEILINGS ARE LESS THAN 20 FEET. TYPICAL FOR ALL ACCESS CONTROL DOORS SHOWN WITH DATA DROPS.
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR. TYPICAL FOR ALL.
P20	COORDINATE WITH CONTROLS CONTRACTOR FOR LOCATION OF BMS PANEL.

KEYPLAN

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NEW 5TH - 6TH GRADE FACILITY
HUDSONVILLE PUBLIC SCHOOLS
HUDSONVILLE, MICHIGAN

ISSUANCES

10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
02.18.2021	BULLETIN 002
04.16.2021	BULLETIN 006
05.11.2021	BULLETIN 007
05.26.2021	BULLETIN 008
06.16.2021	BULLETIN 010
07.01.2021	BULLETIN 011
08.10.2021	BULLETIN 013
08.31.2021	BULLETIN 015
09.28.2021	BULLETIN 018
02.28.2022	BULLETIN 022

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'A' FIRST FLOOR POWER & COMMUNICATIONS PLAN

E2.1A

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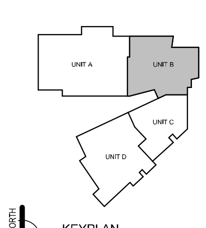
POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20A/1P BRANCH CIRCUIT (WITH BREAKER LOCKING MECHANISM) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT), TERMINATED W/ BOX-COVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES, AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE. INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT. REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.6
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

	ELECTRICAL KEYNOTES
AV01	REFER TO AV DRAWINGS FOR ADDITIONAL SCOPE. COORDINATE ALL ROUGH-IN LOCATIONS WITH AV DRAWINGS.
P10	ALL LOW VOLTAGE CABLING TO BE IN CONDUIT IN SPACES WITH EXPOSED CEILINGS. PRIOR TO INSTALL, COORDINATE EXACT LOCATION OF NETWORK ACTIVATIONS WITH OWNER'S TECHNOLOGY CONTRACTOR (FOR ACCESS POINTS, SECURITY CAMERAS, AV EQUIPMENT, ETC.). TERMINATE CABLING IN SURFACE MOUNT BOX WITH MODULAR CONNECTOR INSIDE JUNCITON BOX, PROVIDE BLANK FACEPLATE FOR UNUSED LOCATIONS. TYPICAL FOR ALL.
P15	MOTORIZED ROLLER SHADES IN THIS SPACE TO BE CONTROLLED BY AV SYSTEM. REFER TO AV DRAWINGS FOR MORE INFORMATION.
P17	HEAT TRACING FOR PLUMBING PIPING PER 22 05 33. LENGTHS FROM PLUMBING PLANS. FIELD VERIFY EXACT LENGTHS REQUIRED. HEAT TRACING SHALL COMPLY WITH NEC ARTICLE 426.
P18	ALL ACCESS CONTROL CONDUITS TO NEAREST CABLE TRAY. TERMINATE CABLING IN JUNTION BOX RECESSED ABOVE DOOR IN MASONRY WALL, OR JUNCTION BOX SURFACE MOUNTED TO STRUCTURE WHERE CEILINGS ARE LESS THAN 20 FEET. TYPICAL FOR ALL ACCESS CONTROL DOORS SHOWN WITH DATA DROPS.
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR. TYPICAL FOR ALL.

UNIT 'B' FIRST FLOOR POWER & COMMUNICATIONS PLAN
1/8" = 1'-0"



KEYPLAN

NEW 5TH - 6TH GRADE FACILITY
HUDSONVILLE PUBLIC SCHOOLS
HUDSONVILLE, MICHIGAN

ISSUANCES	
10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
02.18.2021	BULLETIN 002
04.16.2021	BULLETIN 006
05.26.2021	BULLETIN 008
09.28.2021	BULLETIN 018

DRAWN	JFB
REVIEWED	AAB

PROJECT NO. 5-5065

UNIT 'B' FIRST FLOOR POWER & COMMUNICATIONS PLAN

E2.1B

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UNIT 'C' FIRST FLOOR POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
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5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.6
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

⬡	ELECTRICAL KEYNOTES
P01	DEVICES INSTALLED IN BACK OF CASEWORK FOR AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
P10	ALL LOW VOLTAGE CABLING TO BE IN CONDUIT IN SPACES WITH EXPOSED CEILINGS. PRIOR TO INSTALL, COORDINATE EXACT LOCATION OF NETWORK ACTIVATIONS WITH OWNER'S TECHNOLOGY CONTRACTOR (FOR ACCESS POINTS, SECURITY CAMERAS, AV EQUIPMENT, ETC.). TERMINATE CABLING IN SURFACE MOUNT BOX WITH MODULAR CONNECTOR INSIDE JUNCITON BOX, PROVIDE BLANK FACEPLATE FOR UNUSED LOCATIONS. TYPICAL FOR ALL.
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P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR. TYPICAL FOR ALL.

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NEW 5TH - 6TH GRADE FACILITY
HUDSONVILLE PUBLIC SCHOOLS
HUDSONVILLE, MICHIGAN

ISSUANCES

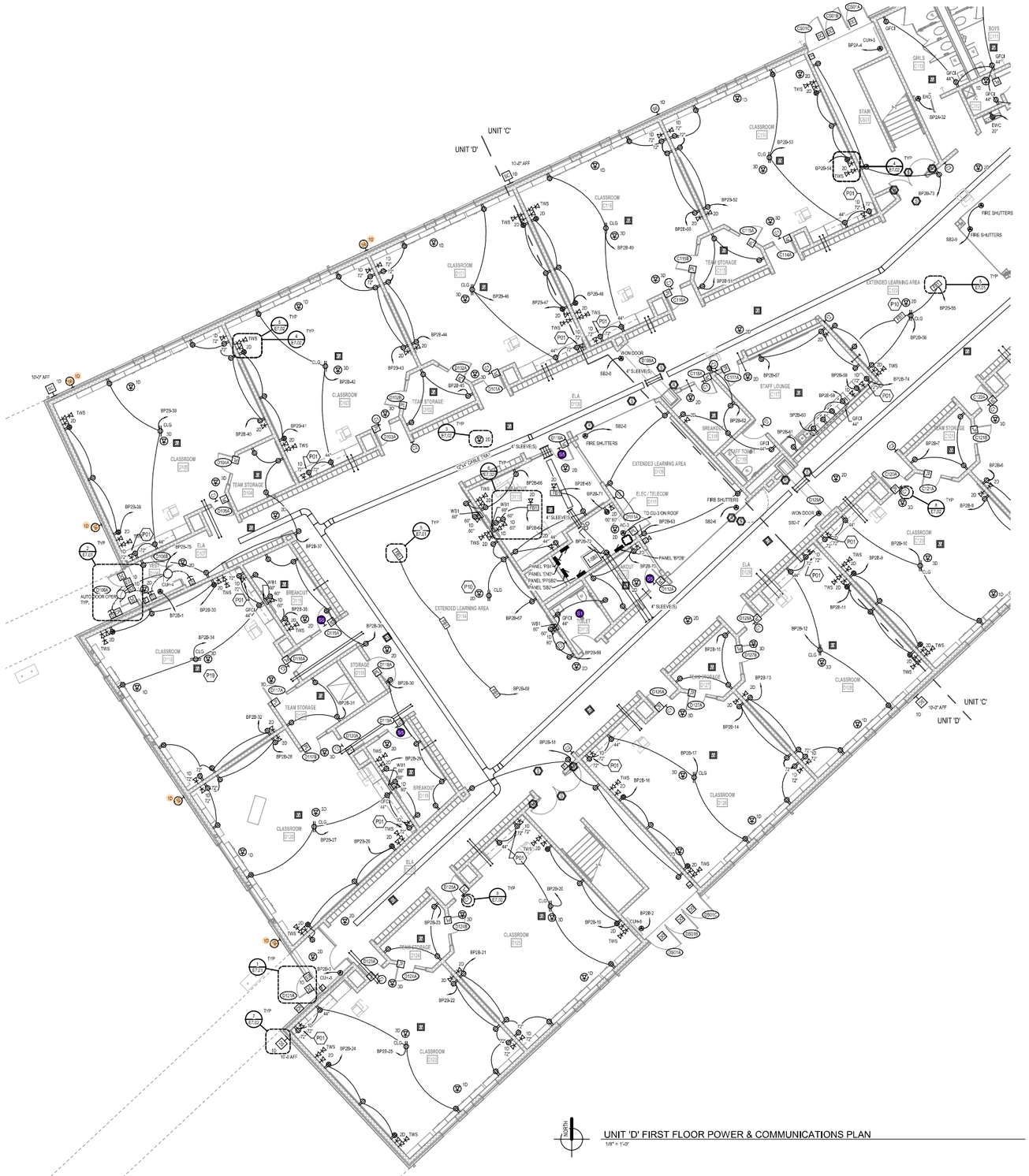
10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
02.18.2021	BULLETIN 002
04.16.2021	BULLETIN 006
05.26.2021	BULLETIN 008
09.28.2021	BULLETIN 018
10.26.2021	BULLETIN 019

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

KEYPLAN

UNIT 'C' FIRST FLOOR POWER & COMMUNICATIONS PLAN

E2.1C



UNIT 'D' FIRST FLOOR POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
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4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES, AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE. INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT. REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.6
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⬡	ELECTRICAL KEYNOTES
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P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR. TYPICAL FOR ALL.

KEYPLAN

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NEW 5TH - 6TH GRADE FACILITY
HUDSONVILLE PUBLIC SCHOOLS
HUDSONVILLE, MICHIGAN

ISSUANCES	
10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
04.16.2021	BULLETIN 006
05.11.2021	BULLETIN 007
10.26.2021	BULLETIN 019

DRAWN JFB
REVIEWED AAB

PROJECT NO. 5-5065

UNIT 'D' FIRST FLOOR POWER & COMMUNICATIONS PLAN

E2.1D

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POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
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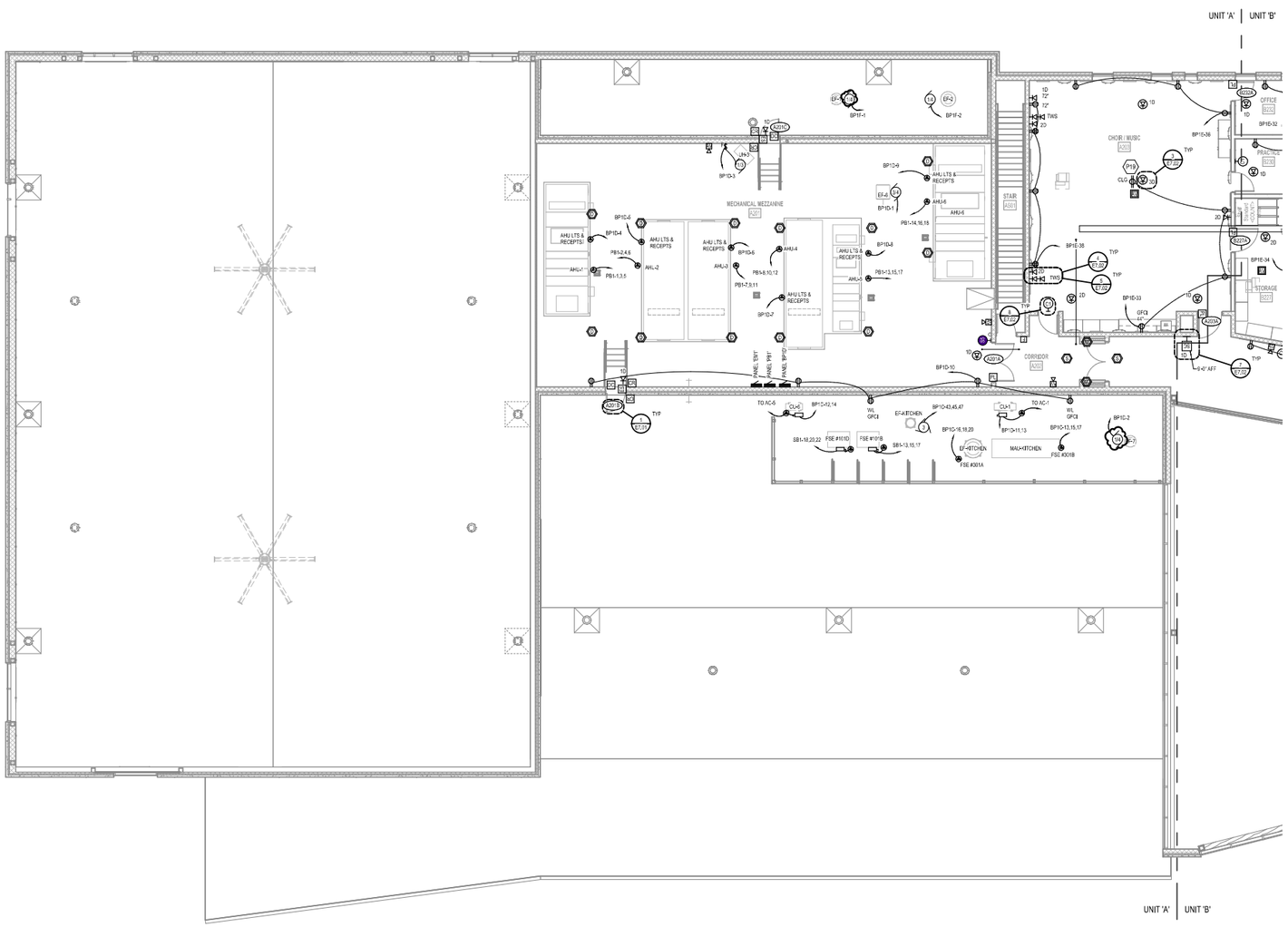
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH (5)AWL (~1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE, BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

ELECTRICAL KEYNOTES

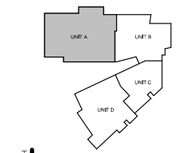
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR. TYPICAL FOR ALL.



NORTH

UNIT 'A' SECOND FLOOR POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"



NORTH

KEYPLAN

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NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES	
10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
04.16.2021	BULLETIN 006

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'A' SECOND FLOOR POWER & COMMUNICATIONS PLAN

E2.2A

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POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.0'.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
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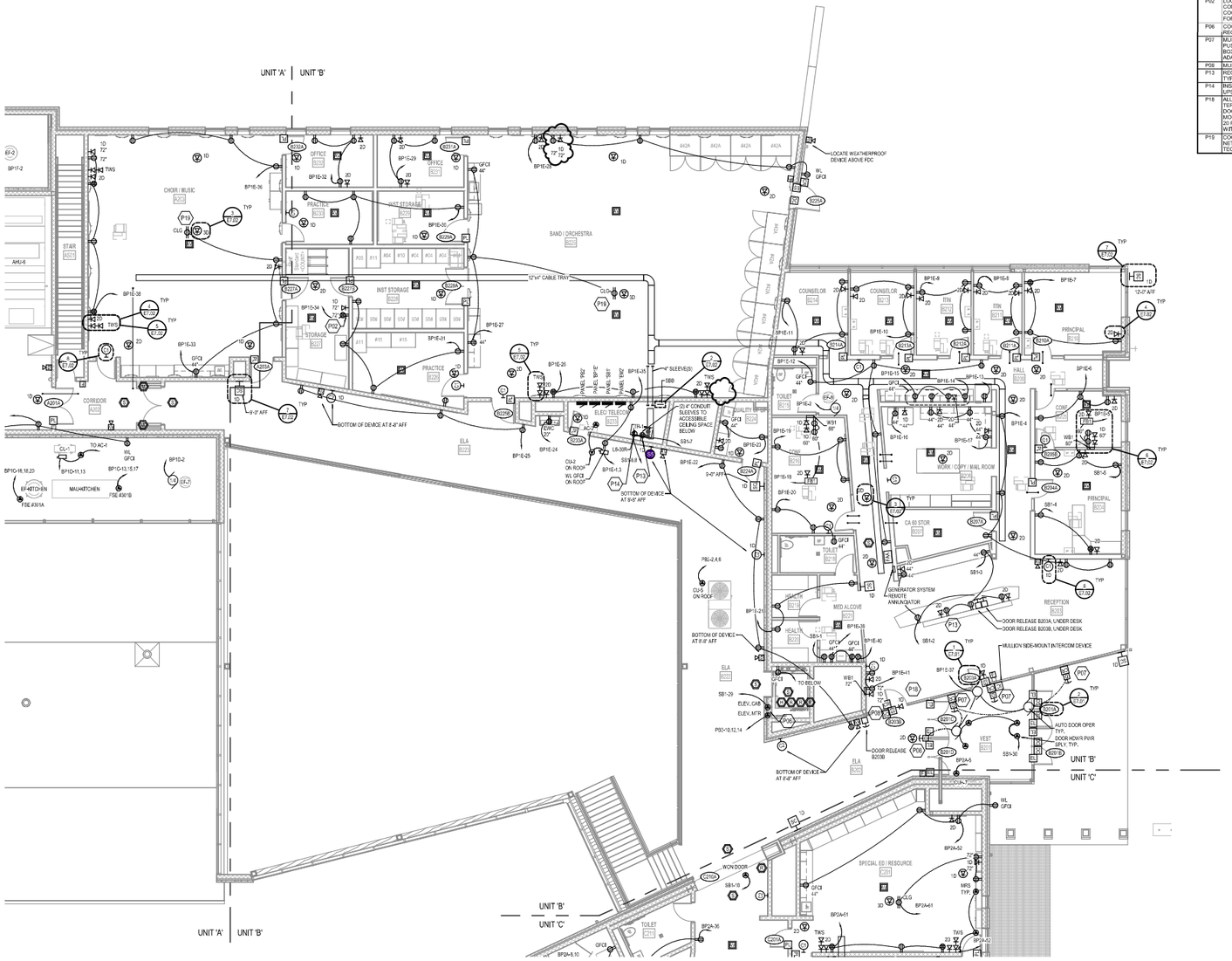
4. PROVIDE FLUSH SINGLE GANG BOXES IN WALLS FOR HVAC TEMPERATURE CONTROL DEVICES. AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE. INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT. REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (IN BUILDING INTERIOR IN ACCESSIBLE LOCATION FOR EACH SHALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

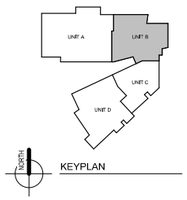
ELECTRICAL KEYNOTES

P02	LOCATION OF AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT; COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
P06	COORDINATE WITH ELEVATOR MANUFACTURER'S REQUIREMENTS FOR DISCONNECTS.
P07	MULLION MOUNT CARD READER AND ADA PUSHBUTTON. ADA PUSH BUTTON SHALL BE MOUNTED AT 40" AFF TO BOTTOM OF BOX. CARD READER SHALL BE MOUNTED DIRECTLY ABOVE ADA PUSHBUTTON.
P08	MULLION MOUNT CARD READER OR ADA PUSHBUTTON.
P13	RECEPTACLES ON STANDBY POWER SHALL BE YELLOW. TYPICAL FOR ALL.
P14	INSTALL UL-WIR RECEPTACLE INSIDE 4-POST RACK FOR UPS. UPS PROVIDED BY OWNER.
P16	ALL ACCESS CONTROL CONDUITS TO NEAREST CABLE TRAY, TERMINATE CABLING IN JUNITION BOX RECESSED ABOVE DOOR IN MASONRY WALL OR JUNCTION BOX SURFACE MOUNTED TO STRUCTURE WHERE CEILINGS ARE LESS THAN 20 FEET. TYPICAL FOR ALL ACCESS CONTROL DOORS SHOWN WITH DATA DROPS.
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR. TYPICAL FOR ALL.



UNIT 'B' SECOND FLOOR POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"



KEYPLAN

GMB
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NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES	
10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
04.16.2021	BULLETIN 006
05.11.2021	BULLETIN 007
05.26.2021	BULLETIN 008
09.28.2021	BULLETIN 018

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'B' SECOND FLOOR POWER & COMMUNICATIONS PLAN

E2.2B

BIM 360://5-5065 Hudsonville Public Schools 5-5/5-5065E 2019.rvt
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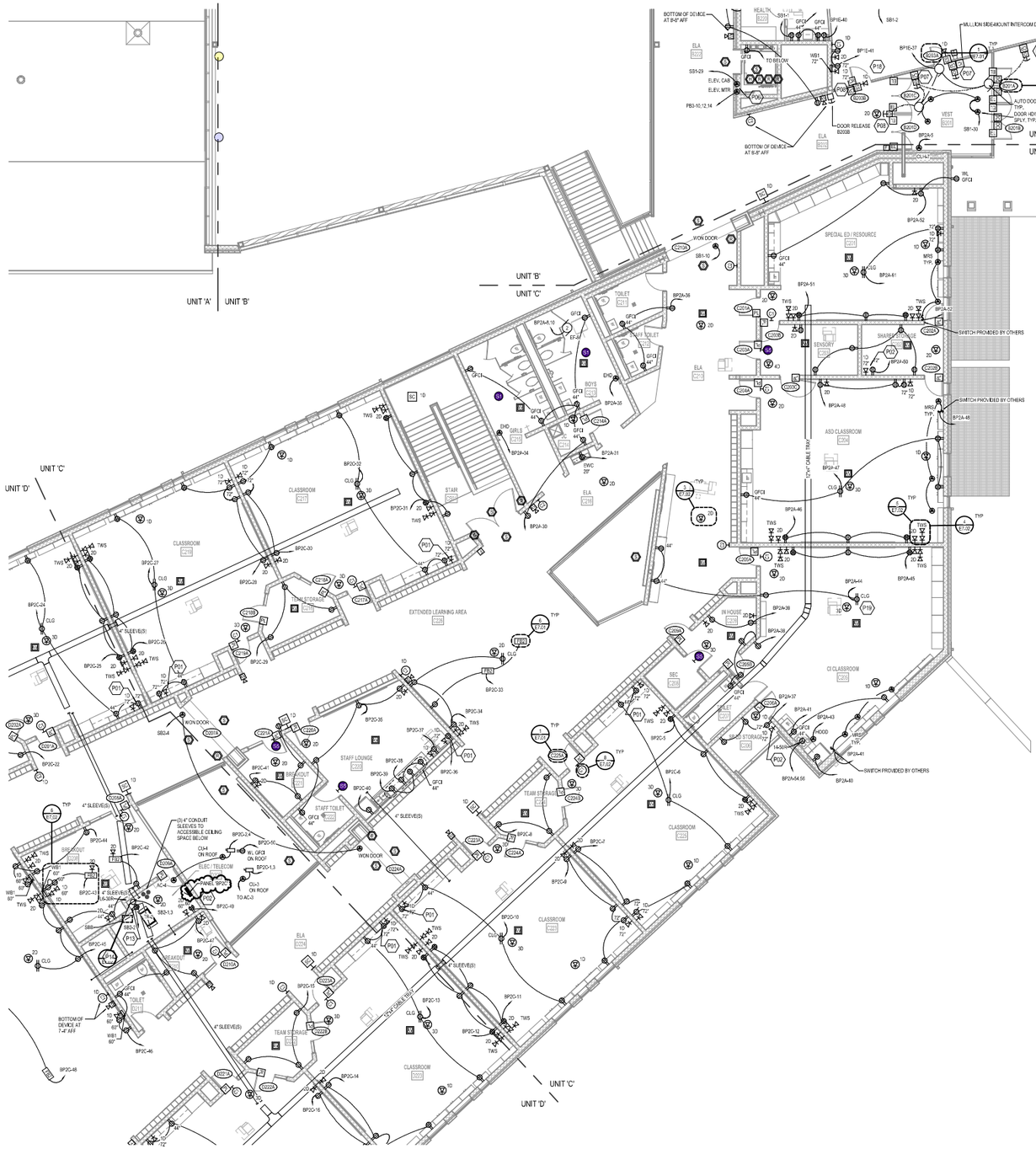


UNIT 'C' SECOND FLOOR POWER & COMMUNICATIONS PLAN

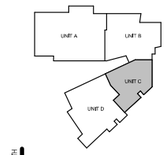
1/8" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20A/1P BRANCH CIRCUIT (WITH BREAKER LOCKING MECHANISM) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT). TERMINATED W/ BOLD COVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES. AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE. INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT. REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

ELECTRICAL KEYNOTES

P01	DEVICES INSTALLED IN BACK OF CASEWORK FOR AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
P02	LOCATION OF AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
P06	COORDINATE WITH ELEVATOR MANUFACTURER'S REQUIREMENTS FOR DISCONNECTS.
P07	MULLION MOUNT CARD READER AND ADA PUSHBUTTON; ADA-PUSH BUTTON SHALL BE MOUNTED AT 40" AFF TO BOTTOM OF BOX. CARD READER SHALL BE MOUNTED DIRECTLY ABOVE ADA PUSHBUTTON.
P08	MULLION MOUNT CARD READER OR ADA PUSHBUTTON.
P13	RECEPTACLES ON STANDBY POWER SHALL BE YELLOW. TYPICAL FOR ALL.
P14	INSTALL LE-30R RECEPTACLE INSIDE 4-POST RACK FOR UPS. UPS PROVIDED BY OWNER.
P18	ALL ACCESS CONTROL CONDUITS TO NEAREST CABLE TRAY. TERMINATE CABLING IN JUNTION BOX RECESSED ABOVE DOOR IN MASONRY WALL, OR JUNCTION BOX SURFACE MOUNTED TO STRUCTURE WHERE CEILINGS ARE LESS THAN 20 FEET. TYPICAL FOR ALL ACCESS CONTROL DOORS SHOWN WITH DATA DROPS.
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR. TYPICAL FOR ALL.



KEYPLAN

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NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES	
10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
04.16.2021	BULLETIN 006
05.26.2021	BULLETIN 008
10.26.2021	BULLETIN 010

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'C' SECOND FLOOR POWER & COMMUNICATIONS PLAN

E2.2C

BIM 360://5-5065 Hudsonville Public Schools 5-5(5-5065)E 2019.rvt
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NORTH

EQUIPMENT PLATFORM POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"

NORTH

UNIT 'D' SECOND FLOOR POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.2'.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20A/1P BRANCH CIRCUIT WITH BREAKER LOCKING MECHANISM IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT). TERMINATE TO (W) BOX-COVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES. AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE. INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT. REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (W) BUILDING INTERIOR IN ACCESSIBLE LOCATION FOR EACH SMALL (< 10 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.s
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

ELECTRICAL KEYNOTES

P01	DEVICES INSTALLED IN BACK OF CASEWORK FOR AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
P02	LOCATION OF AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
P13	RECEPTACLES ON STANDBY POWER SHALL BE YELLOW; TYPICAL FOR ALL.
P14	INSTALL L6-30R RECEPTACLE INSIDE 4-POST RACK FOR UPS. UPS PROVIDED BY OWNER.
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR; TYPICAL FOR ALL.

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NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES

10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
05.11.2021	BULLETIN 007
10.26.2021	BULLETIN 010

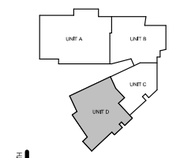
DRAWN JFB

REVIEWED AAB

PROJECT NO. 5-5065

UNIT 'D' SECOND FLOOR POWER & COMMUNICATIONS PLAN

E2.2D



NORTH

KEYPLAN

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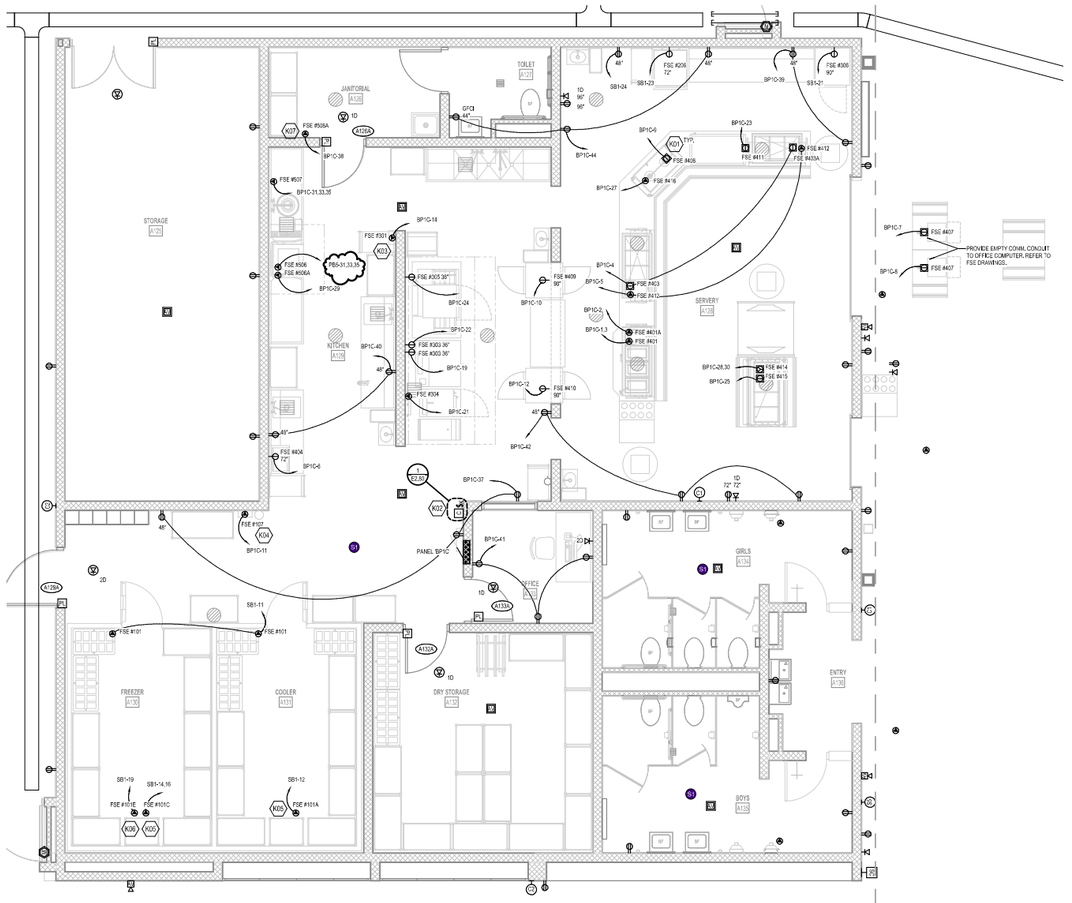


NORTH

ENLARGED KITCHEN POWER & COMMUNICATIONS PLAN

1/4" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

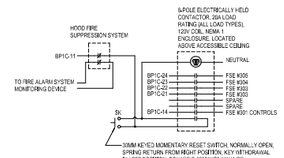
1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20A/1P BRANCH CIRCUIT (WITH BREAKER LOCKING MECHANISM) IN LOCAL PANELBOARD FOR DAMPERS (IN EACH AREA, DAMPERS MAY BE GROUPED ON EACH CIRCUIT), TERMINATED W/ BOX-COVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES. AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE. INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING "TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT". REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH ON BUILDING INTERIOR IN ACCESSIBLE LOCATION FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

FOODSERVICE ELECTRICAL GENERAL NOTES

1. ELEC. CONTRACTOR SHALL REVIEW FOODSERVICE EQUIPMENT DRAWINGS ("FSE"-SERIES) AND FOOD SERVICE SPECIFICATIONS (SECTION 11 40 00) FOR ADDITIONAL SCOPE OF WORK AND REQUIREMENTS. INCLUDE ALL WORK AND MATERIALS AS ASSIGNED TO THE ELEC. CONTRACTOR BY DRAWINGS, SPECIFICATIONS, CONSTRUCTION MANAGER'S WORK CATEGORY DESCRIPTIONS, ETC.
2. IF THERE IS A CONFLICT BETWEEN THE FOODSERVICE DRAWINGS/SPECIFICATION AND THIS DRAWING OR DIVISION 26 SPECIFICATIONS, THE ELEC. CONTRACTOR SHALL BID USING THE MORE STRINGENT AND GREATER-COST REQUIREMENTS. CLARIFICATIONS MAY BE REQUESTED IN WRITING PRIOR TO BID. COORDINATE WITH CONSTRUCTION MANAGER'S PROCEDURES.
3. "THE WORK SHOWN ON THIS DRAWING AND THE DIVISION 26 SPECIFICATIONS SHALL SUPERCEDE THE FOOD SERVICE EQUIPMENT DRAWINGS/SPECIFICATION.
4. LABEL ALL RECEPTACLES IN KITCHEN AND SERVING AREAS WITH CORRESPONDING PANELBOARD, CIRCUIT NUMBER, AND FOODSERVICE EQUIPMENT ITEM NUMBER AS REFERENCED ON THE FOODSERVICE EQUIPMENT DRAWINGS.
5. ELEC. CONTRACTOR SHALL VERIFY AND COORDINATE WITH THE FOODSERVICE EQUIPMENT VENDOR THAT ALL SINGLE-PHASE RECEPTACLES (120V, 1-Ø OR LESS, 50A OR LESS) AND THREE-PHASE RECEPTACLES (120V, L-Ø OR LESS, 100A OR LESS) IN KITCHEN AND SERVING AREAS HAVE GFCI PROTECTION FOR PERSONNEL AS REQUIRED BY NEC 210.8(B)(2), EITHER AT THE DEVICE (GFCI RECEPTACLE) OR AT THE RESPECTIVE PANELBOARD (GFCI BREAKER FOR THE BRANCH CIRCUIT). FOR ANY SUCH RECEPTACLE LOCATIONS THAT ARE NOT READILY ACCESSIBLE (NEC DEFINITION), GFCI PROTECTION SHALL BE PROVIDED FOR THE BRANCH CIRCUIT AT THE PANELBOARD USING A GFCI BRANCH CIRCUIT BREAKER.
6. PROVIDE CONCEALED ROUGH-IN FOR REMOTE MANUAL PULL STATIONS CONNECTED TO VENTILATION HOOD FIRE PROTECTION SYSTEMS. SURFACE-MOUNTED CONDUIT, PIPE, AND PULL STATIONS ARE NOT ACCEPTABLE. COORDINATE LOCATIONS WITH ENGINEERED SHOP DRAWINGS FOR SYSTEM.

ELECTRICAL KEYNOTES

K01	FLOOR-MOUNTED PEDESTAL WITH RECEPTACLE AS REQUIRED. BOX SHALL BE "FD"-TYPE CAST ALUMINUM OR STAINLESS STEEL MOUNTED HORIZONTALLY WITH (2) HUBS ON BOTTOM (LONG) SIDE TO ACCEPT THREADED RIGID METALLIC CONDUIT. PROVIDE WITH CAST METAL, WEATHERPROOF HINGED COVER OVER WIRING DEVICE. TOP OF RECEPTACLE BOX SHALL NOT EXCEED 9" AFF.
K02	RESET STATION FOR EQUIP. SHUTDOWN CONTROLS (REFER TO DETAIL).
K03	E.C. SHALL INTERWIRE ALL COMPONENTS OF MAKE-UP AIR UNIT, EXHAUST FAN, HOOD LIGHTS, AND HOOD CONTROLS AS SHOWN ON FOODSERVICE EQUIP. DRAWINGS AND AS REQUIRED BY EQUIPMENT MANUFACTURER. VERIFY WITH EQUIPMENT SHOP DRAWINGS.
K04	EXHAUST HOOD FIRE SUPPRESSION SYSTEM, INTERCONNECT WITH FIRE ALARM INITIATION CIRCUIT FOR SUPERVISORY MONITORING PER LOCAL CODES AND CONTROL CONTACTOR FOR SHUTDOWN OF EQUIPMENT ELEC. SUPPLY UNDER HOOD UPON RELEASE OF EXTINGUISHING AGENT. REFER TO DETAIL ON FSE DRAWINGS AND CONTROL DETAIL.
K05	E.C. SHALL INTERWIRE ALL COMPONENTS OF WALK-IN COOLER OR FREEZER AS SHOWN ON DRAWINGS AND REQUIRED BY EQUIPMENT MANUFACTURER. COORDINATE WITH SHOP DRAWINGS.
K06	COORDINATE WITH PLUMBING CONTRACTOR FOR LOCATION OF HEAT TRACE POWER SUPPLY.
K07	CONNECT DISHWASHER EXHAUST FAN TO DISHWASHER CONTROL PANEL. REFER TO FSE DRAWINGS.



1 / E2.80 FOODSERVICE EQUIP. ELEC SHUTDOWN DETAIL

NOT TO SCALE

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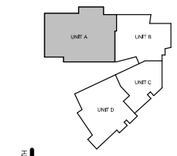
NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES

10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
10.26.2021	BULLETIN 019



NORTH

KEYPLAN

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5085

KITCHEN & SERVING AREA POWER & COMMUNICATIONS ENLARGED PLAN

E2.80

BIM 360://5-5085 Hudsonville Public Schools 5-65-5065E 2019.rvt
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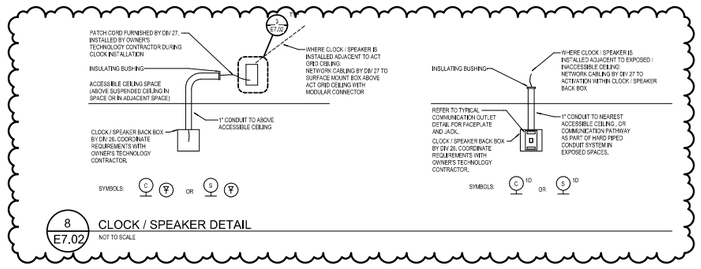
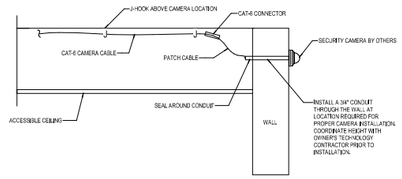
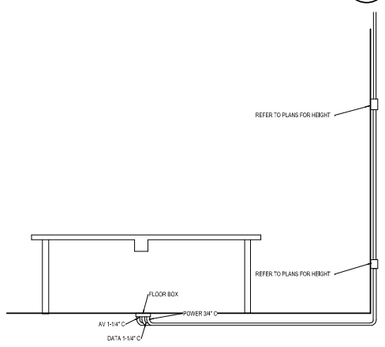


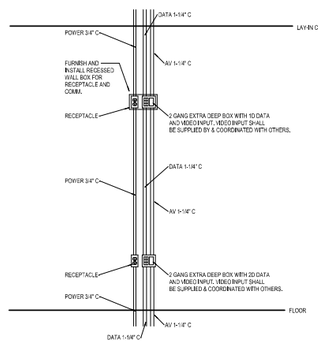
8 E7.02 CLOCK / SPEAKER DETAIL
NOT TO SCALE

NOTES:
1. ROUGH-IN FOR CAMERAS ONLY. CAMERAS PROVIDED BY OWNER'S TECHNOLOGY CONTRACTOR. REFER TO DRAWINGS FOR ROUGH-IN HEIGHT.
2. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR MOUNTING HEIGHTS OF ROUGH-INS.



7 E7.02 TYPICAL WALL MOUNT SURVEILLANCE CAMERA INSTALLATION
NOT TO SCALE





6 E7.02 VIDEO CONFERENCE SECTION
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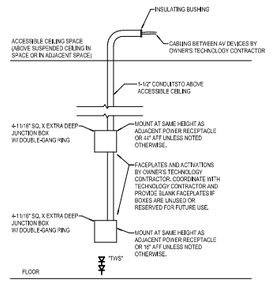
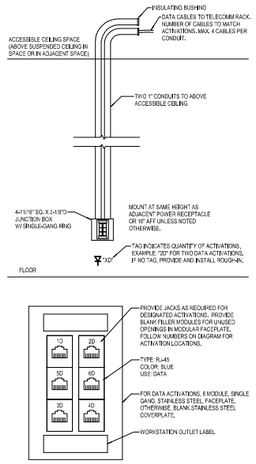


5 E7.02 TEACHER WORKSTATION DETAIL
NOT TO SCALE



4 E7.02 TYPICAL COMMUNICATION OUTLET
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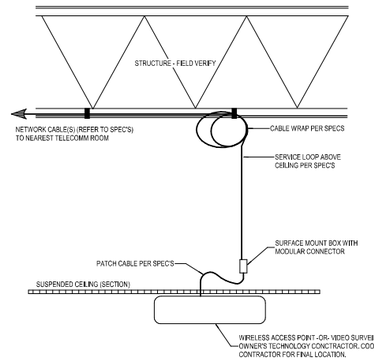
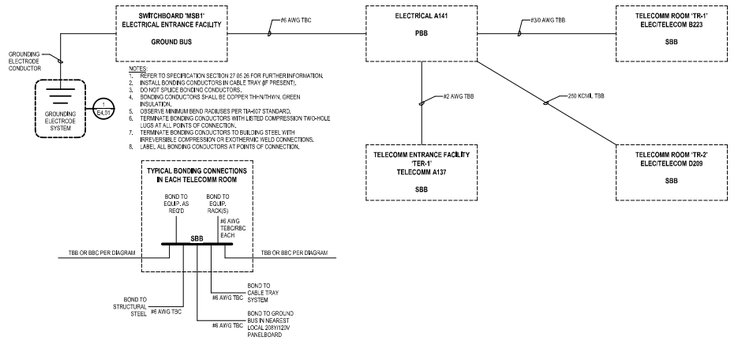
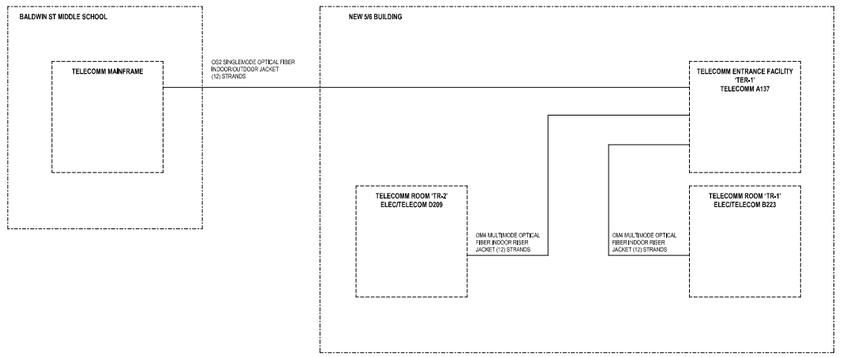


3 E7.02 CEILING MOUNTED COMMUNICATION DEVICE
NOT TO SCALE



2 E7.02 COMMUNICATIONS GROUNDING/BONDING SYSTEM RISER DIAGRAM
NOT TO SCALE



1 E7.02 COMMUNICATIONS CABLING BACKBONE RISER DIAGRAM
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NEW 5TH - 6TH GRADE FACILITY
HUDSONVILLE PUBLIC SCHOOLS
HUDSONVILLE, MICHIGAN

ISSUANCES

10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004

DRAWN JFB
REVIEWED AAB
PROJECT NO. 5-5065

ELECTRICAL DETAILS

E7.02

BIM 360://5-5065 Hudsonville Public Schools_5-65-5065E 2019.rvt
11/24/2020 2:20:27 PM

UNIT 'A' POWER PLAN

1/8" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. PROVIDE 120VAC POWER FOR ALL SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS.
   A. REFER TO MECHANICAL/HVAC DRAWINGS FOR EXACT LOCATIONS OF DAMPERS.
   B. CONNECT TO DEDICATED 20A BRANCH CIRCUIT (WITH BREAKER LOCK-ON ACCESSORY) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT).
   C. TERMINATE W/ BOX-COVER FUSIBLE DISCONNECT SWITCH AT EACH DAMPER.
   D. PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET).
   E. PROVIDE FIRE ALARM ADDRESSABLE RELAY(S) FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT(S) PER CODE REQUIREMENTS.
4. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.
5. DESIGNATED CABLING PATHWAYS (CONDUITS, CABLE TRAYS, PENETRATION SLEEVES, ETC.) SHALL BE RESERVED FOR DIV. 27 COMMUNICATIONS CABLING AND DIV. 28 SAFETY/SECURITY CABLING ONLY. OTHER CABLING TYPES, SUCH AS DIV. 23 CONTROLS, DIV. 26 CONTROLS, AND ARCHITECTURAL EQUIPMENT CABLING SHALL BE SUPPORTED AND SLEEVED BY OTHER INDEPENDENT PATHWAYS, HANGERS, AND SUPPORTS.
6. CONSOLIDATE ALL POWER SUPPLIES REQUIRED FOR ELECTRONIC DOOR HARDWARE (REF. SECTION 08 71 00) TO CENTRAL LOCATION(S) ADJACENT TO DESIGNATED ACCESS CONTROL EQUIPMENT LOCATION(S). CONNECT ALL POWER SUPPLIES TO DEDICATED STANDBY POWER SYSTEM BRANCH CIRCUIT(S) AS DESIGNATED.
7. THE FOLLOWING DIV. 27 AND DIV. 28 SYSTEMS WILL BE DOCUMENTED AND BID SEPARATELY BY CONSULTANT IN ASSOCIATION WITH HUDSONVILLE P.S. TECHNOLOGY DEPT.:
   A. NETWORK ELECTRONICS (SWITCHES, ACCESS POINTS, ETC.)
   B. VOIP TELEPHONE SYSTEMS
   C. CLASSROOM AUDIO-VIDEO EQUIPMENT AND INSTRUCTIONAL TECHNOLOGY
   D. AUDIO-VIDEO SYSTEM FOR GYMNASIUM
   E. ACCESS CONTROL SYSTEM
   F. VIDEO SURVEILLANCE SYSTEM

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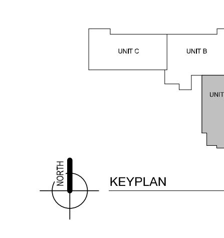
FOREST GROVE ELEMENTARY GYM ADDITION

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES

09.22.2021 BIDS & CONSTRUCTION



KEYPLAN

DRAWN	MCK
REVIEWED	JFB
PROJECT NO.	5-5362

UNIT 'A' POWER PLAN

E2.1A

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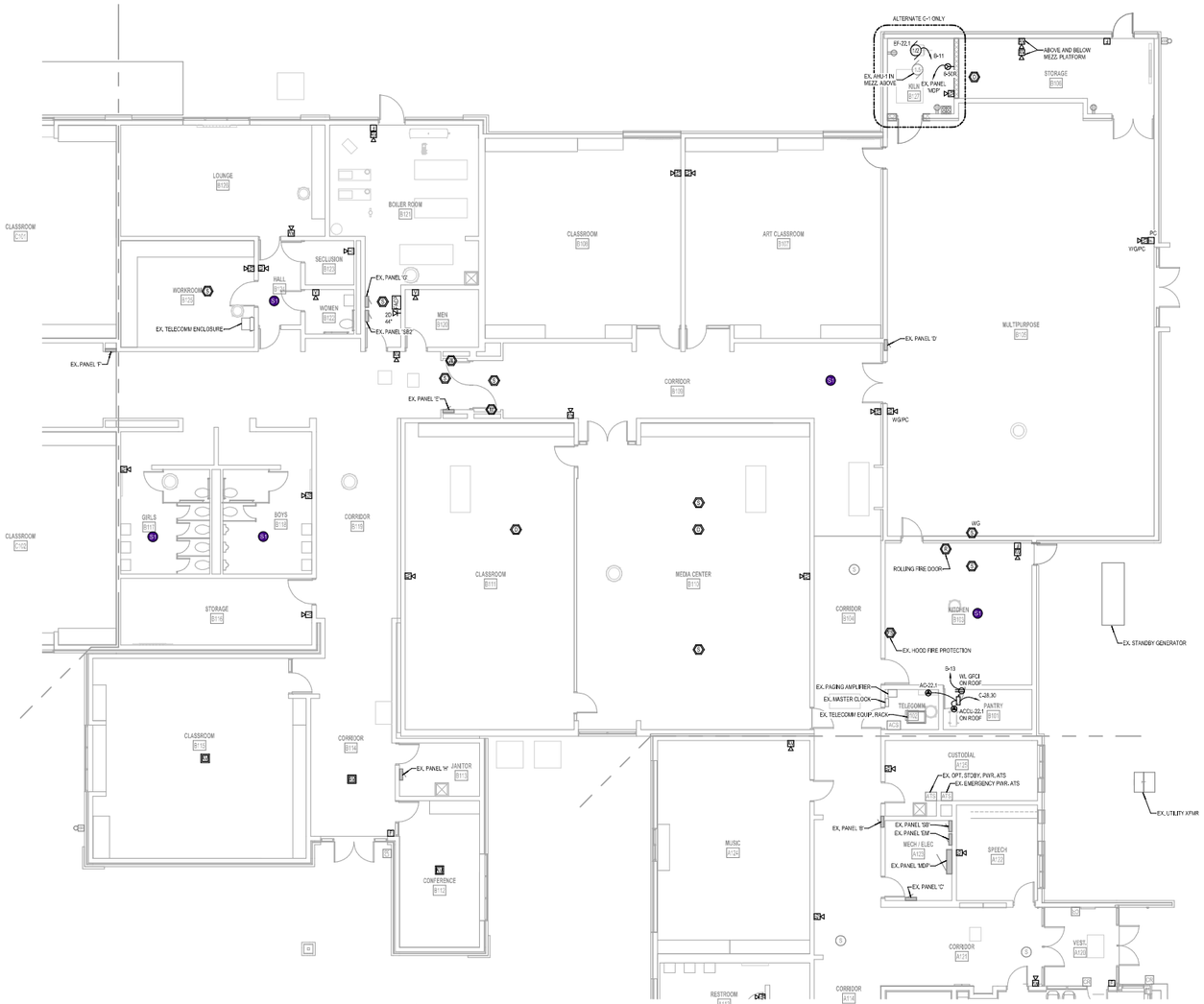

NORTH

UNIT 'B' POWER PLAN

1/8" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. PROVIDE 120VAC POWER FOR ALL SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS.
   A. REFER TO MECHANICAL/HVAC DRAWINGS FOR EXACT LOCATIONS OF DAMPERS.
   B. CONNECT TO DEDICATED 20A BRANCH CIRCUIT (WITH BREAKER LOCK-ON ACCESSORY) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT).
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   D. PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET).
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4. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (<1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.
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HUDSONVILLE PUBLIC SCHOOLS
HUDSONVILLE, MICHIGAN

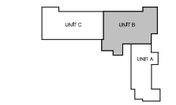
ISSUANCES
09.22.2021 BIDS & CONSTRUCTION

DRAWN MCK
REVIEWED JFB

PROJECT NO. 5-5362

UNIT 'B' POWER PLAN

E2.1B



NORTH KEYPLAN

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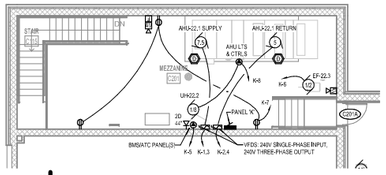

NORTH

MEZZANINE POWER PLAN

1/8" = 1'-0"

AUDIO-VIDEO SYSTEMS BOX & CONNECTOR PLATE SCHEDULE						
ITEM I.D. / TAG	ROUGH-IN OR ITEM SIZE	MOUNTING	LOCATION (HEIGHT TO BOTTOM OF BOX)	BOX & CONDUIT PROVIDED BY	CONNECTOR PLATE & WIRE/CABLE PROVIDED BY	SPECIAL NOTES
A/V-AC1	TWO GANG x 3 1/2" DEEP	FLUSH	44" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	A/V SYSTEM CONTROL TOUCHPANEL
A/V-AC2	SINGLE GANG x 3 1/2" DEEP	FLUSH	15'-9" AFF (VERIFY; SEE DETAIL)	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	PROJECTION SCREEN CONTROL
A/V-AS1	4" SQ. x 2 1/8" DEEP	SURFACE	SIDE OF ROOF JOIST JUST ABOVE BOTTOM CHORD (APPROX. 22'-0" AFF)	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	SPEAKER JUNCTION BOX
A/V-AS2	4" SQ. x 2 1/8" DEEP	SURFACE	SIDE OF ROOF JOIST JUST ABOVE BOTTOM CHORD (APPROX. 22'-0" AFF)	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	SPEAKER JUNCTION BOX
A/V-AV1	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	16" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	VIDEO INPUT(S)
A/V-AV2	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	16" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	VIDEO INPUT(S)
A/V-AV3	4" SQ. x 2 1/8" DEEP	SURFACE	SIDE OF ROOF JOIST JUST ABOVE BOTTOM CHORD (APPROX. 22'-0" AFF)	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	VIDEO PROJECTOR OUTPUT/CONTROL. VERIFY EXACT LOCATION OF PROJ. W/ INSTALLERS
A/V-AW1	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	16" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	AUDIO/VIDEO INPUT(S)
A/V-AW2	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	16" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	AUDIO/VIDEO INPUT(S)
A/V-AW3	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	16" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	AUDIO/VIDEO INPUT(S)
A/V-AW4	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	16" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	AUDIO/VIDEO INPUT(S)

POWER & COMMUNICATION GENERAL NOTES

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   E. PROVIDE FIRE ALARM ADDRESSABLE RELAY(S) FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT(S) PER CODE REQUIREMENTS.
4. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 12 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.
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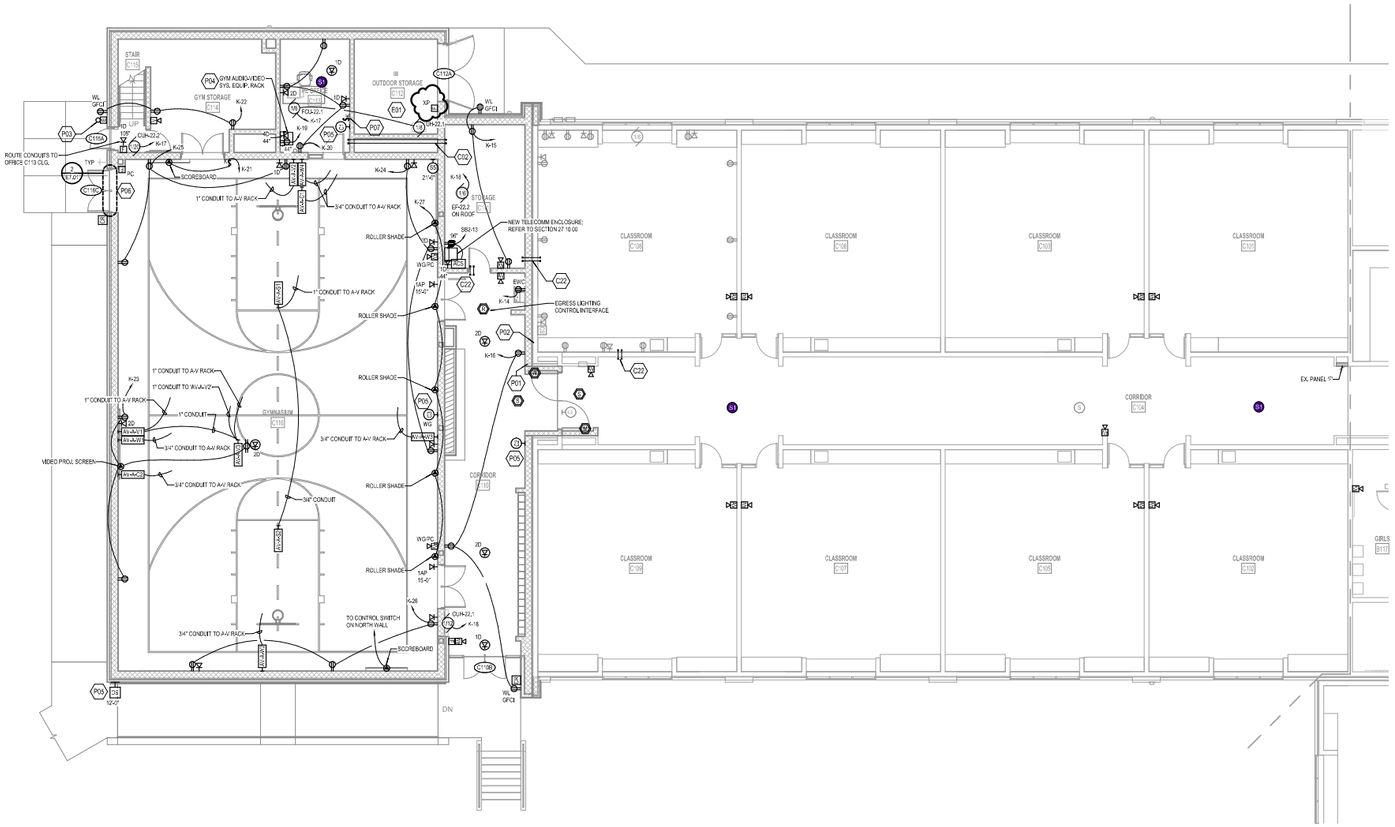
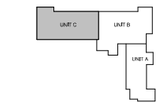


NORTH

UNIT 'C' POWER PLAN

1/8" = 1'-0"

ELECTRICAL KEYNOTES	
C02	(2) 4" CONDUIT SLEEVES FOR DIV. 27 COMMUNICATIONS CABLING
C22	(2) 6.7 SQ. IN. CABLE PATHWAY PENETRATION DEVICE (FIRE) PER SECTION 27 05 28
E01	ALL ELECTRICAL MATERIALS AND INSTALLATION IN THIS ROOM SHALL COMPLY WITH NEC ARTICLE 500 HAZARDOUS LOCATION REQUIREMENTS FOR CLASS 1, DIVISION 1, GROUP C & D
P01	ESTABLISH NEW CONCRETE-ENCASED GROUNDING ELECTRODE IN FOOTING OF NEW ADDITION; INTERCONNECT WITH GROUNDING ELECTRODE SYSTEM AT SERVICE ENTRANCE OR NEAREST SEPARATELY-DERIVED SYSTEM PER NEC AND SPECIFICATION REQUIREMENTS.
P02	BOND METAL STRUCTURE OF ADDITION TO METAL STRUCTURE OF EXISTING BUILDING PER NEC REQUIREMENTS.
P03	RE-INSTALL EX. SIGNALING BELL SALVAGED FROM BUILDING EXTERIOR; INTERCEPT AND EXTEND EXIST. WIRING FROM PREVIOUS LOCATION AND RECONNECT TO RELOCATED BELL.
P04	INSTALL 8"W X 8"W X 6"D JUNCTION BOX BEHIND AUDIO EQUIP. RACK FOR A/V CONDUITS TO ENTER RACK WHILE RECESSED IN WALL. SURFACE-MOUNTED CONDUITS ARE NOT ACCEPTABLE ABOVE, BELOW, OR ON SIDES RACK. STUB AN ADDITIONAL (2) 1" CONDUITS OUT ABOVE ACCESSIBLE CEILING SPACE FROM BOX.
P05	PROVIDE "1D" NETWORK ACTIVATION FOR CONNECTION TO COMMUNICATIONS OR SAFETY/SECURITY DEVICE. TERMINATED INSIDE RECESSED DEVICE BACKBOX
P06	ROUTE ACCESS CONTROL CONDUITS FROM DOOR FRAME THROUGH WALL OVER TO STAIRWELL AND STUB OUT ABOVE 6'-0" AFF.
P07	ROLLER SHADE CONTROL FOR GYMNASIUM. KEY-OPERATED SWITCH FURNISHED BY SECTION 12 24 13. WIRED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS



NORTH

KEYPLAN

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FOREST GROVE ELEMENTARY GYM ADDITION

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES

09.22.2021 BIDS & CONSTRUCTION

11.16.2021 BULLETIN 001

DRAWN MCK

REVIEWED JFB

PROJECT NO. 5-5362

UNIT 'C' POWER PLAN

E2.1C

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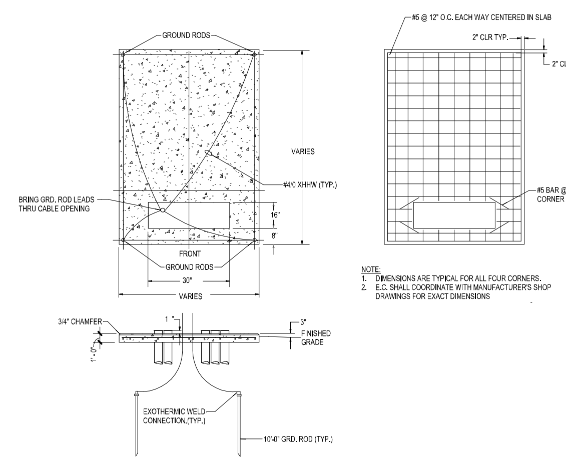
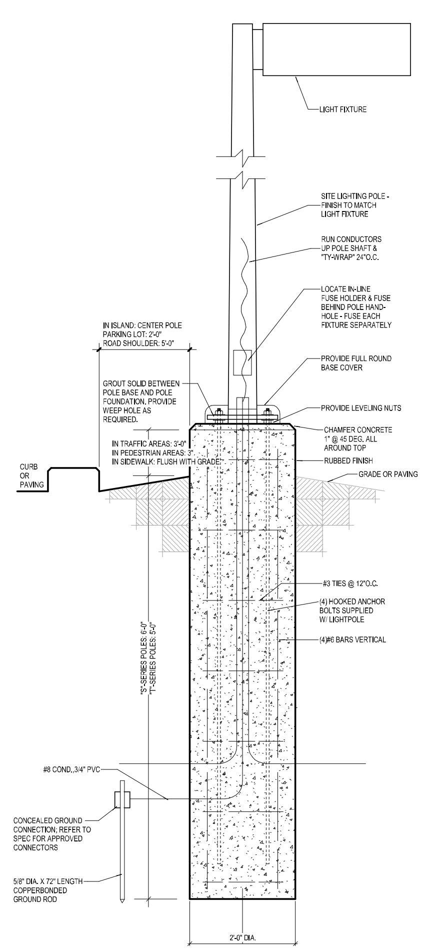


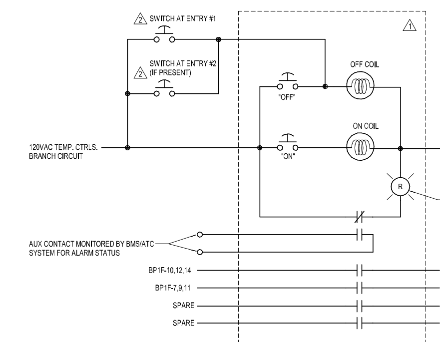
NOTES:
1. DIMENSIONS ARE TYPICAL FOR ALL FOUR CORNERS.
2. E.C. SHALL COORDINATE WITH MANUFACTURER'S SHOP DRAWINGS FOR EXACT DIMENSIONS

NOTES:
1. CONCRETE TO BE PLACED ON ONE FOOT OF PACKED WASHED GRAVEL OR PEA STONE.
2. CONCRETE = 4,000 PSI COMPRESSIVE STRENGTH AT 28 DAYS WITH AIR ENTRAINMENT.
3. GRADE OF REINFORCING RODS = ASTM A615: GRADE 60 O R 75.
4. TOLERANCES OVERALL DIMENSIONS AND PAD OPENING DIMENSIONS = 1/2".

10 E7.01 TRANSFORMER/GENERATOR GROUNDING DETAIL
NOT TO SCALE



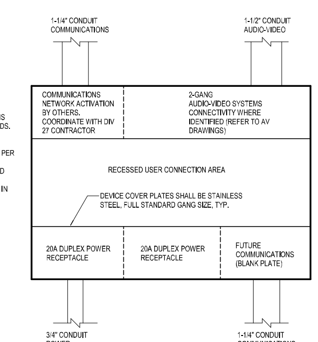
9 E7.01 SITE LIGHTING POLE FOUNDATION
NOT TO SCALE



1. 30A, 4-POLE, MECHANICALLY-HELD CONTACTOR WITH 120VAC CONTROL COILS, MOMENTARY ON/OFF PUSH BUTTONS, ONE N.C. AND ONE N.O. AUX CONTACTS, RED LED PILOT LIGHT WIRED TO N.C. AUX CONTACT FOR "OFF" INDICATION. CUSTOM ENGRAVED DEVICE LABELS, NEMA 1 ENCLOSURE. PROVIDE ENGRAVED NAMEPLATE INDICATING "EMERGENCY BOILER SHUTDOWN".
2. RED MOMENTARY PUSHBUTTON SWITCH MOUNTED ON YELLOW POLYCARBONATE BODY, CLEAR POLYCARBONATE HINGED COVER, CUSTOM LABEL "BOILER SHUTDOWN". PROVIDE "STOPPER STATION" SERIES AS MFR'D BY SAFETY TECHNOLOGY INTL. INC., MODEL NO. SS2224ZA-EN OR APPROVED EQUIV. PROVIDE W/ MATCHING BACKBOX (MODEL NO. KIT-71101A-Y) FOR APPLICATIONS WITHOUT A RECESSED SWITCH BOX FOR MOUNTING

8 E7.01 BOILER EMERGENCY SHUTDOWN CONTROL DETAIL
NOT TO SCALE

FLOOR BOX NOTES:
1. REFER TO SECTION 270528 "PATHWAYS FOR COMMUNICATIONS SYSTEMS" FOR ACCEPTABLE CONDUIT INSTALLATION METHODS. OBSERVE BEND RADIUS AND PULL BOX REQUIREMENTS PER CURRENT BICSI AND EIA/TIA STANDARDS.
2. PROVIDE TWO 20A GENERAL PURPOSE DUPLEX RECEPTACLE PER FLOOR BOX. REFER TO PLAN FOR CIRCUIT.
3. SIDE KNOCKOUTS SHOWN IN USE FOR REPRESENTATION. END AND BOTTOM KNOCKOUTS MAY BE USED AS NECESSARY.
4. ELECTRICAL CONTRACTOR SHALL PROVIDE NYLON PULL LINE IN ALL COMMUNICATIONS CONDUITS.
5. COORDINATE INSTALLATION WITH OTHER TRADES.
6. COMMUNICATIONS CONTRACTOR SHALL PROVIDE MODULAR FACEPLATES/FRAMES, JACKS, AND MODULE BLANKS FOR ALL UNUSED OPENINGS.
7. REFER TO SPEC'S FOR MANUFACTURER/MODEL APPROVALS. LAYOUT MAY VARY SLIGHTLY DEPENDING ON SELECTED PRODUCT; COORDINATE EXACT LAYOUT WITH ENGINEER.



7 E7.01 TYPE "FB3" FLOOR BOX CONFIGURATION
NOT TO SCALE

FLOOR BOX NOTES:
1. REFER TO SECTION 270528 "PATHWAYS FOR COMMUNICATIONS SYSTEMS" FOR ACCEPTABLE CONDUIT INSTALLATION METHODS. OBSERVE BEND RADIUS AND PULL BOX REQUIREMENTS PER CURRENT BICSI AND EIA/TIA STANDARDS.
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4. COMMUNICATIONS CONTRACTOR SHALL PROVIDE MODULAR FACEPLATES/FRAMES, JACKS, AND MODULE BLANKS FOR ALL UNUSED OPENINGS.
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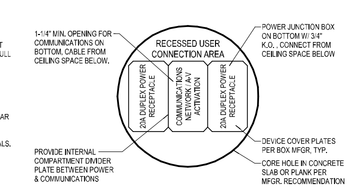
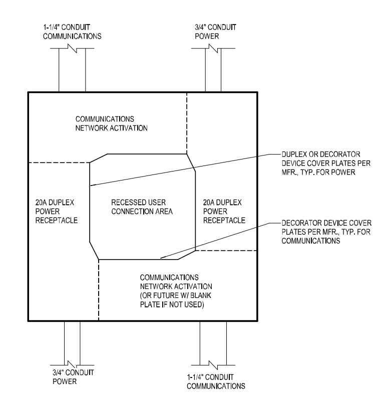
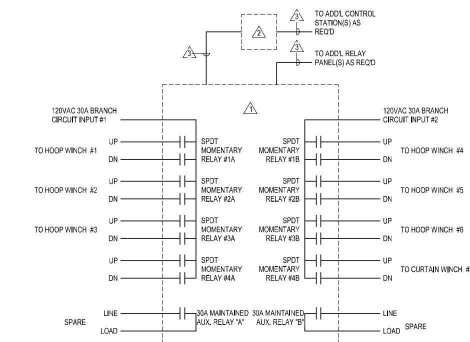


6 E7.01 TYPE "FB2" FLOOR BOX CONFIGURATION
NOT TO SCALE

FLOOR BOX NOTES:
1. REFER TO SECTION 27 05 28 "PATHWAYS FOR COMMUNICATIONS SYSTEMS" FOR ACCEPTABLE CONDUIT INSTALLATION METHODS. OBSERVE BEND RADIUS AND PULL BOX REQUIREMENTS PER CURRENT BICSI AND EIA/TIA STANDARDS.
2. PROVIDE TWO 20A GENERAL PURPOSE DUPLEX RECEPTACLE PER FLOOR BOX. REFER TO PLAN FOR CIRCUIT.
3. SIDE KNOCKOUTS SHOWN IN USE FOR REPRESENTATION. END AND BOTTOM KNOCKOUTS MAY BE USED AS NECESSARY.
4. ELECTRICAL CONTRACTOR SHALL PROVIDE NYLON PULL LINE IN ALL COMMUNICATIONS CONDUITS.
5. COORDINATE INSTALLATION WITH OTHER TRADES.
6. COMMUNICATIONS CONTRACTOR SHALL PROVIDE MODULAR FACEPLATES/FRAMES, JACKS, AND MODULE BLANKS FOR ALL UNUSED OPENINGS.
7. REFER TO SPEC'S FOR MANUFACTURER/MODEL APPROVALS. LAYOUT MAY VARY SLIGHTLY DEPENDING ON SELECTED PRODUCT; COORDINATE EXACT LAYOUT WITH ENGINEER.



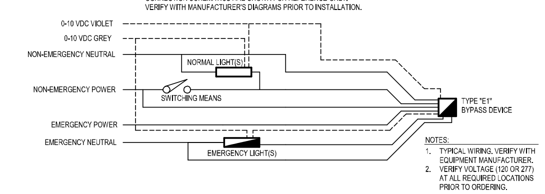
5 E7.01 TYPE "FB1" FLOOR BOX CONFIGURATION
NOT TO SCALE



1. GYMNASIUM EQUIPMENT CONTROL SYSTEM RELAY PANEL, FURNISHED BY SECTION 11 66 23, INSTALLED AND WIRED BY ELEC. CONTRACTOR. WIRING CONNECTIONS ARE SHOWN FOR CONCEPT ONLY; REFER TO MANUFACTURER'S SHOP DRAWINGS FOR EXACT REQUIREMENTS AND WIRING ARRANGEMENTS.
2. GYMNASIUM EQUIPMENT CONTROL SYSTEM OPERATOR INTERFACE (KEYPAD OR TOUCHPANEL, AS SPEC'D), FURNISHED BY SECTION 11 66 23, INSTALLED AND WIRED BY ELEC. CONTRACTOR. MOUNT SEMI-FLUSH AT 44" AFF TO BOTTOM OF BOX WITHIN LINE OF SIGHT OF ALL EQUIPMENT TO BE CONTROLLED. REFER TO MANUFACTURER'S SHOP DRAWINGS FOR EXACT ROUGH-IN REQUIREMENTS.
3. CONTROL-VOLTAGE CABLE, FURNISHED AND WIRED BY ELEC. CONTRACTOR. REFER TO SECTION 26 05 23 FOR TYPICAL CABLE; REFER TO MANUFACTURER'S SHOP DRAWINGS TO CONFIRM EXACT CABLE TYPE REQ'D.

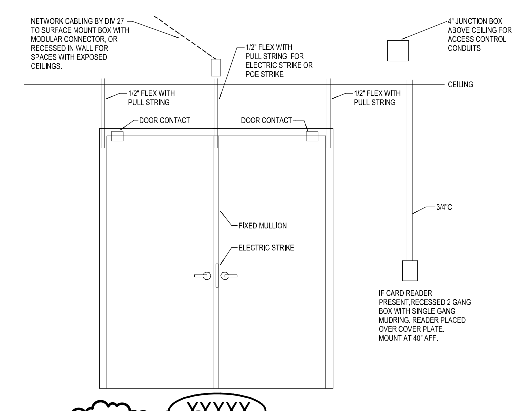
4 E7.01 GYMNASIUM EQUIPMENT CONTROL SYSTEM DETAIL
NOT TO SCALE

CONNECTION SCHEMATICS ARE SHOWN FOR REFERENCE ONLY. VERIFY WITH MANUFACTURER'S DIAGRAMS PRIOR TO INSTALLATION.



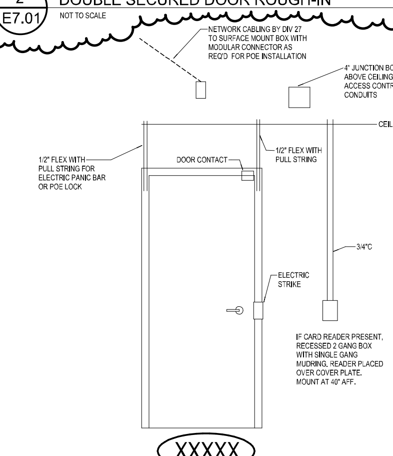
NOTES:
1. TYPICAL WIRING, VERIFY WITH EQUIPMENT MANUFACTURER.
2. VERIFY VOLTAGE (120 OR 277) AT ALL REQUIRED LOCATIONS PRIOR TO ORDERING.

3 E7.01 EMERGENCY LIGHTING AUTOMATIC LOAD CONTROL RELAY
NOT TO SCALE



NOTES:
1. SEE SPECIFICATIONS FOR SPECIFIC DOOR CONTROL DEVICES PER SECURED DOOR.
2. COORDINATE WITH ACCESS CONTROL CONTRACTOR AND SHOP DRAWINGS FOR SPECIFIC REQUIREMENTS.
3. WHERE POE DEVICES ARE SPECIFIED IN THE DOOR HARDWARE SCHEDULE, COORDINATE LOCATION OF ACTIVATION AS TO PREVENT TAMPERING WITH NETWORK CONNECTION TO HARDWARE.
4. REFER TO DOOR HARDWARE SCHEDULE FOR MORE INFORMATION.

2 E7.01 DOUBLE SECURED DOOR ROUGH-IN
NOT TO SCALE



NOTES:
1. SEE SPECIFICATIONS FOR SPECIFIC DOOR CONTROL DEVICES PER SECURED DOOR.
2. COORDINATE WITH ACCESS CONTROL CONTRACTOR AND SHOP DRAWINGS FOR SPECIFIC REQUIREMENTS.
3. WHERE POE DEVICES ARE SPECIFIED IN THE DOOR HARDWARE SCHEDULE, COORDINATE LOCATION OF ACTIVATION AS TO PREVENT TAMPERING WITH NETWORK CONNECTION TO HARDWARE.
4. REFER TO DOOR HARDWARE SCHEDULE FOR MORE INFORMATION.

1 E7.01 SINGLE SECURED DOOR ROUGH-IN
NOT TO SCALE

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NEW 5TH - 6TH GRADE FACILITY
HUDSONVILLE PUBLIC SCHOOLS
HUDSONVILLE, MICHIGAN

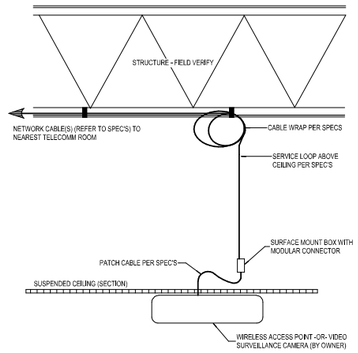
ISSUANCES

10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001

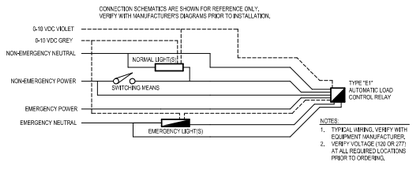
DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

ELECTRICAL DETAILS

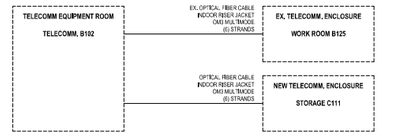
E7.01



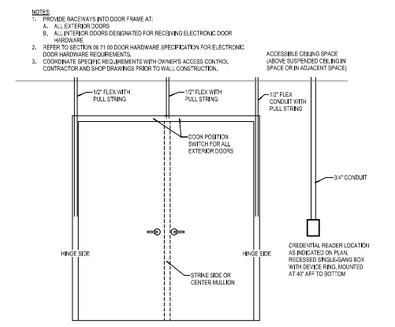
5 E7.01 CEILING MOUNTED COMMUNICATION DEVICE
NOT TO SCALE



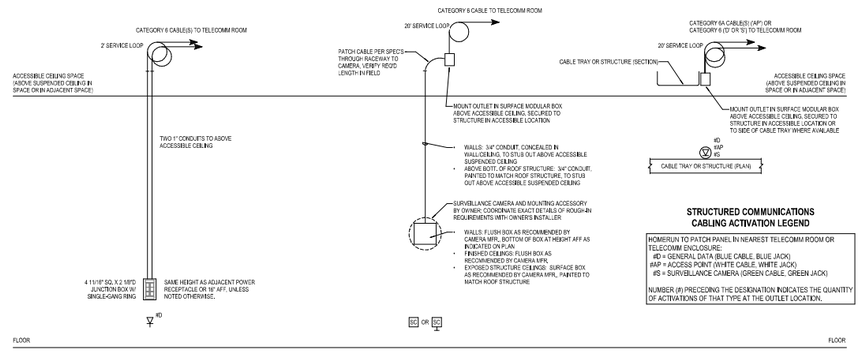
4 E7.01 EMERGENCY LIGHTING AUTOMATIC LOAD CONTROL RELAY
NOT TO SCALE

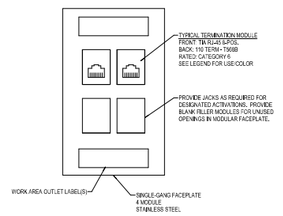


3 E7.01 COMMUNICATIONS CABLING BACKBONE RISER DIAGRAM
NOT TO SCALE

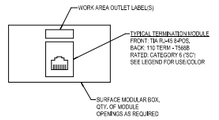


2 E7.01 TYPICAL ROUGH-IN FOR DOORS WITH ELECTRONIC ACCESS CONTROL / MONITORING
NOT TO SCALE

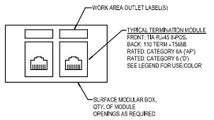




TYPICAL COMMUNICATIONS WALL OUTLET WITH '_D' OR '_AP' ACTIVATION



TYPICAL COMMUNICATIONS OUTLET FOR VIDEO SURVEILLANCE CAMERA



TYPICAL COMMUNICATIONS OUTLET ABOVE ACCESSIBLE CEILING (WIRELESS ACCESS POINT, AUDIO-VIDEO SYSTEM EQUIP., ETC.)

1 E7.01 TYPICAL COMMUNICATIONS OUTLET DETAILS
NOT TO SCALE

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FOREST GROVE ELEMENTARY GYM ADDITION
HUDSONVILLE PUBLIC SCHOOLS
HUDSONVILLE, MICHIGAN

ISSUANCES
09.22.2021 BIDS & CONSTRUCTION

DRAWN MCK
REVIEWED JFB

PROJECT NO. 5-5362

ELECTRICAL DETAILS

E7.01

BIM 360://5-5362 Hudsonville Forest Grove Elem Gym Addition/5-5362E 2019.rvt
9/17/2021 8:22:03 AM

ELECTRICAL ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	INTLK	INTERLOCK
BKR	BREAKER	JCT	JUNCTION
BOB	BOTTOM OF BOX	JB	JUNCTION BOX
BOS	BOTTOM OF STRUCTURE	KW	KILOWATT
BP	BREAKER PANEL	KWH	KILOWATT HOUR
BLDG	BUILDING	KO	KNOCK-OUT
CAP	CAPACITY	LBL	LABEL
CLG	CEILING	LT	LIGHT
CKT	CIRCUIT	LC	LIGHT CONTROL
CB	CIRCUIT BREAKER	LCM	LIGHTING CONTROL MODULE
C	CONDUIT	LCN	LIGHTING CONTROL NARRATIVE
COMM	COMMUNICATIONS	LTG	LIGHTING
CONN	CONNECTION	MAX	MAXIMUM
CONST	CONSTRUCTION	MCC	MOTOR CONTROL CENTER
CONTR	CONTRACT (OR)	MIN	MINIMUM
CLL	CONTRACT LIMIT LINE	MRS	MOTORIZED ROLLER SHADE
CT	CURRENT TRANSFORMER	NEC	NATIONAL ELECTRIC CODE
E.C.	ELECTRICAL CONTRACTOR	NEG	NEGATIVE (-)
EHD	ELECTRIC HAND DRYER	NC	NORMALLY CLOSED
ELEC	ELECTRIC (AL)	NO	NORMALLY OPEN
EWC	ELECTRIC WATER COOLER	N/A	NOT APPLICABLE
EM	EMERGENCY	NIC	NOT IN CONTRACT
ENT	ENTRANCE	NL	NIGHT LIGHT
EQ	EQUAL	PC	PHOTO CELL
EQUIP	EQUIPMENT	POS	POSITIVE (+)
EST	ESTIMATE	PWR	POWER
EF	EXHAUST FAN	P & L	POWER & LIGHTING
ETR	EXISTING TO REMAIN	S	SURFACE
EX	EXISTING	S.B.O.	SUPPLIED BY OTHERS
F	FLUSH	SP	SINGLE POLE
FA	FIRE ALARM	SPD	SURGE PROTECTION DEVICE
FSE	FOOD SERVICE EQUIPMENT	SPKR	SPEAKER
FP	FIRE PROOF / FIRE PROTECTION	SPEC	SPECIFICATION
FLR	FLOOR	SUB	SUBSTITUTE
FLUOR	FLUORESCENT	SWBD	SWITCHBOARD
GEN	GENERATOR	TEL	TELEPHONE
GFCI	GROUND FAULT CIRCUIT INTERRUPTER	TSTAT	THERMOSTAT
GRD	GROUND	XFMR	TRANSFORMER
HORIZ	HORIZONTAL	UG	UNDERGROUND
HTR	HEATER	UL	UNDERWRITERS LABORATORIES
HTG	HEATING	UH	UNIT HEATER
H/V	HEATING / VENTILATING	UNO	UNLESS NOTED OTHERWISE
HVAC	HEATING, VENTILATING, AIR CONDITIONING	VERT	VERTICAL
HOA	HAND-OFF-AUTOMATIC	W	WITH
HP	HEAT PUMP	W/O	WITHOUT
		WL	WET LOCATION
		WP	WEATHER PROOF

MAXIMUM CONDUCTOR LENGTHS FOR TYPICAL BRANCH CIRCUITS

FEET ONE-WAY BASED ON SINGLE PHASE, 20A CIRCUIT, 75% LOAD, 100% P.F., IN STEEL CONDUIT, 3% VOLTAGE DROP

CIRCUIT VOLTAGE	CONDUCTOR SIZE				
	#12 AWG	#10 AWG	#8 AWG	#6 AWG	#4 AWG
120	60	100	159	245	385
208	100	170	265	425	670
277	135	230	355	565	890
480	240	400	615	980	

FEET ONE-WAY BASED ON SINGLE PHASE, 30A CIRCUIT, 75% LOAD, 100% P.F., IN STEEL CONDUIT, 3% VOLTAGE DROP

CIRCUIT VOLTAGE	CONDUCTOR SIZE				
	#10 AWG	#8 AWG	#6 AWG	#4 AWG	
120	60	100	159	245	
208	100	170	265	425	670
277	135	230	355	565	890
480	240	400	615	980	

FEET ONE-WAY BASED ON THREE PHASE, 20A CIRCUIT, 75% LOAD, 100% P.F., IN STEEL CONDUIT, 3% VOLTAGE DROP

CIRCUIT VOLTAGE	CONDUCTOR SIZE				
	#12 AWG	#10 AWG	#8 AWG	#6 AWG	#4 AWG
208	120	200	385	490	775
480	275	460	710	1,130	

FEET ONE-WAY BASED ON THREE PHASE, 30A CIRCUIT, 75% LOAD, 100% P.F., IN STEEL CONDUIT, 3% VOLTAGE DROP

CIRCUIT VOLTAGE	CONDUCTOR SIZE			
	#10 AWG	#8 AWG	#6 AWG	#4 AWG
208	120	200	305	490
480	275	460	710	1,130

COMMUNICATIONS SYMBOL LEGEND

- COMMUNICATIONS OUTLET ROUGH-IN
- COMMUNICATIONS OUTLET, ONE DATA ACTIVATION
- COMMUNICATIONS OUTLET, CEILING-MOUNTED
- COMMUNICATIONS OUTLET, FLOOR-MOUNTED
- CEILING-MOUNTED VIDEO PROJECTOR
- COMMUNICATIONS EQUIPMENT RACK, FLOOR-MOUNTED
- COMMUNICATIONS EQUIPMENT RACK, WALL-MOUNTED
- CONDUIT SLEEVE FOR COMMUNICATIONS CABLING, 2" TYP, UNLESS NOTED OTHERWISE
- LOUDSPEAKER, CEILING-MOUNTED, DEVICE FURNISHED AND INSTALLED BY OWNER'S TECHNOLOGY CONTRACTOR
- LOUDSPEAKER, WALL-MOUNTED, DEVICE FURNISHED AND INSTALLED BY OWNER'S TECHNOLOGY CONTRACTOR
- INTERCOM SYSTEM CALL STATION BUTTON
- VOLUME CONTROL FOR AUDIO SYSTEM, PAGING, OR INTERCOM LOUDSPEAKERS
- SECONDARY CLOCK, CEILING-MOUNTED, DEVICE FURNISHED AND INSTALLED BY OWNER'S TECHNOLOGY CONTRACTOR
- SECONDARY CLOCK, WALL-MOUNTED, DEVICE FURNISHED AND INSTALLED BY OWNER'S TECHNOLOGY CONTRACTOR

NOTE: NOT ALL SYMBOLS ARE NECESSARILY USED

ELECTRONIC SAFETY / SECURITY SYMBOL LEGEND

- DOOR CONTACT
- ELECTRONIC LATCH
- ELECTRONIC STRIKE
- PUSH BUTTON LOCK
- WALL-MOUNTED SURVEILLANCE CAMERA COMMUNICATIONS ROUGH-IN
- CEILING-MOUNTED SURVEILLANCE CAMERA COMMUNICATIONS ROUGH-IN
- CARD READER
- ACCESS CONTROL DOOR TAG, REFER TO HARDWARE SCHEDULE(S)IN SPECIFICATION 08 71 00 AND/OR 28 13 00 FOR DETAILS.
- ACCESS CONTROL SYSTEM EQUIPMENT

NOTE: NOT ALL SYMBOLS ARE NECESSARILY USED

POWER SYMBOL LEGEND

- THREE PHASE MOTOR CONNECTION, 5 HORSE POWER
- SINGLE PHASE MOTOR CONNECTION, 1/2 HORSE POWER
- SAFETY SWITCH DISCONNECTING MEANS, NOT FUSIBLE
- SAFETY SWITCH DISCONNECTING MEANS, FUSIBLE
- COMBINATION MOTOR STARTER AND FUSIBLE DISCONNECTING MEANS
- VARIABLE FREQUENCY DRIVE WITH INTEGRAL DISCONNECTING MEANS
- MOTOR STARTER
- BOX-COVER FUSIBLE DISCONNECT SWITCH
- MANUAL MOTOR CONTROLLER
- POWER SWITCH, REFER TO LIGHTING SYMBOL LEGEND FOR SIMILAR SWITCH TYPES
- DIRECT ELECTRICAL CONNECTION
- SINGLE RECEPTACLE
- SINGLE RECEPTACLE, FLOOR-MOUNTED
- DUPLEX RECEPTACLE
- WHERE "WL" IS NOTED PROVIDE WHILE-IN-USE WET LOCATION COVER AND WEATHER RESISTANT DUPLEX RECEPTACLE.
- SURFACE MOUNTED RECEPTACLE
- "T" TAG ON DEVICE INDICATES REPLACEMENT OF DEVICE USING EXISTING ROUGH-IN
- DUPLEX RECEPTACLE, CEILING-MOUNTED
- DUPLEX RECEPTACLE, FLOOR-MOUNTED
- DUPLEX STANDBY POWER RECEPTACLE
- DUPLEX SPLIT WIRED RECEPTACLE
- DUPLEX GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE
- QUADRUPLEX RECEPTACLE
- QUADRUPLEX RECEPTACLE, CEILING-MOUNTED
- QUADRUPLEX RECEPTACLE, FLOOR-MOUNTED
- MULTI-PHASE RECEPTACLE. SEE PLAN FOR TYPE
- MULTI-PHASE RECEPTACLE, FLOOR-MOUNTED
- SURFACE RACEWAY SYSTEM
- AUTOMATIC TRANSFER SWITCH
- SWITCHBOARD
- PANELBOARD
- TRANSFORMER
- MOTOR CONTROL CENTER
- EMERGENCY STOP STATION, REFER TO DETAIL FOR REQUIREMENTS.
- AUTOMATIC DOOR OPERATOR PUSH-BUTTON
- ON/OFF PUSH-BUTTON
- THREE-FUNCTION PUSH BUTTON
- FLOORBOX, TYPE 1
- JUNCTION BOX
- METER
- THERMOSTAT ROUGH-IN
- RELAY
- ENCLOSED CONTROL CONTACTOR

NOTE: NOT ALL SYMBOLS ARE NECESSARILY USED

LIGHTING SYMBOL LEGEND

- SINGLE POLE LIGHT SWITCH
- DOUBLE POLE LIGHT SWITCH
- THREE-WAY LIGHT SWITCH
- FOUR-WAY LIGHT SWITCH
- SINGLE POLE LIGHT SWITCH WITH INTEGRAL OCCUPANCY SENSOR
- OCCUPANCY SENSOR DIMMER
- WALL-BOX DIMMER SWITCH
- THREE-WAY DIMMER SWITCH
- ELECTRONIC INTERVAL TIMER SWITCH
- LIGHT SWITCH WITH PILOT LIGHT
- LIGHTING CONTROL SYMBOL REFER TO LIGHTING CONTROL SWITCH SCHEDULE AND SPECIFICATIONS FOR DETAILS.
- DOUBLE THROW (MAINTAINED) LIGHT SWITCH
- KEY-OPERATED LIGHT SWITCH - (SUFFIX DESIGNATION | BLANK: SINGLE POLE, 2: DOUBLE POLE, 3: THREE-WAY, 4: FOUR-WAY)
- LOCKING SWITCH - (SUFFIX DESIGNATION | BLANK: SINGLE POLE, 2: DOUBLE POLE, 3: THREE-WAY, 4: FOUR-WAY)
- TOUCHSCREEN PANEL
- CIRCUIT NUMBER FOR LIGHT FIXTURES WITH INDICATED A SPACE
- WALL-MOUNTED LIGHTING FIXTURE, TYPE 'A'
- RECESSED LIGHTING FIXTURE, TYPE 'A'
- SURFACE-MOUNTED LIGHTING FIXTURE, TYPE 'A'
- TRACK LIGHTING
- SINGLE FACE EXIT SIGN, TYPE "X1" IN SCHEDULE UNLESS OTHERWISE NOTED. SHADING INDICATES FACE ORIENTATION
- DOUBLE FACE EXIT SIGN, TYPE "X2" IN SCHEDULE UNLESS OTHERWISE NOTED. SHADING INDICATES FACE ORIENTATION
- WALL-MOUNTED EXIT SIGN
- EMERGENCY LIGHT FIXTURE DESIGNATION
- EMERGENCY LIGHTING AUTOMATIC LOAD CONTROL RELAY
- LIGHTING CONTROL RELAY
- LIGHTING CONTROL ENCLOSED CONTACTOR
- TRUE SWITCH
- LIGHTING CONTROL MODULE
- EMERGENCY LIGHTING INVERTER, TYPE 1
- WALL-MOUNTED OCCUPANCY SENSOR
- CEILING-MOUNTED OCCUPANCY SENSOR
- WALL-MOUNTED PHOTOCELL FOR ON/OFF CONTROL
- CEILING-MOUNTED PHOTOCELL FOR ON/OFF CONTROL
- WALL-MOUNTED PHOTOSENSOR FOR DAYLIGHT HARVESTING DIMMING CONTROL
- CEILING-MOUNTED PHOTOSENSOR FOR DAYLIGHT HARVESTING DIMMING CONTROL
- POLE-MOUNTED SITE/AREA FIXTURE
- SELF-CONTAINED EMERGENCY LIGHTING UNIT

NOTE: NOT ALL SYMBOLS ARE NECESSARILY USED

FIRE ALARM SYMBOL LEGEND

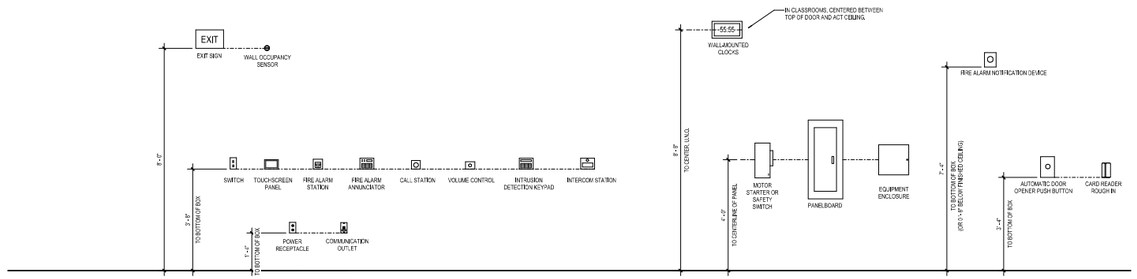
- MANUAL PULL STATION
- AUDIBLE NOTIFICATION APPLIANCE, WALL-MOUNTED
- VISUAL NOTIFICATION APPLIANCE, WALL-MOUNTED
- AUDIBLE/VISUAL NOTIFICATION APPLIANCE, WALL-MOUNTED
- AUDIBLE NOTIFICATION APPLIANCE, CEILING-MOUNTED
- AUDIBLE/VISUAL NOTIFICATION APPLIANCE, CEILING-MOUNTED
- VISUAL NOTIFICATION APPLIANCE, CEILING-MOUNTED
- WHERE "WG/PC" IS NOTED, PROVIDE LISTED WIRE GUARD OR PROTECTIVE POLYCARBONATE COVER FOR NOTIFICATION DEVICE.
- WHERE "WL" IS NOTED, PROVIDE LISTED WET-LOCATION NOTIFICATION DEVICE, SUITABLE FOR INDOOR OR OUTDOOR USE.
- SMOKE DETECTOR
- HEAT DETECTOR
- DUCT SMOKE DETECTOR
- SMOKE DAMPER OPERATOR MOTOR
- FIRE PROTECTION FLOW SWITCH
- FIRE PROTECTION TAMPER SWITCH
- ELECTROMAGNETIC DOOR HOLD-OPEN DEVICE
- ADDRESSABLE RELAY FOR FIRE ALARM CONTROL
- PRESSURE SWITCH
- CARBON MONOXIDE DETECTOR
- NOTIFICATION APPLIANCE CONTROL PANEL
- FIRE ALARM REMOTE ANNUNCIATOR
- FIRE ALARM CONTROL PANEL
- KEYED TEST SWITCH AND REMOTE INDICATOR FOR DUCT SMOKE DETECTOR
- FIRE PROTECTION OR ALARM BELL

NOTE: NOT ALL SYMBOLS ARE NECESSARILY USED

ELECTRICAL GENERAL NOTES

1. ALL WORK SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE AS AMENDED AND ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION WHERE THE WORK IS PERFORMED.
2. ALL "LOW-VOLTAGE" CONTROLS, COMMUNICATIONS, AND SAFETY/SECURITY CABLING MAY BE INSTALLED WITHOUT CONDUIT, RACEWAY, OR CABLE TRAY ONLY WHERE CONCEALED ABOVE A SUSPENDED CEILING SYSTEM AND ACCESSIBLE FOR FUTURE MAINTENANCE; OTHERWISE, ALL CABLING (INCLUDING BUT NOT LIMITED TO CABLES ASSOCIATED WITH SYSTEMS SUCH AS ARCHITECTURAL EQUIPMENT, BUILDING ENERGY MANAGEMENT, TEMPERATURE CONTROLS, LIGHTING CONTROLS, COMMUNICATIONS NETWORKS, TELEPHONE, AUDIO-VIDEO, INTERCOM, PAGING, CLOCK, SURVEILLANCE, ACCESS CONTROL, FIRE ALARM, ETC.) SHALL BE INSTALLED IN AN APPROVED CONDUIT, RACEWAY SYSTEM, AND/OR CABLE TRAY UNLESS OTHERWISE NOTED. IN EXPOSED STRUCTURE CEILING AREAS, CONCEALED INSTALLATION OF CABLES IN RACEWAYS SHALL BE REQUIRED FOR AESTHETIC REASONS. REFER TO REFLECTED CEILING PLANS FOR LOCATIONS. THIS APPLIES TO ALL TRADES AND WORK CATEGORIES. EXCEPTIONS:
   A. DEDICATED MECHANICAL AND/OR ELECTRICAL ROOMS ABOVE EACH APP.
   B. DEDICATED TELECOMMUNICATIONS ROOMS
3. "LOW-VOLTAGE" CONTROLS, COMMUNICATIONS, AND SAFETY/SECURITY CABLING SHALL NOT BE PAINTED. PAINTING CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARY PROTECTION OF ANY EXISTING CABLING PRIOR TO PAINTING EXISTING AREAS. CONTRACTORS INSTALLING CABLING WHERE APPROVED FOR EXPOSED INSTALLATION SHALL INSTALL CABLES AFTER PAINTING HAS BEEN COMPLETED OR PROVIDE TEMPORARY PROTECTION OF CABLES UNTIL PAINTING HAS BEEN COMPLETED. PAINTED CABLES SHALL BE REPLACED AT THE EXPENSE OF THE NEGLIGENT CONTRACTOR.
4. METAL CLAD CABLE MAY BE USED FOR FIXTURE WHIPS IN LENGTHS OF 6 FEET OR LESS ABOVE AN ACCESSIBLE SUSPENDED CEILING SYSTEM ONLY, OTHERWISE METAL CLAD OR OTHER FLEXIBLE CABLE TYPES SHALL NOT BE USED UNLESS SPECIFICALLY AUTHORIZED BY THE ENGINEER (IT IS THE INTENT OF THESE CONTRACT DOCUMENTS THAT ALL INSTALLED BRANCH CIRCUITS CONSIST OF SEPARATE RACEWAY AND CONDUCTORS ALLOWING REMOVAL AND REPLACEMENT OF WIRING AS REQUIRED FOR FUTURE UPGRADES). REFER TO SPECIFICATIONS FOR EXCEPTIONS.
5. CIRCUIT WIRING FOR ARTICLE 700 EMERGENCY SYSTEMS AND ARTICLE 708 CRITICAL OPERATIONS POWER SYSTEMS SHALL BE INSTALLED IN SEPARATE CONDUIT/RACEWAYS AND BE KEPT ENTIRELY INDEPENDENT OF ALL OTHER WIRING AND EQUIPMENT PER NEC REQUIREMENTS.
6. ALL FEEDERS AND BRANCH CIRCUITS SHALL CONTAIN AN EQUIPMENT GROUNDING CONDUCTOR SIZED ACCORDING TO THE NEC RACEWAYS INCLUDING CONDUITS, BOXES, WIREWAYS, ETC. SHALL NOT BE CONSIDERED AN ACCEPTABLE GROUND.
7. CONDUITS AND CABLING SHALL NOT BE INSTALLED WITHIN 4" OF ROOF DECK, EXCEPT AS NECESSARY TO SERVE ROOF-MOUNTED ITEMS AND ONLY WHEN THE CONDUIT OR CABLE IS ROUTED VERTICALLY TO SUCH EQUIPMENT FROM BELOW.
8. SUPPLEMENTAL METAL FRAMING SHALL BE PROVIDED FOR SUSPENSION POINTS OF ALL ITEMS LOCATED BETWEEN OVERHEAD STRUCTURAL MEMBERS (JOISTS, TRUSSES, BEAMS, ETC.) IN OPEN ASSEMBLE STRUCTURE CEILING AREAS. METAL FRAMING SHALL SPAN ACROSS THE TOP CHORD OR FLANGE OF THE STRUCTURAL MEMBERS FOR BOTH STRUCTURAL AND AESTHETIC PURPOSES. SPECIFIC EXCEPTIONS SHALL BE COORDINATED IN WRITING WITH THE ARCHITECT/ENGINEER.
9. CONDUIT INSTALLED WITHIN INACCESSIBLE CONSTRUCTION SHALL BE 3/4" MINIMUM SIZE.
10. FEEDERS SHOWN ON DRAWINGS ARE SCHEMATIC ONLY. CONDUIT RUNS SHALL COMPLY WITH CONDUIT SPECIFICATIONS AND CONTAIN BENDS THAT ARE NO GREATER THAN 90 DEGREES. CONDUITS INSTALLED ABOVE GRADE SHALL BE RUN PARALLEL TO, OR PERPENDICULAR WITH, BUILDING STEEL AND/OR ARCHITECTURAL LINES.
11. CONTRACTOR(S) SHALL VERIFY COLOR FINISH OF WIRING DEVICES, DEVICE FACEPLATES, SURFACE RACEWAY SYSTEMS, AND/OR MULTI-OUTLET ASSEMBLIES WITH ARCHITECT/ENGINEER IF NOT EXPLICITLY SPECIFIED.
12. ELECTRICAL CONTRACTOR SHALL REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR ADDITIONAL LIGHTING FIXTURE INFORMATION AND MOUNTING LOCATIONS.
13. ELECTRICAL CONTRACTOR SHALL ADJUST LIGHTING FIXTURE LOCATIONS IN MECHANICAL ROOMS TO ACCOMMODATE MECHANICAL EQUIPMENT AND FIELD CONDITIONS.
14. CONTRACTOR(S) SHALL BE RESPONSIBLE TO REVIEW INTERIOR ELEVATION SHEETS FOR PLACEMENT OF DEVICE BOXES. COORDINATE LOCATIONS SO TV-AT NO DEVICES ARE INSTALLED BEHIND CASEWORK, MILLWORK, VISUAL DISPLAY BOARDS, MIRRORS, CUSTOM GRAPHICS, SIGNAGE, ETC.
15. ELECTRICAL CONTRACTOR SHALL REVIEW TOILET EQUIPMENT SHOP DRAWINGS AND ARCHITECTURAL DETAILS/ELEVATIONS FOR CORRECT DEVICE ROUGH-IN LOCATION OF HAND DRYERS.
16. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH PLUMBING CONTRACTOR AND THE ELECTRIC WATER COOLER / BOTTLE FILLER SHOP DRAWINGS FOR MOUNTING HEIGHT AND CONNECTION METHOD OF PLUMBING EQUIPMENT POWER CONNECTIONS. REMOVABLE ACCESSIBLE QC/PROTECTION SHALL BE PROVIDED FOR THE BRANCH CIRCUIT(S) SUPPLYING ALL SUCH UNITS PER NEC REQUIREMENTS.
17. REFER TO MECHANICAL EQUIPMENT SCHEDULE FOR DETAILED INFORMATION REGARDING EQUIPMENT AND CONTROL. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING AND PROVIDING ITEMS AS SPECIFICALLY LISTED AND ASSIGNED ON MECHANICAL EQUIPMENT SCHEDULE SUCH AS DISCONNECT SWITCHES, VARIABLE-FREQUENCY DRIVES, STARTERS, TIMERS, SWITCHES, ETC.
18. ELECTRICAL CONTRACTOR SHALL CONFIRM THE LOCATION OF THE EXHAUST FANS LISTED IN THE MECHANICAL EQUIPMENT SCHEDULES BY REFERRING TO MECHANICAL/HVAC PLANS.
19. REFER TO ROOF PLANS FOR EXACT LOCATIONS OF ROOF-TOP MECHANICAL EQUIPMENT.
20. CABINET HEATERS: MAY HAVE LINE VOLTAGE THERMOSTATS SUPPLIED BY MECHANICAL CONTRACTOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR. REFER TO MECHANICAL EQUIPMENT SCHEDULE.
21. DIVISION 26 CONTRACTOR SHALL PROVIDE CONDUIT SLEEVES WITH APPROPRIATE BUSHINGS FOR CONTROLS AND ELECTRONIC SAFETY/SECURITY CABLING THROUGH WALLS AND FLOORS. SLEEVE SIZES SHALL BE COORDINATED WITH CABLING REQUIREMENTS.
22. SECTION 27 05 28 CONTRACTOR SHALL PROVIDE CONDUIT SLEEVES WITH APPROPRIATE BUSHINGS FOR COMMUNICATIONS CABLING THROUGH WALLS AND FLOORS. SLEEVE SIZE SHALL BE 2" MIN. UNLESS NOTED OTHERWISE.
23. PROVIDE DIRECT CONNECTIONS FROM LOCAL RECEPTACLE CIRCUIT TO ACCESS CONTROL SYSTEM AND DOOR HARDWARE POWER SUPPLIES WHERE REQUIRED FOR DOOR LOCK DEVICES, CONTROLLERS, ETC. REFER TO DOOR HARDWARE SCHEDULE AND ACCESS CONTROL SYSTEM SCHEDULE IN RESPECTIVE SPECIFICATIONS FOR QUANTITIES AND LOCATIONS.

Section 27 53 13 - Clock System



NOTE: ALL HEIGHTS ARE AS SHOWN UNLESS NOTED OTHERWISE.

TYPICAL MOUNTING HEIGHTS FOR WALL DEVICES, EQUIPMENT, & FIXTURES

NOT TO SCALE

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NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES

10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001

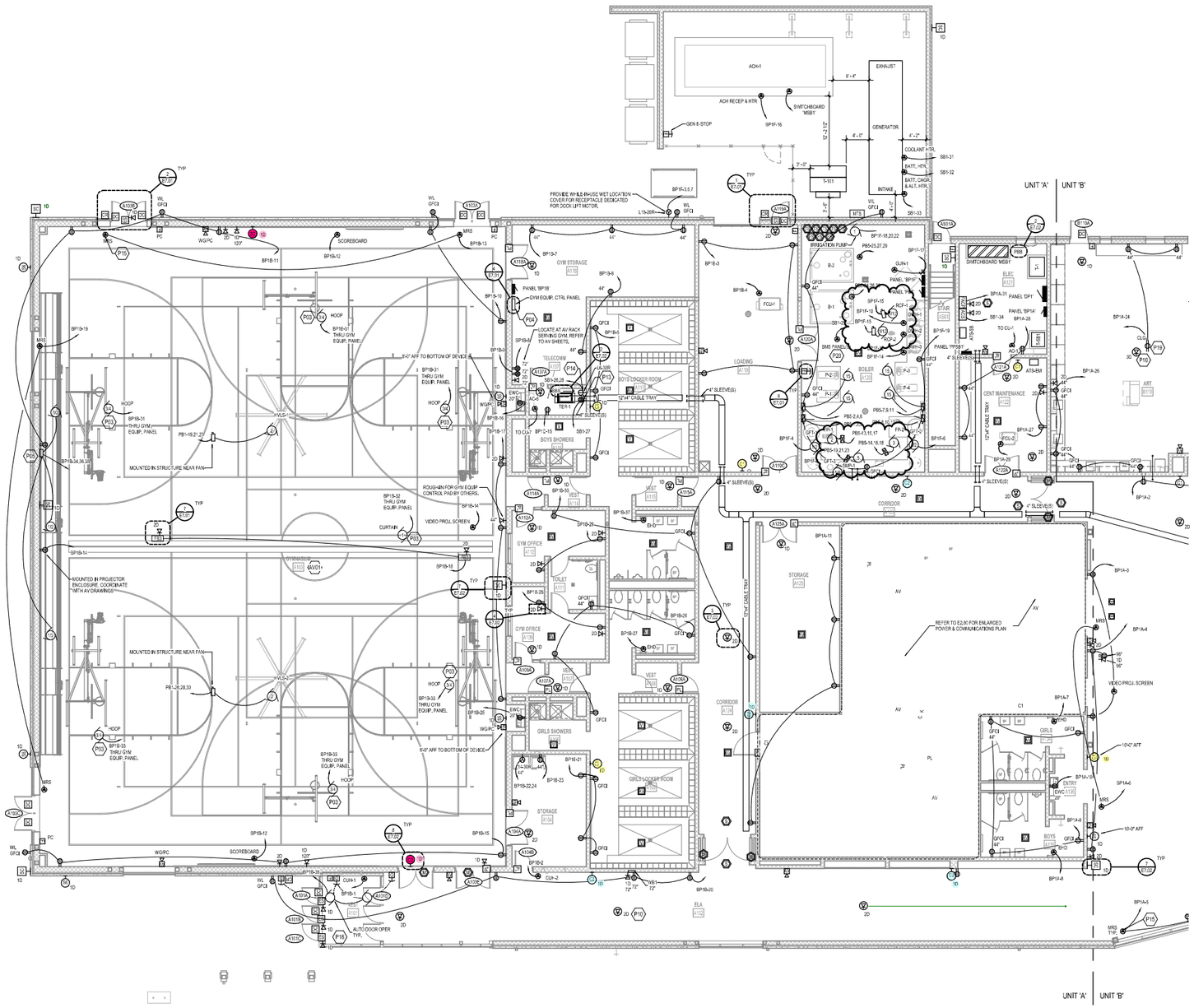
DRAWN JFB

REVIEWED AAB

PROJECT NO. 5-5065

ELECTRICAL SYMBOL LEGENDS & GENERAL NOTES

E0.01



POWER & COMMUNICATION GENERAL NOTES

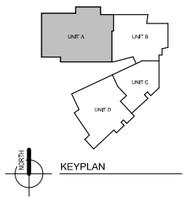
1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BULDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20A/1P BRANCH CIRCUIT (WITH BREAKER LOCKING MECHANISM) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT). TERMINATED W/ BOX-COVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES. AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE, INSTALL 3/4" CONDUIT RACEWAY FROM BOX TO CORRESPONDING TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT. REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.#
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

ELECTRICAL KEYNOTES

AV01	REFER TO AV DRAWINGS FOR ADDITIONAL SCOPE. COORDINATE ALL ROUGH-IN LOCATIONS WITH AV DRAWINGS.
P03	E.C. SHALL PROVIDE AND INSTALL 4" SQUARE JUNCTION BOX WITHIN 3'-0" OF WINCH LOCATION FOR TWIST-LOCK RECEPTACLE. TWIST LOCK RECEPTACLE AND COVER PROVIDED BY EQUIPMENT PROVIDER. (1) HOOK-UP REQUIRED PER DEVICE. REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR FURTHER DETAILS.
P04	6-RELAY GYM EQUIPMENT CONTROL PANEL REQUIRED TO SUPPORT (6) HOOP WINCH MOTORS AND (1) DIVIDER CURTAIN MOTOR. USE (1) RELAY PER DEVICE. POWER EACH PANEL WITH (2) 120V SINGLE PHSE CIRCUITS AS INDICATED IN PANEL SCHEDULE. REFER TO MANUFACTURER INSTRUCTIONS FOR FURTHER DETAILS.
P05	E.C. SHALL PROVIDE AND INSTALL NON-FUSIBLE SAFETY SWITCHES FOR BLEACHER MOTOR. JUNCTION BOX SHALL BE MOUNTED AT 6'-0" AFF. COORDINATE LOCATION WITH EQUIPMENT PROVIDER. REFER TO BLEACHER DETAILS ON ARCHITECTURE SHEETS FOR FURTHER DETAILS.
P10	ALL LOW VOLTAGE CABLING TO BE IN CONDUIT IN SPACES WITH EXPOSED CEILINGS. PRIOR TO INSTALL, COORDINATE EXACT LOCATION OF NETWORK ACTIVATIONS WITH OWNER'S TECHNOLOGY CONTRACTOR (FOR ACCESS POINTS, SECURITY CAMERAS, AV EQUIPMENT, ETC.). TERMINATE CABLING IN SURFACE MOUNT BOX WITH MODULAR CONNECTOR INSIDE JUNCITON BOX. PROVIDE BLANK FACEPLATE FOR UNUSED LOCATIONS. TYPICAL FOR ALL.
P13	RECEPTACLES ON STANDBY POWER SHALL BE YELLOW. TYPICAL FOR ALL.
P14	INSTALL L6-30R RECEPTACLE INSIDE 4-POST RACK FOR UPS. UPS PROVIDED BY OWNER.
P15	MOTORIZED ROLLER SHADES IN THIS SPACE TO BE CONTROLLED BY AV SYSTEM. REFER TO AV DRAWINGS FOR MORE INFORMATION.
P18	ALL ACCESS CONTROL CONDUITS TO NEAREST CABLE TRAY. TERMINATE CABLING IN JUNCTION BOX RECESSED ABOVE DOOR IN MASONRY WALL, OR JUNCTION BOX SURFACE MOUNTED TO STRUCTURE WHERE CEILINGS ARE LESS THAN 20 FEET. TYPICAL FOR ALL ACCESS CONTROL DOORS SHOWN WITH DATA DROPS.
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR, TYPICAL FOR ALL.
P20	COORDINATE WITH CONTROLS CONTRACTOR FOR LOCATION OF BMS PANEL.

UNIT 'A' FIRST FLOOR POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"



KEYPLAN

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NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES	
10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
02.18.2021	BULLETIN 002
04.16.2021	BULLETIN 006
05.11.2021	BULLETIN 007
05.26.2021	BULLETIN 008
06.16.2021	BULLETIN 010
07.01.2021	BULLETIN 011
08.10.2021	BULLETIN 013
08.31.2021	BULLETIN 015
09.28.2021	BULLETIN 018
02.28.2022	BULLETIN 022

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'A' FIRST FLOOR POWER & COMMUNICATIONS PLAN

E2.1A

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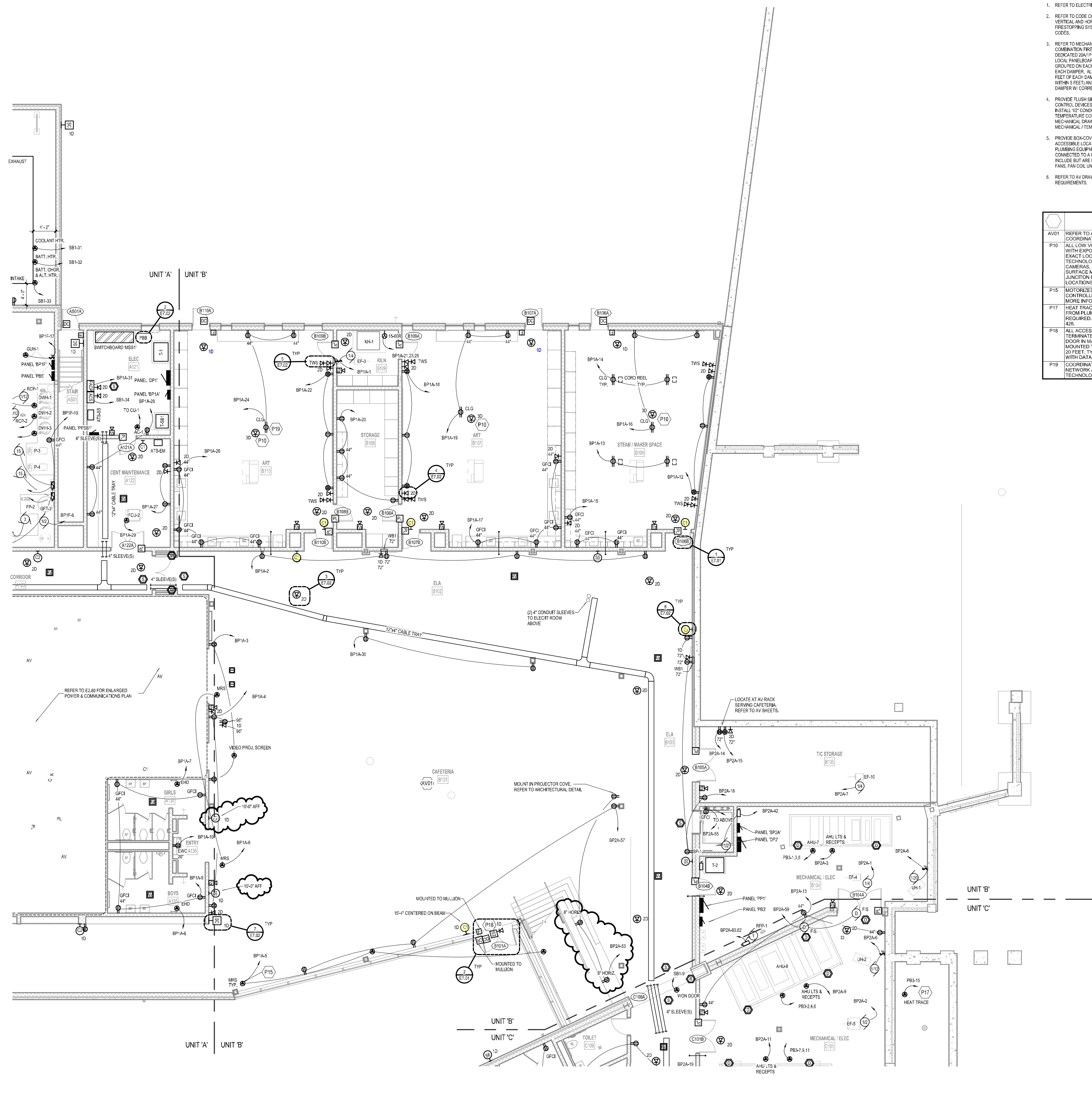

UNIT 'B' FIRST FLOOR POWER & COMMUNICATIONS PLAN
1/8" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20A/1P BRANCH CIRCUIT (WITH BREAKER LOCKING MECHANISM) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT), TERMINATED W/ BOX-COVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES, AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE. INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT. REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.6
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

	ELECTRICAL KEYNOTES
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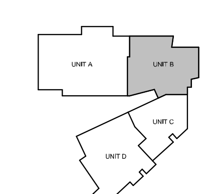
P10	ALL LOW VOLTAGE CABLING TO BE IN CONDUIT IN SPACES WITH EXPOSED CEILINGS. PRIOR TO INSTALL, COORDINATE EXACT LOCATION OF NETWORK ACTIVATIONS WITH OWNER'S TECHNOLOGY CONTRACTOR (FOR ACCESS POINTS, SECURITY CAMERAS, AV EQUIPMENT, ETC.). TERMINATE CABLING IN SURFACE MOUNT BOX WITH MODULAR CONNECTOR INSIDE JUNCITON BOX, PROVIDE BLANK FACEPLATE FOR UNUSED LOCATIONS. TYPICAL FOR ALL.
P15	MOTORIZED ROLLER SHADES IN THIS SPACE TO BE CONTROLLED BY AV SYSTEM. REFER TO AV DRAWINGS FOR MORE INFORMATION.
P17	HEAT TRACING FOR PLUMBING PIPING PER 22 05 33. LENGTHS FROM PLUMBING PLANS. FIELD VERIFY EXACT LENGTHS REQUIRED. HEAT TRACING SHALL COMPLY WITH NEC ARTICLE 426.
P18	ALL ACCESS CONTROL CONDUITS TO NEAREST CABLE TRAY. TERMINATE CABLING IN JUNTION BOX RECESSED ABOVE DOOR IN MASONRY WALL, OR JUNCTION BOX SURFACE MOUNTED TO STRUCTURE WHERE CEILINGS ARE LESS THAN 20 FEET. TYPICAL FOR ALL ACCESS CONTROL DOORS SHOWN WITH DATA DROPS.
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR. TYPICAL FOR ALL.

NEW 5TH - 6TH GRADE FACILITY
HUDSONVILLE PUBLIC SCHOOLS
HUDSONVILLE, MICHIGAN

ISSUANCES	
10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
02.18.2021	BULLETIN 002
04.16.2021	BULLETIN 006
05.26.2021	BULLETIN 008
09.28.2021	BULLETIN 018



KEYPLAN

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'B' FIRST FLOOR POWER & COMMUNICATIONS PLAN

E2.1B

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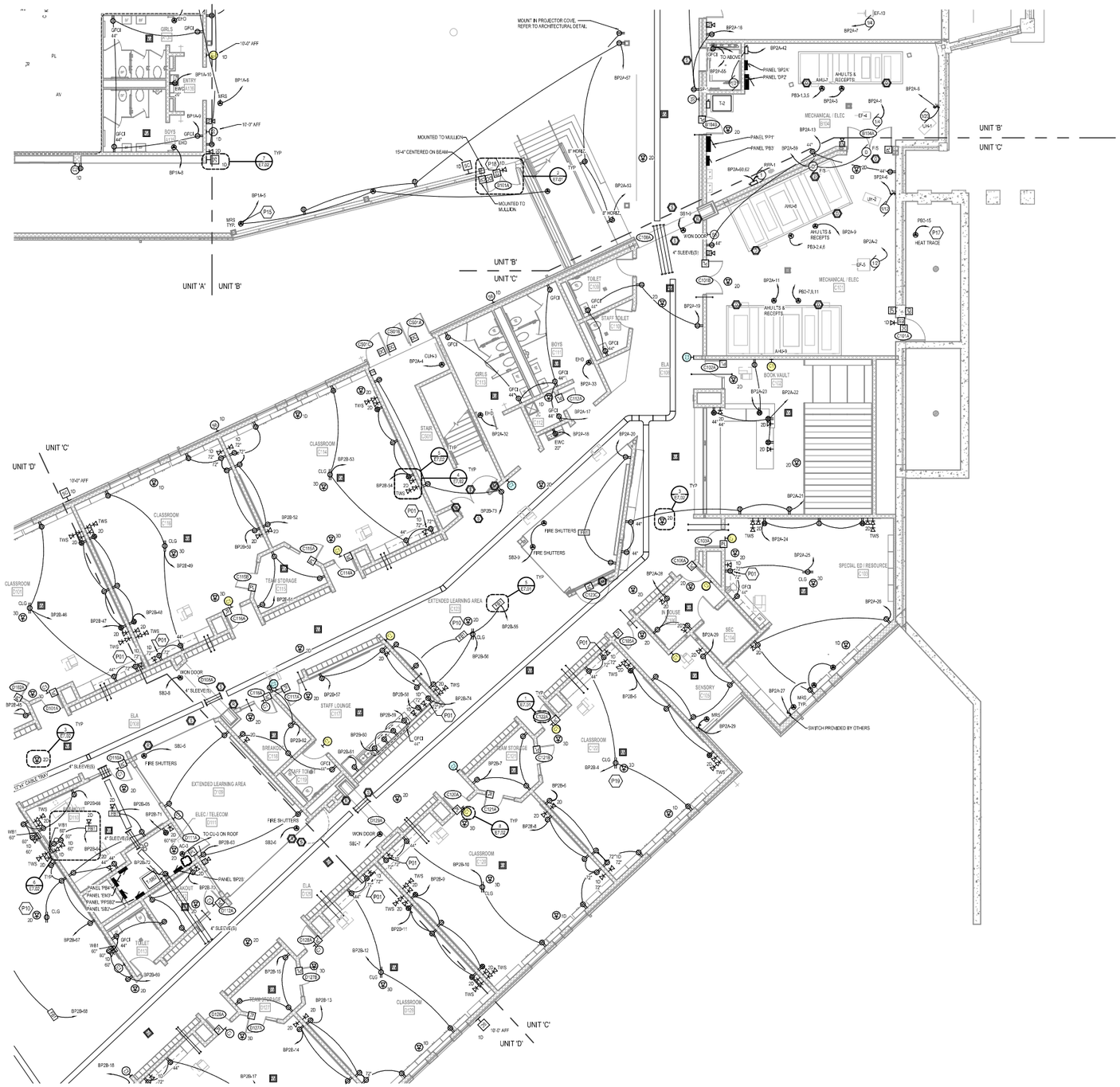

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
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5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH ON BUILDING INTERIOR IN ACCESSIBLE LOCATION FOR EACH (MAU, 1- 12 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.S
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

ELECTRICAL KEYNOTES

P01	DEVICES INSTALLED IN BACK OF CASEWORK FOR AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
P10	ALL LOW VOLTAGE CABLING TO BE IN CONDUIT IN SPACES WITH EXPOSED CEILINGS. PRIOR TO INSTALL, COORDINATE EXACT LOCATION OF NETWORK ACTIVATIONS WITH OWNER'S TECHNOLOGY CONTRACTOR (FOR ACCESS POINTS, SECURITY CAMERAS, AV EQUIPMENT, ETC.). TERMINATE CABLING IN SURFACE MOUNT BOX WITH MODULAR CONNECTOR INSIDE JUNCITON BOX. PROVIDE BLANK FACEPLATE FOR UNUSED LOCATIONS. TYPICAL FOR ALL.
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P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR, TYPICAL FOR ALL.

UNIT 'C' FIRST FLOOR POWER & COMMUNICATIONS PLAN
1/8" = 1'-0"

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NEW 5TH - 6TH GRADE FACILITY
HUDSONVILLE PUBLIC SCHOOLS
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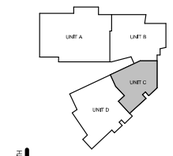
ISSUANCES	
10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
02.18.2021	BULLETIN 002
04.16.2021	BULLETIN 006
05.26.2021	BULLETIN 008
09.28.2021	BULLETIN 018
10.26.2021	BULLETIN 019

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'C' FIRST FLOOR POWER & COMMUNICATIONS PLAN

E2.1C



KEYPLAN

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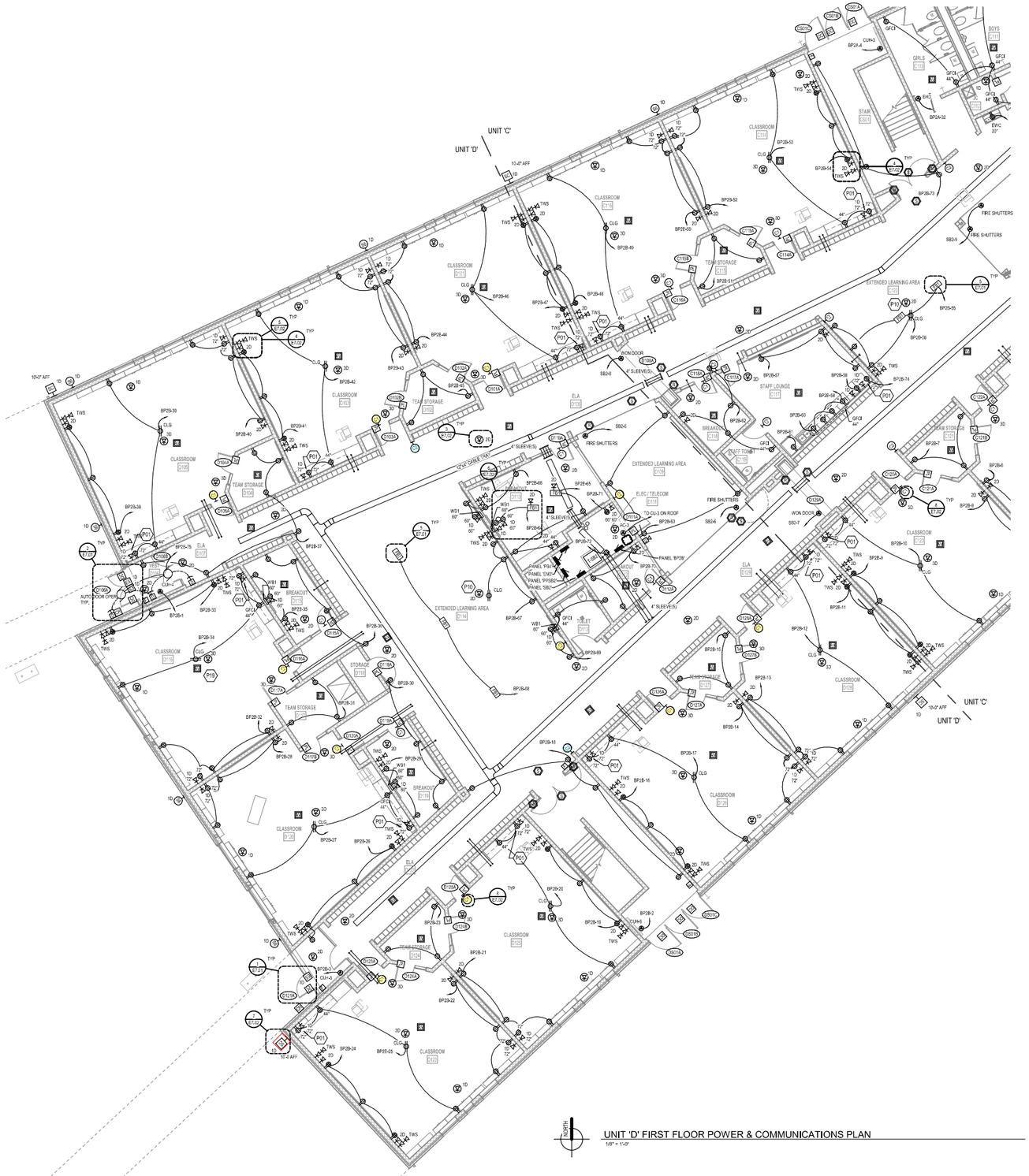

UNIT 'D' FIRST FLOOR POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
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6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

⬡	ELECTRICAL KEYNOTES
P01	DEVICES INSTALLED IN BACK OF CASEWORK FOR AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
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NEW 5TH - 6TH GRADE FACILITY
HUDSONVILLE PUBLIC SCHOOLS
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ISSUANCES

10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
04.16.2021	BULLETIN 006
05.11.2021	BULLETIN 007
10.26.2021	BULLETIN 019

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

KEYPLAN

UNIT 'D' FIRST FLOOR POWER & COMMUNICATIONS PLAN

E2.1D

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
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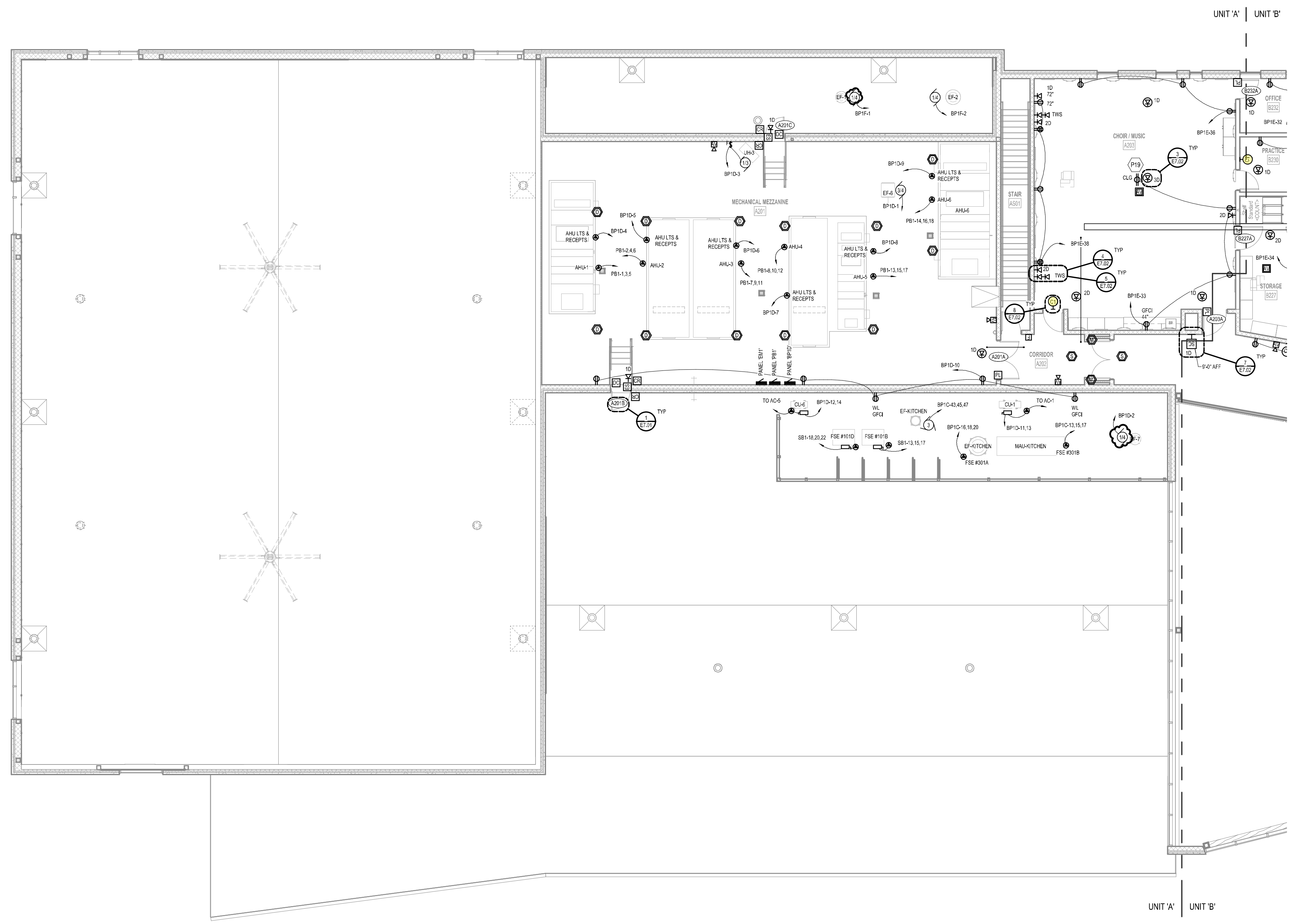
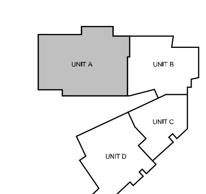
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

	ELECTRICAL KEYNOTES
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR. TYPICAL FOR ALL.



UNIT 'A' SECOND FLOOR POWER & COMMUNICATIONS PLAN
1/8" = 1'-0"



KEYPLAN

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NEW 5TH - 6TH GRADE FACILITY
HUDSONVILLE PUBLIC SCHOOLS
HUDSONVILLE, MICHIGAN

ISSUANCES	
10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
04.16.2021	BULLETIN 006

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'A' SECOND FLOOR POWER & COMMUNICATIONS PLAN

E2.2A

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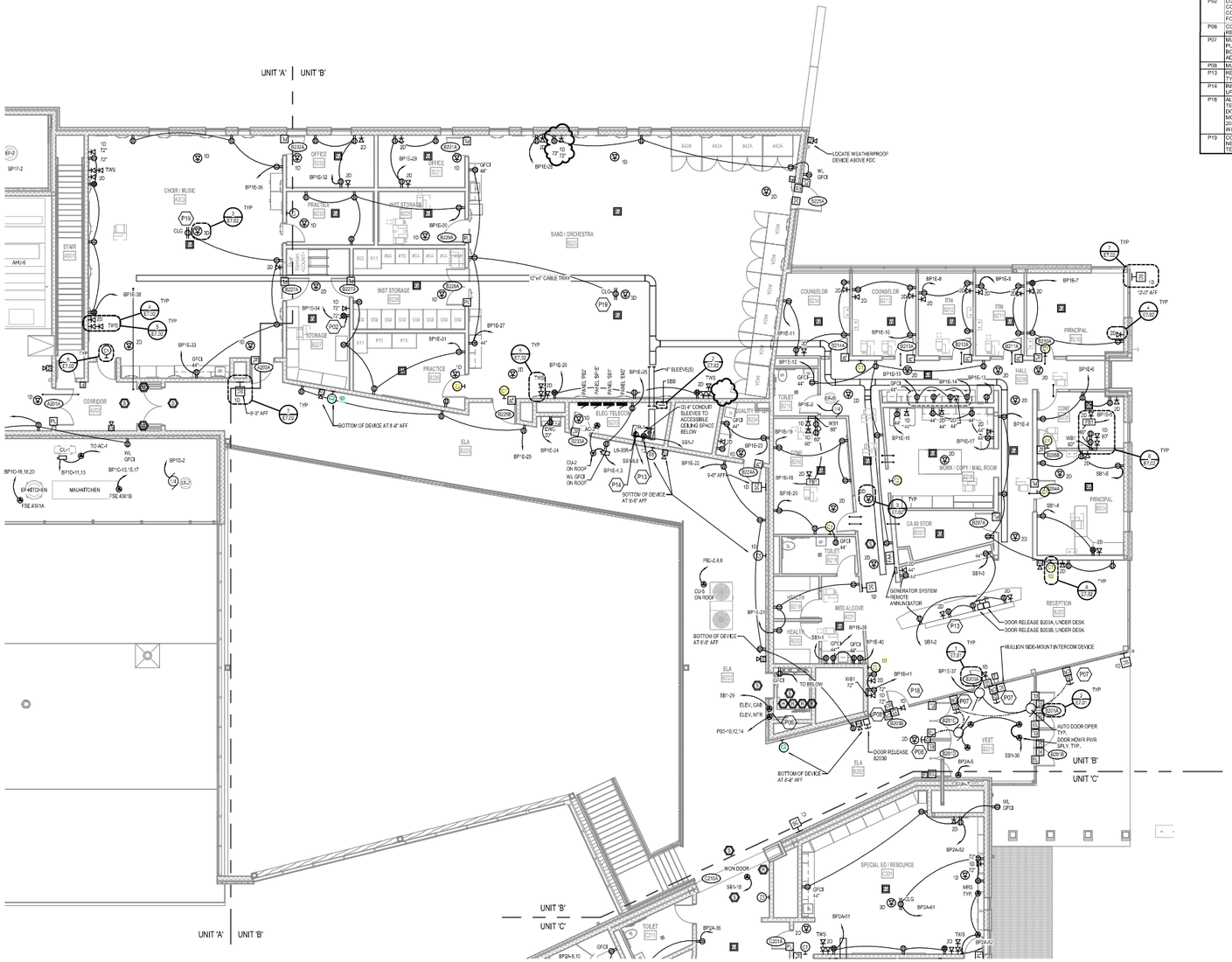

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20A/1P BRANCH CIRCUIT (WITH BREAKER LOCKING MECHANISM) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT), TERMINATED W/ BOX-COVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES, AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE. INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT. REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.6
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

⬡	ELECTRICAL KEYNOTES
P02	LOCATION OF AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
P06	COORDINATE WITH ELEVATOR MANUFACTURER'S REQUIREMENTS FOR DISCONNECTS.
P07	MULLION MOUNT CARD READER AND ADA PUSHBUTTON. ADA PUSH BUTTON SHALL BE MOUNTED AT 40" AFF TO BOTTOM OF BOX. CARD READER SHALL BE MOUNTED DIRECTLY ABOVE ADA PUSHBUTTON.
P08	MULLION MOUNT CARD READER OR ADA PUSHBUTTON.
P13	RECEPTACLES ON STANDBY POWER SHALL BE YELLOW. TYPICAL FOR ALL.
P14	INSTALL L6-30R RECEPTACLE INSIDE 4-POST RACK FOR UPS. UPS PROVIDED BY OWNER.
P18	ALL ACCESS CONTROL CONDUITS TO NEAREST CABLE TRAY. TERMINATE CABLING IN JUNTION BOX RECESSED ABOVE DOOR IN MASONRY WALL, OR JUNCTION BOX SURFACE MOUNTED TO STRUCTURE WHERE CEILINGS ARE LESS THAN 20 FEET. TYPICAL FOR ALL ACCESS CONTROL DOORS SHOWN WITH DATA DROPS.
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR. TYPICAL FOR ALL.

UNIT 'B' SECOND FLOOR POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"

KEYPLAN

GMB

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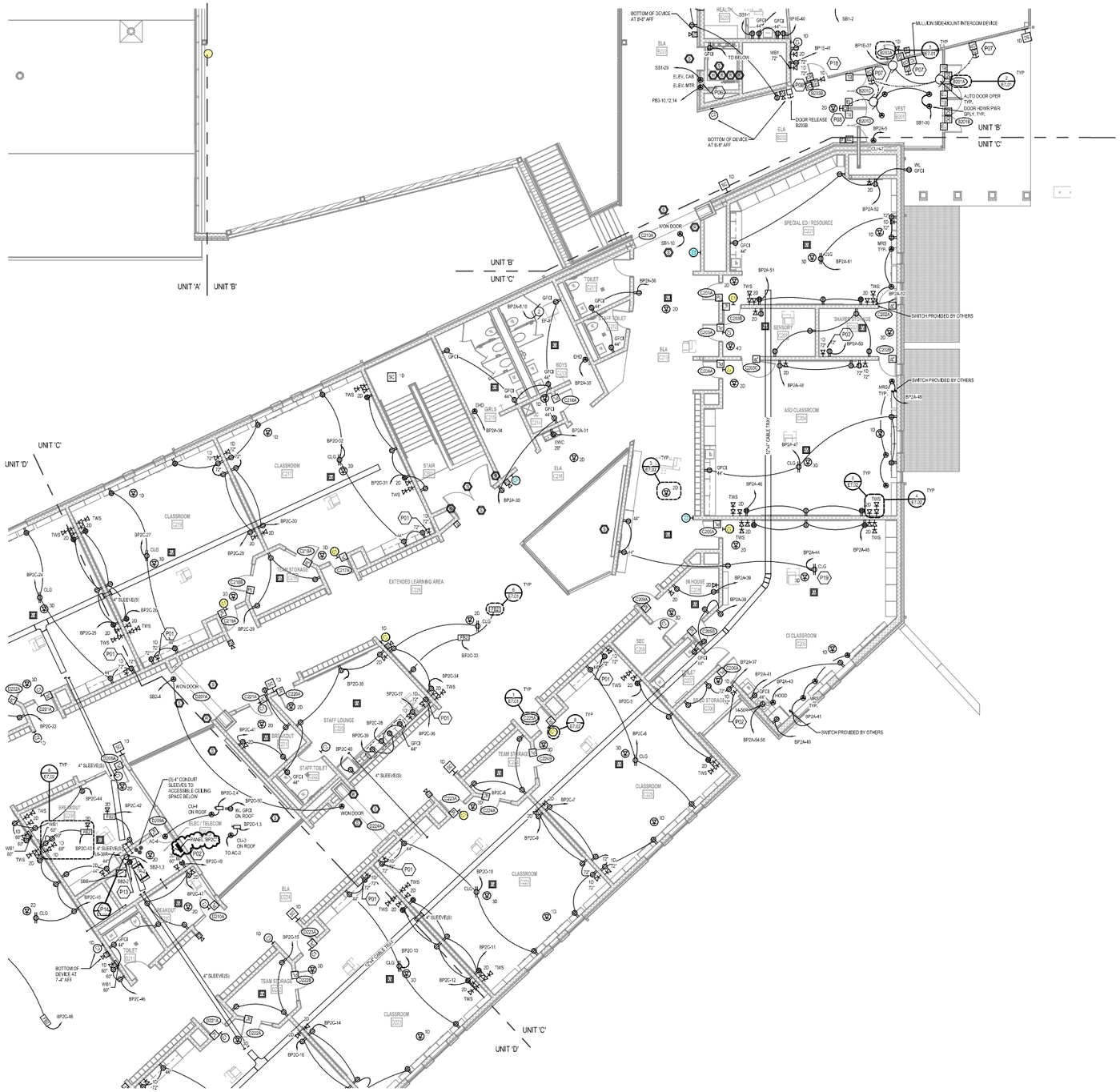
NEW 5TH - 6TH GRADE FACILITY
HUDSONVILLE PUBLIC SCHOOLS
HUDSONVILLE, MICHIGAN

ISSUANCES	
10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
04.16.2021	BULLETIN 006
05.11.2021	BULLETIN 007
05.26.2021	BULLETIN 008
09.28.2021	BULLETIN 018

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'B' SECOND FLOOR
POWER & COMMUNICATIONS
PLAN

E2.2B



POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20A/1P BRANCH CIRCUIT (WITH BREAKER LOCKING MECHANISM) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT), TERMINATED W/ BOX-COVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
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5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.6
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

⬡	ELECTRICAL KEYNOTES
P01	DEVICES INSTALLED IN BACK OF CASEWORK FOR AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
P02	LOCATION OF AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
P06	COORDINATE WITH ELEVATOR MANUFACTURER'S REQUIREMENTS FOR DISCONNECTS.
P07	MULLION MOUNT CARD READER AND ADA PUSHBUTTON. ADA PUSH BUTTON SHALL BE MOUNTED AT 40" AFF TO BOTTOM OF BOX. CARD READER SHALL BE MOUNTED DIRECTLY ABOVE ADA PUSHBUTTON.
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P13	RECEPTACLES ON STANDBY POWER SHALL BE YELLOW. TYPICAL FOR ALL.
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P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR. TYPICAL FOR ALL.

UNIT 'C' SECOND FLOOR POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"

BIM 360://5-5065 Hudsonville Public Schools 5-6/5-5065E 2019.rvt
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NEW 5TH - 6TH GRADE FACILITY
HUDSONVILLE PUBLIC SCHOOLS
HUDSONVILLE, MICHIGAN

ISSUANCES

10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
04.16.2021	BULLETIN 006
05.26.2021	BULLETIN 008
10.26.2021	BULLETIN 019

KEYPLAN

DRAWN	JFB
REVIEWED	AAB

PROJECT NO. 5-5065

UNIT 'C' SECOND FLOOR
POWER & COMMUNICATIONS
PLAN

E2.2C

NORTH

EQUIPMENT PLATFORM POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"

NORTH

UNIT 'D' SECOND FLOOR POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.2'.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
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4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES. AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE. INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT. REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH ON BUILDING INTERIOR IN ACCESSIBLE LOCATION FOR EACH SMALL (< 10 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.s
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

ELECTRICAL KEYNOTES

P01	DEVICES INSTALLED IN BACK OF CASEWORK FOR AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
P02	LOCATION OF AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT; COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
P13	RECEPTACLES ON STANDBY POWER SHALL BE YELLOW; TYPICAL FOR ALL.
P14	INSTALL L6-30R RECEPTACLE INSIDE 4-POST RACK FOR UPS, UPS PROVIDED BY OWNER.
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR; TYPICAL FOR ALL.

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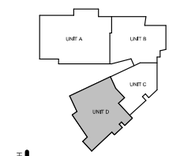
NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES

10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
05.11.2021	BULLETIN 007
10.26.2021	BULLETIN 010



North

KEYPLAN

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'D' SECOND FLOOR POWER & COMMUNICATIONS PLAN

E2.2D

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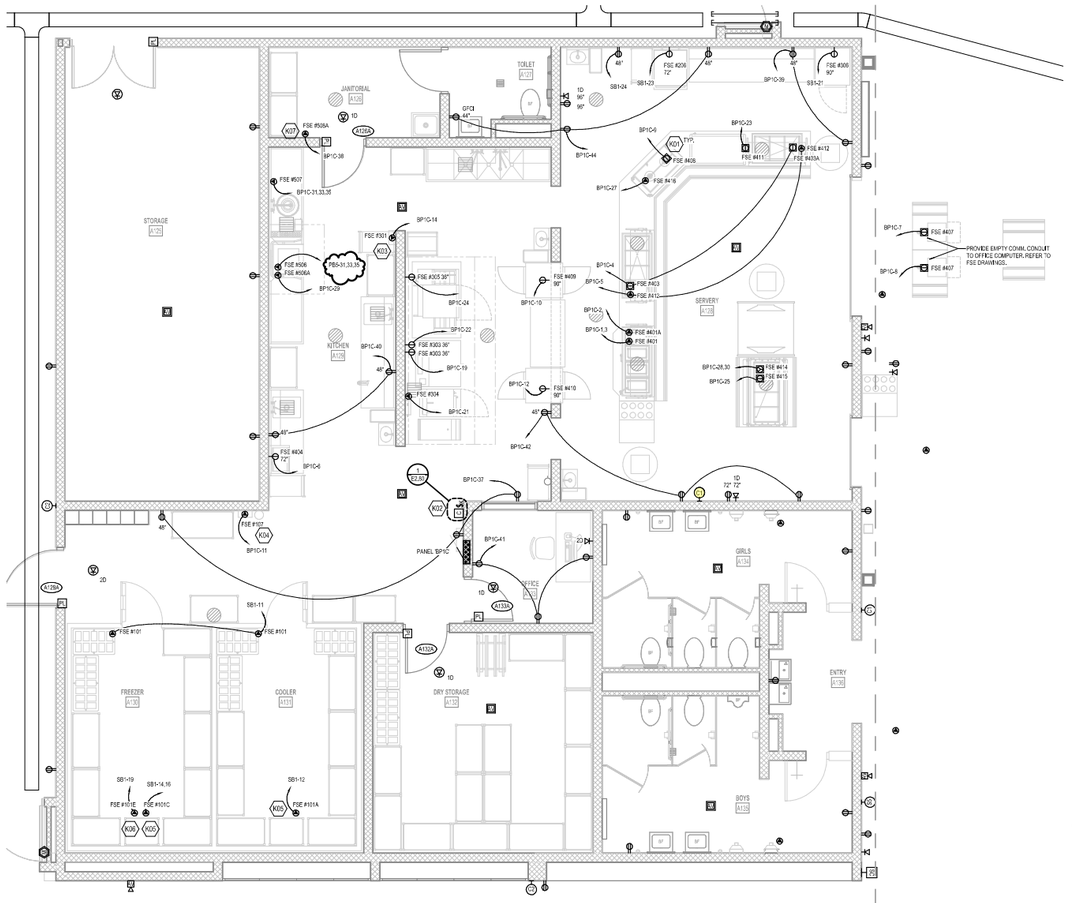

NORTH

ENLARGED KITCHEN POWER & COMMUNICATIONS PLAN

1/4" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
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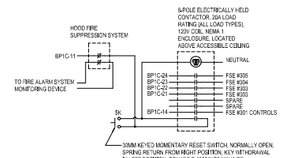
4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES. AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE, INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING "TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT". REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH ON IN BUILDING INTERIOR IN ACCESSIBLE LOCATION FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

FOODSERVICE ELECTRICAL GENERAL NOTES

1. ELEC. CONTRACTOR SHALL REVIEW FOODSERVICE EQUIPMENT DRAWINGS ("FSE"-SERIES) AND FOOD SERVICE SPECIFICATIONS (SECTION 11 40 00) FOR ADDITIONAL SCOPE OF WORK AND REQUIREMENTS. INCLUDE ALL WORK AND MATERIALS AS ASSIGNED TO THE ELEC. CONTRACTOR BY DRAWINGS, SPECIFICATIONS, CONSTRUCTION MANAGER'S WORK CATEGORY DESCRIPTIONS, ETC.
2. IF THERE IS A CONFLICT BETWEEN THE FOODSERVICE DRAWINGS/SPECIFICATION AND THIS DRAWING OR DIVISION 26 SPECIFICATIONS, THE ELEC. CONTRACTOR SHALL BID USING THE MORE STRINGENT AND GREATER-COST REQUIREMENTS. CLARIFICATIONS MAY BE REQUESTED IN WRITING PRIOR TO BID; COORDINATE WITH CONSTRUCTION MANAGER'S PROCEDURES.
3. "THE WORK SHOWN ON THIS DRAWING AND THE DIVISION 26 SPECIFICATIONS SHALL SUPERCEDE THE FOOD SERVICE EQUIPMENT DRAWINGS/SPECIFICATION.
4. LABEL ALL RECEPTACLES IN KITCHEN AND SERVING AREAS WITH CORRESPONDING PANELBOARD, CIRCUIT NUMBER, AND FOODSERVICE EQUIPMENT ITEM NUMBER AS REFERENCED ON THE FOODSERVICE EQUIPMENT DRAWINGS.
5. ELEC. CONTRACTOR SHALL VERIFY AND COORDINATE WITH THE FOODSERVICE EQUIPMENT VENDOR THAT ALL SINGLE-PHASE RECEPTACLES (120V - J-O OR LESS, 50A OR LESS) AND THREE-PHASE RECEPTACLES (120V-L-O OR LESS, 100A OR LESS) IN KITCHEN AND SERVING AREAS HAVE GFCI PROTECTION FOR PERSONNEL AS REQUIRED BY NEC 210.8(B)(2), EITHER AT THE DEVICE (GFCI RECEPTACLE) OR AT THE RESPECTIVE PANELBOARD (GFCI BREAKER FOR THE BRANCH CIRCUIT). FOR ANY SUCH RECEPTACLE LOCATIONS THAT ARE NOT READILY ACCESSIBLE (NEC DEFINITION), GFCI PROTECTION SHALL BE PROVIDED FOR THE BRANCH CIRCUIT AT THE PANELBOARD USING A GFCI BRANCH CIRCUIT BREAKER.
6. PROVIDE CONCEALED ROUGH-IN FOR REMOTE MANUAL PULL STATIONS CONNECTED TO VENTILATION HOOD FIRE PROTECTION SYSTEMS. SURFACE-MOUNTED CONDUIT, PIPE, AND PULL STATIONS ARE NOT ACCEPTABLE. COORDINATE LOCATIONS WITH ENGINEERED SHOP DRAWINGS FOR SYSTEM.

ELECTRICAL KEYNOTES

K01	FLOOR-MOUNTED PEDESTAL WITH RECEPTACLE AS REQUIRED. BOX SHALL BE "FD"-TYPE CAST ALUMINUM OR STAINLESS STEEL MOUNTED HORIZONTALLY WITH (2) HUBS ON BOTTOM (LONG) SIDE TO ACCEPT THREADED RIGID METALLIC CONDUIT. PROVIDE WITH CAST METAL, WEATHERPROOF HINGED COVER OVER WIRING DEVICE. TOP OF RECEPTACLE BOX SHALL NOT EXCEED 9" AFF.
K02	RESET STATION FOR EQUIP. SHUTDOWN CONTROLS (REFER TO DETAIL).
K03	E.C. SHALL INTERWIRE ALL COMPONENTS OF MAKE-UP AIR UNIT, EXHAUST FAN, HOOD LIGHTS, AND HOOD CONTROLS AS SHOWN ON FOODSERVICE EQUIP. DRAWINGS AND AS REQUIRED BY EQUIPMENT MANUFACTURER. VERIFY WITH EQUIPMENT SHOP DRAWINGS.
K04	EXHAUST HOOD FIRE SUPPRESSION SYSTEM, INTERCONNECT WITH FIRE ALARM INITIATION CIRCUIT FOR SUPERVISORY MONITORING PER LOCAL CODES AND CONTROL CONTACTOR FOR SHUTDOWN OF EQUIPMENT ELEC. SUPPLY UNDER HOOD UPON RELEASE OF EXTINGUISHING AGENT. REFER TO DETAIL ON FSE DRAWINGS AND CONTROL DETAIL.
K05	E.C. SHALL INTERWIRE ALL COMPONENTS OF WALK-IN COOLER OR FREEZER AS SHOWN ON DRAWINGS AND REQUIRED BY EQUIPMENT MANUFACTURER. COORDINATE WITH SHOP DRAWINGS.
K06	COORDINATE WITH PLUMBING CONTRACTOR FOR LOCATION OF HEAT TRACE POWER SUPPLY.
K07	CONNECT DISHWASHER EXHAUST FAN TO DISHWASHER CONTROL PANEL. REFER TO FSE DRAWINGS.



1 / E2.80 FOODSERVICE EQUIP. ELEC SHUTDOWN DETAIL

NOT TO SCALE

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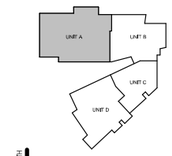
NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES

10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
10.26.2021	BULLETIN 019



NORTH

KEYPLAN

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5085

KITCHEN & SERVING AREA POWER & COMMUNICATIONS ENLARGED PLAN

E2.80

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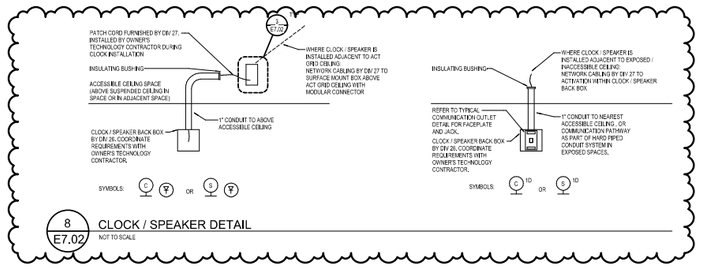
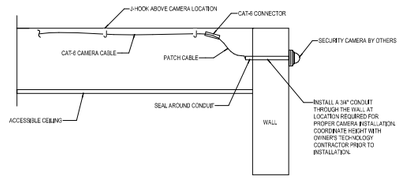
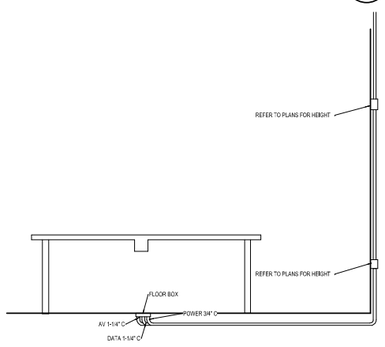


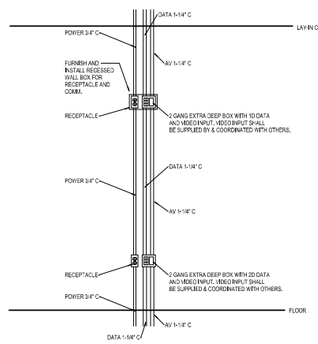
8 E7.02 CLOCK / SPEAKER DETAIL
NOT TO SCALE

NOTES:
1. ROUGH-IN FOR CAMERAS ONLY. CAMERAS PROVIDED BY OWNER'S TECHNOLOGY CONTRACTOR. REFER TO DRAWINGS FOR ROUGH-IN HEIGHT.
2. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR MOUNTING HEIGHTS OF ROUGH-INS.

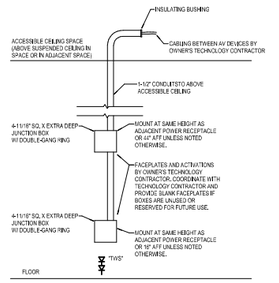


7 E7.02 TYPICAL WALL MOUNT SURVEILLANCE CAMERA INSTALLATION
NOT TO SCALE

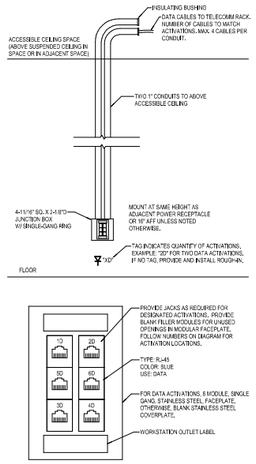




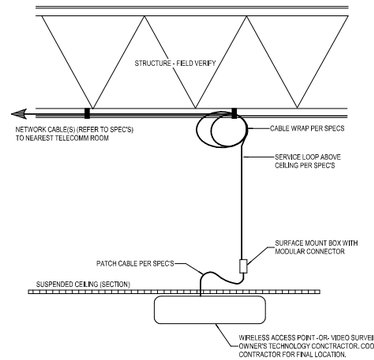
6 E7.02 VIDEO CONFERENCE SECTION
NOT TO SCALE



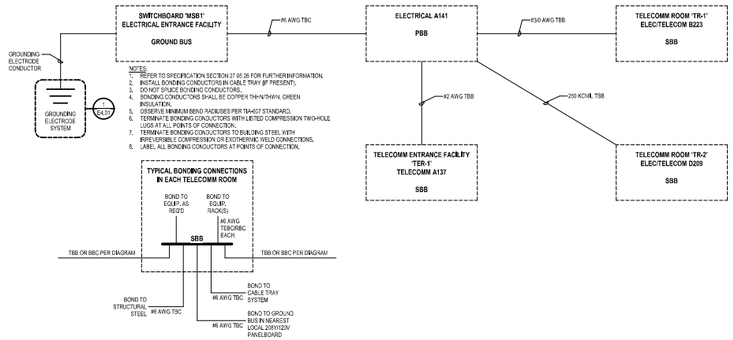
5 E7.02 TEACHER WORKSTATION DETAIL
NOT TO SCALE



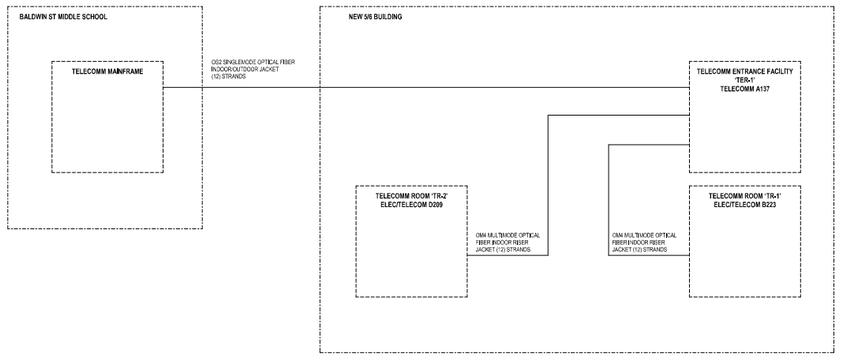
4 E7.02 TYPICAL COMMUNICATION OUTLET
NOT TO SCALE



3 E7.02 CEILING MOUNTED COMMUNICATION DEVICE
NOT TO SCALE



2 E7.02 COMMUNICATIONS GROUNDING/BONDING SYSTEM RISER DIAGRAM
NOT TO SCALE



1 E7.02 COMMUNICATIONS CABLING BACKBONE RISER DIAGRAM
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HUDSONVILLE, MICHIGAN

ISSUANCES

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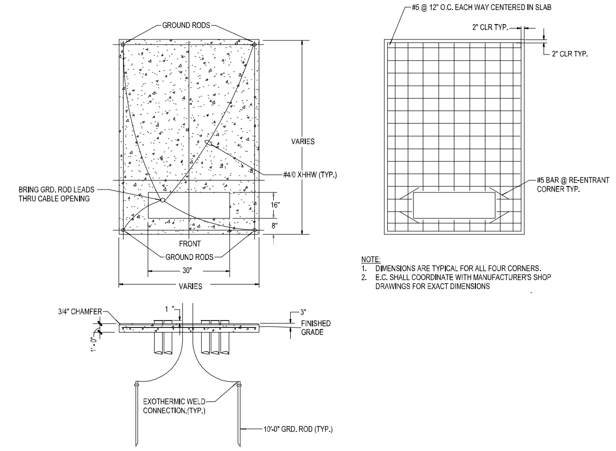
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004

DRAWN JFB
REVIEWED AAB
PROJECT NO. 5-5065

ELECTRICAL DETAILS

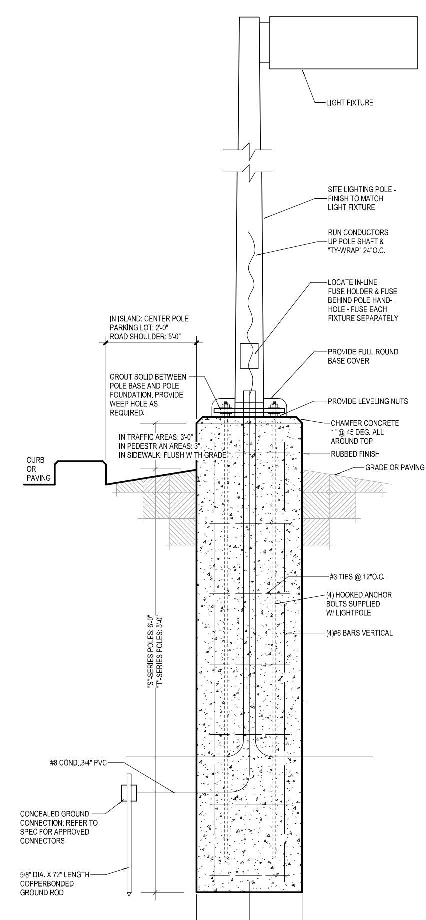
E7.02

BIM 360://5-5065 Hudsonville Public Schools_5-65-5065E 2019.rvt
11/24/2020 2:20:27 PM

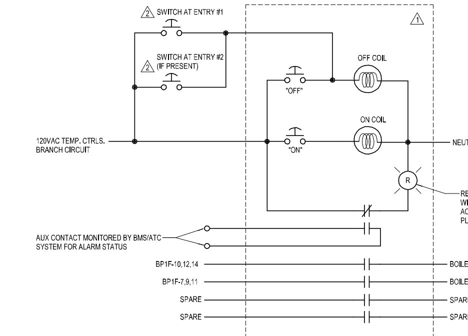


NOTES:
1. CONCRETE TO BE PLACED ON ONE FOOT OF PACKED WASHED GRAVEL OR PEA STONE.
2. CONCRETE = 4,000 PSI COMPRESSIVE STRENGTH AT 28 DAYS WITH AIR ENTRAINMENT.
3. GRADE OF REINFORCING RODS = ASTM A615: GRADE 60 O R 75.
4. TOLERANCES OVERALL DIMENSIONS AND PAD OPENING DIMENSIONS = 1/2".

10 E7.01 TRANSFORMER/GENERATOR GROUNDING DETAIL
NOT TO SCALE



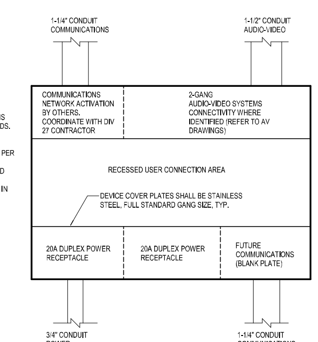
9 E7.01 SITE LIGHTING POLE FOUNDATION
NOT TO SCALE



1. 30A, 4-POLE, MECHANICALLY-HELD CONTACTOR WITH 120VAC CONTROL COILS, MOMENTARY ON/OFF PUSH BUTTONS, ONE N.C. AND ONE N.O. AUX CONTACTS, RED LED PILOT LIGHT WIRED TO N.C. AUX CONTACT FOR "OFF" INDICATION. CUSTOM ENGRAVED DEVICE LABELS, NEMA 1 ENCLOSURE. PROVIDE ENGRAVED NAMEPLATE INDICATING "EMERGENCY BOILER SHUTDOWN".
2. RED MOMENTARY PUSHBUTTON SWITCH MOUNTED ON YELLOW POLYCARBONATE BODY, CLEAR POLYCARBONATE HINGED COVER, CUSTOM LABEL "BOILER SHUTDOWN". PROVIDE "STOPPER STATION" SERIES AS MFR'D BY SAFETY TECHNOLOGY INTL. INC., MODEL NO. SS2224ZA-EN OR APPROVED EQUIV. PROVIDE W/ MATCHING BACKBOX (MODEL NO. KIT-71101A-Y) FOR APPLICATIONS WITHOUT A RECESSED SWITCH BOX FOR MOUNTING

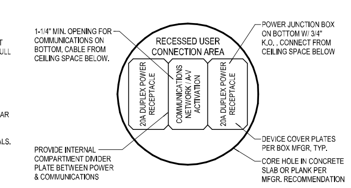
8 E7.01 BOILER EMERGENCY SHUTDOWN CONTROL DETAIL
NOT TO SCALE

FLOOR BOX NOTES:
1. REFER TO SECTION 270528 "PATHWAYS FOR COMMUNICATIONS SYSTEMS" FOR ACCEPTABLE CONDUIT INSTALLATION METHODS. OBSERVE BEND RADIUS AND PULL BOX REQUIREMENTS PER CURRENT BICSI AND EIA/TIA STANDARDS.
2. PROVIDE TWO 20A GENERAL PURPOSE DUPLEX RECEPTACLE PER FLOOR BOX. REFER TO PLAN FOR CIRCUIT.
3. SIDE KNOCKOUTS SHOWN IN USE FOR REPRESENTATION. END AND BOTTOM KNOCKOUTS MAY BE USED AS NECESSARY.
4. ELECTRICAL CONTRACTOR SHALL PROVIDE NYLON PULL LINE IN ALL COMMUNICATIONS CONDUITS.
5. COORDINATE INSTALLATION WITH OTHER TRADES.
6. COMMUNICATIONS CONTRACTOR SHALL PROVIDE MODULAR FACEPLATES/FRAMES, JACKS, AND MODULE BLANKS FOR ALL UNUSED OPENINGS.
7. REFER TO SPEC'S FOR MANUFACTURER/MODEL APPROVALS. LAYOUT MAY VARY SLIGHTLY DEPENDING ON SELECTED PRODUCT; COORDINATE EXACT LAYOUT WITH ENGINEER.



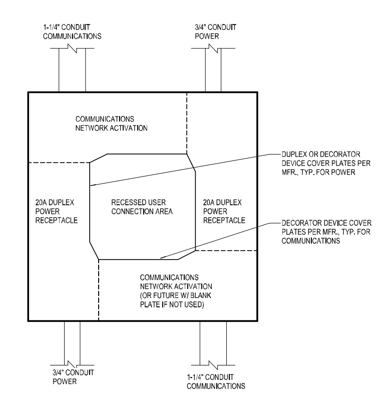
7 E7.01 TYPE "FB3" FLOOR BOX CONFIGURATION
NOT TO SCALE

FLOOR BOX NOTES:
1. REFER TO SECTION 270528 "PATHWAYS FOR COMMUNICATIONS SYSTEMS" FOR ACCEPTABLE CONDUIT INSTALLATION METHODS. OBSERVE BEND RADIUS AND PULL BOX REQUIREMENTS PER CURRENT BICSI AND EIA/TIA STANDARDS.
2. PROVIDE TWO 20A GENERAL PURPOSE DUPLEX RECEPTACLE PER FLOOR BOX. REFER TO PLAN FOR CIRCUIT.
3. COORDINATE INSTALLATION WITH OTHER TRADES.
4. COMMUNICATIONS CONTRACTOR SHALL PROVIDE MODULAR FACEPLATES/FRAMES, JACKS, AND MODULE BLANKS FOR ALL UNUSED OPENINGS.
5. REFER TO SPEC'S FOR MANUFACTURER/MODEL APPROVALS. LAYOUT MAY VARY SLIGHTLY DEPENDING ON SELECTED PRODUCT; COORDINATE EXACT LAYOUT WITH ENGINEER.

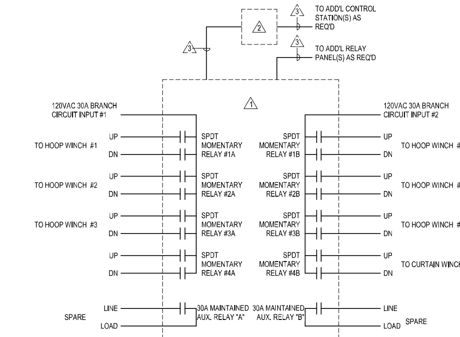


6 E7.01 TYPE "FB2" FLOOR BOX CONFIGURATION
NOT TO SCALE

FLOOR BOX NOTES:
1. REFER TO SECTION 27 05 28 "PATHWAYS FOR COMMUNICATIONS SYSTEMS" FOR ACCEPTABLE CONDUIT INSTALLATION METHODS. OBSERVE BEND RADIUS AND PULL BOX REQUIREMENTS PER CURRENT BICSI AND EIA/TIA STANDARDS.
2. PROVIDE TWO 20A GENERAL PURPOSE DUPLEX RECEPTACLE PER FLOOR BOX. REFER TO PLAN FOR CIRCUIT.
3. SIDE KNOCKOUTS SHOWN IN USE FOR REPRESENTATION. END AND BOTTOM KNOCKOUTS MAY BE USED AS NECESSARY.
4. ELECTRICAL CONTRACTOR SHALL PROVIDE NYLON PULL LINE IN ALL COMMUNICATIONS CONDUITS.
5. COORDINATE INSTALLATION WITH OTHER TRADES.
6. COMMUNICATIONS CONTRACTOR SHALL PROVIDE MODULAR FACEPLATES/FRAMES, JACKS, AND MODULE BLANKS FOR ALL UNUSED OPENINGS.
7. REFER TO SPEC'S FOR MANUFACTURER/MODEL APPROVALS. LAYOUT MAY VARY SLIGHTLY DEPENDING ON SELECTED PRODUCT; COORDINATE EXACT LAYOUT WITH ENGINEER.

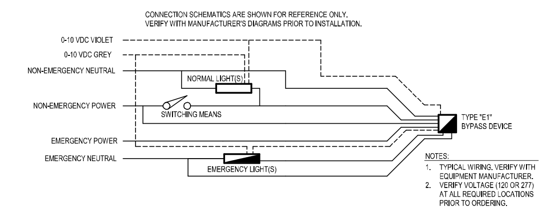


5 E7.01 TYPE "FB1" FLOOR BOX CONFIGURATION
NOT TO SCALE

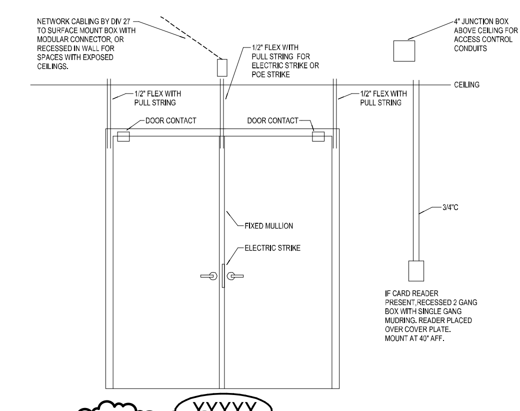


1. GYMNASIUM EQUIPMENT CONTROL SYSTEM RELAY PANEL, FURNISHED BY SECTION 11 66 23, INSTALLED AND WIRED BY ELEC. CONTRACTOR. WIRING CONNECTIONS ARE SHOWN FOR CONCEPT ONLY; REFER TO MANUFACTURER'S SHOP DRAWINGS FOR EXACT REQUIREMENTS AND WIRING ARRANGEMENTS.
2. GYMNASIUM EQUIPMENT CONTROL SYSTEM OPERATOR INTERFACE (KEYPAD OR TOUCHPANEL, AS SPEC'D), FURNISHED BY SECTION 11 66 23, INSTALLED AND WIRED BY ELEC. CONTRACTOR. MOUNT SEMI-FLUSH AT 44" AFF TO BOTTOM OF BOX WITHIN LINE OF SIGHT OF ALL EQUIPMENT TO BE CONTROLLED. REFER TO MANUFACTURER'S SHOP DRAWINGS FOR EXACT ROUGH-IN REQUIREMENTS.
3. CONTROL-VOLTAGE CABLE, FURNISHED AND WIRED BY ELEC. CONTRACTOR. REFER TO SECTION 26 05 23 FOR TYPICAL CABLE; REFER TO MANUFACTURER'S SHOP DRAWINGS TO CONFIRM EXACT CABLE TYPE REQ'D.

4 E7.01 GYMNASIUM EQUIPMENT CONTROL SYSTEM DETAIL
NOT TO SCALE

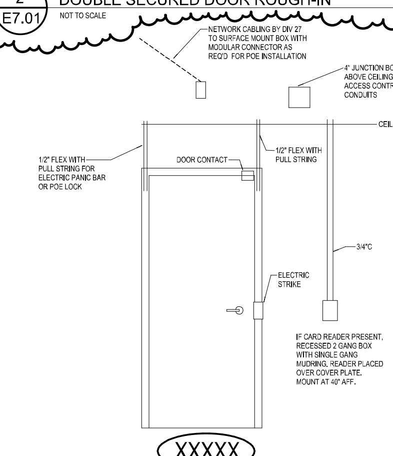


3 E7.01 EMERGENCY LIGHTING AUTOMATIC LOAD CONTROL RELAY
NOT TO SCALE



NOTES:
1. SEE SPECIFICATIONS FOR SPECIFIC DOOR CONTROL DEVICES PER SECURED DOOR.
2. COORDINATE WITH ACCESS CONTROL CONTRACTOR AND SHOP DRAWINGS FOR SPECIFIC REQUIREMENTS.
3. WHERE POE DEVICES ARE SPECIFIED IN THE DOOR HARDWARE SCHEDULE, COORDINATE LOCATION OF ACTIVATION AS TO PREVENT TAMPERING WITH NETWORK CONNECTION TO HARDWARE.
4. REFER TO DOOR HARDWARE SCHEDULE FOR MORE INFORMATION.

2 E7.01 DOUBLE SECURED DOOR ROUGH-IN
NOT TO SCALE



NOTES:
1. SEE SPECIFICATIONS FOR SPECIFIC DOOR CONTROL DEVICES PER SECURED DOOR.
2. COORDINATE WITH ACCESS CONTROL CONTRACTOR AND SHOP DRAWINGS FOR SPECIFIC REQUIREMENTS.
3. WHERE POE DEVICES ARE SPECIFIED IN THE DOOR HARDWARE SCHEDULE, COORDINATE LOCATION OF ACTIVATION AS TO PREVENT TAMPERING WITH NETWORK CONNECTION TO HARDWARE.
4. REFER TO DOOR HARDWARE SCHEDULE FOR MORE INFORMATION.

1 E7.01 SINGLE SECURED DOOR ROUGH-IN
NOT TO SCALE

GMB
616.796.0200
www.gmb.com

NEW 5TH - 6TH GRADE FACILITY
HUDSONVILLE PUBLIC SCHOOLS
HUDSONVILLE, MICHIGAN

ISSUANCES
10.30.2020 BIDS & CONSTRUCTION
11.18.2020 ADDENDUM 001

DRAWN JFB
REVIEWED AAB
PROJECT NO. 5-5065

ELECTRICAL DETAILS

E7.01

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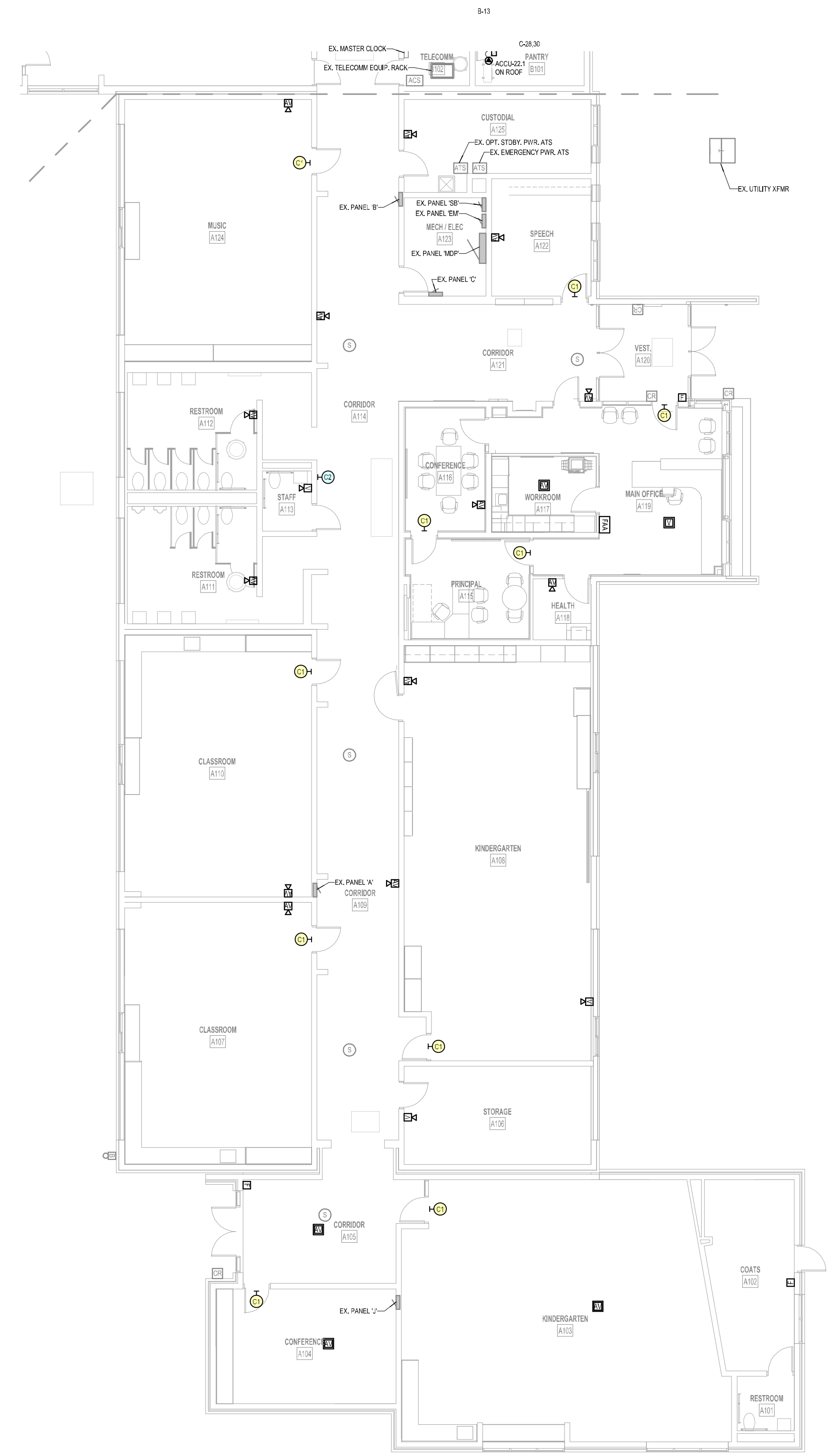
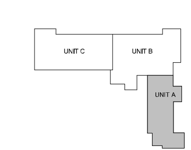
POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. PROVIDE 120VAC POWER FOR ALL SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS.
   A. REFER TO MECHANICAL/HVAC DRAWINGS FOR EXACT LOCATIONS OF DAMPERS.
   B. CONNECT TO DEDICATED 20A BRANCH CIRCUIT (WITH BREAKER LOCK-ON ACCESSORY) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT).
   C. TERMINATE W/ BOX-COVER FUSIBLE DISCONNECT SWITCH AT EACH DAMPER.
   D. PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET).
   E. PROVIDE FIRE ALARM ADDRESSABLE RELAY(S) FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT(S) PER CODE REQUIREMENTS.
4. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.
5. DESIGNATED CABLING PATHWAYS (CONDUITS, CABLE TRAYS, PENETRATION SLEEVES, ETC.) SHALL BE RESERVED FOR DIV. 27 COMMUNICATIONS CABLING AND DIV. 28 SAFETY/SECURITY CABLING ONLY. OTHER CABLING TYPES, SUCH AS DIV. 23 CONTROLS, DIV. 26 CONTROLS, AND ARCHITECTURAL EQUIPMENT CABLING SHALL BE SUPPORTED AND SLEEVED BY OTHER INDEPENDENT PATHWAYS, HANGERS, AND SUPPORTS.
6. CONSOLIDATE ALL POWER SUPPLIES REQUIRED FOR ELECTRONIC DOOR HARDWARE (REF. SECTION 08 71 00) TO CENTRAL LOCATION(S) ADJACENT TO DESIGNATED ACCESS CONTROL EQUIPMENT LOCATION(S). CONNECT ALL POWER SUPPLIES TO DEDICATED STANDBY POWER SYSTEM BRANCH CIRCUIT(S) AS DESIGNATED.
7. THE FOLLOWING DIV. 27 AND DIV. 28 SYSTEMS WILL BE DOCUMENTED AND BID SEPARATELY BY CONSULTANT IN ASSOCIATION WITH HUDSONVILLE P.S. TECHNOLOGY DEPT.:
   A. NETWORK ELECTRONICS (SWITCHES, ACCESS POINTS, ETC.)
   B. VOIP TELEPHONE SYSTEMS
   C. CLASSROOM AUDIO-VIDEO EQUIPMENT AND INSTRUCTIONAL TECHNOLOGY
   D. AUDIO-VIDEO SYSTEM FOR GYMNASIUM
   E. ACCESS CONTROL SYSTEM
   F. VIDEO SURVEILLANCE SYSTEM



UNIT 'A' POWER PLAN
1/8" = 1'-0"



KEYPLAN

FOREST GROVE ELEMENTARY GYM ADDITION
HUDSONVILLE PUBLIC SCHOOLS
HUDSONVILLE, MICHIGAN

ISSUANCES	
09.22.2021	BIDS & CONSTRUCTION

DRAWN	MCK
REVIEWED	JFB
PROJECT NO.	5-5362

UNIT 'A' POWER PLAN

E2.1A

BIM 360://5-5362 Hudsonville Forest Grove Elem Gym Addition/5-5362E 2019.rvt
9/17/2021 8:21:13 AM

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. PROVIDE 120VAC POWER FOR ALL SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS.
   A. REFER TO MECHANICAL/HVAC DRAWINGS FOR EXACT LOCATIONS OF DAMPERS.
   B. CONNECT TO DEDICATED 20A BRANCH CIRCUIT (WITH BREAKER LOCK-ON ACCESSORY) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT).
   C. TERMINATE W/ BOX-COVER FUSIBLE DISCONNECT SWITCH AT EACH DAMPER.
   D. PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET).
   E. PROVIDE FIRE ALARM ADDRESSABLE RELAY(S) FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT(S) PER CODE REQUIREMENTS.
4. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.
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6. CONSOLIDATE ALL POWER SUPPLIES REQUIRED FOR ELECTRONIC DOOR HARDWARE (REF. SECTION 08 71 00) TO CENTRAL LOCATION(S) ADJACENT TO DESIGNATED ACCESS CONTROL EQUIPMENT LOCATION(S). CONNECT ALL POWER SUPPLIES TO DEDICATED STANDBY POWER SYSTEM BRANCH CIRCUIT(S) AS DESIGNATED.
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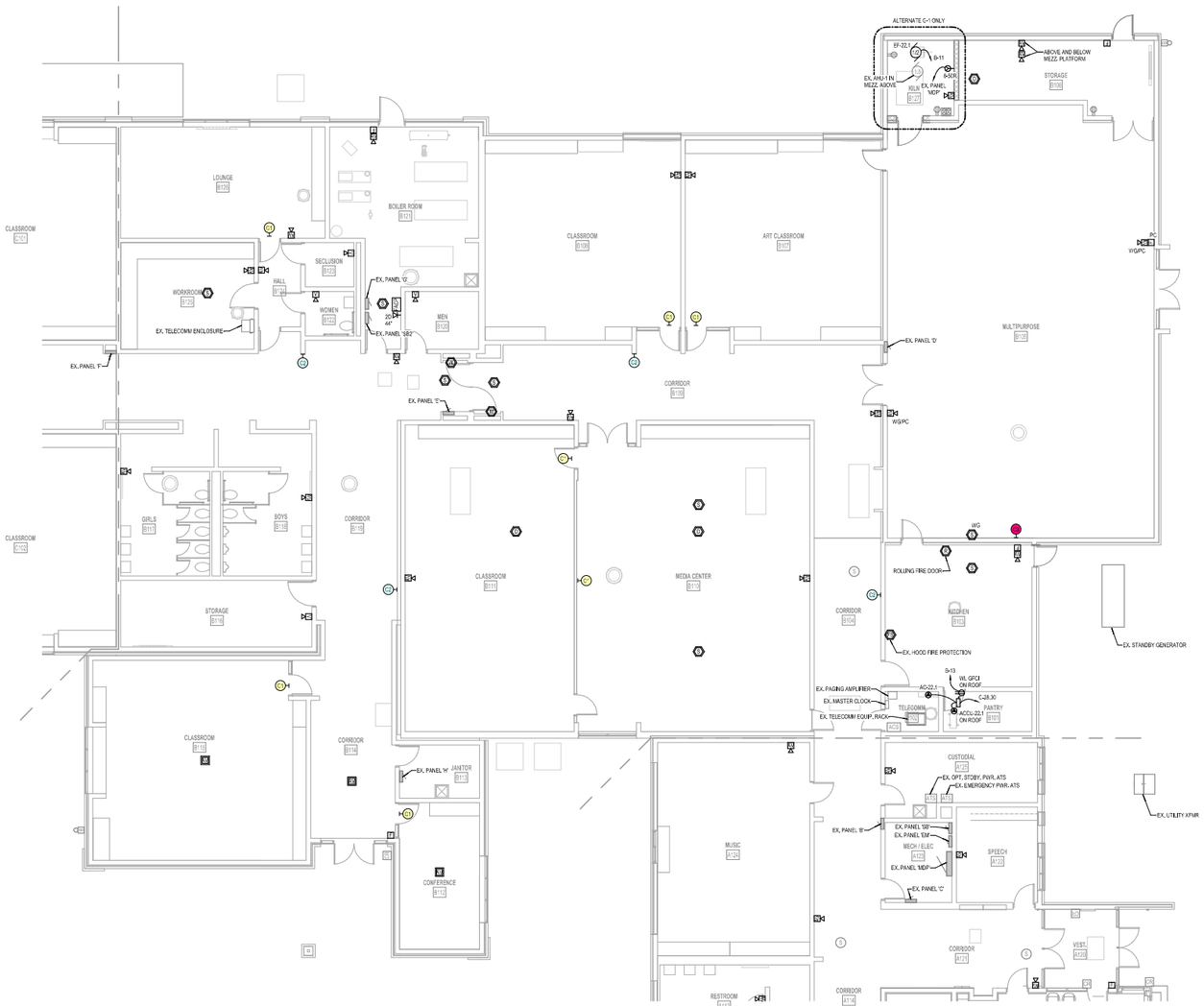
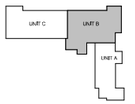
   B. VOIP TELEPHONE SYSTEMS
   C. CLASSROOM AUDIO-VIDEO EQUIPMENT AND INSTRUCTIONAL TECHNOLOGY
   D. AUDIO-VIDEO SYSTEM FOR GYMNASIUM
   E. ACCESS CONTROL SYSTEM
   F. VIDEO SURVEILLANCE SYSTEM



NORTH

UNIT 'B' POWER PLAN

1/8" = 1'-0"



NORTH

KEYPLAN

GMB
616.796.0200
www.gmb.com

FOREST GROVE ELEMENTARY GYM ADDITION

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES

09.22.2021 BIDS & CONSTRUCTION

DRAWN MCK
REVIEWED JFB

PROJECT NO. 5-5362

UNIT 'B' POWER PLAN

E2.1B

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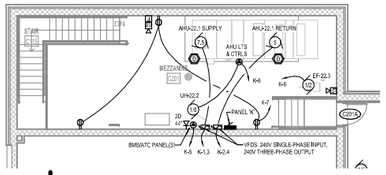

NORTH

MEZZANINE POWER PLAN

1/8" = 1'-0"

AUDIO-VIDEO SYSTEMS BOX & CONNECTOR PLATE SCHEDULE						
ITEM I.D. / TAG	ROUGH-IN OR ITEM SIZE	MOUNTING	LOCATION (HEIGHT TO BOTTOM OF BOX)	BOX & CONDUIT PROVIDED BY	CONNECTOR PLATE & WIRE/CABLE PROVIDED BY	SPECIAL NOTES
AV-A-C1	TWO GANG x 3 1/2" DEEP	FLUSH	44" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	A-V SYSTEM CONTROL TOUCHPANEL
AV-A-C2	SINGLE GANG x 3 1/2" DEEP	FLUSH	15'-9" AFF (VERIFY; SEE DETAIL)	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	PROJECTION SCREEN CONTROL
AV-A-S1	4" SQ. x 2 1/8" DEEP	SURFACE	SIDE OF ROOF JOIST JUST ABOVE BOTTOM CHORD (APPROX. 22'-0" AFF)	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	SPEAKER JUNCTION BOX
AV-A-S2	4" SQ. x 2 1/8" DEEP	SURFACE	SIDE OF ROOF JOIST JUST ABOVE BOTTOM CHORD (APPROX. 22'-0" AFF)	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	SPEAKER JUNCTION BOX
AV-A-V1	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	16" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	VIDEO INPUT(S)
AV-A-V2	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	16" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	VIDEO INPUT(S)
AV-A-V3	4" SQ. x 2 1/8" DEEP	SURFACE	SIDE OF ROOF JOIST JUST ABOVE BOTTOM CHORD (APPROX. 22'-0" AFF)	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	VIDEO PROJECTOR OUTPUT/CONTROL. VERIFY EXACT LOCATION OF PROJ. W/ INSTALLERS
AV-A-W1	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	16" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	AUDIO/VIDEO INPUT(S)
AV-A-W2	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	16" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	AUDIO/VIDEO INPUT(S)
AV-A-W3	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	16" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	AUDIO/VIDEO INPUT(S)
AV-A-W4	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	16" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	AUDIO/VIDEO INPUT(S)

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. PROVIDE 120VAC POWER FOR ALL SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS.
   A. REFER TO MECHANICAL/HVAC DRAWINGS FOR EXACT LOCATIONS OF DAMPERS.
   B. CONNECT TO DEDICATED 20A BRANCH CIRCUIT (WITH BREAKER LOCK-ON ACCESSORY) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT).
   C. TERMINATE W/ BOX-COVER FUSIBLE DISCONNECT SWITCH AT EACH DAMPER.
   D. PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET).
   E. PROVIDE FIRE ALARM ADDRESSABLE RELAY(S) FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT(S) PER CODE REQUIREMENTS.
4. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR (2ND WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.
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6. CONSOLIDATE ALL POWER SUPPLIES REQUIRED FOR ELECTRONIC DOOR HARDWARE (REF. SECTION 08 71 00) TO CENTRAL LOCATION(S) ADJACENT TO DESIGNATED ACCESS CONTROL EQUIPMENT LOCATION(S). CONNECT ALL POWER SUPPLIES TO DEDICATED 'STANDBY' POWER SYSTEM BRANCH CIRCUIT(S) AS DESIGNATED.
7. THE FOLLOWING DIV. 27 AND DIV. 28 SYSTEMS WILL BE DOCUMENTED AND BID SEPARATELY BY CONSULTANT IN ASSOCIATION WITH HUDSONVILLE P.S. TECHNOLOGY DEPT.:
   A. NETWORK ELECTRONICS (SWITCHES, ACCESS POINTS, ETC.)
   B. VOIP TELEPHONE SYSTEMS
   C. CLASSROOM AUDIO-VIDEO EQUIPMENT AND INSTRUCTIONAL TECHNOLOGY
   D. AUDIO-VIDEO SYSTEM FOR GYMNASIUM
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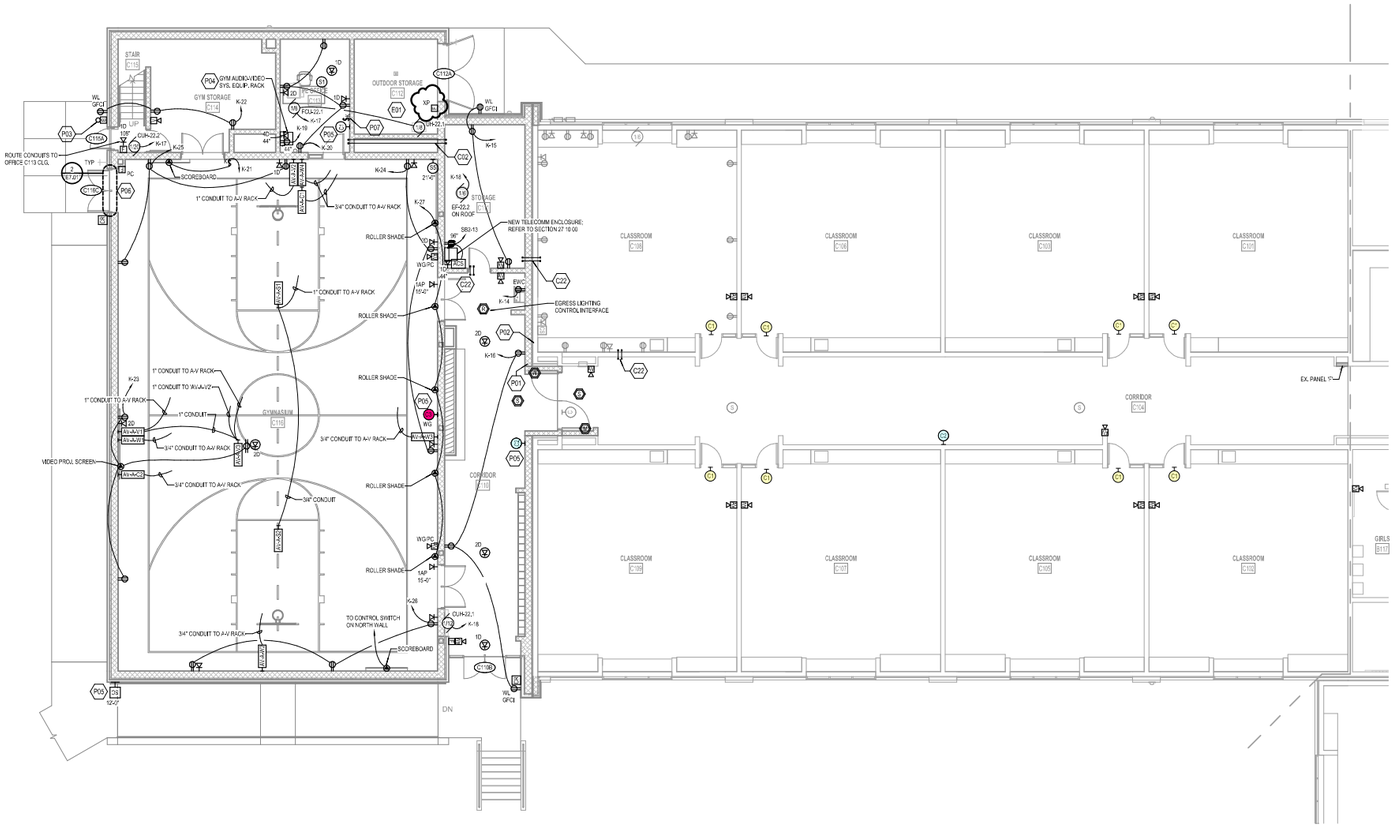
   F. VIDEO SURVEILLANCE SYSTEM



NORTH

UNIT 'C' POWER PLAN

1/8" = 1'-0"

ELECTRICAL KEYNOTES	
C02	(2) 4" CONDUIT SLEEVES FOR DIV. 27 COMMUNICATIONS CABLING
C22	(2) 6.7 SQ. IN. CABLE PATHWAY PENETRATION DEVICE (FIRE) PER SECTION 27 05 28
E01	ALL ELECTRICAL MATERIALS AND INSTALLATION IN THIS ROOM SHALL COMPLY WITH NEC ARTICLE 500 HAZARDOUS LOCATION REQUIREMENTS FOR CLASS 1, DIVISION 1, GROUP C & D
P01	ESTABLISH NEW CONCRETE-ENCASED GROUNDING ELECTRODE IN FOOTING OF NEW ADDITION; INTERCONNECT WITH GROUNDING ELECTRODE SYSTEM AT SERVICE ENTRANCE OR NEAREST SEPARATELY-DERIVED SYSTEM PER NEC AND SPECIFICATION REQUIREMENTS.
P02	BOND METAL STRUCTURE OF ADDITION TO METAL STRUCTURE OF EXISTING BUILDING PER NEC REQUIREMENTS.
P03	RE-INSTALL EX. SIGNALING BELL SALVAGED FROM BUILDING EXTERIOR; INTERCEPT AND EXTEND EXIST. WIRING FROM PREVIOUS LOCATION AND RECONNECT TO RELOCATED BELL.
P04	INSTALL 8"W X 8"W X 6"D JUNCTION BOX BEHIND AUDIO EQUIP. RACK FOR A/V CONDUITS TO ENTER RACK WHILE RECESSED IN WALL. SURFACE-MOUNTED CONDUITS ARE NOT ACCEPTABLE ABOVE, BELOW, OR ON SIDES RACK. STUB AN ADDITIONAL (2) 1" CONDUITS OUT ABOVE ACCESSIBLE CEILING SPACE FROM BOX.
P05	PROVIDE '1D' NETWORK ACTIVATION FOR CONNECTION TO COMMUNICATIONS OR SAFETY/SECURITY DEVICE. TERMINATED INSIDE RECESSED DEVICE BACKBOX
P06	ROUTE ACCESS CONTROL CONDUITS FROM DOOR FRAME THROUGH WALL OVER TO STAIRWELL AND STUB OUT ABOVE 6'-0" AFF.
P07	ROLLER SHADE CONTROL FOR GYMNASIUM. KEY-OPERATED SWITCH FURNISHED BY SECTION 12 24 13. WIRED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS

NORTH

KEYPLAN

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FOREST GROVE ELEMENTARY GYM ADDITION

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES
09.22.2021 BIDS & CONSTRUCTION
11.16.2021 BULLETIN 001

DRAWN MCK
REVIEWED JFB

PROJECT NO. 5-5362

UNIT 'C' POWER PLAN

E2.1C

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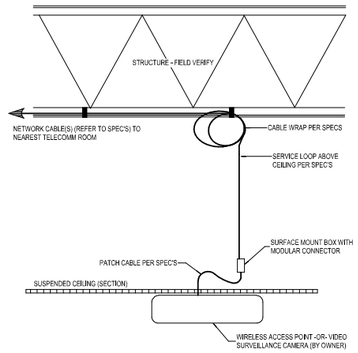
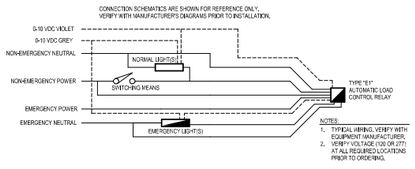
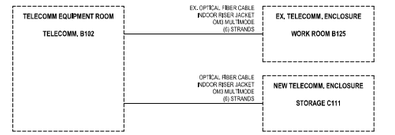


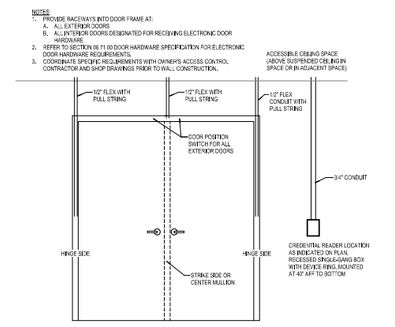
5 E7.01 CEILING MOUNTED COMMUNICATION DEVICE
NOT TO SCALE



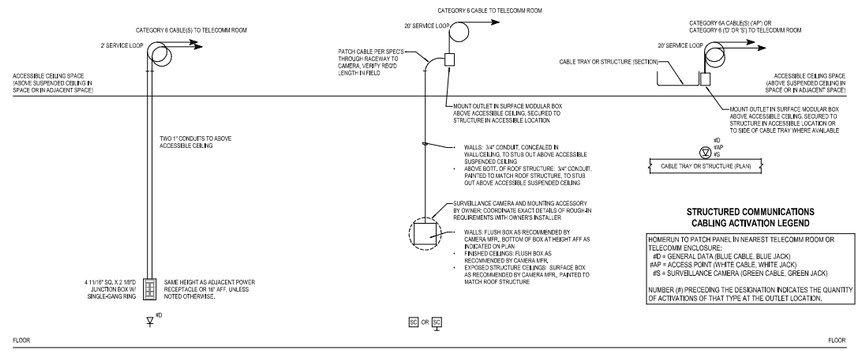
4 E7.01 EMERGENCY LIGHTING AUTOMATIC LOAD CONTROL RELAY
NOT TO SCALE

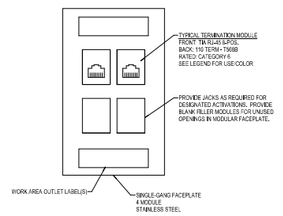


3 E7.01 COMMUNICATIONS CABLING BACKBONE RISER DIAGRAM
NOT TO SCALE

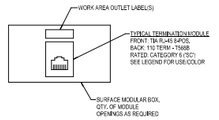


2 E7.01 TYPICAL ROUGH-IN FOR DOORS WITH ELECTRONIC ACCESS CONTROL / MONITORING
NOT TO SCALE

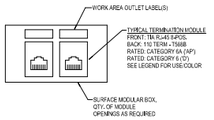




TYPICAL COMMUNICATIONS WALL OUTLET WITH '_D' OR '_AP' ACTIVATION



TYPICAL COMMUNICATIONS OUTLET FOR VIDEO SURVEILLANCE CAMERA



TYPICAL COMMUNICATIONS OUTLET ABOVE ACCESSIBLE CEILING (WIRELESS ACCESS POINT, AUDIO-VIDEO SYSTEM EQUIP., ETC.)

1 E7.01 TYPICAL COMMUNICATIONS OUTLET DETAILS
NOT TO SCALE

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FOREST GROVE ELEMENTARY GYM ADDITION
HUDSONVILLE PUBLIC SCHOOLS
HUDSONVILLE, MICHIGAN

ISSUANCES
09.22.2021 BIDS & CONSTRUCTION

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REVIEWED JFB

PROJECT NO. 5-5362

ELECTRICAL DETAILS

E7.01

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ELECTRICAL ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	INTLK	INTERLOCK
BKR	BREAKER	JCT	JUNCTION
BOB	BOTTOM OF BOX	JB	JUNCTION BOX
BOS	BOTTOM OF STRUCTURE	KW	KILOWATT
BP	BREAKER PANEL	KWH	KILOWATT HOUR
BLDG	BUILDING	KO	KNOCK-OUT
CAP	CAPACITY	LBL	LABEL
CLG	CEILING	LT	LIGHT
CKT	CIRCUIT	LC	LIGHT CONTROL
CB	CIRCUIT BREAKER	LCM	LIGHTING CONTROL MODULE
C	CONDUIT	LCN	LIGHTING CONTROL NARRATIVE
COMM	COMMUNICATIONS	LTG	LIGHTING
CONN	CONNECTION	MAX	MAXIMUM
CONST	CONSTRUCTION	MCC	MOTOR CONTROL CENTER
CONTR	CONTRACT (OR)	MIN	MINIMUM
CLL	CONTRACT LIMIT LINE	MRS	MOTORIZED ROLLER SHADE
CT	CURRENT TRANSFORMER	NEC	NATIONAL ELECTRIC CODE
E.C.	ELECTRICAL CONTRACTOR	NEG	NEGATIVE (-)
EHD	ELECTRIC HAND DRYER	NC	NORMALLY CLOSED
ELEC	ELECTRIC (AL)	NO	NORMALLY OPEN
EWC	ELECTRIC WATER COOLER	N/A	NOT APPLICABLE
EM	EMERGENCY	NIC	NOT IN CONTRACT
ENT	ENTRANCE	NL	NIGHT LIGHT
EQ	EQUAL	PC	PHOTO CELL
EQUIP	EQUIPMENT	POS	POSITIVE (+)
EST	ESTIMATE	PWR	POWER
EF	EXHAUST FAN	P & L	POWER & LIGHTING
ETR	EXISTING TO REMAIN	S	SURFACE
EX	EXISTING	S.B.O.	SUPPLIED BY OTHERS
F	FLUSH	SP	SINGLE POLE
FA	FIRE ALARM	SPD	SURGE PROTECTION DEVICE
FSE	FOOD SERVICE EQUIPMENT	SPKR	SPEAKER
FP	FIRE PROOF / FIRE PROTECTION	SPEC	SPECIFICATION
FLR	FLOOR	SUB	SUBSTITUTE
FLUOR	FLUORESCENT	SWBD	SWITCHBOARD
GEN	GENERATOR	TEL	TELEPHONE
GFCI	GROUND FAULT CIRCUIT INTERRUPTER	TSTAT	THERMOSTAT
GRD	GROUND	XFMR	TRANSFORMER
HORIZ	HORIZONTAL	UG	UNDERGROUND
HTR	HEATER	UL	UNDERWRITERS LABORATORIES
HTG	HEATING	UH	UNIT HEATER
H/V	HEATING / VENTILATING	UNO	UNLESS NOTED OTHERWISE
HVAC	HEATING, VENTILATING, AIR CONDITIONING	VERT	VERTICAL
HOA	HAND-OFF-AUTOMATIC	W	WITH
HP	HEAT PUMP	W/O	WITHOUT
		WL	WET LOCATION
		WP	WEATHER PROOF

MAXIMUM CONDUCTOR LENGTHS FOR TYPICAL BRANCH CIRCUITS

FEET ONE-WAY BASED ON SINGLE PHASE, 20A CIRCUIT, 75% LOAD, 100% P.F., IN STEEL CONDUIT, 3% VOLTAGE DROP

CIRCUIT VOLTAGE	CONDUCTOR SIZE				
	#12 AWG	#10 AWG	#8 AWG	#6 AWG	#4 AWG
120	60	100	159	245	385
208	100	170	265	425	670
277	135	230	355	565	890
480	240	400	615	980	

FEET ONE-WAY BASED ON SINGLE PHASE, 30A CIRCUIT, 75% LOAD, 100% P.F., IN STEEL CONDUIT, 3% VOLTAGE DROP

CIRCUIT VOLTAGE	CONDUCTOR SIZE			
	#10 AWG	#8 AWG	#6 AWG	#4 AWG
120	60	100	159	245
208	100	170	265	425
277	135	230	355	565
480	240	400	615	980

FEET ONE-WAY BASED ON THREE PHASE, 20A CIRCUIT, 75% LOAD, 100% P.F., IN STEEL CONDUIT, 3% VOLTAGE DROP

CIRCUIT VOLTAGE	CONDUCTOR SIZE				
	#12 AWG	#10 AWG	#8 AWG	#6 AWG	#4 AWG
208	120	200	305	490	775
480	275	460	710	1,130	

FEET ONE-WAY BASED ON THREE PHASE, 30A CIRCUIT, 75% LOAD, 100% P.F., IN STEEL CONDUIT, 3% VOLTAGE DROP

CIRCUIT VOLTAGE	CONDUCTOR SIZE			
	#10 AWG	#8 AWG	#6 AWG	#4 AWG
208	120	200	305	490
480	275	460	710	1,130

COMMUNICATIONS SYMBOL LEGEND

- COMMUNICATIONS OUTLET ROUGH-IN
- COMMUNICATIONS OUTLET, ONE DATA ACTIVATION
- COMMUNICATIONS OUTLET, CEILING-MOUNTED
- COMMUNICATIONS OUTLET, FLOOR-MOUNTED
- CEILING-MOUNTED VIDEO PROJECTOR
- COMMUNICATIONS EQUIPMENT RACK, FLOOR-MOUNTED
- COMMUNICATIONS EQUIPMENT RACK, WALL-MOUNTED
- CONDUIT SLEEVE FOR COMMUNICATIONS CABLING, 2" TYP, UNLESS NOTED OTHERWISE
- LOUDSPEAKER, CEILING-MOUNTED, DEVICE FURNISHED AND INSTALLED BY OWNER'S TECHNOLOGY CONTRACTOR
- LOUDSPEAKER, WALL-MOUNTED, DEVICE FURNISHED AND INSTALLED BY OWNER'S TECHNOLOGY CONTRACTOR
- INTERCOM SYSTEM CALL STATION BUTTON
- VOLUME CONTROL FOR AUDIO SYSTEM, PAGING, OR INTERCOM LOUDSPEAKERS
- SECONDARY CLOCK, CEILING-MOUNTED, DEVICE FURNISHED AND INSTALLED BY OWNER'S TECHNOLOGY CONTRACTOR
- SECONDARY CLOCK, WALL-MOUNTED, DEVICE FURNISHED AND INSTALLED BY OWNER'S TECHNOLOGY CONTRACTOR

NOTE: NOT ALL SYMBOLS ARE NECESSARILY USED

ELECTRONIC SAFETY / SECURITY SYMBOL LEGEND

- DOOR CONTACT
- ELECTRONIC LATCH
- ELECTRONIC STRIKE
- PUSH BUTTON FOR DOOR LOCK
- WALL-MOUNTED SURVEILLANCE CAMERA COMMUNICATIONS ROUGH-IN
- CEILING-MOUNTED SURVEILLANCE CAMERA COMMUNICATIONS ROUGH-IN
- CARD READER
- ACCESS CONTROL DOOR TAG, REFER TO HARDWARE SCHEDULE(S)IN SPECIFICATION 08 71 00 AND/OR 28 13 00 FOR DETAILS.
- ACCESS CONTROL SYSTEM EQUIPMENT

NOTE: NOT ALL SYMBOLS ARE NECESSARILY USED

POWER SYMBOL LEGEND

- THREE PHASE MOTOR CONNECTION, 5 HORSE POWER
- SINGLE PHASE MOTOR CONNECTION, 1/2 HORSE POWER
- SAFETY SWITCH DISCONNECTING MEANS, NOT FUSIBLE
- SAFETY SWITCH DISCONNECTING MEANS, FUSIBLE
- COMBINATION MOTOR STARTER AND FUSIBLE DISCONNECTING MEANS
- VARIABLE FREQUENCY DRIVE WITH INTEGRAL DISCONNECTING MEANS
- MOTOR STARTER
- BOX-COVER FUSIBLE DISCONNECT SWITCH
- MANUAL MOTOR CONTROLLER
- POWER SWITCH, REFER TO LIGHTING SYMBOL LEGEND FOR SIMILAR SWITCH TYPES
- DIRECT ELECTRICAL CONNECTION
- SINGLE RECEPTACLE
- SINGLE RECEPTACLE, FLOOR-MOUNTED
- DUPLEX RECEPTACLE
- WHERE "WL" IS NOTED PROVIDE WHILE-IN-USE WET LOCATION COVER AND WEATHER RESISTANT DUPLEX RECEPTACLE.
- SURFACE MOUNTED RECEPTACLE
- "T" TAG ON DEVICE INDICATES REPLACEMENT OF DEVICE USING EXISTING ROUGH-IN
- DUPLEX RECEPTACLE, CEILING-MOUNTED
- DUPLEX RECEPTACLE, FLOOR-MOUNTED
- DUPLEX STANDBY POWER RECEPTACLE
- DUPLEX SPLIT WIRED RECEPTACLE
- DUPLEX GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE
- QUADRUPLEX RECEPTACLE
- QUADRUPLEX RECEPTACLE, CEILING-MOUNTED
- QUADRUPLEX RECEPTACLE, FLOOR-MOUNTED
- MULTI-PHASE RECEPTACLE. SEE PLAN FOR TYPE
- MULTI-PHASE RECEPTACLE, FLOOR-MOUNTED
- SURFACE RACEWAY SYSTEM
- AUTOMATIC TRANSFER SWITCH
- SWITCHBOARD
- PANELBOARD
- TRANSFORMER
- MOTOR CONTROL CENTER
- EMERGENCY STOP STATION, REFER TO DETAIL FOR REQUIREMENTS.
- AUTOMATIC DOOR OPERATOR PUSH-BUTTON
- ON/OFF PUSH-BUTTON
- THREE-FUNCTION PUSH BUTTON
- FLOORBOX, TYPE 1
- JUNCTION BOX
- METER
- THERMOSTAT ROUGH-IN
- RELAY
- ENCLOSED CONTROL CONTACTOR

NOTE: NOT ALL SYMBOLS ARE NECESSARILY USED

LIGHTING SYMBOL LEGEND

- SINGLE POLE LIGHT SWITCH
- DOUBLE POLE LIGHT SWITCH
- THREE-WAY LIGHT SWITCH
- FOUR-WAY LIGHT SWITCH
- SINGLE POLE LIGHT SWITCH WITH INTEGRAL OCCUPANCY SENSOR
- OCCUPANCY SENSOR DIMMER
- WALL-BOX DIMMER SWITCH
- THREE-WAY DIMMER SWITCH
- ELECTRONIC INTERVAL TIMER SWITCH
- LIGHT SWITCH WITH PILOT LIGHT
- LIGHTING CONTROL SYSTEM, REFER TO LIGHTING CONTROL SWITCH SCHEDULE AND SPECIFICATIONS FOR DETAILS.
- DOUBLE THROW (MAINTAINED) LIGHT SWITCH
- KEY-OPERATED LIGHT SWITCH - (SUFFIX DESIGNATION | BLANK: SINGLE POLE, 2: DOUBLE POLE, 3: THREE-WAY, 4: FOUR-WAY)
- LOCKING SWITCH - (SUFFIX DESIGNATION | BLANK: SINGLE POLE, 2: DOUBLE POLE, 3: THREE-WAY, 4: FOUR-WAY)
- TOUCHSCREEN PANEL
- CIRCUIT NUMBER FOR LIGHT FIXTURES WITH INDICATED SPACE
- WALL-MOUNTED LIGHTING FIXTURE, TYPE 'A'
- RECESSED LIGHTING FIXTURE, TYPE 'A'
- SURFACE-MOUNTED LIGHTING FIXTURE, TYPE 'A'
- TRACK LIGHTING
- SINGLE FACE EXIT SIGN, TYPE "X1" IN SCHEDULE UNLESS OTHERWISE NOTED. SHADING INDICATES FACE ORIENTATION
- DOUBLE FACE EXIT SIGN, TYPE "X2" IN SCHEDULE UNLESS OTHERWISE NOTED. SHADING INDICATES FACE ORIENTATION
- WALL-MOUNTED EXIT SIGN
- EMERGENCY LIGHT FIXTURE DESIGNATION
- EMERGENCY LIGHTING AUTOMATIC LOAD CONTROL RELAY
- LIGHTING CONTROL RELAY
- LIGHTING CONTROL ENCLOSED CONTACTOR
- TRUE SWITCH
- LIGHTING CONTROL MODULE
- EMERGENCY LIGHTING INVERTER, TYPE 1
- WALL-MOUNTED OCCUPANCY SENSOR
- CEILING-MOUNTED OCCUPANCY SENSOR
- WALL-MOUNTED PHOTOCELL FOR ON/OFF CONTROL
- CEILING-MOUNTED PHOTOCELL FOR ON/OFF CONTROL
- WALL-MOUNTED PHOTOSENSOR FOR DAYLIGHT HARVESTING DIMMING CONTROL
- CEILING-MOUNTED PHOTOSENSOR FOR DAYLIGHT HARVESTING DIMMING CONTROL
- POLE-MOUNTED SITE/AREA FIXTURE
- SELF-CONTAINED EMERGENCY LIGHTING UNIT

NOTE: NOT ALL SYMBOLS ARE NECESSARILY USED

FIRE ALARM SYMBOL LEGEND

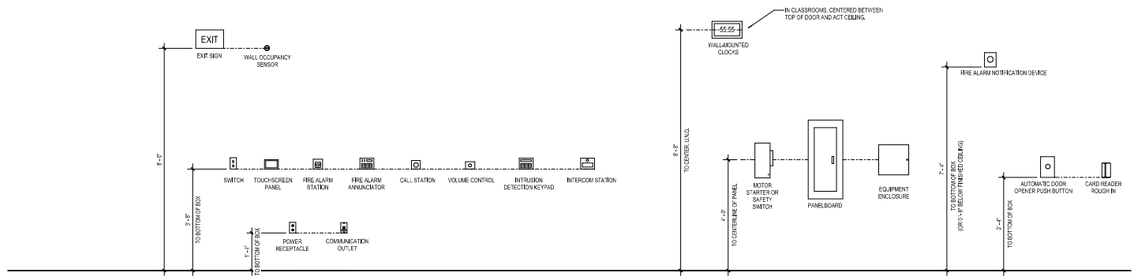
- MANUAL PULL STATION
- AUDIBLE NOTIFICATION APPLIANCE, WALL-MOUNTED
- VISUAL NOTIFICATION APPLIANCE, WALL-MOUNTED
- AUDIBLE/VISUAL NOTIFICATION APPLIANCE, WALL-MOUNTED
- AUDIBLE NOTIFICATION APPLIANCE, CEILING-MOUNTED
- AUDIBLE/VISUAL NOTIFICATION APPLIANCE, CEILING-MOUNTED
- VISUAL NOTIFICATION APPLIANCE, CEILING-MOUNTED
- WHERE "WG/PC" IS NOTED, PROVIDE LISTED WIRE GUARD OR PROTECTIVE POLYCARBONATE COVER FOR NOTIFICATION DEVICE.
- WHERE "WL" IS NOTED, PROVIDE LISTED WET-LOCATION NOTIFICATION DEVICE, SUITABLE FOR INDOOR OR OUTDOOR USE.
- SMOKE DETECTOR
- HEAT DETECTOR
- DUCT SMOKE DETECTOR
- SMOKE DAMPER OPERATOR MOTOR
- FIRE PROTECTION FLOW SWITCH
- FIRE PROTECTION TAMPER SWITCH
- ELECTROMAGNETIC DOOR HOLD-OPEN DEVICE
- ADDRESSABLE RELAY FOR FIRE ALARM CONTROL
- PRESSURE SWITCH
- CARBON MONOXIDE DETECTOR
- NOTIFICATION APPLIANCE CONTROL PANEL
- FIRE ALARM REMOTE ANNUNCIATOR
- FIRE ALARM CONTROL PANEL
- KEYED TEST SWITCH AND REMOTE INDICATOR FOR DUCT SMOKE DETECTOR
- FIRE PROTECTION OR ALARM BELL

NOTE: NOT ALL SYMBOLS ARE NECESSARILY USED

ELECTRICAL GENERAL NOTES

1. ALL WORK SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE AS AMENDED AND ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION WHERE THE WORK IS PERFORMED.
2. ALL "LOW-VOLTAGE" CONTROLS, COMMUNICATIONS, AND SAFETY/SECURITY CABLING MAY BE INSTALLED WITHOUT CONDUIT, RACEWAY, OR CABLE TRAY ONLY WHERE CONCEALED ABOVE A SUSPENDED CEILING SYSTEM AND ACCESSIBLE FOR FUTURE MAINTENANCE; OTHERWISE, ALL CABLING (INCLUDING BUT NOT LIMITED TO CABLES ASSOCIATED WITH SYSTEMS SUCH AS ARCHITECTURAL EQUIPMENT, BUILDING ENERGY MANAGEMENT, TEMPERATURE CONTROLS, LIGHTING CONTROLS, COMMUNICATIONS NETWORKS, TELEPHONE, AUDIO-VIDEO, INTERCOM, PAGING, CLOCK, SURVEILLANCE, ACCESS CONTROL, FIRE ALARM, ETC.) SHALL BE INSTALLED IN AN APPROVED CONDUIT, RACEWAY SYSTEM, AND/OR CABLE TRAY UNLESS OTHERWISE NOTED. IN EXPOSED STRUCTURE CEILING AREAS, CONCEALED INSTALLATION OF CABLES IN RACEWAYS SHALL BE REQUIRED FOR AESTHETIC REASONS. REFER TO REFLECTED CEILING PLANS FOR LOCATIONS. THIS APPLIES TO ALL TRADES AND WORK CATEGORIES. EXCEPTIONS:
   A. DEDICATED MECHANICAL AND/OR ELECTRICAL ROOMS ABOVE EACH APP.
   B. DEDICATED TELECOMMUNICATIONS ROOMS
3. "LOW-VOLTAGE" CONTROLS, COMMUNICATIONS, AND SAFETY/SECURITY CABLING SHALL NOT BE PAINTED. PAINTING CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARY PROTECTION OF ANY EXISTING CABLING PRIOR TO PAINTING EXISTING AREAS. CONTRACTORS INSTALLING CABLING WHERE APPROVED FOR EXPOSED INSTALLATION SHALL INSTALL CABLES AFTER PAINTING HAS BEEN COMPLETED OR PROVIDE TEMPORARY PROTECTION OF CABLES UNTIL PAINTING HAS BEEN COMPLETED. PAINTED CABLES SHALL BE REPLACED AT THE EXPENSE OF THE NEGLIGENT CONTRACTOR.
4. METAL CLAD CABLE MAY BE USED FOR FIXTURE WHIPS IN LENGTHS OF 6 FEET OR LESS ABOVE AN ACCESSIBLE SUSPENDED CEILING SYSTEM ONLY, OTHERWISE METAL CLAD OR OTHER FLEXIBLE CABLE TYPES SHALL NOT BE USED UNLESS SPECIFICALLY AUTHORIZED BY THE ENGINEER (IT IS THE INTENT OF THESE CONTRACT DOCUMENTS THAT ALL INSTALLED BRANCH CIRCUITS CONSIST OF SEPARATE RACEWAY AND CONDUCTORS ALLOWING REMOVAL AND REPLACEMENT OF WIRING AS REQUIRED FOR FUTURE UPGRADES). REFER TO SPECIFICATIONS FOR EXCEPTIONS.
5. CIRCUIT WIRING FOR ARTICLE 700 EMERGENCY SYSTEMS AND ARTICLE 708 CRITICAL OPERATIONS POWER SYSTEMS SHALL BE INSTALLED IN SEPARATE CONDUIT/RACEWAYS AND BE KEPT ENTIRELY INDEPENDENT OF ALL OTHER WIRING AND EQUIPMENT PER NEC REQUIREMENTS.
6. ALL FEEDERS AND BRANCH CIRCUITS SHALL CONTAIN AN EQUIPMENT GROUNDING CONDUCTOR SIZED ACCORDING TO THE NEC RACEWAYS INCLUDING CONDUITS, BOXES, WIREWAYS, ETC. SHALL NOT BE CONSIDERED AN ACCEPTABLE GROUND.
7. CONDUITS AND CABLING SHALL NOT BE INSTALLED WITHIN 4" OF ROOF DECK, EXCEPT AS NECESSARY TO SERVE ROOF-MOUNTED ITEMS AND ONLY WHEN THE CONDUIT OR CABLE IS ROUTED VERTICALLY TO SUCH EQUIPMENT FROM BELOW.
8. SUPPLEMENTAL METAL FRAMING SHALL BE PROVIDED FOR SUSPENSION POINTS OF ALL ITEMS LOCATED BETWEEN OVERHEAD STRUCTURAL MEMBERS (JOISTS, TRUSSES, BEAMS, ETC.) IN OPEN ASSEMBLE STRUCTURE CEILING AREAS. METAL FRAMING SHALL SPAN ACROSS THE TOP CHORD OR FLANGE OF THE STRUCTURAL MEMBERS FOR BOTH STRUCTURAL AND AESTHETIC PURPOSES. SPECIFIC EXCEPTIONS SHALL BE COORDINATED IN WRITING WITH THE ARCHITECT/ENGINEER.
9. CONDUIT INSTALLED WITHIN INACCESSIBLE CONSTRUCTION SHALL BE 3/4" MINIMUM SIZE.
10. FEEDERS SHOWN ON DRAWINGS ARE SCHEMATIC ONLY. CONDUIT RUNS SHALL COMPLY WITH CONDUIT SPECIFICATIONS AND CONTAIN BENDS THAT ARE NO GREATER THAN 90 DEGREES. CONDUITS INSTALLED ABOVE GRADE SHALL BE RUN PARALLEL TO, OR PERPENDICULAR WITH, BUILDING STEEL AND/OR ARCHITECTURAL LINES.
11. CONTRACTOR(S) SHALL VERIFY COLOR FINISH OF WIRING DEVICES, DEVICE FACEPLATES, SURFACE RACEWAY SYSTEMS, AND/OR MULTI-OUTLET ASSEMBLIES WITH ARCHITECT/ENGINEER IF NOT EXPLICITLY SPECIFIED.
12. ELECTRICAL CONTRACTOR SHALL REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR ADDITIONAL LIGHTING FIXTURE INFORMATION AND MOUNTING LOCATIONS.
13. ELECTRICAL CONTRACTOR SHALL ADJUST LIGHTING FIXTURE LOCATIONS IN MECHANICAL ROOMS TO ACCOMMODATE MECHANICAL EQUIPMENT AND FIELD CONDITIONS.
14. CONTRACTOR(S) SHALL BE RESPONSIBLE TO REVIEW INTERIOR ELEVATION SHEETS FOR PLACEMENT OF DEVICE BOXES. COORDINATE LOCATIONS SO TV-AT NO DEVICES ARE INSTALLED BEHIND CASEWORK, MILLWORK, VISUAL DISPLAY BOARDS, MIRRORS, CUSTOM GRAPHICS, SIGNAGE, ETC.
15. ELECTRICAL CONTRACTOR SHALL REVIEW TOILET EQUIPMENT SHOP DRAWINGS AND ARCHITECTURAL DETAILS/ELEVATIONS FOR CORRECT DEVICE ROUGH-IN LOCATION OF HAND DRYERS.
16. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH PLUMBING CONTRACTOR AND THE ELECTRIC WATER COOLER / BOTTLE FILLER SHOP DRAWINGS FOR MOUNTING HEIGHT AND CONNECTION METHOD OF PLUMBING EQUIPMENT POWER CONNECTIONS. READILY ACCESSIBLE GFCI PROTECTION SHALL BE PROVIDED FOR THE BRANCH CIRCUIT(S) SUPPLYING ALL SUCH UNITS PER NEC REQUIREMENTS.
17. REFER TO MECHANICAL EQUIPMENT SCHEDULE FOR DETAILED INFORMATION REGARDING EQUIPMENT AND CONTROL. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING AND PROVIDING ITEMS AS SPECIFICALLY LISTED AND ASSIGNED ON MECHANICAL EQUIPMENT SCHEDULE SUCH AS DISCONNECT SWITCHES, VARIABLE FREQUENCY DRIVES, STARTERS, TIMERS, SWITCHES, ETC.
18. ELECTRICAL CONTRACTOR SHALL CONFIRM THE LOCATION OF THE EXHAUST FANS LISTED IN THE MECHANICAL EQUIPMENT SCHEDULES BY REFERRING TO MECHANICAL/HVAC PLANS.
19. REFER TO ROOF PLANS FOR EXACT LOCATIONS OF ROOF-TOP MECHANICAL EQUIPMENT.
20. CABINET HEATERS MAY HAVE LINE VOLTAGE THERMOSTATS SUPPLIED BY MECHANICAL CONTRACTOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR. REFER TO MECHANICAL EQUIPMENT SCHEDULE.
21. DIVISION 26 CONTRACTOR SHALL PROVIDE CONDUIT SLEEVES WITH APPROPRIATE BUSHINGS FOR CONTROLS AND ELECTRONIC SAFETY/SECURITY CABLING THROUGH WALLS AND FLOORS. SLEEVE SIZES SHALL BE COORDINATED WITH CABLING REQUIREMENTS.
22. SECTION 27 05 28 CONTRACTOR SHALL PROVIDE CONDUIT SLEEVES WITH APPROPRIATE BUSHINGS FOR COMMUNICATIONS CABLING THROUGH WALLS AND FLOORS. SLEEVE SIZE SHALL BE 2" MIN. UNLESS NOTED OTHERWISE.
23. PROVIDE DIRECT CONNECTIONS FROM LOCAL RECEPTACLE CIRCUIT TO ACCESS CONTROL SYSTEM AND DOOR HARDWARE POWER SUPPLIES WHERE REQUIRED FOR DOOR LOCK DEVICES, CONTROLLERS, ETC. REFER TO DOOR HARDWARE SCHEDULE AND ACCESS CONTROL SYSTEM SCHEDULE IN RESPECTIVE SPECIFICATIONS FOR QUANTITIES AND LOCATIONS.

Section 27 41 16 - Multimedia Systems



NOTE: ALL HEIGHTS ARE AS SHOWN UNLESS NOTED OTHERWISE.

TYPICAL MOUNTING HEIGHTS FOR WALL DEVICES, EQUIPMENT, & FIXTURES

NOT TO SCALE

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NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES

10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001

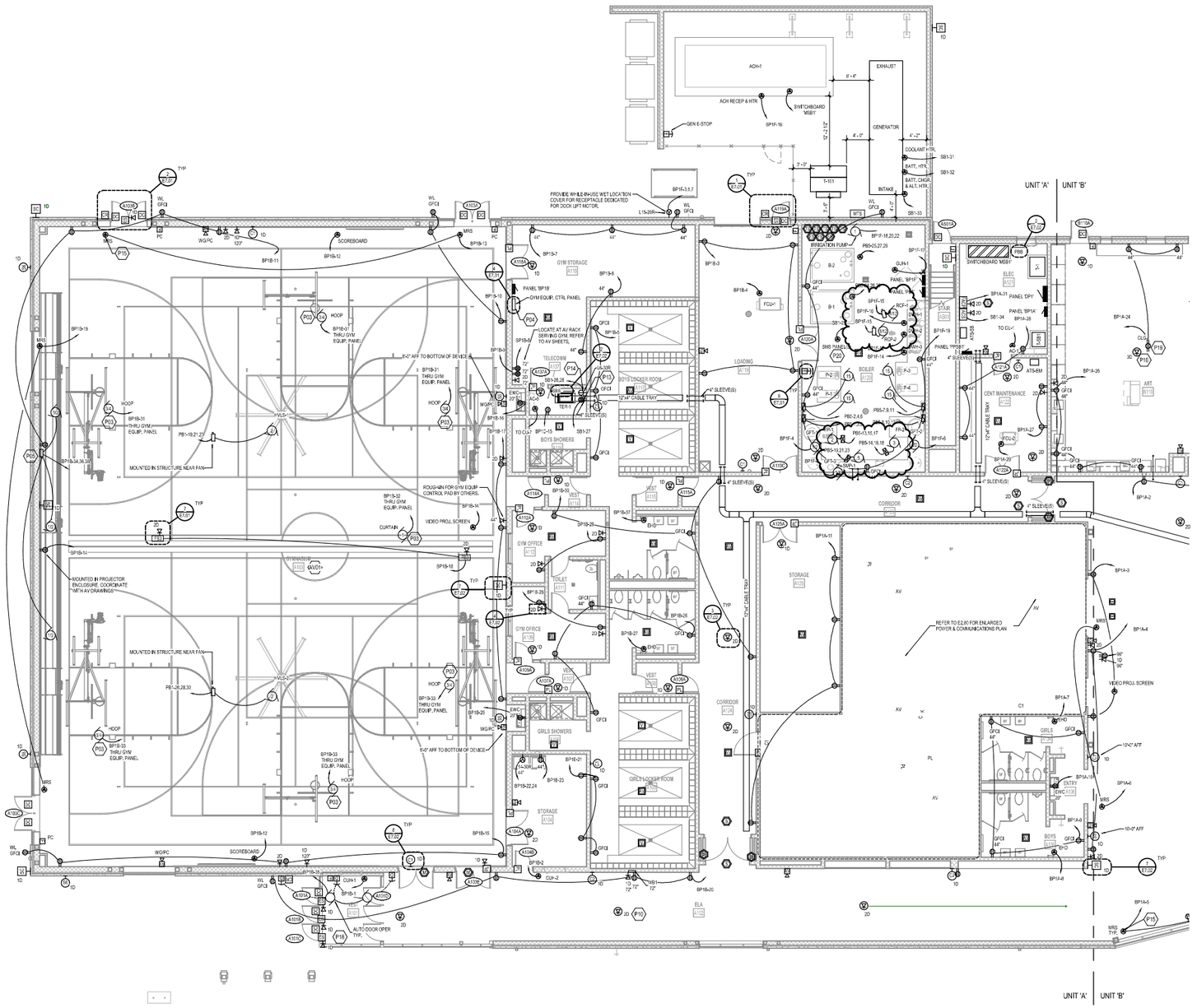
DRAWN JFB

REVIEWED AAB

PROJECT NO. 5-5065

ELECTRICAL SYMBOL LEGENDS & GENERAL NOTES

E0.01



UNIT 'A' FIRST FLOOR POWER & COMMUNICATIONS PLAN

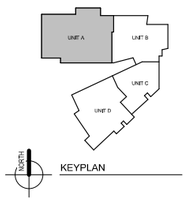
1/8" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BULDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20A/1P BRANCH CIRCUIT (WITH BREAKER LOCKING MECHANISM) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT). TERMINATED W/ BOX-COVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES. AT LEAST ONE PER ROOM/PABLE ROOM OR SPACE, INSTALL 3/4" CONDUIT RACEWAY FROM BOX TO CORRESPONDING TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT. REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.#
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

ELECTRICAL KEYNOTES

AV01	REFER TO AV DRAWINGS FOR ADDITIONAL SCOPE. COORDINATE ALL ROUGH-IN LOCATIONS WITH AV DRAWINGS.
P03	E.C. SHALL PROVIDE AND INSTALL 4" SQUARE JUNCTION BOX WITHIN 3'-0" OF WINCH LOCATION FOR TWIST-LOCK RECEPTACLE. TWIST LOCK RECEPTACLE AND COVER PROVIDED BY EQUIPMENT PROVIDER. (1) HOOK-UP REQUIRED PER DEVICE. REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR FURTHER DETAILS.
P04	6-RELAY GYM EQUIPMENT CONTROL PANEL REQUIRED TO SUPPORT (6) HOOP WINCH MOTORS AND (1) DIVIDER CURTAIN MOTOR. USE (1) RELAY PER DEVICE. POWER EACH PANEL WITH (2) 120V SINGLE PHSE CIRCUITS AS INDICATED IN PANEL SCHEDULE. REFER TO MANUFACTURER INSTRUCTIONS FOR FURTHER DETAILS.
P05	E.C. SHALL PROVIDE AND INSTALL NON-FUSIBLE SAFETY SWITCHES FOR BLEACHER MOTOR. JUNCTION BOX SHALL BE MOUNTED AT 6'-0" AFF. COORDINATE LOCATION WITH EQUIPMENT PROVIDER. REFER TO BLEACHER DETAILS ON ARCHITECTURE SHEETS FOR FURTHER DETAILS.
P10	ALL LOW VOLTAGE CABLING TO BE IN CONDUIT IN SPACES WITH EXPOSED CEILINGS. PRIOR TO INSTALL, COORDINATE EXACT LOCATION OF NETWORK ACTIVATIONS WITH OWNER'S TECHNOLOGY CONTRACTOR (FOR ACCESS POINTS, SECURITY CAMERAS, AV EQUIPMENT, ETC.). TERMINATE CABLING IN SURFACE MOUNT BOX WITH MODULAR CONNECTOR INSIDE JUNCITON BOX. PROVIDE BLANK FACEPLATE FOR UNUSED LOCATIONS. TYPICAL FOR ALL.
P13	RECEPTACLES ON STANDBY POWER SHALL BE YELLOW. TYPICAL FOR ALL.
P14	INSTALL L6-30R RECEPTACLE INSIDE 4-POST RACK FOR UPS. UPS PROVIDED BY OWNER.
P15	MOTORIZED ROLLER SHADES IN THIS SPACE TO BE CONTROLLED BY AV SYSTEM. REFER TO AV DRAWINGS FOR MORE INFORMATION.
P18	ALL ACCESS CONTROL CONDUITS TO NEAREST CABLE TRAY. TERMINATE CABLING IN JUNCTION BOX RECESSED ABOVE DOOR IN MASONRY WALL, OR JUNCTION BOX SURFACE MOUNTED TO STRUCTURE WHERE CEILINGS ARE LESS THAN 20 FEET. TYPICAL FOR ALL ACCESS CONTROL DOORS SHOWN WITH DATA DROPS.
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR. TYPICAL FOR ALL.
P20	COORDINATE WITH CONTROLS CONTRACTOR FOR LOCATION OF BMS PANEL.



KEYPLAN

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NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES	
10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
02.18.2021	BULLETIN 002
04.16.2021	BULLETIN 006
05.11.2021	BULLETIN 007
05.26.2021	BULLETIN 008
06.16.2021	BULLETIN 010
07.01.2021	BULLETIN 011
08.10.2021	BULLETIN 013
08.31.2021	BULLETIN 015
09.28.2021	BULLETIN 018
02.28.2022	BULLETIN 022

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'A' FIRST FLOOR POWER & COMMUNICATIONS PLAN

E2.1A

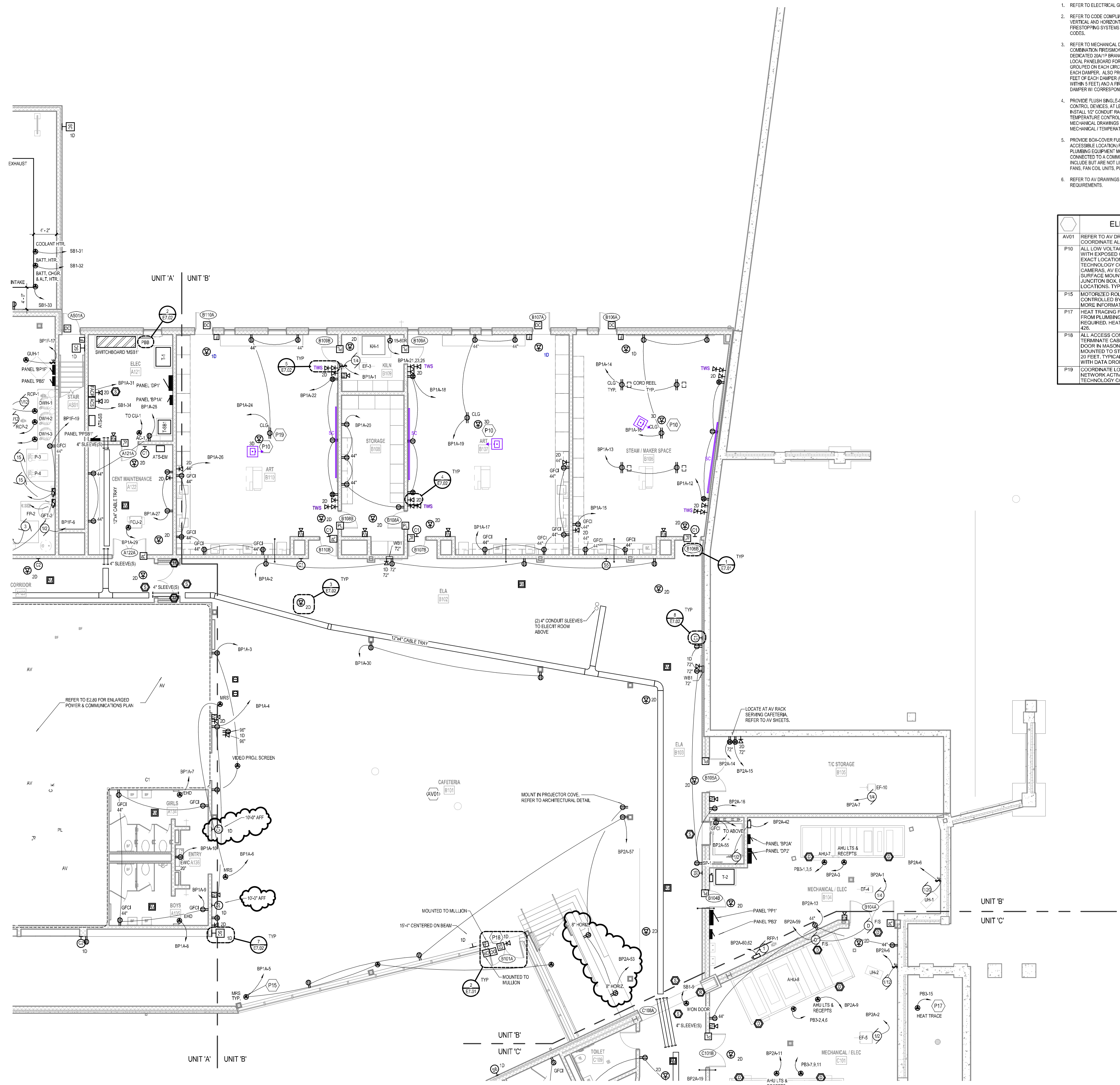
BIM 360://5-5065 Hudsonville Public Schools 5-65-5065E 2018.rvt
2/28/2022 8:40:18 AM

POWER & COMMUNICATION GENERAL NOTES

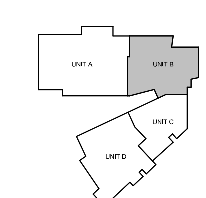
1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20A/1P BRANCH CIRCUIT (WITH BREAKER LOCKING MECHANISM) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT), TERMINATED W/ BOX-COVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES, AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE. INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT. REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.6
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

ELECTRICAL KEYNOTES

AV01	REFER TO AV DRAWINGS FOR ADDITIONAL SCOPE. COORDINATE ALL ROUGH-IN LOCATIONS WITH AV DRAWINGS.
P10	ALL LOW VOLTAGE CABLING TO BE IN CONDUIT IN SPACES WITH EXPOSED CEILINGS. PRIOR TO INSTALL, COORDINATE EXACT LOCATION OF NETWORK ACTIVATIONS WITH OWNER'S TECHNOLOGY CONTRACTOR (FOR ACCESS POINTS, SECURITY CAMERAS, AV EQUIPMENT, ETC.). TERMINATE CABLING IN SURFACE MOUNT BOX WITH MODULAR CONNECTOR INSIDE JUNCITON BOX, PROVIDE BLANK FACEPLATE FOR UNUSED LOCATIONS. TYPICAL FOR ALL.
P15	MOTORIZED ROLLER SHADES IN THIS SPACE TO BE CONTROLLED BY AV SYSTEM. REFER TO AV DRAWINGS FOR MORE INFORMATION.
P17	HEAT TRACING FOR PLUMBING PIPING PER 22 05 33. LENGTHS FROM PLUMBING PLANS. FIELD VERIFY EXACT LENGTHS REQUIRED. HEAT TRACING SHALL COMPLY WITH NEC ARTICLE 426.
P18	ALL ACCESS CONTROL CONDUITS TO NEAREST CABLE TRAY. TERMINATE CABLING IN JUNTION BOX RECESSED ABOVE DOOR IN MASONRY WALL, OR JUNCTION BOX SURFACE MOUNTED TO STRUCTURE WHERE CEILINGS ARE LESS THAN 20 FEET. TYPICAL FOR ALL ACCESS CONTROL DOORS SHOWN WITH DATA DROPS.
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR. TYPICAL FOR ALL.



UNIT 'B' FIRST FLOOR POWER & COMMUNICATIONS PLAN
1/8" = 1'-0"



KEYPLAN

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NEW 5TH - 6TH GRADE FACILITY
HUDSONVILLE PUBLIC SCHOOLS
HUDSONVILLE, MICHIGAN

ISSUANCES

10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
02.18.2021	BULLETIN 002
04.16.2021	BULLETIN 006
05.26.2021	BULLETIN 008
09.28.2021	BULLETIN 018

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'B' FIRST FLOOR POWER & COMMUNICATIONS PLAN

E2.1B

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20A/1P BRANCH CIRCUIT (WITH BREAKER LOCKING MECHANISM) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT), TERMINATED W/ BOX-COVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES, AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE. INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT. REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH ON BUILDING INTERIOR IN ACCESSIBLE LOCATION FOR EACH 5kVA (~ 12 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

ELECTRICAL KEYNOTES

P01	DEVICES INSTALLED IN BACK OF CASEWORK FOR AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
P10	ALL LOW VOLTAGE CABLING TO BE IN CONDUIT IN SPACES WITH EXPOSED CEILINGS. PRIOR TO INSTALL, COORDINATE EXACT LOCATION OF NETWORK ACTIVATIONS WITH OWNER'S TECHNOLOGY CONTRACTOR (FOR ACCESS POINTS, SECURITY CAMERAS, AV EQUIPMENT, ETC.). TERMINATE CABLING IN SURFACE MOUNT BOX WITH MODULAR CONNECTOR INSIDE JUNCITON BOX. PROVIDE BLANK FACEPLATE FOR UNUSED LOCATIONS. TYPICAL FOR ALL.
P15	MOTORIZED ROLLER SHADES IN THIS SPACE TO BE CONTROLLED BY AV SYSTEM. REFER TO AV DRAWINGS FOR MORE INFORMATION.
P17	HEAT TRACING FOR PLUMBING PIPING PER 22 05 33. LENGTHS FROM PLUMBING PLANS. FIELD VERIFY EXACT LENGTHS REQUIRED. HEAT TRACING SHALL COMPLY WITH NEC ARTICLE 426.
P18	ALL ACCESS CONTROL CONDUITS TO NEAREST CABLE TRAY. TERMINATE CABLING IN JUNTION BOX RECESSED ABOVE DOOR IN MASONRY WALL, OR JUNCTION BOX SURFACE MOUNTED TO STRUCTURE WHERE CIELINGS ARE LESS THAN 20 FEET. TYPICAL FOR ALL ACCESS CONTROL DOORS SHOWN WITH DATA DROPS.
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR, TYPICAL FOR ALL.

UNIT 'C' FIRST FLOOR POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"

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NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

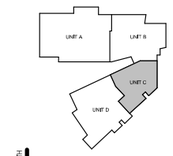
HUDSONVILLE, MICHIGAN

ISSUANCES	
10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
02.18.2021	BULLETIN 002
04.16.2021	BULLETIN 006
05.26.2021	BULLETIN 008
09.28.2021	BULLETIN 018
10.26.2021	BULLETIN 019

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'C' FIRST FLOOR POWER & COMMUNICATIONS PLAN

E2.1C



KEYPLAN

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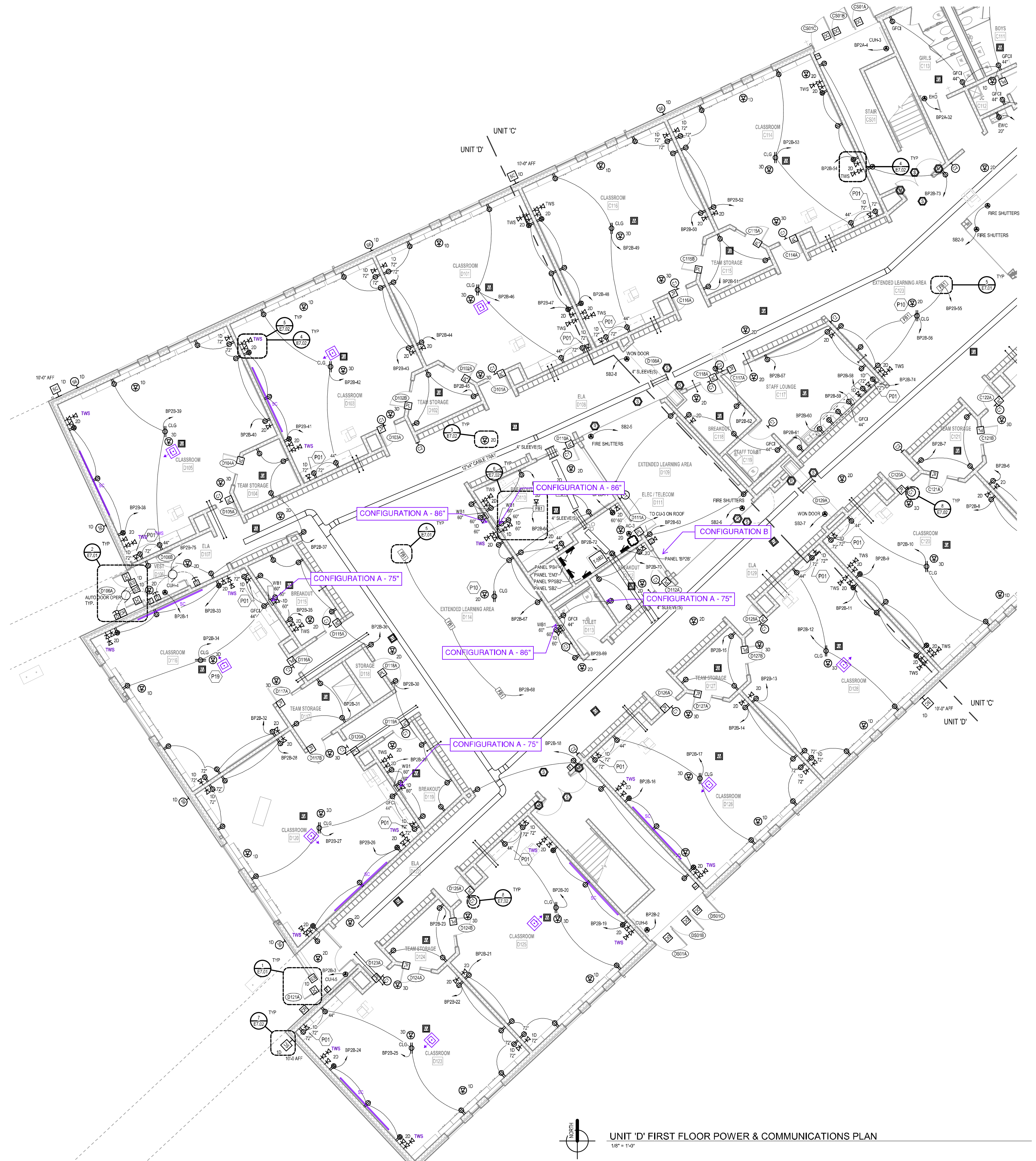
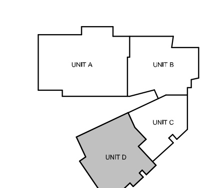


UNIT 'D' FIRST FLOOR POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"



KEYPLAN

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
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5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.6
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

	ELECTRICAL KEYNOTES
P01	DEVICES INSTALLED IN BACK OF CASEWORK FOR AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
P10	ALL LOW VOLTAGE CABLING TO BE IN CONDUIT IN SPACES WITH EXPOSED CEILINGS. PRIOR TO INSTALL, COORDINATE EXACT LOCATION OF NETWORK ACTIVATIONS WITH OWNER'S TECHNOLOGY CONTRACTOR (FOR ACCESS POINTS, SECURITY CAMERAS, AV EQUIPMENT, ETC.). TERMINATE CABLING IN SURFACE MOUNT BOX WITH MODULAR CONNECTOR INSIDE JUNCITON BOX, PROVIDE BLANK FACEPLATE FOR UNUSED LOCATIONS. TYPICAL FOR ALL.
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR. TYPICAL FOR ALL.

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NEW 5TH - 6TH GRADE FACILITY
HUDSONVILLE PUBLIC SCHOOLS
HUDSONVILLE, MICHIGAN

ISSUANCES

10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
04.16.2021	BULLETIN 006
05.11.2021	BULLETIN 007
10.26.2021	BULLETIN 019

DRAWN	JFB
REVIEWED	AAB

PROJECT NO. 5-5065

UNIT 'D' FIRST FLOOR POWER & COMMUNICATIONS PLAN

E2.1D

BIM 360://5-5065 Hudsonville Public Schools 5-65-5065E 2019.rvt
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POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
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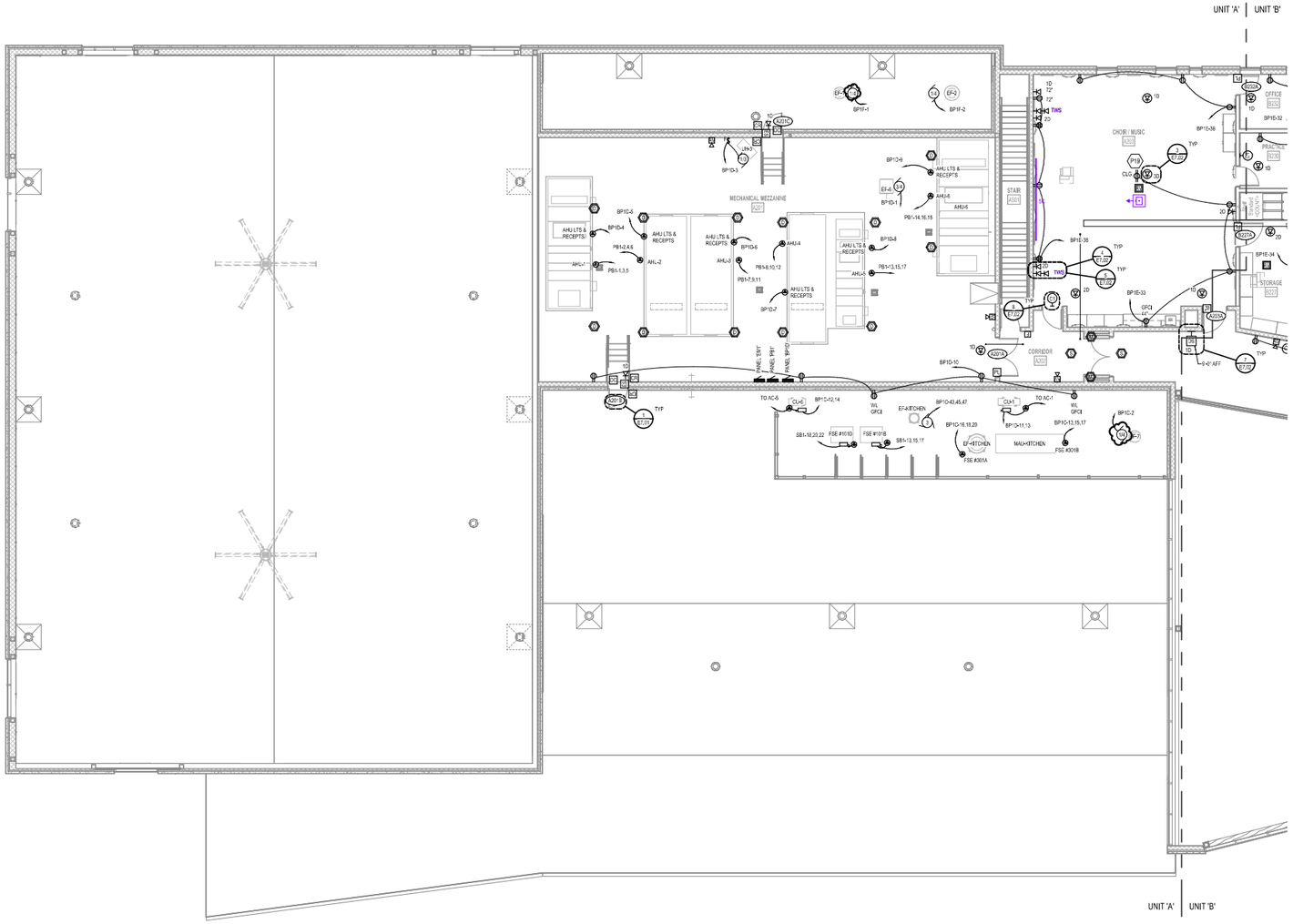
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH (NULL-1-1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE, BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

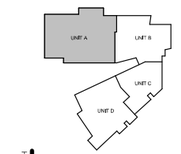
	ELECTRICAL KEYNOTES
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR. TYPICAL FOR ALL.



NORTH

UNIT 'A' SECOND FLOOR POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"



NORTH KEYPLAN

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NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES	
10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
04.16.2021	BULLETIN 006

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'A' SECOND FLOOR POWER & COMMUNICATIONS PLAN

E2.2A

BIM 360://5-5065 Hudsonville Public Schools 5-6/5-5065E 2019.rvt
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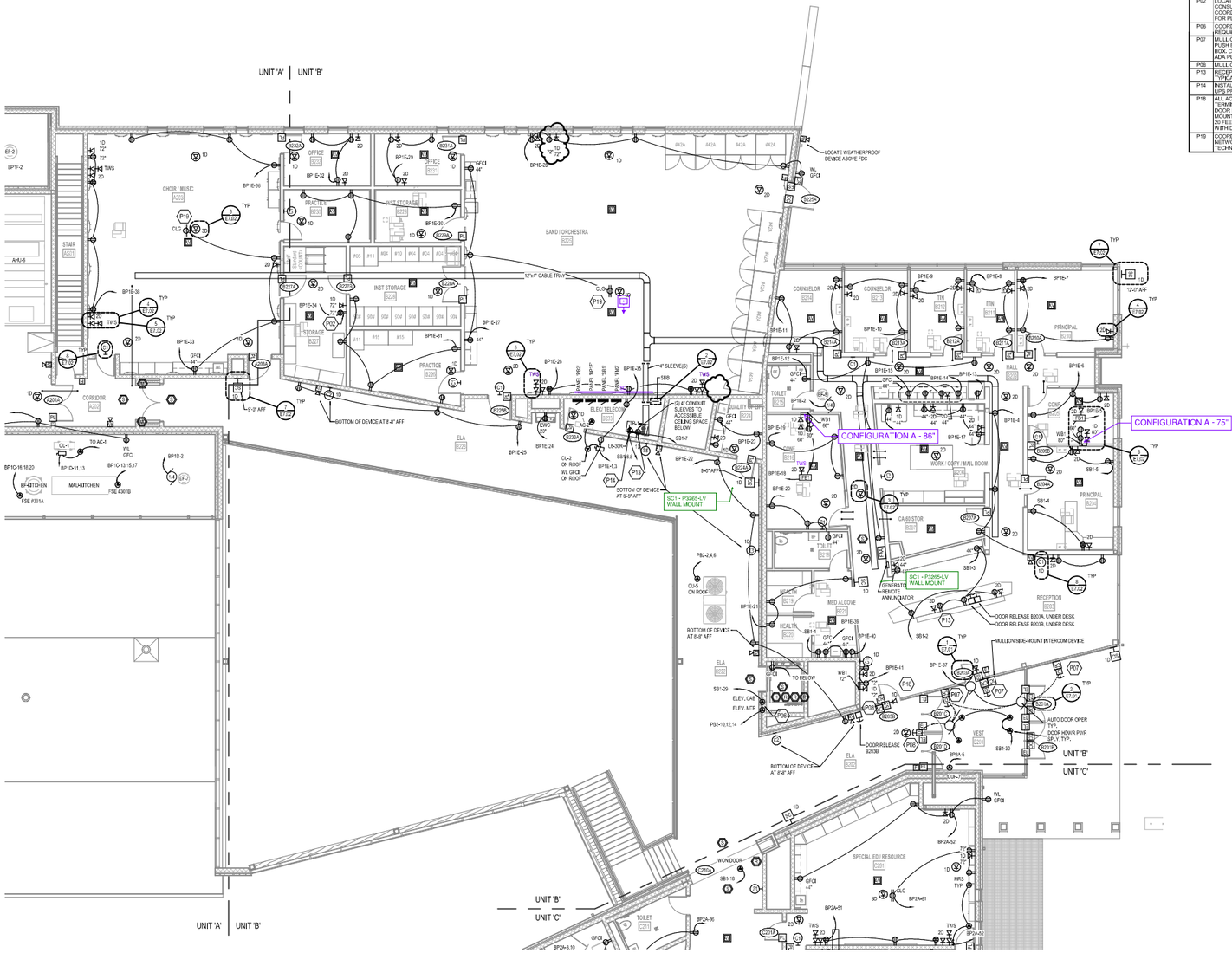
POWER & COMMUNICATION GENERAL NOTES

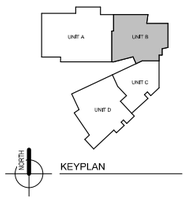
1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.0'.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20AFP BRANCH CIRCUIT (WITH BREAKER LOCKING MECHANISM) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT). TERMINATED W/ BOX/COVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
4. PROVIDE PLUS (+) SINGLE-GANG BOXES IN WALLS FOR HVAC TEMPERATURE CONTROL DEVICES. AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE. INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT. REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION FOR EACH SHALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE, BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.).
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

ELECTRICAL KEYNOTES

P02	LOCATION OF AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT; COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
P06	COORDINATE WITH ELEVATOR MANUFACTURER'S REQUIREMENTS FOR DISCONNECTS.
P07	MULLION MOUNT CARD READER AND ADA PUSHBUTTON. ADA PUSH BUTTON SHALL BE MOUNTED AT 40" AFF TO BOTTOM OF BOX. CARD READER SHALL BE MOUNTED DIRECTLY ABOVE ADA PUSHBUTTON.
P08	MULLION MOUNT CARD READER OR ADA PUSHBUTTON.
P13	RECEPTACLES ON STANDBY POWER SHALL BE YELLOW. TYPICAL FOR ALL.
P14	INSTALL UL-924R RECEPTACLE INSIDE 4-POST RACK FOR UPS. UPS PROVIDED BY OWNER.
P18	ALL ACCESS CONTROL CONDUITS TO NEAREST CABLE TRAY, TERMINATE CABLING IN JUNITION BOX RECESSED ABOVE DOOR IN MASONRY WALL OR JUNCTION BOX SURFACE MOUNTED TO STRUCTURE WHERE CEILINGS ARE LESS THAN 20 FEET. TYPICAL FOR ALL ACCESS CONTROL DOORS SHOWN WITH DATA DROPS.
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR. TYPICAL FOR ALL.



UNIT 'B' SECOND FLOOR POWER & COMMUNICATIONS PLAN
1/8" = 1'-0"



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NEW 5TH - 6TH GRADE FACILITY
HUDSONVILLE PUBLIC SCHOOLS
HUDSONVILLE, MICHIGAN

ISSUANCES

10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
04.16.2021	BULLETIN 006
05.11.2021	BULLETIN 007
05.26.2021	BULLETIN 008
09.28.2021	BULLETIN 018

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'B' SECOND FLOOR POWER & COMMUNICATIONS PLAN

E2.2B

BIM 360://5-5065 Hudsonville Public Schools 5-65/5-5065E 2019.rvt
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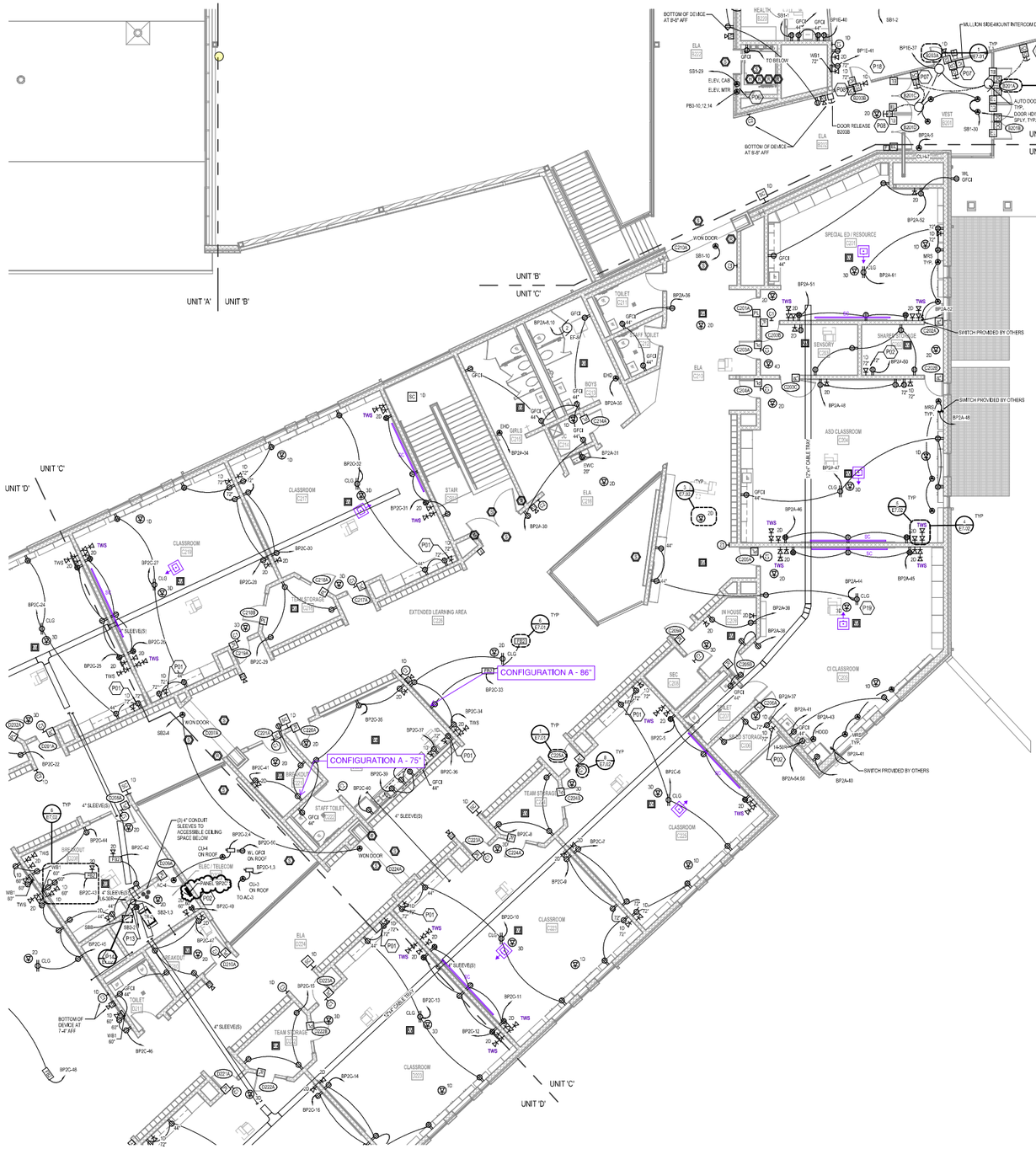


POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20A/1P BRANCH CIRCUIT (WITH BREAKER LOCKING MECHANISM) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT). TERMINATED W/ BOLD COVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES. AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE. INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT. REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.#
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

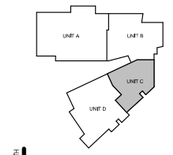
ELECTRICAL KEYNOTES

P01	DEVICES INSTALLED IN BACK OF CASEWORK FOR AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
P02	LOCATION OF AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
P06	COORDINATE WITH ELEVATOR MANUFACTURER'S REQUIREMENTS FOR DISCONNECTS.
P07	MULLION MOUNT CARD READER AND ADA PUSHBUTTON; ADA-PUSH BUTTON SHALL BE MOUNTED AT 40" AFF TO BOTTOM OF BOX. CARD READER SHALL BE MOUNTED DIRECTLY ABOVE ADA PUSHBUTTON.
P08	MULLION MOUNT CARD READER OR ADA PUSHBUTTON.
P13	RECEPTACLES ON STANDBY POWER SHALL BE YELLOW. TYPICAL FOR ALL.
P14	INSTALL L6-30R RECEPTACLE INSIDE 4-POST RACK FOR UPS. UPS PROVIDED BY OWNER.
P18	ALL ACCESS CONTROL CONDUITS TO NEAREST CABLE TRAY. TERMINATE CABLING IN JUNTION BOX RECESSED ABOVE DOOR IN MASONRY WALL, OR JUNCTION BOX SURFACE MOUNTED TO STRUCTURE WHERE CEILINGS ARE LESS THAN 20 FEET. TYPICAL FOR ALL ACCESS CONTROL DOORS SHOWN WITH DATA DROPS.
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR. TYPICAL FOR ALL.

North

UNIT 'C' SECOND FLOOR POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"



KEYPLAN

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NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES	
10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
04.16.2021	BULLETIN 006
05.26.2021	BULLETIN 008
10.26.2021	BULLETIN 010

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'C' SECOND FLOOR POWER & COMMUNICATIONS PLAN

E2.2C

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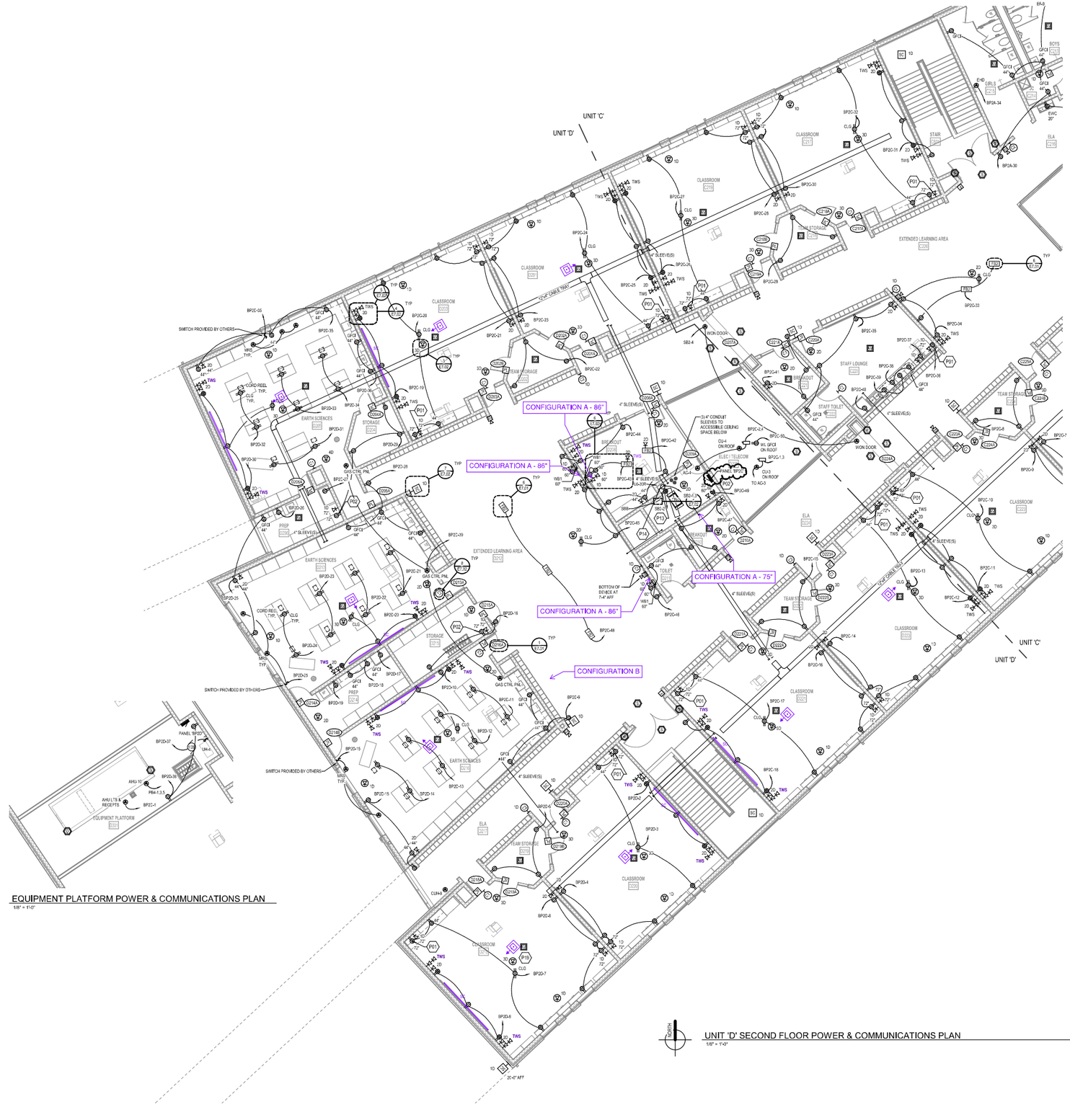

NORTH

EQUIPMENT PLATFORM POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"

NORTH

UNIT 'D' SECOND FLOOR POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.2'.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20A/1P BRANCH CIRCUIT WITH BREAKER LOCKING MECHANISM IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT). TERMINATE(S) W/ BOX-COVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES. AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE. INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT. REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH ON BUILDING INTERIOR IN ACCESSIBLE LOCATION FOR EACH SMALL (< 10 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.s
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

ELECTRICAL KEYNOTES

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P02	LOCATION OF AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
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P14	INSTALL L6-30R RECEPTACLE INSIDE 4-POST RACK FOR UPS. UPS PROVIDED BY OWNER.
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR; TYPICAL FOR ALL.

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NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES	
10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
05.11.2021	BULLETIN 007
10.26.2021	BULLETIN 019

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'D' SECOND FLOOR POWER & COMMUNICATIONS PLAN

E2.2D

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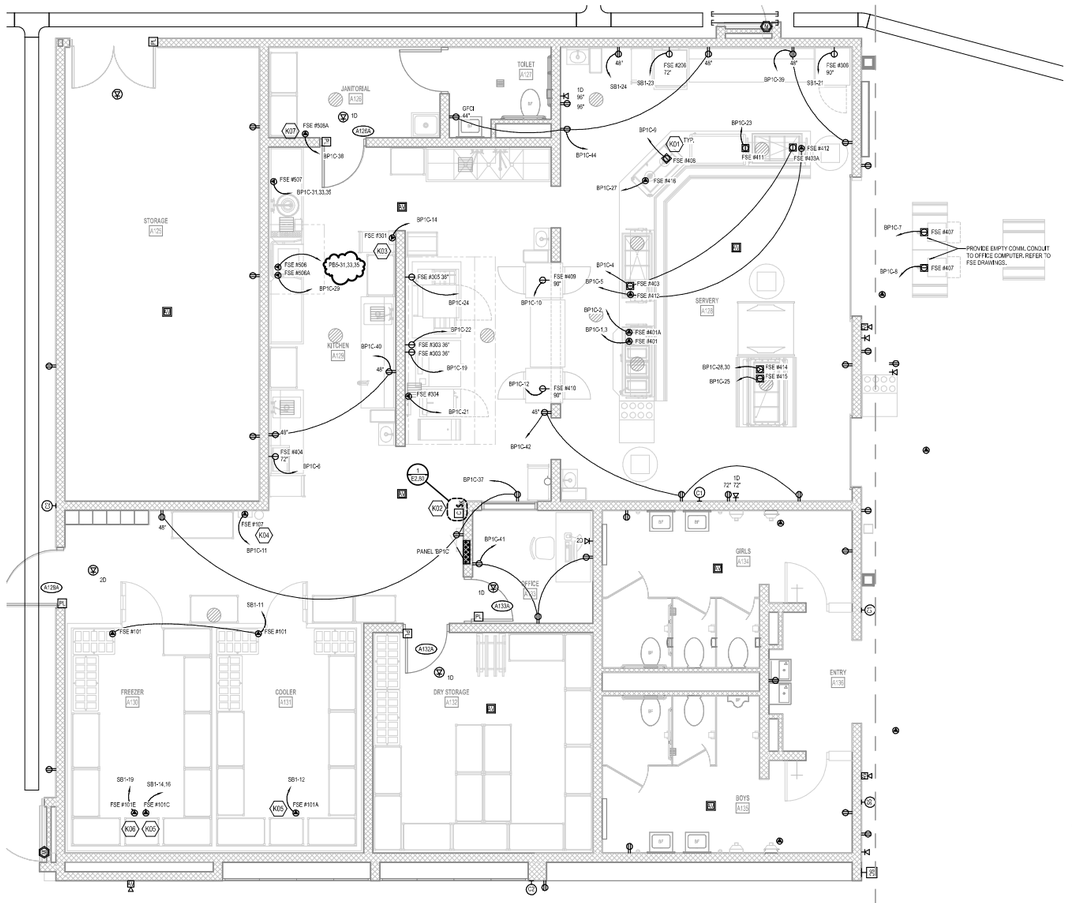


NORTH

ENLARGED KITCHEN POWER & COMMUNICATIONS PLAN

1/4" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

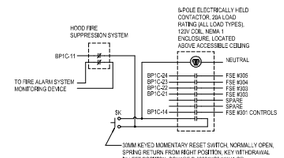
1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20A/1P BRANCH CIRCUIT (WITH BREAKER LOCKING MECHANISM) IN LOCAL PANELBOARD FOR DAMPERS (IN EACH AREA, DAMPERS MAY BE GROUPED ON EACH CIRCUIT), TERMINATED W/ BOX-COVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES. AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE. INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING "TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT". REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH ON BUILDING INTERIOR IN ACCESSIBLE LOCATION FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

FOODSERVICE ELECTRICAL GENERAL NOTES

1. ELEC. CONTRACTOR SHALL REVIEW FOODSERVICE EQUIPMENT DRAWINGS ("FSE"-SERIES) AND FOOD SERVICE SPECIFICATIONS (SECTION 11 40 00) FOR ADDITIONAL SCOPE OF WORK AND REQUIREMENTS. INCLUDE ALL WORK AND MATERIALS AS ASSIGNED TO THE ELEC. CONTRACTOR BY DRAWINGS, SPECIFICATIONS, CONSTRUCTION MANAGER'S WORK CATEGORY DESCRIPTIONS, ETC.
2. IF THERE IS A CONFLICT BETWEEN THE FOODSERVICE DRAWINGS/SPECIFICATION AND THIS DRAWING OR DIVISION 26 SPECIFICATIONS, THE ELEC. CONTRACTOR SHALL BID USING THE MORE STRINGENT AND GREATER-COST REQUIREMENTS. CLARIFICATIONS MAY BE REQUESTED IN WRITING PRIOR TO BID. COORDINATE WITH CONSTRUCTION MANAGER'S PROCEDURES.
3. "THE WORK SHOWN ON THIS DRAWING AND "THE DIVISION 26 SPECIFICATIONS SHALL SUPERCEDE THE FOOD SERVICE EQUIPMENT DRAWINGS/SPECIFICATION.
4. LABEL ALL RECEPTACLES IN KITCHEN AND SERVING AREAS WITH CORRESPONDING PANELBOARD, CIRCUIT NUMBER, AND FOODSERVICE EQUIPMENT ITEM NUMBER AS REFERENCED ON THE FOODSERVICE EQUIPMENT DRAWINGS.
5. ELEC. CONTRACTOR SHALL VERIFY AND COORDINATE WITH THE FOODSERVICE EQUIPMENT VENDOR THAT ALL SINGLE-PHASE RECEPTACLES (120V, 1-Ø OR LESS, 50A OR LESS) AND THREE-PHASE RECEPTACLES (120V, L-G OR LESS, 100A OR LESS) IN KITCHEN AND SERVING AREAS HAVE GFCI PROTECTION FOR PERSONNEL AS REQUIRED BY NEC 210.8(B)(2), EITHER AT THE DEVICE (GFCI RECEPTACLE) OR AT THE RESPECTIVE PANELBOARD (GFCI BREAKER FOR THE BRANCH CIRCUIT). FOR ANY SUCH RECEPTACLE LOCATIONS THAT ARE NOT READILY ACCESSIBLE (NEC DEFINITION), GFCI PROTECTION SHALL BE PROVIDED FOR THE BRANCH CIRCUIT AT THE PANELBOARD USING A GFCI BRANCH CIRCUIT BREAKER.
6. PROVIDE CONCEALED ROUGH-IN FOR REMOTE MANUAL PULL STATIONS CONNECTED TO VENTILATION HOOD FIRE PROTECTION SYSTEMS. SURFACE-MOUNTED CONDUIT, PIPE, AND PULL STATIONS ARE NOT ACCEPTABLE. COORDINATE LOCATIONS WITH ENGINEERED SHOP DRAWINGS FOR SYSTEM.

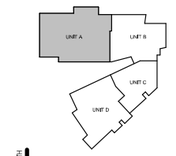
ELECTRICAL KEYNOTES

K01	FLOOR-MOUNTED PEDESTAL WITH RECEPTACLE AS REQUIRED. BOX SHALL BE "FD"-TYPE CAST ALUMINUM OR STAINLESS STEEL MOUNTED HORIZONTALLY WITH (2) HUBS ON BOTTOM (LONG) SIDE TO ACCEPT THREADED RIGID METALLIC CONDUIT. PROVIDE WITH CAST METAL, WEATHERPROOF HINGED COVER OVER WIRING DEVICE. TOP OF RECEPTACLE BOX SHALL NOT EXCEED 9" AFF.
K02	RESET STATION FOR EQUIP. SHUTDOWN CONTROLS (REFER TO DETAIL)
K03	E.C. SHALL INTERWIRE ALL COMPONENTS OF MAKE-UP AIR UNIT, EXHAUST FAN, HOOD LIGHTS, AND HOOD CONTROLS AS SHOWN ON FOODSERVICE EQUIP. DRAWINGS AND AS REQUIRED BY EQUIPMENT MANUFACTURER. VERIFY WITH EQUIPMENT SHOP DRAWINGS.
K04	EXHAUST HOOD FIRE SUPPRESSION SYSTEM, INTERCONNECT WITH FIRE ALARM INITIATION CIRCUIT FOR SUPERVISORY MONITORING PER LOCAL CODES AND CONTROL CONTACTOR FOR SHUTDOWN OF EQUIPMENT ELEC. SUPPLY UNDER HOOD UPON RELEASE OF EXTINGUISHING AGENT. REFER TO DETAIL ON FSE DRAWINGS AND CONTROL DETAIL.
K05	E.C. SHALL INTERWIRE ALL COMPONENTS OF WALK-IN COOLER OR FREEZER AS SHOWN ON DRAWINGS AND REQUIRED BY EQUIPMENT MANUFACTURER. COORDINATE WITH SHOP DRAWINGS.
K06	COORDINATE WITH PLUMBING CONTRACTOR FOR LOCATION OF HEAT TRACE POWER SUPPLY.
K07	CONNECT DISHWASHER EXHAUST FAN TO DISHWASHER CONTROL PANEL. REFER TO FSE DRAWINGS.



1 / E2.80 FOODSERVICE EQUIP. ELEC SHUTDOWN DETAIL

NOT TO SCALE



NORTH

KEYPLAN

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NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES

10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
10.26.2021	BULLETIN 019

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5085

KITCHEN & SERVING AREA POWER & COMMUNICATIONS ENLARGED PLAN

E2.80

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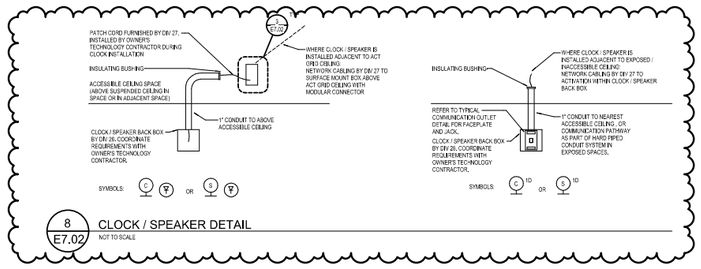
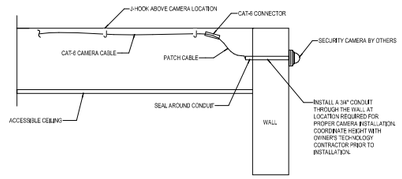
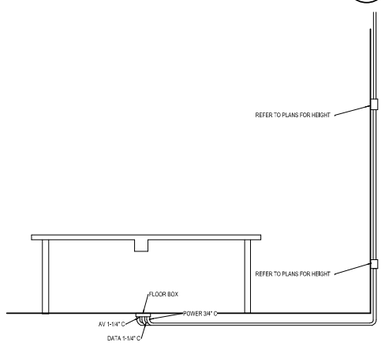


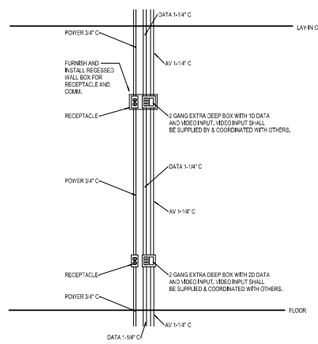
8 E7.02 CLOCK / SPEAKER DETAIL
NOT TO SCALE

NOTES:
1. ROUGH-IN FOR CAMERAS ONLY. CAMERAS PROVIDED BY OWNER'S TECHNOLOGY CONTRACTOR. REFER TO DRAWINGS FOR ROUGH-IN HEIGHT.
2. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR MOUNTING HEIGHTS OF ROUGH-INS.



7 E7.02 TYPICAL WALL MOUNT SURVEILLANCE CAMERA INSTALLATION
NOT TO SCALE





6 E7.02 VIDEO CONFERENCE SECTION
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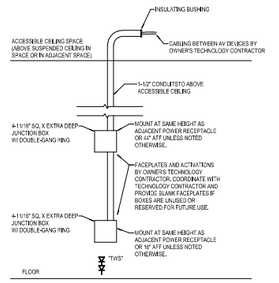
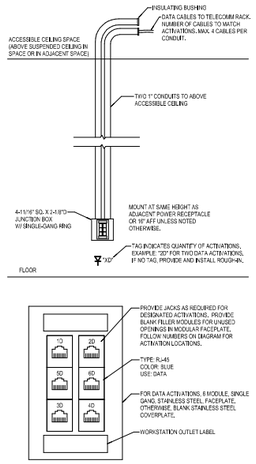


5 E7.02 TEACHER WORKSTATION DETAIL
NOT TO SCALE



4 E7.02 TYPICAL COMMUNICATION OUTLET
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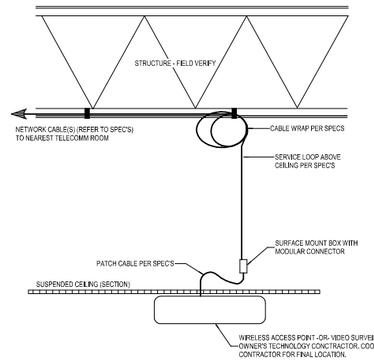

3 E7.02 CEILING MOUNTED COMMUNICATION DEVICE
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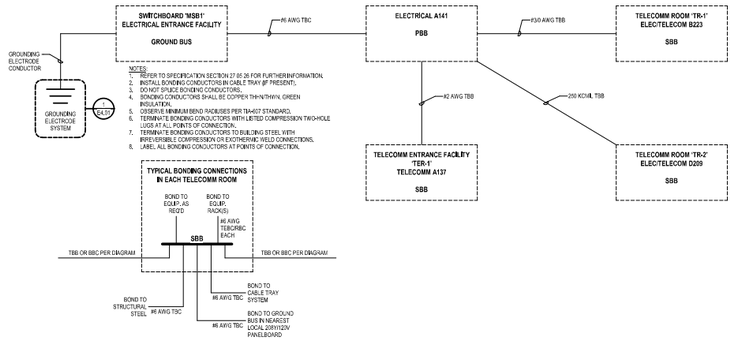
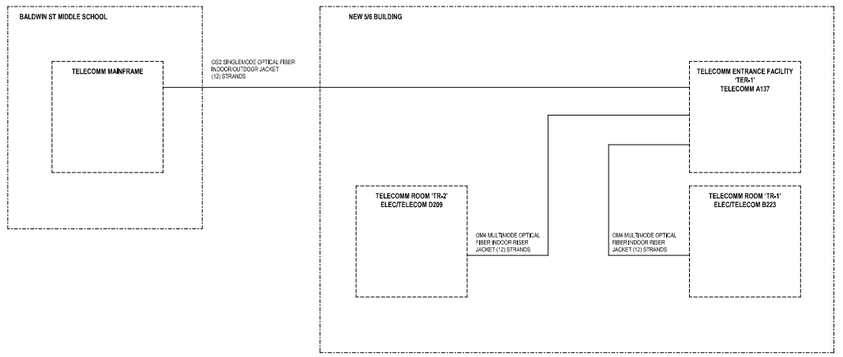


2 E7.02 COMMUNICATIONS GROUNDING/BONDING SYSTEM RISER DIAGRAM
NOT TO SCALE



1 E7.02 COMMUNICATIONS CABLING BACKBONE RISER DIAGRAM
NOT TO SCALE

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NEW 5TH - 6TH GRADE FACILITY
HUDSONVILLE PUBLIC SCHOOLS
HUDSONVILLE, MICHIGAN

ISSUANCES

10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004

DRAWN JFB
REVIEWED AAB
PROJECT NO. 5-5065

ELECTRICAL DETAILS

E7.02

BIM 360://5-5065 Hudsonville Public Schools_5-65-5065E 2019.rvt
11/24/2020 2:20:27 PM

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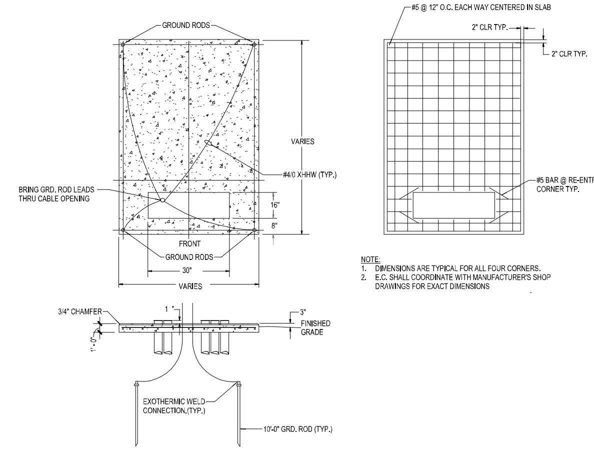
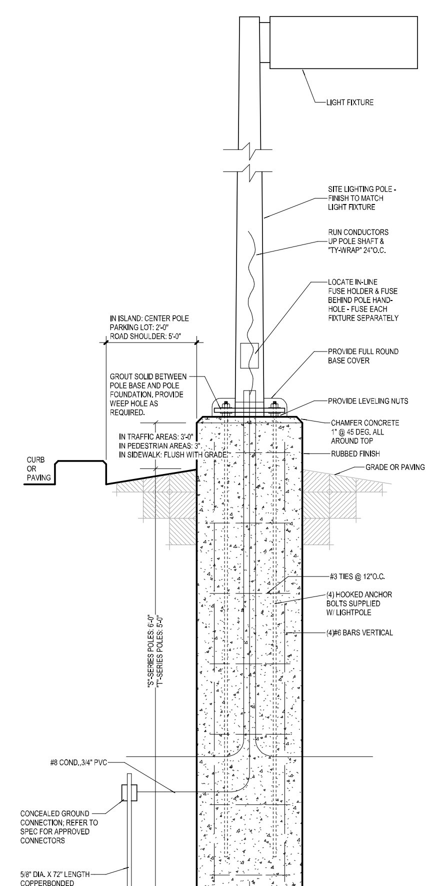
NEW 5TH - 6TH GRADE FACILITY
HUDSONVILLE PUBLIC SCHOOLS
HUDSONVILLE, MICHIGAN

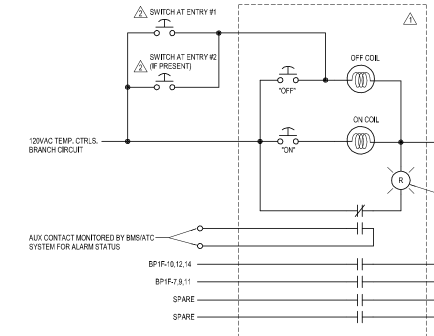


NOTES:
1. CONCRETE TO BE PLACED ON ONE FOOT OF PACKED WASHED GRAVEL OR PEA STONE.
2. CONCRETE = 4,000 PSI COMPRESSIVE STRENGTH AT 28 DAYS WITH AIR ENTRAINMENT.
3. GRADE OF REINFORCING RODS = ASTM A615: GRADE 60 O R 75.
4. TOLERANCES OVERALL DIMENSIONS AND PAD OPENING DIMENSIONS = 1/2".

10 / E7.01 TRANSFORMER/GENERATOR GROUNDING DETAIL
NOT TO SCALE



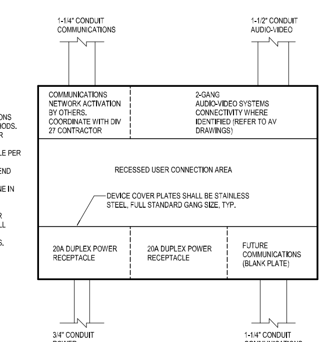
9 / E7.01 SITE LIGHTING POLE FOUNDATION
NOT TO SCALE



1. 30A, 4-POLE, MECHANICALLY-HELD CONTACTOR WITH 120VAC CONTROL COILS, MOMENTARY ON/OFF PUSH BUTTONS, ONE N.C. AND ONE N.O. AUX CONTACTS, RED LED PILOT LIGHT WIRED TO N.C. AUX CONTACT FOR "OFF" INDICATION. CUSTOM ENGRAVED DEVICE LABELS, NEMA 1 ENCLOSURE. PROVIDE ENGRAVED NAMEPLATE INDICATING "EMERGENCY BOILER SHUTDOWN".
2. RED MOMENTARY PUSHBUTTON SWITCH MOUNTED ON YELLOW POLYCARBONATE BODY, CLEAR POLYCARBONATE HINGED COVER, CUSTOM LABEL "BOILER SHUTDOWN". PROVIDE "STOPPER STATION" SERIES AS MFR'D BY SAFETY TECHNOLOGY INTL. INC., MODEL NO. SS2224ZA-EN OR APPROVED EQUIV. PROVIDE W/ MATCHING BACKBOX (MODEL NO. KIT-71101A-Y) FOR APPLICATIONS WITHOUT A RECESSED SWITCH BOX FOR MOUNTING

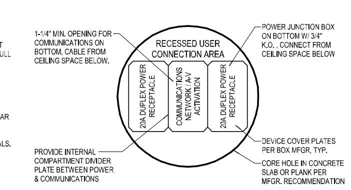
8 / E7.01 BOILER EMERGENCY SHUTDOWN CONTROL DETAIL
NOT TO SCALE

FLOOR BOX NOTES:
1. REFER TO SECTION 270528 "PATHWAYS FOR COMMUNICATIONS SYSTEMS" FOR ACCEPTABLE CONDUIT INSTALLATION METHODS. OBSERVE BEND RADIUS AND PULL BOX REQUIREMENTS PER CURRENT BICSI AND EIA/TIA STANDARDS.
2. PROVIDE TWO 20A GENERAL PURPOSE DUPLEX RECEPTACLE PER FLOOR BOX. REFER TO PLAN FOR CIRCUIT.
3. SIDE KNOCKOUTS SHOWN IN USE FOR REPRESENTATION. END AND BOTTOM KNOCKOUTS MAY BE USED AS NECESSARY.
4. ELECTRICAL CONTRACTOR SHALL PROVIDE NYLON PULL LINE IN ALL COMMUNICATIONS CONDUITS.
5. COORDINATE INSTALLATION WITH OTHER TRADES.
6. COMMUNICATIONS CONTRACTOR SHALL PROVIDE MODULAR FACEPLATES/FRAMES, JACKS, AND MODULE BLANKS FOR ALL UNUSED OPENINGS.
7. REFER TO SPEC'S FOR MANUFACTURER/MODEL APPROVALS. LAYOUT MAY VARY SLIGHTLY DEPENDING ON SELECTED PRODUCT; COORDINATE EXACT LAYOUT WITH ENGINEER.



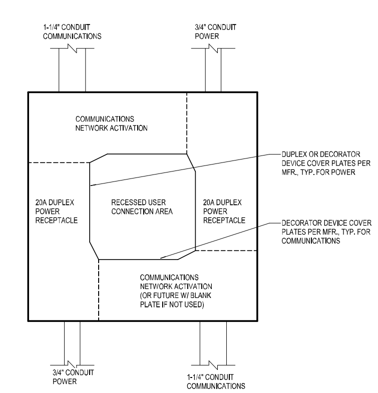
7 / E7.01 TYPE "FB3" FLOOR BOX CONFIGURATION
NOT TO SCALE

FLOOR BOX NOTES:
1. REFER TO SECTION 270528 "PATHWAYS FOR COMMUNICATIONS SYSTEMS" FOR ACCEPTABLE CONDUIT INSTALLATION METHODS. OBSERVE BEND RADIUS AND PULL BOX REQUIREMENTS PER CURRENT BICSI AND EIA/TIA STANDARDS.
2. PROVIDE TWO 20A GENERAL PURPOSE DUPLEX RECEPTACLE PER FLOOR BOX. REFER TO PLAN FOR CIRCUIT.
3. COORDINATE INSTALLATION WITH OTHER TRADES.
4. COMMUNICATIONS CONTRACTOR SHALL PROVIDE MODULAR FACEPLATES/FRAMES, JACKS, AND MODULE BLANKS FOR ALL UNUSED OPENINGS.
5. REFER TO SPEC'S FOR MANUFACTURER/MODEL APPROVALS, LAYOUT MAY VARY SLIGHTLY DEPENDING ON SELECTED PRODUCT; COORDINATE EXACT LAYOUT WITH ENGINEER.

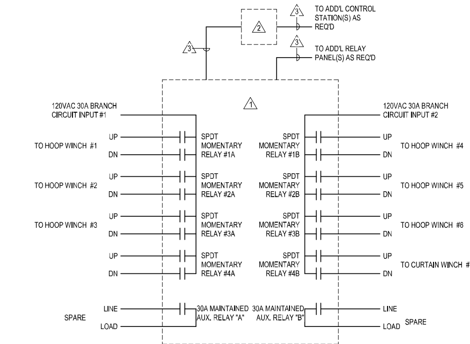


6 / E7.01 TYPE "FB2" FLOOR BOX CONFIGURATION
NOT TO SCALE

FLOOR BOX NOTES:
1. REFER TO SECTION 27 05 28 "PATHWAYS FOR COMMUNICATIONS SYSTEMS" FOR ACCEPTABLE CONDUIT INSTALLATION METHODS. OBSERVE BEND RADIUS AND PULL BOX REQUIREMENTS PER CURRENT BICSI AND EIA/TIA STANDARDS.
2. PROVIDE TWO 20A GENERAL PURPOSE DUPLEX RECEPTACLE PER FLOOR BOX. REFER TO PLAN FOR CIRCUIT.
3. SIDE KNOCKOUTS SHOWN IN USE FOR REPRESENTATION, END AND BOTTOM KNOCKOUTS MAY BE USED AS NECESSARY.
4. ELECTRICAL CONTRACTOR SHALL PROVIDE NYLON PULL LINE IN ALL COMMUNICATIONS CONDUITS.
5. COORDINATE INSTALLATION WITH OTHER TRADES.
6. COMMUNICATIONS CONTRACTOR SHALL PROVIDE MODULAR FACEPLATES/FRAMES, JACKS, AND MODULE BLANKS FOR ALL UNUSED OPENINGS.
7. REFER TO SPEC'S FOR MANUFACTURER/MODEL APPROVALS, LAYOUT MAY VARY SLIGHTLY DEPENDING ON SELECTED PRODUCT; COORDINATE EXACT LAYOUT WITH ENGINEER.

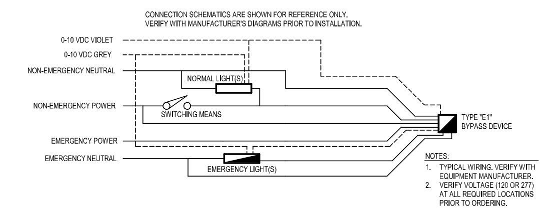


5 / E7.01 TYPE "FB1" FLOOR BOX CONFIGURATION
NOT TO SCALE

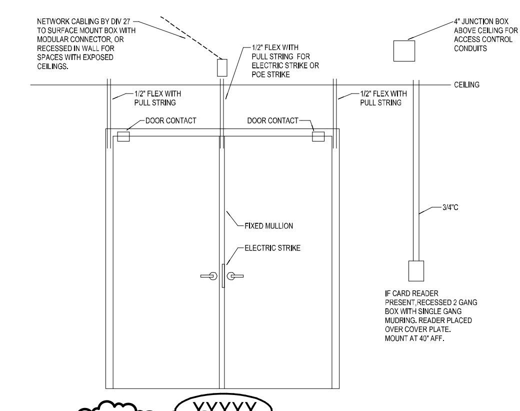


1. GYMNASIUM EQUIPMENT CONTROL SYSTEM RELAY PANEL, FURNISHED BY SECTION 11 66 23, INSTALLED AND WIRED BY ELEC. CONTRACTOR. WIRING CONNECTIONS ARE SHOWN FOR CONCEPT ONLY; REFER TO MANUFACTURER'S SHOP DRAWINGS FOR EXACT REQUIREMENTS AND WIRING ARRANGEMENTS.
2. GYMNASIUM EQUIPMENT CONTROL SYSTEM OPERATOR INTERFACE (KEYPAD OR TOUCHPANEL, AS SPEC'D), FURNISHED BY SECTION 11 66 23, INSTALLED AND WIRED BY ELEC. CONTRACTOR. MOUNT SEMI-FLUSH AT 44" AFF TO BOTTOM OF BOX WITHIN LINE OF SIGHT OF ALL EQUIPMENT TO BE CONTROLLED. REFER TO MANUFACTURER'S SHOP DRAWINGS FOR EXACT ROUGH-IN REQUIREMENTS.
3. CONTROL-VOLTAGE CABLE, FURNISHED AND WIRED BY ELEC. CONTRACTOR. REFER TO SECTION 26 05 23 FOR TYPICAL CABLE; REFER TO MANUFACTURER'S SHOP DRAWINGS TO CONFIRM EXACT CABLE TYPE REQ'D.

4 / E7.01 GYMNASIUM EQUIPMENT CONTROL SYSTEM DETAIL
NOT TO SCALE

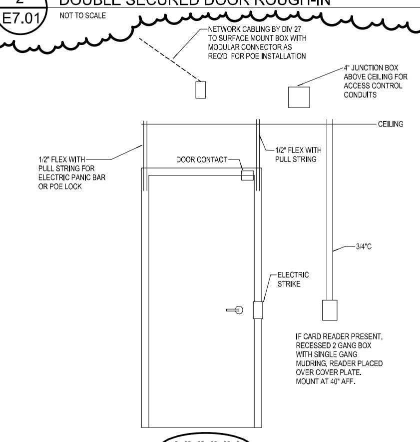


3 / E7.01 EMERGENCY LIGHTING AUTOMATIC LOAD CONTROL RELAY
NOT TO SCALE



NOTES:
1. SEE SPECIFICATIONS FOR SPECIFIC DOOR CONTROL DEVICES PER SECURED DOOR.
2. COORDINATE WITH ACCESS CONTROL CONTRACTOR AND SHOP DRAWINGS FOR SPECIFIC REQUIREMENTS.
3. WHERE POE DEVICES ARE SPECIFIED IN THE DOOR HARDWARE SCHEDULE, COORDINATE LOCATION OF ACTIVATION AS TO PREVENT TAMPERING WITH NETWORK CONNECTION TO HARDWARE.
4. REFER TO DOOR HARDWARE SCHEDULE FOR MORE INFORMATION.

2 / E7.01 DOUBLE SECURED DOOR ROUGH-IN
NOT TO SCALE



NOTES:
1. SEE SPECIFICATIONS FOR SPECIFIC DOOR CONTROL DEVICES PER SECURED DOOR.
2. COORDINATE WITH ACCESS CONTROL CONTRACTOR AND SHOP DRAWINGS FOR SPECIFIC REQUIREMENTS.
3. WHERE POE DEVICES ARE SPECIFIED IN THE DOOR HARDWARE SCHEDULE, COORDINATE LOCATION OF ACTIVATION AS TO PREVENT TAMPERING WITH NETWORK CONNECTION TO HARDWARE.
4. REFER TO DOOR HARDWARE SCHEDULE FOR MORE INFORMATION.

1 / E7.01 SINGLE SECURED DOOR ROUGH-IN
NOT TO SCALE

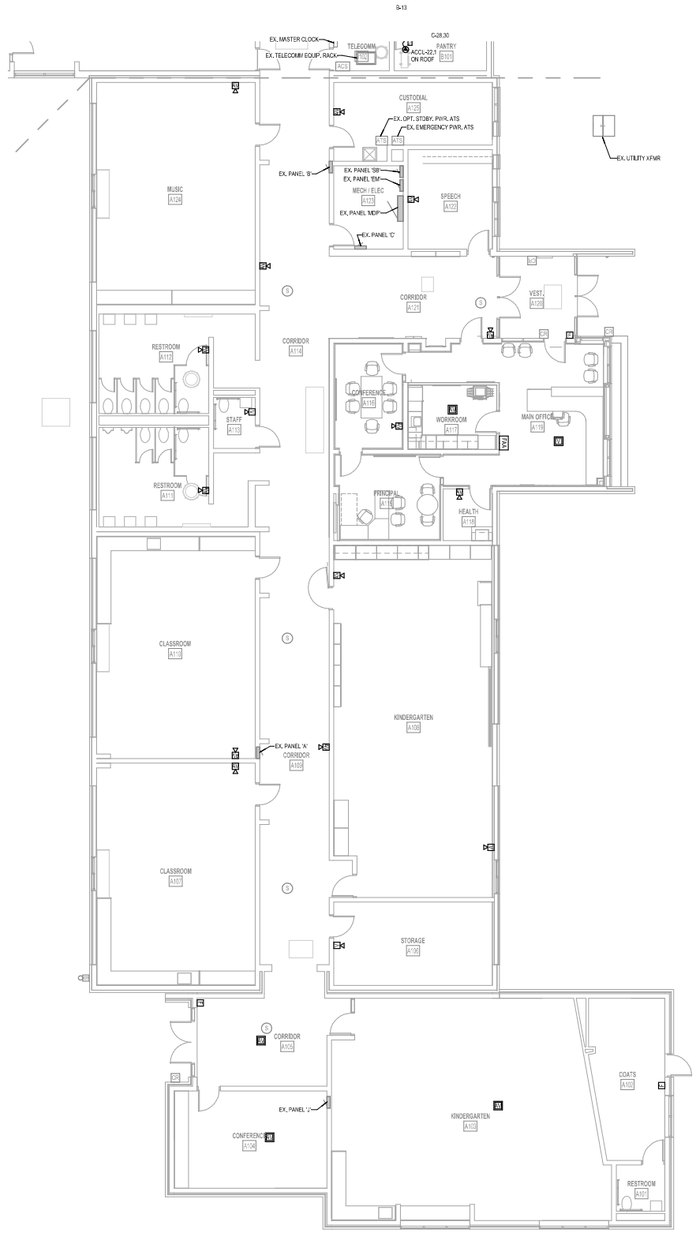
ISSUANCES

10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

ELECTRICAL DETAILS

E7.01



North

UNIT 'A' POWER PLAN

1/8" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. PROVIDE 120VAC POWER FOR ALL SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS.
   A. REFER TO MECHANICAL/HVAC DRAWINGS FOR EXACT LOCATIONS OF DAMPERS.
   B. CONNECT TO DEDICATED 20A BRANCH CIRCUIT (WITH BREAKER LOCK-ON ACCESSORY) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT).
   C. TERMINATE WI BOX-COVER FUSIBLE DISCONNECT SWITCH AT EACH DAMPER.
   D. PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET).
   E. PROVIDE FIRE ALARM ADDRESSABLE RELAY(S) FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT(S) PER CODE REQUIREMENTS.
4. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 10 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR (AND WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT). TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.
5. DESIGNATED CABLING PATHWAYS (CONDUITS, CABLE TRAYS, PENETRATION SLEEVES, ETC.) SHALL BE RESERVED FOR DIV. 27 COMMUNICATIONS CABLING AND DIV. 28 SAFETY/SECURITY CABLING ONLY. OTHER CABLING TYPES, SUCH AS DIV. 23 CONTROLS, DIV. 26 CONTROLS, AND ARCHITECTURAL EQUIPMENT CABLING SHALL BE SUPPORTED AND SLEEVED BY OTHER INDEPENDENT PATHWAYS, HANGERS, AND SUPPORTS.
6. CONCEDLEATE ALL POWER SUPPLIES REQUIRED FOR ELECTRONIC DOOR HARDWARE (REF. SECTION 08 71 00) TO CENTRAL LOCATION(S) ADJACENT TO DESIGNATED ACCESS CONTROL EQUIPMENT LOCATION(S). CONNECT ALL POWER SUPPLIES TO DEDICATED STANDBY POWER SYSTEM BRANCH CIRCUIT(S) AS DESIGNATED.
7. THE FOLLOWING DIV. 27 AND DIV. 28 SYSTEMS WILL BE DOCUMENTED AND BID SEPARATELY BY CONSULTANTS IN ASSOCIATION WITH HUDSONVILLE P.S. TECHNOLOGY DEPT.
   A. NETWORK ELECTRONICS (SWITCHES, ACCESS POINTS, ETC.)
   B. VOIP TELEPHONE SYSTEMS
   C. CLASSROOM AUDIO-VIDEO EQUIPMENT AND INSTRUCTIONAL TECHNOLOGY
   D. AUDIO-VIDEO SYSTEM FOR GYMNASIUM
   E. ACCESS CONTROL SYSTEM
   F. VIDEO SURVEILLANCE SYSTEM

North

KEYPLAN

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FOREST GROVE ELEMENTARY GYM ADDITION

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES

09.22.2021 BIDS & CONSTRUCTION

DRAWN MCK

REVIEWED JFB

PROJECT NO. 5-5362

UNIT 'A' POWER PLAN

E2.1A

BIM 360://5-5362 Hudsonville Forest Grove Elem Gym Addition/5-5362E 2019.rvt
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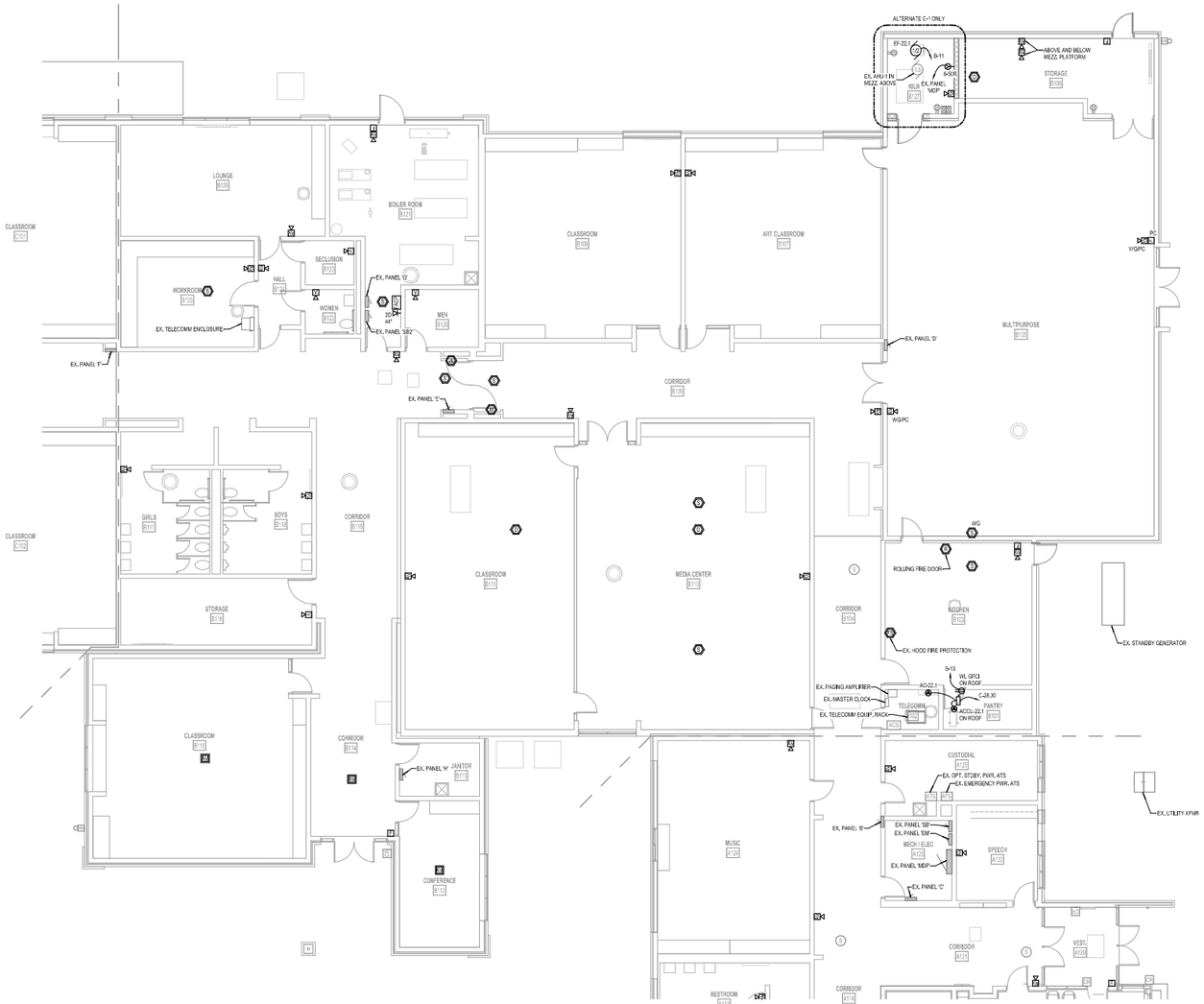
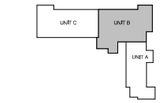


UNIT 'B' POWER PLAN

1/8" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. PROVIDE 120VAC POWER FOR ALL SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS.
   A. REFER TO MECHANICAL/HVAC DRAWINGS FOR EXACT LOCATIONS OF DAMPERS.
   B. CONNECT TO DEDICATED 20A BRANCH CIRCUIT (WITH BREAKER LOCK-ON ACCESSORY) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT).
   C. TERMINATE W/ BOX-COVER FUSIBLE DISCONNECT SWITCH AT EACH DAMPER.
   D. PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET).
   E. PROVIDE FIRE ALARM ADDRESSABLE RELAY(S) FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT(S) PER CODE REQUIREMENTS.
4. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.
5. DESIGNATED CABLING PATHWAYS (CONDUITS, CABLE TRAYS, PENETRATION SLEEVES, ETC.) SHALL BE RESERVED FOR DIV. 27 COMMUNICATIONS CABLING AND DIV. 28 SAFETY/SECURITY CABLING ONLY. OTHER CABLING TYPES, SUCH AS DIV. 23 CONTROLS, DIV. 26 CONTROLS, AND ARCHITECTURAL EQUIPMENT CABLING SHALL BE SUPPORTED AND SLEEVED BY OTHER INDEPENDENT PATHWAYS, HANGERS, AND SUPPORTS.
6. CONSOLIDATE ALL POWER SUPPLIES REQUIRED FOR ELECTRONIC DOOR HARDWARE (REF. SECTION 08 71 00) TO CENTRAL LOCATION(S) ADJACENT TO DESIGNATED ACCESS CONTROL EQUIPMENT LOCATION(S). CONNECT ALL POWER SUPPLIES TO DEDICATED 'STANDBY' POWER SYSTEM BRANCH CIRCUIT(S) AS DESIGNATED.
7. THE FOLLOWING DIV. 27 AND DIV. 28 SYSTEMS WILL BE DOCUMENTED AND BID SEPARATELY BY CONSULTANT IN ASSOCIATION WITH HUDSONVILLE P.S. TECHNOLOGY DEPT.:
   A. NETWORK ELECTRONICS (SWITCHES, ACCESS POINTS, ETC.)
   B. VOIP TELEPHONE SYSTEMS
   C. CLASSROOM AUDIO-VIDEO EQUIPMENT AND INSTRUCTIONAL TECHNOLOGY
   D. AUDIO-VIDEO SYSTEM FOR GYMNASIUM
   E. ACCESS CONTROL SYSTEM
   F. VIDEO SURVEILLANCE SYSTEM



KEYPLAN

GMB
616.796.0200
www.gmb.com

FOREST GROVE ELEMENTARY GYM ADDITION

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES

09.22.2021 BIDS & CONSTRUCTION

DRAWN MCK
REVIEWED JFB

PROJECT NO. 5-5362

UNIT 'B' POWER PLAN

E2.1B

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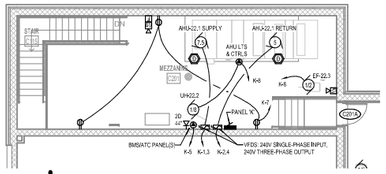
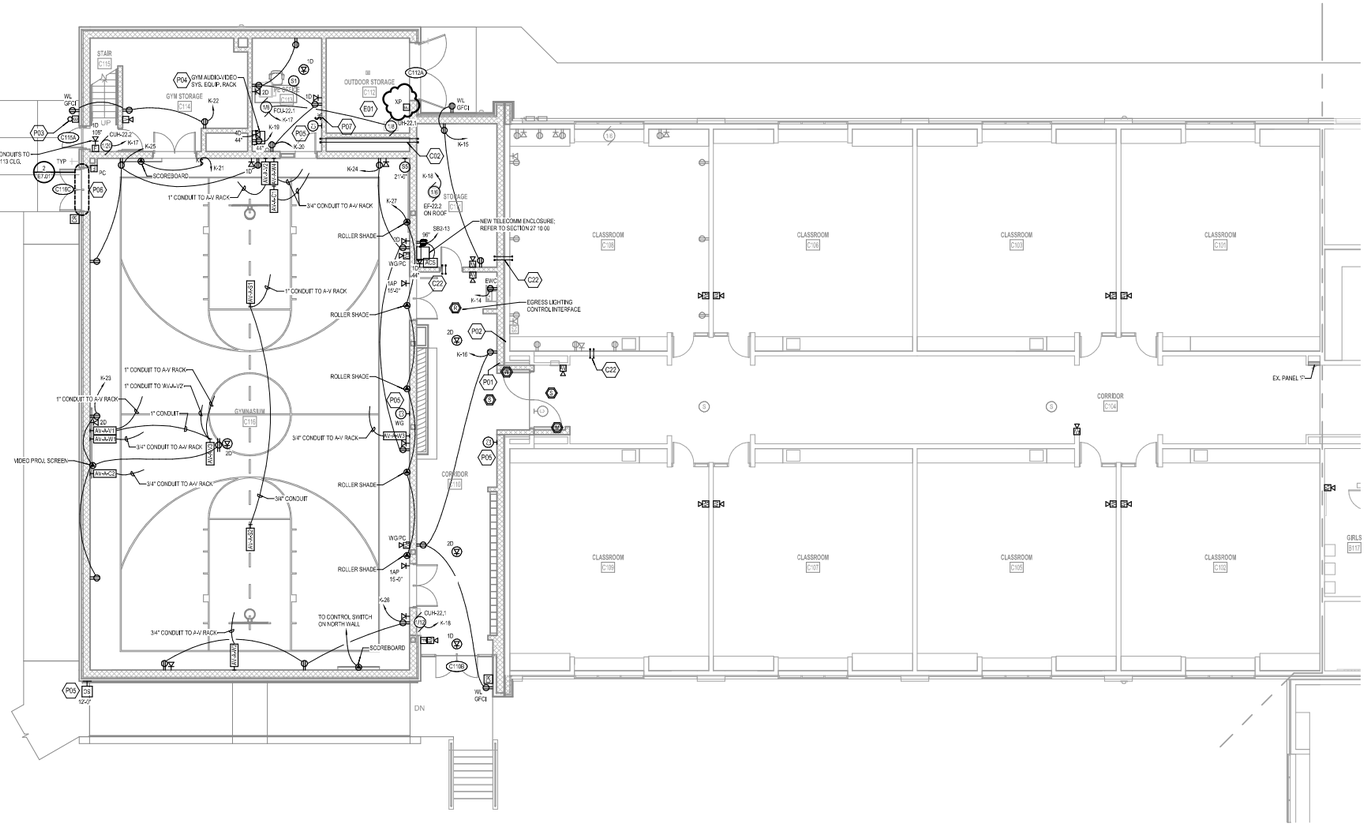


NORTH

MEZZANINE POWER PLAN

1/8" = 1'-0"



NORTH

UNIT 'C' POWER PLAN

1/8" = 1'-0"

AUDIO-VIDEO SYSTEMS BOX & CONNECTOR PLATE SCHEDULE

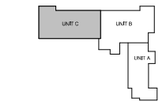
ITEM I.D. / TAG	ROUGH-IN OR ITEM SIZE	MOUNTING	LOCATION (HEIGHT TO BOTTOM OF BOX)	BOX & CONDUIT PROVIDED BY	CONNECTOR PLATE & WIRE/CABLE PROVIDED BY	SPECIAL NOTES
A/V-AC1	TWO GANG x 3 1/2" DEEP	FLUSH	44" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	A/V SYSTEM CONTROL TOUCHPANEL
A/V-AC2	SINGLE GANG x 3 1/2" DEEP	FLUSH	15'-9" AFF (VERIFY; SEE DETAIL)	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	PROJECTION SCREEN CONTROL
A/V-AS1	4" SQ. x 2 1/8" DEEP	SURFACE	SIDE OF ROOF JOIST JUST ABOVE BOTTOM CHORD (APPROX. 22'-0" AFF)	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	SPEAKER JUNCTION BOX
A/V-AS2	4" SQ. x 2 1/8" DEEP	SURFACE	SIDE OF ROOF JOIST JUST ABOVE BOTTOM CHORD (APPROX. 22'-0" AFF)	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	SPEAKER JUNCTION BOX
A/V-AV1	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	16" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	VIDEO INPUT(S)
A/V-AV2	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	16" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	VIDEO INPUT(S)
A/V-AV3	4" SQ. x 2 1/8" DEEP	SURFACE	SIDE OF ROOF JOIST JUST ABOVE BOTTOM CHORD (APPROX. 22'-0" AFF)	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	VIDEO PROJECTOR OUTPUT/CONTROL. VERIFY EXACT LOCATION OF PROJ. W/ INSTALLERS
A/V-AW1	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	16" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	AUDIO/VIDEO INPUT(S)
A/V-AW2	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	16" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	AUDIO/VIDEO INPUT(S)
A/V-AW3	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	16" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	AUDIO/VIDEO INPUT(S)
A/V-AW4	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	16" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	AUDIO/VIDEO INPUT(S)

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. PROVIDE 120VAC POWER FOR ALL SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS.
   A. REFER TO MECHANICAL/HVAC DRAWINGS FOR EXACT LOCATIONS OF DAMPERS.
   B. CONNECT TO DEDICATED 20A BRANCH CIRCUIT (WITH BREAKER LOCK-ON ACCESSORY) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT).
   C. TERMINATE W/ BOX-COVER FUSIBLE DISCONNECT SWITCH AT EACH DAMPER.
   D. PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET).
   E. PROVIDE FIRE ALARM ADDRESSABLE RELAY(S) FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT(S) PER CODE REQUIREMENTS.
4. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR (2ND WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.
5. DESIGNATED CABLING PATHWAYS (CONDUITS, CABLE TRAYS, PENETRATION SLEEVES, ETC.) SHALL BE RESERVED FOR DIV. 27 COMMUNICATIONS CABLING AND DIV. 28 SAFETY/SECURITY CABLING ONLY. OTHER CABLING TYPES, SUCH AS DIV. 23 CONTROLS, DIV. 26 CONTROLS, AND ARCHITECTURAL EQUIPMENT CABLING SHALL BE SUPPORTED AND SLEEVED BY OTHER INDEPENDENT PATHWAYS, HANGERS, AND SUPPORTS.
6. CONSOLIDATE ALL POWER SUPPLIES REQUIRED FOR ELECTRONIC DOOR HARDWARE (REF. SECTION 08 71 00) TO CENTRAL LOCATION(S) ADJACENT TO DESIGNATED ACCESS CONTROL EQUIPMENT LOCATION(S). CONNECT ALL POWER SUPPLIES TO DEDICATED 'STANDBY' POWER SYSTEM BRANCH CIRCUIT(S) AS DESIGNATED.
7. THE FOLLOWING DIV. 27 AND DIV. 28 SYSTEMS WILL BE DOCUMENTED AND BID SEPARATELY BY CONSULTANT IN ASSOCIATION WITH HUDSONVILLE P.S. TECHNOLOGY DEPT.:
   A. NETWORK ELECTRONICS (SWITCHES, ACCESS POINTS, ETC.)
   B. VOIP TELEPHONE SYSTEMS
   C. CLASSROOM AUDIO-VIDEO EQUIPMENT AND INSTRUCTIONAL TECHNOLOGY
   D. AUDIO-VIDEO SYSTEM FOR GYMNASIUM
   E. ACCESS CONTROL SYSTEM
   F. VIDEO SURVEILLANCE SYSTEM

ELECTRICAL KEYNOTES

C02	(2) 4" CONDUIT SLEEVES FOR DIV. 27 COMMUNICATIONS CABLING
C22	(2) 6.7 SQ. IN. CABLE PATHWAY PENETRATION DEVICE (FIRE) PER SECTION 27 05 28
E01	ALL ELECTRICAL MATERIALS AND INSTALLATION IN THIS ROOM SHALL COMPLY WITH NEC ARTICLE 500 HAZARDOUS LOCATION REQUIREMENTS FOR CLASS 1, DIVISION 1, GROUP C & D
P01	ESTABLISH NEW CONCRETE-ENCASED GROUNDING ELECTRODE IN FOOTING OF NEW ADDITION, INTERCONNECT WITH GROUNDING ELECTRODE SYSTEM AT SERVICE ENTRANCE OR NEAREST SEPARATELY-DERIVED SYSTEM PER NEC AND SPECIFICATION REQUIREMENTS.
P02	BOND METAL STRUCTURE OF ADDITION TO METAL STRUCTURE OF EXISTING BUILDING PER NEC REQUIREMENTS.
P03	RE-INSTALL EX. SIGNALING BELL SALVAGED FROM BUILDING EXTERIOR; INTERCEPT AND EXTEND EXIST. WIRING FROM PREVIOUS LOCATION AND RECONNECT TO RELOCATED BELL.
P04	INSTALL 8"W X 8"W X 6"D JUNCTION BOX BEHIND AUDIO EQUIP. RACK FOR A/V CONDUITS TO ENTER RACK WHILE RECESSED IN WALL. SURFACE-MOUNTED CONDUITS ARE NOT ACCEPTABLE ABOVE, BELOW, OR ON SIDES RACK. STUB AN ADDITIONAL (2) 1" CONDUITS OUT ABOVE ACCESSIBLE CEILING SPACE FROM BOX.
P05	PROVIDE '1D' NETWORK ACTIVATION FOR CONNECTION TO COMMUNICATIONS OR SAFETY/SECURITY DEVICE. TERMINATED INSIDE RECESSED DEVICE BACKBOX
P06	ROUTE ACCESS CONTROL CONDUITS FROM DOOR FRAME THROUGH WALL OVER TO STAIRWELL AND STUB OUT ABOVE 6'-0" AFF.
P07	ROLLER SHADE CONTROL FOR GYMNASIUM. KEY-OPERATED SWITCH FURNISHED BY SECTION 12 24 13. WIRED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS



NORTH

KEYPLAN

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FOREST GROVE ELEMENTARY GYM ADDITION
HUDSONVILLE PUBLIC SCHOOLS
HUDSONVILLE, MICHIGAN

ISSUANCES
09.22.2021 BIDS & CONSTRUCTION
11.16.2021 BULLETIN 001

DRAWN MCK
REVIEWED JFB
PROJECT NO. 5-5362

UNIT 'C' POWER PLAN

E2.1C

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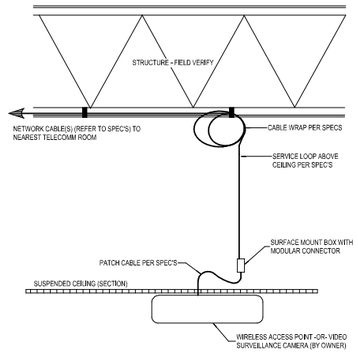
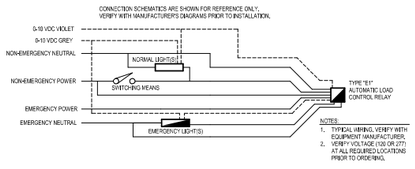
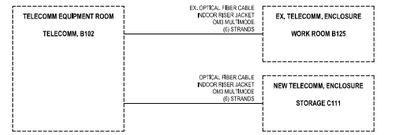


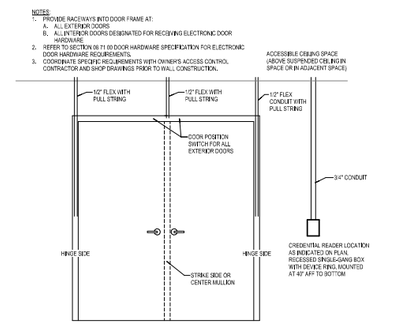
5 E7.01 CEILING MOUNTED COMMUNICATION DEVICE
NOT TO SCALE



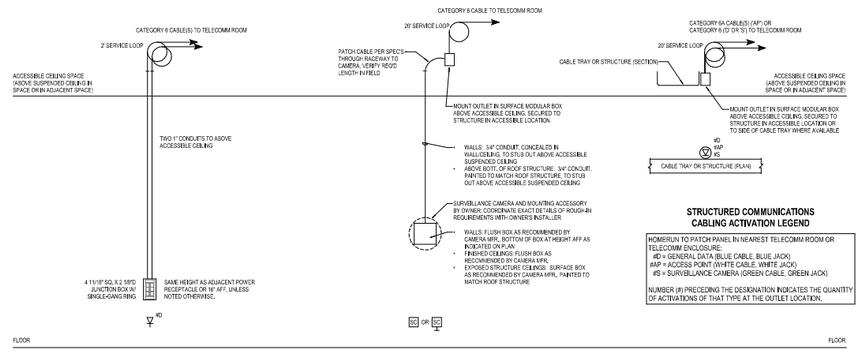
4 E7.01 EMERGENCY LIGHTING AUTOMATIC LOAD CONTROL RELAY
NOT TO SCALE

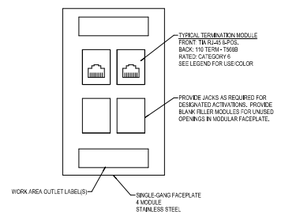


3 E7.01 COMMUNICATIONS CABLING BACKBONE RISER DIAGRAM
NOT TO SCALE

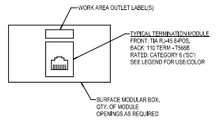


2 E7.01 TYPICAL ROUGH-IN FOR DOORS WITH ELECTRONIC ACCESS CONTROL / MONITORING
NOT TO SCALE

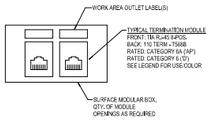




TYPICAL COMMUNICATIONS WALL OUTLET WITH '_D' OR '_AP' ACTIVATION



TYPICAL COMMUNICATIONS OUTLET FOR VIDEO SURVEILLANCE CAMERA



TYPICAL COMMUNICATIONS OUTLET ABOVE ACCESSIBLE CEILING (WIRELESS ACCESS POINT, AUDIO-VIDEO SYSTEM EQUIP., ETC.)

1 E7.01 TYPICAL COMMUNICATIONS OUTLET DETAILS
NOT TO SCALE

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ELECTRICAL DETAILS

E7.01

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ELECTRICAL ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	INTLK	INTERLOCK
BKR	BREAKER	JCT	JUNCTION
BOB	BOTTOM OF BOX	JB	JUNCTION BOX
BOS	BOTTOM OF STRUCTURE	KW	KILOWATT
BP	BREAKER PANEL	KWH	KILOWATT HOUR
BLDG	BUILDING	KO	KNOCK-OUT
CAP	CAPACITY	LBL	LABEL
CLG	CEILING	LT	LIGHT
CKT	CIRCUIT	LC	LIGHT CONTROL
CB	CIRCUIT BREAKER	LCM	LIGHTING CONTROL MODULE
C	CONDUIT	LCN	LIGHTING CONTROL NARRATIVE
COMM	COMMUNICATIONS	LTG	LIGHTING
CONN	CONNECTION	MAX	MAXIMUM
CONST	CONSTRUCTION	MCC	MOTOR CONTROL CENTER
CONTR	CONTRACT (OR)	MIN	MINIMUM
CLL	CONTRACT LIMIT LINE	MRS	MOTORIZED ROLLER SHADE
CT	CURRENT TRANSFORMER	NEC	NATIONAL ELECTRIC CODE
E.C.	ELECTRICAL CONTRACTOR	NEG	NEGATIVE (-)
EHD	ELECTRIC HAND DRYER	NC	NORMALLY CLOSED
ELEC	ELECTRIC (AL)	NO	NORMALLY OPEN
EWC	ELECTRIC WATER COOLER	N/A	NOT APPLICABLE
EM	EMERGENCY	NIC	NOT IN CONTRACT
ENT	ENTRANCE	NL	NIGHT LIGHT
EQ	EQUAL	PC	PHOTO CELL
EQUIP	EQUIPMENT	POS	POSITIVE (+)
EST	ESTIMATE	PWR	POWER
EF	EXHAUST FAN	P & L	POWER & LIGHTING
ETR	EXISTING TO REMAIN	S	SURFACE
EX	EXISTING	S.B.O.	SUPPLIED BY OTHERS
F	FLUSH	SP	SINGLE POLE
FA	FIRE ALARM	SPD	SURGE PROTECTION DEVICE
FSE	FOOD SERVICE EQUIPMENT	SPKR	SPEAKER
FP	FIRE PROOF / FIRE PROTECTION	SPEC	SPECIFICATION
FLR	FLOOR	SUB	SUBSTITUTE
FLUOR	FLUORESCENT	SWBD	SWITCHBOARD
GEN	GENERATOR	TEL	TELEPHONE
GFCI	GROUND FAULT CIRCUIT INTERRUPTER	TSTAT	THERMOSTAT
GRD	GROUND	XFMR	TRANSFORMER
HORIZ	HORIZONTAL	UG	UNDERGROUND
HTR	HEATER	UL	UNDERWRITERS LABORATORIES
HTG	HEATING	UH	UNIT HEATER
H/V	HEATING / VENTILATING	UNO	UNLESS NOTED OTHERWISE
HVAC	HEATING, VENTILATING, AIR CONDITIONING	VERT	VERTICAL
HOA	HAND-OFF-AUTOMATIC	W	WITH
HP	HEAT PUMP	W/O	WITHOUT
		WL	WET LOCATION
		WP	WEATHER PROOF

MAXIMUM CONDUCTOR LENGTHS FOR TYPICAL BRANCH CIRCUITS

FEET ONE-WAY BASED ON SINGLE PHASE, 20A CIRCUIT, 75% LOAD, 100% P.F., IN STEEL CONDUIT, 3% VOLTAGE DROP

CIRCUIT VOLTAGE	CONDUCTOR SIZE				
	#12 AWG	#10 AWG	#8 AWG	#6 AWG	#4 AWG
120	60	100	159	245	385
208	100	170	265	425	670
277	135	230	355	565	890
480	240	400	615	980	

FEET ONE-WAY BASED ON SINGLE PHASE, 30A CIRCUIT, 75% LOAD, 100% P.F., IN STEEL CONDUIT, 3% VOLTAGE DROP

CIRCUIT VOLTAGE	CONDUCTOR SIZE				
	#10 AWG	#8 AWG	#6 AWG	#4 AWG	
120	60	100	159	245	
208	100	170	265	425	670
277	135	230	355	565	890
480	240	400	615	980	

FEET ONE-WAY BASED ON THREE PHASE, 20A CIRCUIT, 75% LOAD, 100% P.F., IN STEEL CONDUIT, 3% VOLTAGE DROP

CIRCUIT VOLTAGE	CONDUCTOR SIZE				
	#12 AWG	#10 AWG	#8 AWG	#6 AWG	#4 AWG
208	120	200	385	490	775
480	275	460	710	1,130	

FEET ONE-WAY BASED ON THREE PHASE, 30A CIRCUIT, 75% LOAD, 100% P.F., IN STEEL CONDUIT, 3% VOLTAGE DROP

CIRCUIT VOLTAGE	CONDUCTOR SIZE			
	#10 AWG	#8 AWG	#6 AWG	#4 AWG
208	120	200	305	490
480	275	460	710	1,130

Section 28 23 00 - Video Monitoring System

COMMUNICATIONS SYMBOL LEGEND

- COMMUNICATIONS OUTLET ROUGH-IN
- COMMUNICATIONS OUTLET, ONE DATA ACTIVATION
- COMMUNICATIONS OUTLET, CEILING MOUNTED
- COMMUNICATIONS OUTLET, FLOOR MOUNTED
- CEILING MOUNTED VIDEO PROJECTOR
- COMMUNICATIONS EQUIPMENT RACK, FLOOR MOUNTED
- COMMUNICATIONS EQUIPMENT RACK, WALL MOUNTED
- CONDUIT SLEEVE FOR COMMUNICATIONS CABLING, 2" TYP, UNLESS NOTED OTHERWISE
- LOUDSPEAKER, CEILING MOUNTED, DEVICE FURNISHED AND INSTALLED BY OWNER'S TECHNOLOGY CONTRACTOR
- LOUDSPEAKER, WALL MOUNTED, DEVICE FURNISHED AND INSTALLED BY OWNER'S TECHNOLOGY CONTRACTOR
- INTERCOM SYSTEM CALL STATION BUTTON
- VOLUME CONTROL FOR AUDIO SYSTEM, PAGING, OR INTERCOM LOUDSPEAKERS
- SECONDARY CLOCK, CEILING MOUNTED, DEVICE FURNISHED AND INSTALLED BY OWNER'S TECHNOLOGY CONTRACTOR
- SECONDARY CLOCK, WALL MOUNTED, DEVICE FURNISHED AND INSTALLED BY OWNER'S TECHNOLOGY CONTRACTOR

NOTE: NOT ALL SYMBOLS ARE NECESSARILY USED

ELECTRONIC SAFETY / SECURITY SYMBOL LEGEND

- DOOR CONTACT
- ELECTRONIC LATCH
- ELECTRONIC STRIKE
- PUSH BUTTON LOCK
- WALL-MOUNTED SURVEILLANCE CAMERA COMMUNICATIONS ROUGH-IN
- CEILING-MOUNTED SURVEILLANCE CAMERA COMMUNICATIONS ROUGH-IN
- CARD READER
- ACCESS CONTROL DOOR TAG, REFER TO HARDWARE SCHEDULE(S)IN SPECIFICATION 08 71 00 AND/OR 28 13 00 FOR DETAILS.
- ACCESS CONTROL SYSTEM EQUIPMENT

NOTE: NOT ALL SYMBOLS ARE NECESSARILY USED

POWER SYMBOL LEGEND

- THREE PHASE MOTOR CONNECTION, 5 HORSE POWER
- SINGLE PHASE MOTOR CONNECTION, 1/2 HORSE POWER
- SAFETY SWITCH DISCONNECTING MEANS, NOT FUSIBLE
- SAFETY SWITCH DISCONNECTING MEANS, FUSIBLE
- COMBINATION MOTOR STARTER AND FUSIBLE DISCONNECTING MEANS
- VARIABLE FREQUENCY DRIVE WITH INTEGRAL DISCONNECTING MEANS
- MOTOR STARTER
- BOX-COVER FUSIBLE DISCONNECT SWITCH
- MANUAL MOTOR CONTROLLER
- POWER SWITCH, REFER TO LIGHTING SYMBOL LEGEND FOR SIMILAR SWITCH TYPES
- DIRECT ELECTRICAL CONNECTION
- SINGLE RECEPTACLE
- SINGLE RECEPTACLE, FLOOR-MOUNTED
- DUPLEX RECEPTACLE
- WHERE "WL" IS NOTED PROVIDE WHILE-IN-USE WET LOCATION COVER AND WEATHER RESISTANT DUPLEX RECEPTACLE.
- SURFACE MOUNTED RECEPTACLE
- "T" TAG ON DEVICE INDICATES REPLACEMENT OF DEVICE USING EXISTING ROUGH-IN
- DUPLEX RECEPTACLE, CEILING-MOUNTED
- DUPLEX RECEPTACLE, FLOOR-MOUNTED
- DUPLEX STANDBY POWER RECEPTACLE
- DUPLEX SPLIT WIRED RECEPTACLE
- DUPLEX GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE
- QUADRUPLEX RECEPTACLE
- QUADRUPLEX RECEPTACLE, CEILING-MOUNTED
- QUADRUPLEX RECEPTACLE, FLOOR-MOUNTED
- MULTI-PHASE RECEPTACLE, SEE PLAN FOR TYPE
- MULTI-PHASE RECEPTACLE, FLOOR-MOUNTED
- SURFACE RACEWAY SYSTEM
- AUTOMATIC TRANSFER SWITCH
- SWITCHBOARD
- PANELBOARD
- TRANSFORMER
- MOTOR CONTROL CENTER
- EMERGENCY STOP STATION, REFER TO DETAIL FOR REQUIREMENTS.
- AUTOMATIC DOOR OPERATOR PUSH-BUTTON
- ON/OFF PUSH-BUTTON
- THREE-FUNCTION PUSH BUTTON
- FLOORBOX, TYPE 1
- JUNCTION BOX
- METER
- THERMOSTAT ROUGH-IN
- RELAY
- ENCLOSED CONTROL CONTACTOR

NOTE: NOT ALL SYMBOLS ARE NECESSARILY USED

LIGHTING SYMBOL LEGEND

- SINGLE POLE LIGHT SWITCH
- DOUBLE POLE LIGHT SWITCH
- THREE-WAY LIGHT SWITCH
- FOUR-WAY LIGHT SWITCH
- SINGLE POLE LIGHT SWITCH WITH INTEGRAL OCCUPANCY SENSOR
- OCCUPANCY SENSOR DIMMER
- WALL-BOX DIMMER SWITCH
- THREE-WAY DIMMER SWITCH
- ELECTRONIC INTERVAL TIMER SWITCH
- LIGHT SWITCH WITH PILOT LIGHT
- LIGHTING CONTROL SYSTEM, REFER TO LIGHTING CONTROL SWITCH SCHEDULE AND SPECIFICATIONS FOR DETAILS.
- DOUBLE THROW (MAINTAINED) LIGHT SWITCH
- KEY-OPERATED LIGHT SWITCH - (SUFFIX DESIGNATION | BLANK: SINGLE POLE, 2: DOUBLE POLE, 3: THREE-WAY, 4: FOUR-WAY)
- LOCKING SWITCH - (SUFFIX DESIGNATION | BLANK: SINGLE POLE, 2: DOUBLE POLE, 3: THREE-WAY, 4: FOUR-WAY)
- TOUCHSCREEN PANEL
- CIRCUIT NUMBER FOR LIGHT FIXTURES WITH INDICATED SPACE
- WALL-MOUNTED LIGHTING FIXTURE, TYPE 'A'
- RECESSED LIGHTING FIXTURE, TYPE 'A'
- SURFACE-MOUNTED LIGHTING FIXTURE, TYPE 'A'
- TRACK LIGHTING
- SINGLE FACE EXIT SIGN, TYPE "X1" IN SCHEDULE UNLESS OTHERWISE NOTED. SHADING INDICATES FACE ORIENTATION
- DOUBLE FACE EXIT SIGN, TYPE "X2" IN SCHEDULE UNLESS OTHERWISE NOTED. SHADING INDICATES FACE ORIENTATION
- WALL-MOUNTED EXIT SIGN
- EMERGENCY LIGHT FIXTURE DESIGNATION
- EMERGENCY LIGHTING AUTOMATIC LOAD CONTROL RELAY
- LIGHTING CONTROL RELAY
- LIGHTING CONTROL ENCLOSED CONTACTOR
- TRUE SWITCH
- LIGHTING CONTROL MODULE
- EMERGENCY LIGHTING INVERTER, TYPE 1
- WALL-MOUNTED OCCUPANCY SENSOR
- CEILING-MOUNTED OCCUPANCY SENSOR
- WALL-MOUNTED PHOTOCELL FOR ON/OFF CONTROL
- CEILING-MOUNTED PHOTOCELL FOR ON/OFF CONTROL
- WALL-MOUNTED PHOTOSENSOR FOR DAYLIGHT HARVESTING DIMMING CONTROL
- CEILING-MOUNTED PHOTOSENSOR FOR DAYLIGHT HARVESTING DIMMING CONTROL
- POLE-MOUNTED SITE/AREA FIXTURE
- SELF-CONTAINED EMERGENCY LIGHTING UNIT

NOTE: NOT ALL SYMBOLS ARE NECESSARILY USED

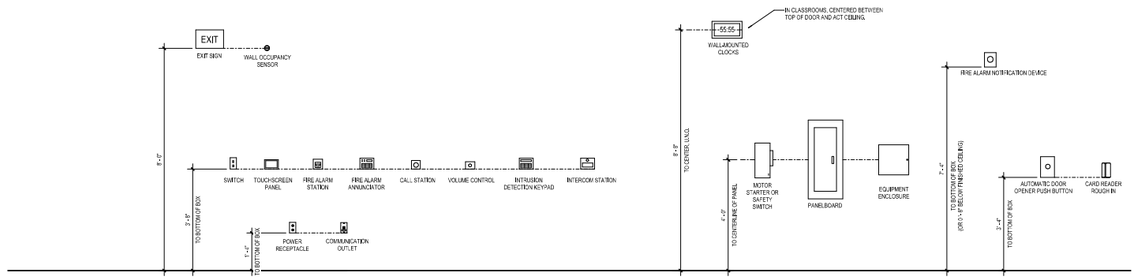
FIRE ALARM SYMBOL LEGEND

- MANUAL PULL STATION
- AUDIBLE NOTIFICATION APPLIANCE, WALL-MOUNTED
- VISUAL NOTIFICATION APPLIANCE, WALL-MOUNTED
- AUDIBLE/VISUAL NOTIFICATION APPLIANCE, WALL-MOUNTED
- AUDIBLE NOTIFICATION APPLIANCE, CEILING-MOUNTED
- AUDIBLE/VISUAL NOTIFICATION APPLIANCE, CEILING-MOUNTED
- VISUAL NOTIFICATION APPLIANCE, CEILING-MOUNTED
- WHERE "WG/PC" IS NOTED, PROVIDE LISTED WIRE GUARD OR PROTECTIVE POLYCARBONATE COVER FOR NOTIFICATION DEVICE.
- WHERE "WL" IS NOTED, PROVIDE LISTED WET-LOCATION NOTIFICATION DEVICE, SUITABLE FOR INDOOR OR OUTDOOR USE.
- SMOKE DETECTOR
- HEAT DETECTOR
- DUCT SMOKE DETECTOR
- SMOKE DAMPER OPERATOR MOTOR
- FIRE PROTECTION FLOW SWITCH
- FIRE PROTECTION TAMPER SWITCH
- ELECTROMAGNETIC DOOR HOLD-OPEN DEVICE
- ADDRESSABLE RELAY FOR FIRE ALARM CONTROL
- PRESSURE SWITCH
- CARBON MONOXIDE DETECTOR
- NOTIFICATION APPLIANCE CONTROL PANEL
- FIRE ALARM REMOTE ANNUNCIATOR
- FIRE ALARM CONTROL PANEL
- KEYED TEST SWITCH AND REMOTE INDICATOR FOR DUCT SMOKE DETECTOR
- FIRE PROTECTION OR ALARM BELL

NOTE: NOT ALL SYMBOLS ARE NECESSARILY USED

ELECTRICAL GENERAL NOTES

1. ALL WORK SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE AS AMENDED AND ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION WHERE THE WORK IS PERFORMED.
2. ALL "LOW-VOLTAGE" CONTROLS, COMMUNICATIONS, AND SAFETY/SECURITY CABLING MAY BE INSTALLED WITHOUT CONDUIT, RACEWAY, OR CABLE TRAY ONLY WHERE CONCEALED ABOVE A SUSPENDED CEILING SYSTEM AND ACCESSIBLE FOR FUTURE MAINTENANCE; OTHERWISE, ALL CABLING (INCLUDING BUT NOT LIMITED TO CABLES ASSOCIATED WITH SYSTEMS SUCH AS ARCHITECTURAL EQUIPMENT, BUILDING ENERGY MANAGEMENT, TEMPERATURE CONTROLS, LIGHTING CONTROLS, COMMUNICATIONS NETWORKS, TELEPHONE, AUDIO-VIDEO, INTERCOM, PAGING, CLOCK, SURVEILLANCE, ACCESS CONTROL, FIRE ALARM, ETC.) SHALL BE INSTALLED IN AN APPROVED CONDUIT, RACEWAY SYSTEM, AND/OR CABLE TRAY UNLESS OTHERWISE NOTED. IN EXPOSED STRUCTURE CEILING AREAS, CONCEALED INSTALLATION OF CABLES IN RACEWAYS SHALL BE REQUIRED FOR AESTHETIC REASONS. REFER TO REFLECTED CEILING PLANS FOR LOCATIONS. THIS APPLIES TO ALL TRADES AND WORK CATEGORIES. EXCEPTIONS:
   A. DEDICATED MECHANICAL AND/OR ELECTRICAL ROOMS ABOVE EACH APP.
   B. DEDICATED TELECOMMUNICATIONS ROOMS
3. "LOW-VOLTAGE" CONTROLS, COMMUNICATIONS, AND SAFETY/SECURITY CABLING SHALL NOT BE PAINTED. PAINTING CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARY PROTECTION OF ANY EXISTING CABLING PRIOR TO PAINTING EXISTING AREAS. CONTRACTORS INSTALLING CABLING WHERE APPROVED FOR EXPOSED INSTALLATION SHALL INSTALL CABLES AFTER PAINTING HAS BEEN COMPLETED OR PROVIDE TEMPORARY PROTECTION OF CABLES UNTIL PAINTING HAS BEEN COMPLETED. PAINTED CABLES SHALL BE REPLACED AT THE EXPENSE OF THE NEGLIGENT CONTRACTOR.
4. METAL CLAD CABLE MAY BE USED FOR FIXTURE WHIPS IN LENGTHS OF 6 FEET OR LESS ABOVE AN ACCESSIBLE SUSPENDED CEILING SYSTEM ONLY, OTHERWISE METAL CLAD OR OTHER FLEXIBLE CABLE TYPES SHALL NOT BE USED UNLESS SPECIFICALLY AUTHORIZED BY THE ENGINEER (IT IS THE INTENT OF THESE CONTRACT DOCUMENTS THAT ALL INSTALLED BRANCH CIRCUITS CONSIST OF SEPARATE RACEWAY AND CONDUCTORS ALLOWING REMOVAL AND REPLACEMENT OF WIRING AS REQUIRED FOR FUTURE UPGRADES). REFER TO SPECIFICATIONS FOR EXCEPTIONS.
5. CIRCUIT WIRING FOR ARTICLE 700 EMERGENCY SYSTEMS AND ARTICLE 708 CRITICAL OPERATIONS POWER SYSTEMS SHALL BE INSTALLED IN SEPARATE CONDUIT/RACEWAYS AND BE KEPT ENTIRELY INDEPENDENT OF ALL OTHER WIRING AND EQUIPMENT PER NEC REQUIREMENTS.
6. ALL FEEDERS AND BRANCH CIRCUITS SHALL CONTAIN AN EQUIPMENT GROUNDING CONDUCTOR SIZED ACCORDING TO THE NEC RACEWAYS INCLUDING CONDUITS, BOXES, WIREWAYS, ETC. SHALL NOT BE CONSIDERED AN ACCEPTABLE GROUND.
7. CONDUITS AND CABLING SHALL NOT BE INSTALLED WITHIN 4" OF ROOF DECK, EXCEPT AS NECESSARY TO SERVE ROOF-MOUNTED ITEMS AND ONLY WHEN THE CONDUIT OR CABLE IS ROUTED VERTICALLY TO SUCH EQUIPMENT FROM BELOW.
8. SUPPLEMENTAL METAL FRAMING SHALL BE PROVIDED FOR SUSPENSION POINTS OF ALL ITEMS LOCATED BETWEEN OVERHEAD STRUCTURAL MEMBERS (JOISTS, TRUSSES, BEAMS, ETC.) IN OPEN ASSEMBLE STRUCTURE CEILING AREAS. METAL FRAMING SHALL SPAN ACROSS THE TOP CHORD OR FLANGE OF THE STRUCTURAL MEMBERS FOR BOTH STRUCTURAL AND AESTHETIC PURPOSES. SPECIFIC EXCEPTIONS SHALL BE COORDINATED IN WRITING WITH THE ARCHITECT/ENGINEER.
9. CONDUIT INSTALLED WITHIN INACCESSIBLE CONSTRUCTION SHALL BE 3/4" MINIMUM SIZE.
10. FEEDERS SHOWN ON DRAWINGS ARE SCHEMATIC ONLY. CONDUIT RUNS SHALL COMPLY WITH CONDUIT SPECIFICATIONS AND CONTAIN BENDS THAT ARE NO GREATER THAN 90 DEGREES. CONDUITS INSTALLED ABOVE GRADE SHALL BE RUN PARALLEL TO, OR PERPENDICULAR WITH, BUILDING STEEL AND/OR ARCHITECTURAL LINES.
11. CONTRACTOR(S) SHALL VERIFY COLOR FINISH OF WIRING DEVICES, DEVICE FACEPLATES, SURFACE RACEWAY SYSTEMS, AND/OR MULTI-OUTLET ASSEMBLIES WITH ARCHITECT/ENGINEER IF NOT EXPLICITLY SPECIFIED.
12. ELECTRICAL CONTRACTOR SHALL REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR ADDITIONAL LIGHTING FIXTURE INFORMATION AND MOUNTING LOCATIONS.
13. ELECTRICAL CONTRACTOR SHALL ADJUST LIGHTING FIXTURE LOCATIONS IN MECHANICAL ROOMS TO ACCOMMODATE MECHANICAL EQUIPMENT AND FIELD CONDITIONS.
14. CONTRACTOR(S) SHALL BE RESPONSIBLE TO REVIEW INTERIOR ELEVATION SHEETS FOR PLACEMENT OF DEVICE BOXES. COORDINATE LOCATIONS SO TV-AT NO DEVICES ARE INSTALLED BEHIND CASEWORK, MILLWORK, VISUAL DISPLAY BOARDS, MIRRORS, CUSTOM GRAPHICS, SIGNAGE, ETC.
15. ELECTRICAL CONTRACTOR SHALL REVIEW TOILET EQUIPMENT SHOP DRAWINGS AND ARCHITECTURAL DETAILS/ELEVATIONS FOR CORRECT DEVICE ROUGH-IN LOCATION OF HAND DRYERS.
16. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH PLUMBING CONTRACTOR AND THE ELECTRIC WATER COOLER / BOTTLE FILLER SHOP DRAWINGS FOR MOUNTING HEIGHT AND CONNECTION METHOD OF PLUMBING EQUIPMENT POWER CONNECTIONS. WHERE ACCESSIBLE GFCI PROTECTION SHALL BE PROVIDED FOR THE BRANCH CIRCUIT(S) SUPPLYING ALL SUCH UNITS PER NEC REQUIREMENTS.
17. REFER TO MECHANICAL EQUIPMENT SCHEDULE FOR DETAILED INFORMATION REGARDING EQUIPMENT AND CONTROL. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING AND PROVIDING ITEMS AS SPECIFICALLY LISTED AND ASSIGNED ON MECHANICAL EQUIPMENT SCHEDULE SUCH AS DISCONNECT SWITCHES, VARIABLE FREQUENCY DRIVES, STARTERS, TIMERS, SWITCHES, ETC.
18. ELECTRICAL CONTRACTOR SHALL CONFIRM THE LOCATION OF THE EXHAUST FANS LISTED IN THE MECHANICAL EQUIPMENT SCHEDULES BY REFERRING TO MECHANICAL/HVAC PLANS.
19. REFER TO ROOF PLANS FOR EXACT LOCATIONS OF ROOF-TOP MECHANICAL EQUIPMENT.
20. CABINET HEATERS MAY HAVE LINE VOLTAGE THERMOSTATS SUPPLIED BY MECHANICAL CONTRACTOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR. REFER TO MECHANICAL EQUIPMENT SCHEDULE.
21. DIVISION 26 CONTRACTOR SHALL PROVIDE CONDUIT SLEEVES WITH APPROPRIATE BUSHINGS FOR CONTROLS AND ELECTRONIC SAFETY/SECURITY CABLING THROUGH WALLS AND FLOORS. SLEEVE SIZES SHALL BE COORDINATED WITH CABLING REQUIREMENTS.
22. SECTION 27 05 28 CONTRACTOR SHALL PROVIDE CONDUIT SLEEVES WITH APPROPRIATE BUSHINGS FOR COMMUNICATIONS CABLING THROUGH WALLS AND FLOORS. SLEEVE SIZE SHALL BE 2" MIN. UNLESS NOTED OTHERWISE.
23. PROVIDE DIRECT CONNECTIONS FROM LOCAL RECEPTACLE CIRCUIT TO ACCESS CONTROL SYSTEM AND DOOR HARDWARE POWER SUPPLIES WHERE REQUIRED FOR DOOR LOCK DEVICES, CONTROLLERS, ETC. REFER TO DOOR HARDWARE SCHEDULE AND ACCESS CONTROL SYSTEM SCHEDULE IN RESPECTIVE SPECIFICATIONS FOR QUANTITIES AND LOCATIONS.



NOTE: ALL HEIGHTS ARE AS SHOWN UNLESS NOTED OTHERWISE.

TYPICAL MOUNTING HEIGHTS FOR WALL DEVICES, EQUIPMENT, & FIXTURES

NOT TO SCALE

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NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES

10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001

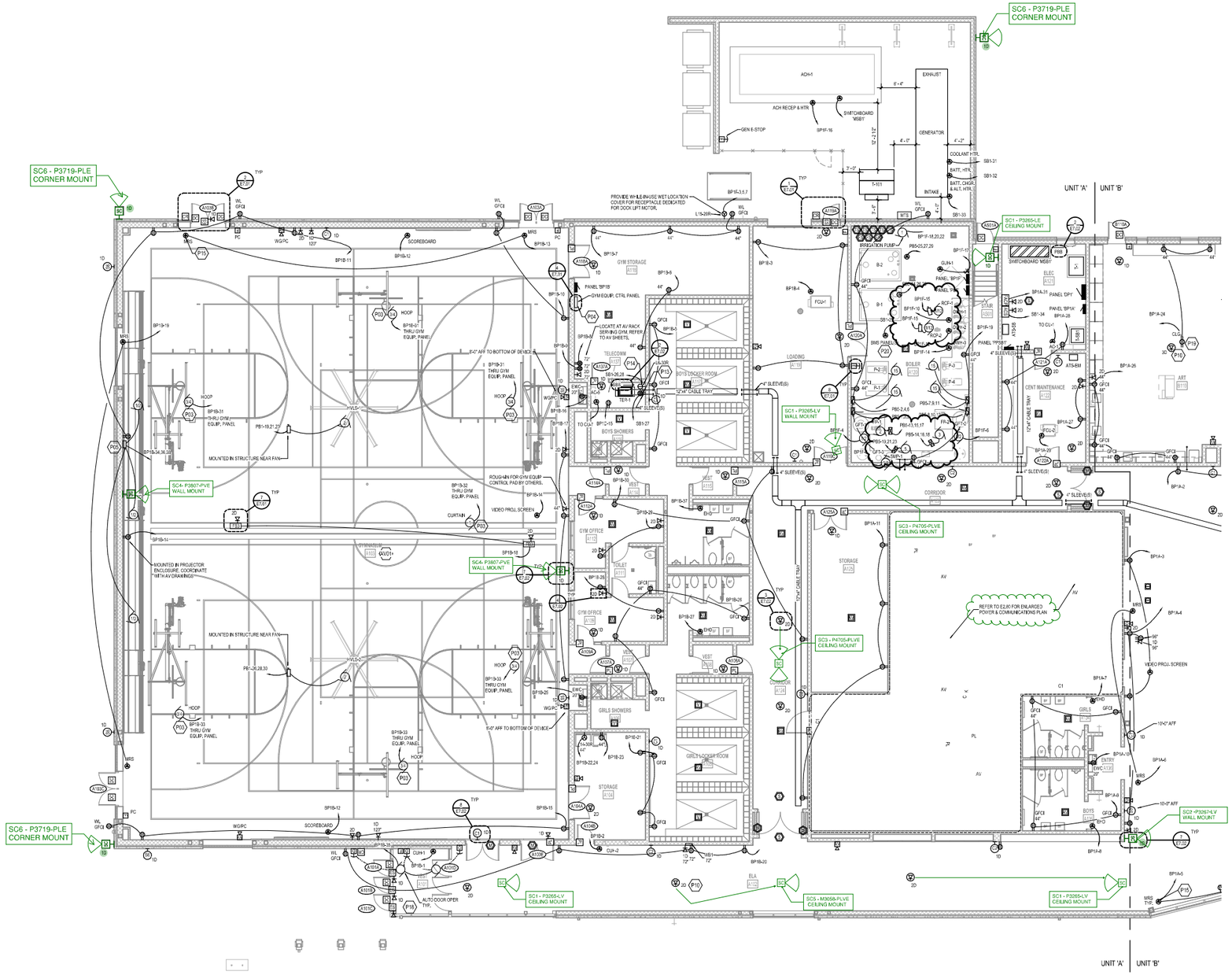
DRAWN JFB

REVIEWED AAB

PROJECT NO. 5-5065

ELECTRICAL SYMBOL LEGENDS & GENERAL NOTES

E0.01



UNIT 'A' FIRST FLOOR POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20A/1P BRANCH CIRCUIT (WITH BREAKER LOCKING MECHANISM) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT), TERMINATED W/ BOX-COVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES, AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE. INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT. REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.6
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

ELECTRICAL KEYNOTES

⬡	ELECTRICAL KEYNOTES
AV01	REFER TO AV DRAWINGS FOR ADDITIONAL SCOPE. COORDINATE ALL ROUGH-IN LOCATIONS WITH AV DRAWINGS.
P03	E.C. SHALL PROVIDE AND INSTALL 4" SQUARE JUNCTION BOX WITHIN 3'-0" OF WINCH LOCATION FOR TWIST-LOCK RECEPTACLE. TWIST LOCK RECEPTACLE AND COVER PROVIDED BY EQUIPMENT PROVIDER. (1) HOOK-UP REQUIRED PER DEVICE. REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR FURTHER DETAILS.
P04	8-RELAY GYM EQUIPMENT CONTROL PANEL REQUIRED TO SUPPORT (6) HOOP WINCH MOTORS AND (1) DIVIDER CURTAIN MOTOR. USE (1) RELAY PER DEVICE. POWER EACH PANEL WITH (2) 120V SINGLE PHSE CIRCUITS AS INDICATED IN PANEL SCHEDULE. REFER TO MANUFACTURER INSTRUCTIONS FOR FURTHER DETAILS.
P05	E.C. SHALL PROVIDE AND INSTALL NON-FUSIBLE SAFETY SWITCHES FOR BLEACHER MOTOR. JUNCTION BOX SHALL BE MOUNTED AT 5'-0" AFF. COORDINATE LOCATION WITH EQUIPMENT PROVIDER. REFER TO BLEACHER DETAILS ON ARCHITECTURE SHEETS FOR FURTHER DETAILS.
P10	ALL LOW VOLTAGE CABLING TO BE IN CONDUIT IN SPACES WITH EXPOSED CEILINGS. PRIOR TO INSTALL, COORDINATE EXACT LOCATION OF NETWORK ACTIVATIONS WITH OWNER'S TECHNOLOGY CONTRACTOR (FOR ACCESS POINTS, SECURITY CAMERAS, AV EQUIPMENT, ETC.). TERMINATE CABLING IN SURFACE MOUNT BOX WITH MODULAR CONNECTOR INSIDE JUNCITON BOX, PROVIDE BLANK FACEPLATE FOR UNUSED LOCATIONS. TYPICAL FOR ALL.
P13	RECEPTACLES ON STANDBY POWER SHALL BE YELLOW. TYPICAL FOR ALL.
P14	INSTALL L6-30R RECEPTACLE INSIDE 4-POST RACK FOR UPS. UPS PROVIDED BY OWNER.
P15	MOTORIZED ROLLER SHADES IN THIS SPACE TO BE CONTROLLED BY AV SYSTEM. REFER TO AV DRAWINGS FOR MORE INFORMATION.
P18	ALL ACCESS CONTROL CONDUITS TO NEAREST CABLE TRAY. TERMINATE CABLING IN JUNTION BOX RECESSED ABOVE DOOR IN MASONRY WALL, OR JUNCTION BOX SURFACE MOUNTED TO STRUCTURE WHERE CEILINGS ARE LESS THAN 20 FEET. TYPICAL FOR ALL ACCESS CONTROL DOORS SHOWN WITH DATA DROPS.
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR. TYPICAL FOR ALL.
P20	COORDINATE WITH CONTROLS CONTRACTOR FOR LOCATION OF BMS PANEL.

KEYPLAN

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NEW 5TH - 6TH GRADE FACILITY
HUDSONVILLE PUBLIC SCHOOLS
HUDSONVILLE, MICHIGAN

ISSUANCES

10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
02.18.2021	BULLETIN 002
04.16.2021	BULLETIN 006
05.11.2021	BULLETIN 007
05.26.2021	BULLETIN 008
06.16.2021	BULLETIN 010
07.01.2021	BULLETIN 011
08.10.2021	BULLETIN 013
08.31.2021	BULLETIN 015
09.28.2021	BULLETIN 018
02.28.2022	BULLETIN 022

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'A' FIRST FLOOR POWER & COMMUNICATIONS PLAN

E2.1A

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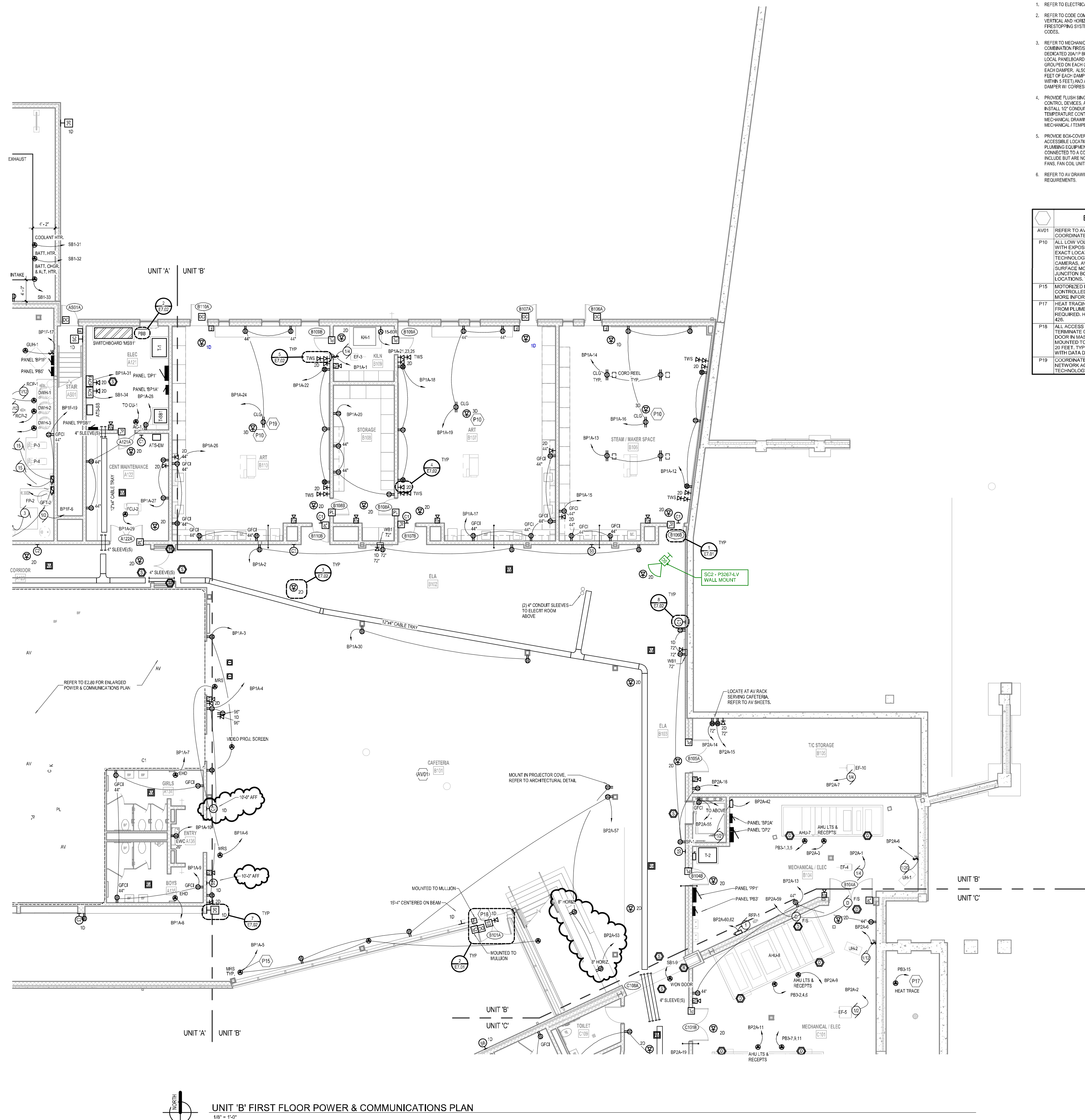
POWER & COMMUNICATION GENERAL NOTES

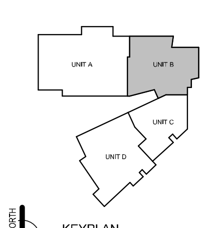
1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20A/1P BRANCH CIRCUIT (WITH BREAKER LOCKING MECHANISM) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT), TERMINATED W/ BOX-COVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES, AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE. INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT. REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.6
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

	ELECTRICAL KEYNOTES
AV01	REFER TO AV DRAWINGS FOR ADDITIONAL SCOPE. COORDINATE ALL ROUGH-IN LOCATIONS WITH AV DRAWINGS.
P10	ALL LOW VOLTAGE CABLING TO BE IN CONDUIT IN SPACES WITH EXPOSED CEILINGS. PRIOR TO INSTALL, COORDINATE EXACT LOCATION OF NETWORK ACTIVATIONS WITH OWNER'S TECHNOLOGY CONTRACTOR (FOR ACCESS POINTS, SECURITY CAMERAS, AV EQUIPMENT, ETC.). TERMINATE CABLING IN SURFACE MOUNT BOX WITH MODULAR CONNECTOR INSIDE JUNCITON BOX, PROVIDE BLANK FACEPLATE FOR UNUSED LOCATIONS. TYPICAL FOR ALL.
P15	MOTORIZED ROLLER SHADES IN THIS SPACE TO BE CONTROLLED BY AV SYSTEM. REFER TO AV DRAWINGS FOR MORE INFORMATION.
P17	HEAT TRACING FOR PLUMBING PIPING PER 22 05 33. LENGTHS FROM PLUMBING PLANS. FIELD VERIFY EXACT LENGTHS REQUIRED. HEAT TRACING SHALL COMPLY WITH NEC ARTICLE 426.
P18	ALL ACCESS CONTROL CONDUITS TO NEAREST CABLE TRAY. TERMINATE CABLING IN JUNTION BOX RECESSED ABOVE DOOR IN MASONRY WALL, OR JUNCTION BOX SURFACE MOUNTED TO STRUCTURE WHERE CEILINGS ARE LESS THAN 20 FEET. TYPICAL FOR ALL ACCESS CONTROL DOORS SHOWN WITH DATA DROPS.
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR. TYPICAL FOR ALL.



UNIT 'B' FIRST FLOOR POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"



KEYPLAN

NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES	
10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
02.18.2021	BULLETIN 002
04.16.2021	BULLETIN 006
05.26.2021	BULLETIN 008
09.28.2021	BULLETIN 018

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'B' FIRST FLOOR POWER & COMMUNICATIONS PLAN

E2.1B

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UNIT 'C' FIRST FLOOR POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20A/1P BRANCH CIRCUIT (WITH BREAKER LOCKING MECHANISM) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT), TERMINATED W/ BOX-COVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES, AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE. INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT. REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH ON BUILDING INTERIOR IN ACCESSIBLE LOCATION FOR EACH 5kVA (+ 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

ELECTRICAL KEYNOTES

P01	DEVICES INSTALLED IN BACK OF CASEWORK FOR AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
P10	ALL LOW VOLTAGE CABLING TO BE IN CONDUIT IN SPACES WITH EXPOSED CEILINGS. PRIOR TO INSTALL, COORDINATE EXACT LOCATION OF NETWORK ACTIVATIONS WITH OWNER'S TECHNOLOGY CONTRACTOR (FOR ACCESS POINTS, SECURITY CAMERAS, AV EQUIPMENT, ETC.). TERMINATE CABLING IN SURFACE MOUNT BOX WITH MODULAR CONNECTOR INSIDE JUNCITON BOX. PROVIDE BLANK FACEPLATE FOR UNUSED LOCATIONS. TYPICAL FOR ALL.
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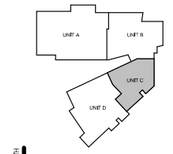
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR, TYPICAL FOR ALL.



KEYPLAN

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NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES	
10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
02.18.2021	BULLETIN 002
04.16.2021	BULLETIN 006
05.26.2021	BULLETIN 008
09.28.2021	BULLETIN 018
10.26.2021	BULLETIN 019

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'C' FIRST FLOOR POWER & COMMUNICATIONS PLAN

E2.1C

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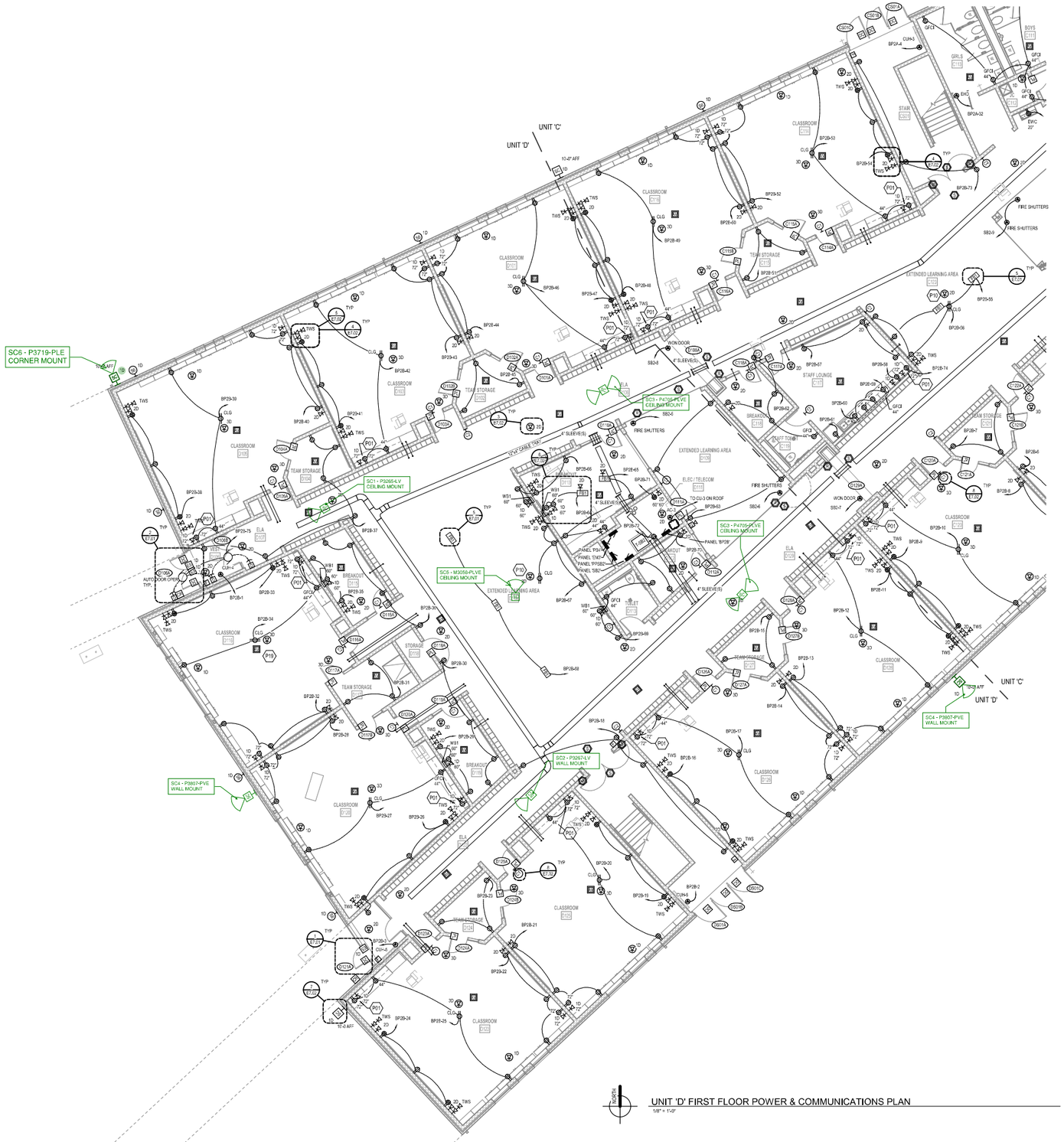

UNIT 'D' FIRST FLOOR POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20A/1P BRANCH CIRCUIT WITH BREAKER LOCKING MECHANISM IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT). TERMINATED W/ BOX-COVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES. AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE. INSTALL 1/2" CONDUIT HOMERUN FROM BOX TO CORRESPONDING TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT. REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION FOR EACH SKALL (~ 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.)
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

ELECTRICAL KEYNOTES

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NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES	
10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
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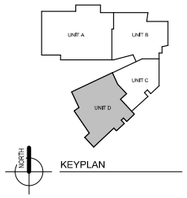
04.16.2021	BULLETIN 006
05.11.2021	BULLETIN 007
10.26.2021	BULLETIN 010

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'D' FIRST FLOOR POWER & COMMUNICATIONS PLAN

E2.1D



KEYPLAN

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POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
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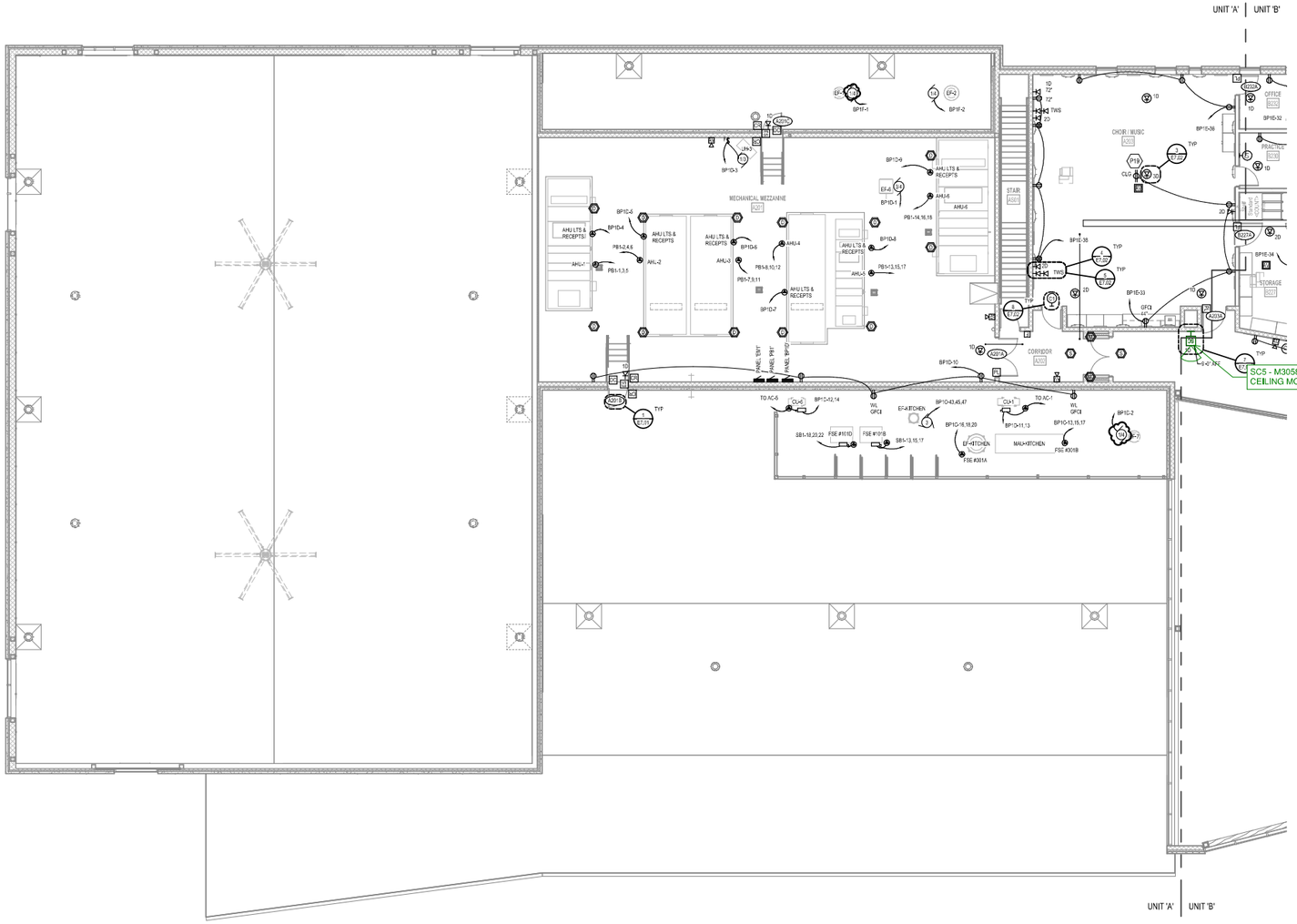
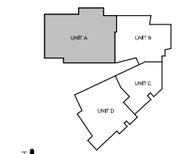
ELECTRICAL KEYNOTES	
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR. TYPICAL FOR ALL.



NORTH

UNIT 'A' SECOND FLOOR POWER & COMMUNICATION PLAN

1/8" = 1'-0"



NORTH KEYPLAN

GMB
616.796.0300
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NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES	
10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
04.16.2021	BULLETIN 006

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'A' SECOND FLOOR POWER & COMMUNICATIONS PLAN

E2.2A

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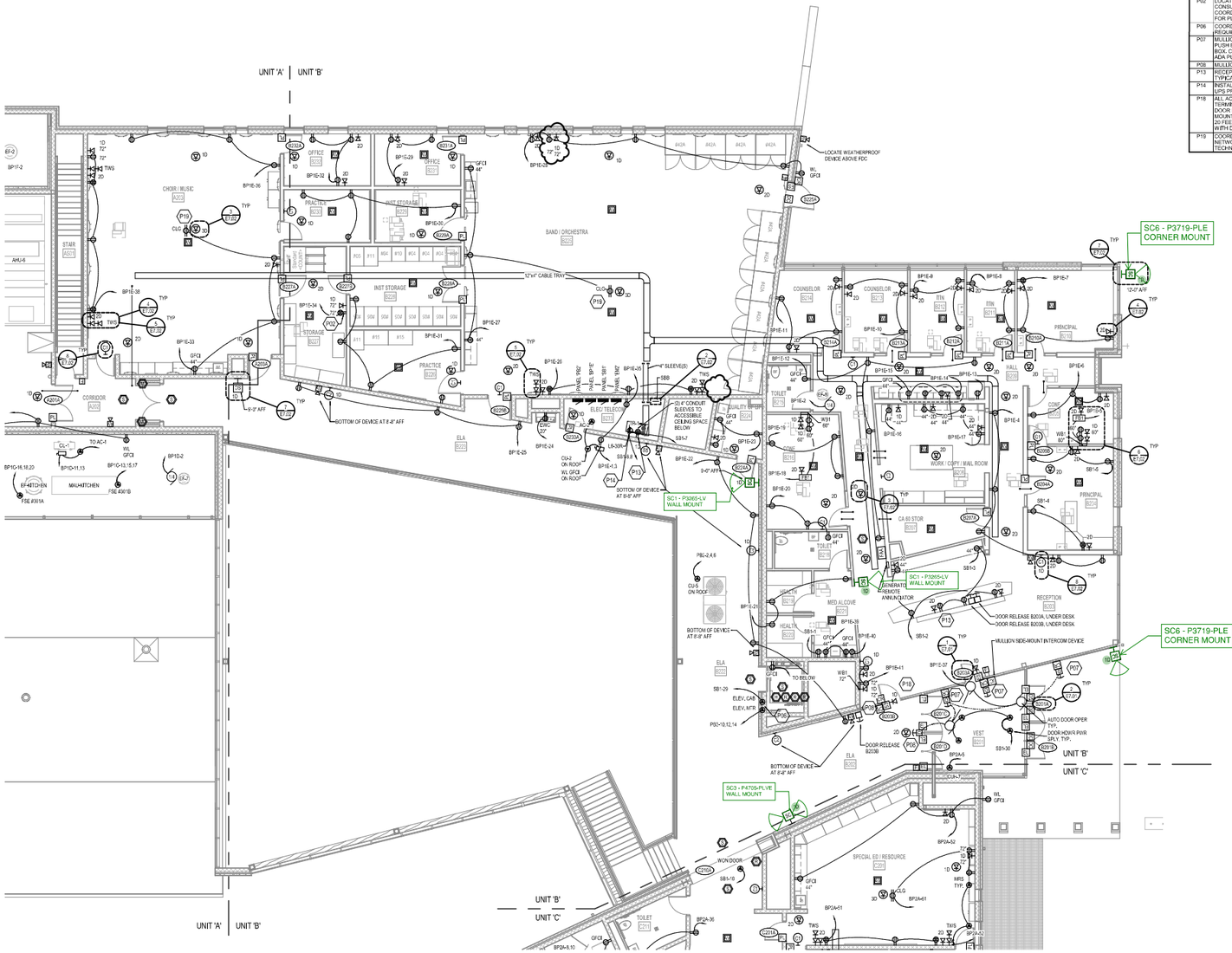
POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.0'.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20AFP BRANCH CIRCUIT (WITH BREAKER LOCKING MECHANISM) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT). TERMINATE (W) BOX/COVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
4. PROVIDE FLUSH 4-SINGLE-GANG BOXES IN WALLS FOR HVAC TEMPERATURE CONTROL DEVICES, AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE. INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT. REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION FOR EACH SHALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT NOT ON LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.).
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

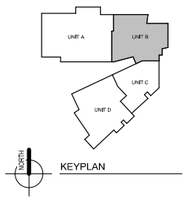
ELECTRICAL KEYNOTES

P02	LOCATION OF AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT; COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
P06	COORDINATE WITH ELEVATOR MANUFACTURER'S REQUIREMENTS FOR DISCONNECTS.
P07	MULLION MOUNT CARD READER AND ADA PUSHBUTTON. ADA PUSH BUTTON SHALL BE MOUNTED AT 40" AFF TO BOTTOM OF BOX. CARD READER SHALL BE MOUNTED DIRECTLY ABOVE ADA PUSHBUTTON.
P08	MULLION MOUNT CARD READER OR ADA PUSHBUTTON.
P13	RECEPTACLES ON STANDBY POWER SHALL BE YELLOW. TYPICAL FOR ALL.
P14	INSTALL UL-WIR RECEPTACLE INSIDE 4-POST RACK FOR UPS. UPS PROVIDED BY OWNER.
P18	ALL ACCESS CONTROL CONDUITS TO NEAREST CABLE TRAY, TERMINATE CABLING IN JUNITION BOX RECESSED ABOVE DOOR IN MASONRY WALL OR JUNCTION BOX SURFACE MOUNTED TO STRUCTURE WHERE CEILINGS ARE LESS THAN 20 FEET. TYPICAL FOR ALL ACCESS CONTROL DOORS SHOWN WITH DATA DROPS.
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR. TYPICAL FOR ALL.



UNIT 'B' SECOND FLOOR POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"



KEYPLAN

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NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES	
10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
04.16.2021	BULLETIN 006
05.11.2021	BULLETIN 007
05.26.2021	BULLETIN 008
09.28.2021	BULLETIN 018

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'B' SECOND FLOOR POWER & COMMUNICATIONS PLAN

E2.2B

BIM 360://5-5065 Hudsonville Public Schools 5-5/5-5065E 2019.rvt
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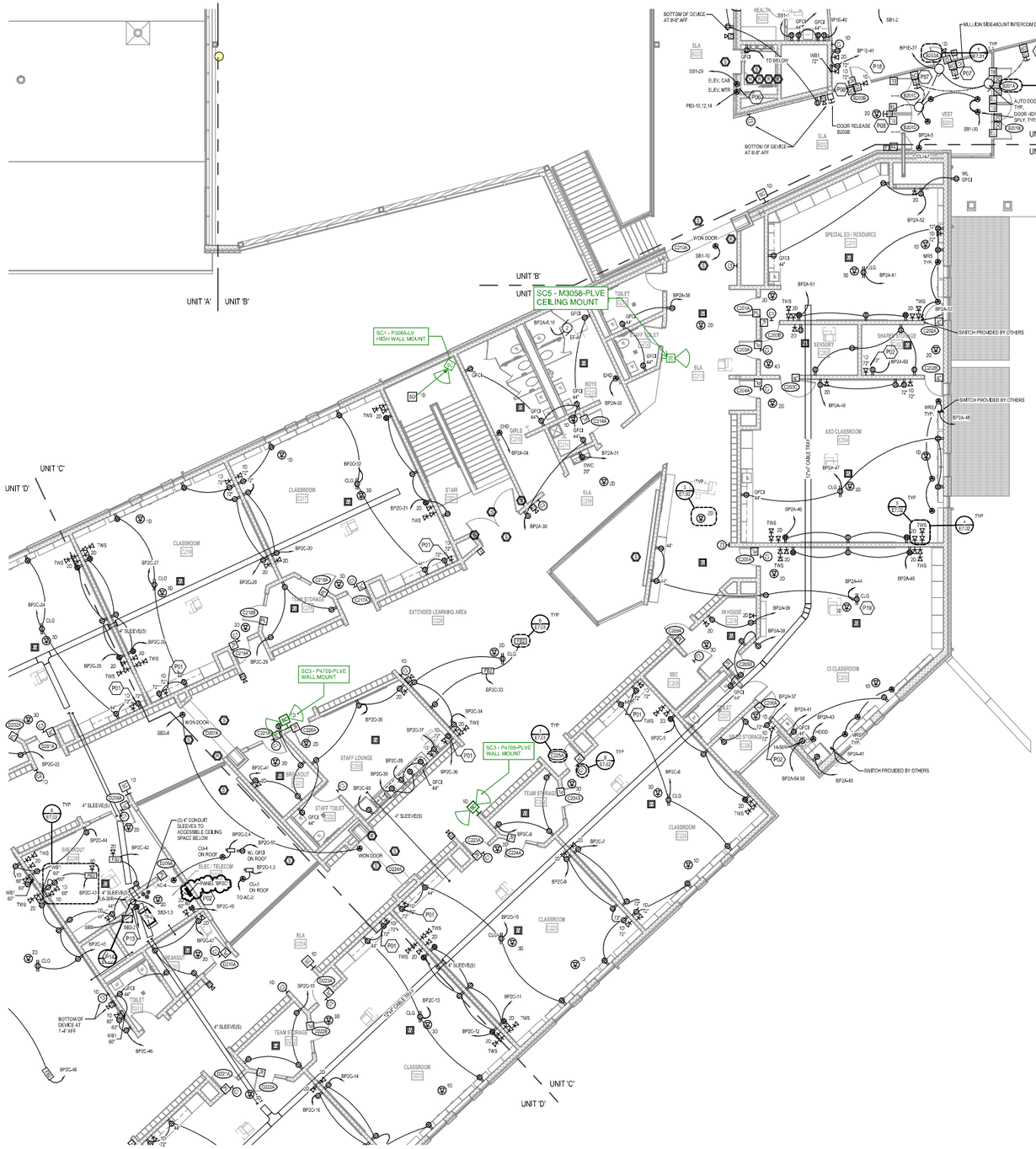

UNIT 'C' SECOND FLOOR POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20A/1P BRANCH CIRCUIT (WITH BREAKER LOCKING MECHANISM) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT). TERMINATED W/ BOLLCOVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES. AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE. INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT. REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE, BUT ARE NOT LIMITED TO, CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.#
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

ELECTRICAL KEYNOTES

P01	DEVICES INSTALLED IN BACK OF CASEWORK FOR AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
P02	LOCATION OF AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
P06	COORDINATE WITH ELEVATOR MANUFACTURER'S REQUIREMENTS FOR DISCONNECTS.
P07	MULLION MOUNT CARD READER AND ADA PUSHBUTTON; ADA-PUSH BUTTON SHALL BE MOUNTED AT 40" AFF TO BOTTOM OF BOX. CARD READER SHALL BE MOUNTED DIRECTLY ABOVE ADA PUSHBUTTON.
P08	MULLION MOUNT CARD READER OR ADA PUSHBUTTON.
P13	RECEPTACLES ON STANDBY POWER SHALL BE YELLOW. TYPICAL FOR ALL.
P14	INSTALL L6-30R RECEPTACLE INSIDE 4-POST RACK FOR UPS. UPS PROVIDED BY OWNER.
P18	ALL ACCESS CONTROL CONDUITS TO NEAREST CABLE TRAY. TERMINATE CABLING IN JUNTION BOX RECESSED ABOVE DOOR IN MASONRY WALL, OR JUNCTION BOX SURFACE MOUNTED TO STRUCTURE WHERE CEILINGS ARE LESS THAN 20 FEET. TYPICAL FOR ALL ACCESS CONTROL DOORS SHOWN WITH DATA DROPS.
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR. TYPICAL FOR ALL.

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NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

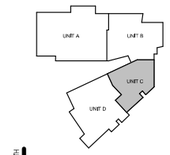
HUDSONVILLE, MICHIGAN

ISSUANCES	
10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
04.16.2021	BULLETIN 006
05.26.2021	BULLETIN 008
10.26.2021	BULLETIN 010

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

UNIT 'C' SECOND FLOOR POWER & COMMUNICATIONS PLAN

E2.2C



KEYPLAN

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NORTH

EQUIPMENT PLATFORM POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"

NORTH

UNIT 'D' SECOND FLOOR POWER & COMMUNICATIONS PLAN

1/8" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.2'.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20A/1P BRANCH CIRCUIT WITH BREAKER LOCKING MECHANISM IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT). TERMINATE TO (W) BOX-COVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES. AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE. INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT. REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (W) BUILDING INTERIOR IN ACCESSIBLE LOCATION FOR EACH SMALL (< 10 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.s
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

ELECTRICAL KEYNOTES

P01	DEVICES INSTALLED IN BACK OF CASEWORK FOR AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
P02	LOCATION OF AV RACK BY OWNER'S TECHNOLOGY CONSULTANT FOR EDUCATIONAL AV EQUIPMENT. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR PLACEMENT OF DEVICES.
P13	RECEPTACLES ON STANDBY POWER SHALL BE YELLOW; TYPICAL FOR ALL.
P14	INSTALL L6-30R RECEPTACLE INSIDE 4-POST RACK FOR UPS, UPS PROVIDED BY OWNER.
P19	COORDINATE LOCATION OF CEILING RECEPTACLE AND NETWORK ACTIVATIONS FOR PROJECTOR WITH OWNER'S TECHNOLOGY CONTRACTOR; TYPICAL FOR ALL.

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NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES

10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004
05.11.2021	BULLETIN 007
10.26.2021	BULLETIN 010

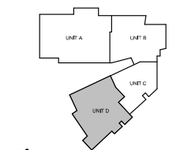
DRAWN JFB

REVIEWED AAB

PROJECT NO. 5-5065

UNIT 'D' SECOND FLOOR POWER & COMMUNICATIONS PLAN

E2.2D



NORTH

KEYPLAN

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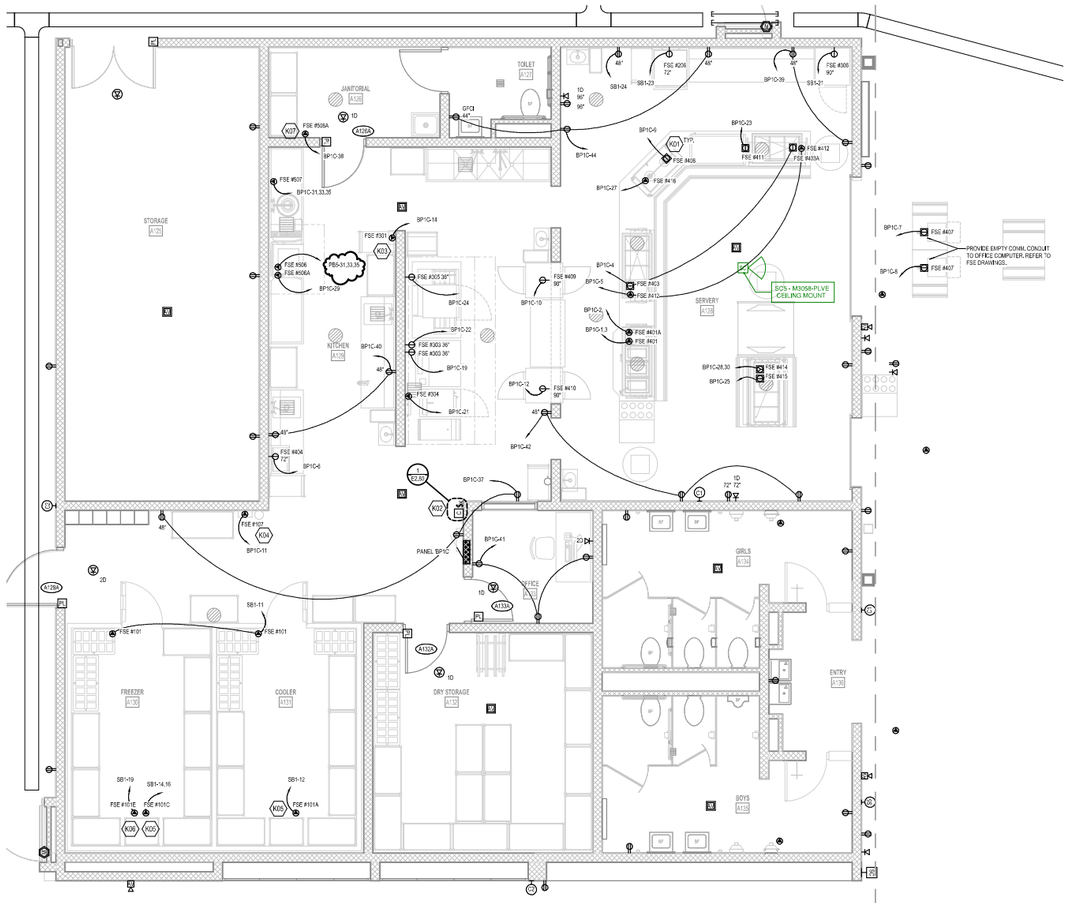


NORTH

ENLARGED KITCHEN POWER & COMMUNICATIONS PLAN

1/4" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

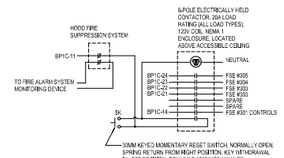
1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL RUN ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. PROVIDE 120VAC POWER FROM DEDICATED 20A/1P BRANCH CIRCUIT (WITH BREAKER LOCKING MECHANISM) IN LOCAL PANELBOARD FOR DAMPERS (IN EACH AREA DAMPERS MAY BE GROUPED ON EACH CIRCUIT), TERMINATED W/ BOX-COVER FUSIBLE SWITCH AT EACH DAMPER. ALSO PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET) AND A FIRE ALARM ADDRESSABLE RELAY FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT PER CODE REQUIREMENTS.
4. PROVIDE FLUSH SINGLE-GANG BOXES IN WALLS FOR HVAC / TEMPERATURE CONTROL DEVICES. AT LEAST ONE PER OCCUPIABLE ROOM OR SPACE, INSTALL 1/2" CONDUIT RACEWAY FROM BOX TO CORRESPONDING "TEMPERATURE CONTROL SYSTEM DEVICE OR CONTROLLED UNIT". REFER TO MECHANICAL DRAWINGS FOR PROPOSED LOCATIONS AND COORDINATE WITH MECHANICAL / TEMPERATURE CONTROLS CONTRACTOR'S SHOP DRAWINGS.
5. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH ON BUILDING INTERIOR IN ACCESSIBLE LOCATION FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.
6. REFER TO AV DRAWINGS FOR ADDITIONAL PATHWAY AND ROUGH-IN REQUIREMENTS.

FOODSERVICE ELECTRICAL GENERAL NOTES

1. ELEC. CONTRACTOR SHALL REVIEW FOODSERVICE EQUIPMENT DRAWINGS ("FSE"-SERIES) AND FOOD SERVICE SPECIFICATIONS (SECTION 11 40 00) FOR ADDITIONAL SCOPE OF WORK AND REQUIREMENTS. INCLUDE ALL WORK AND MATERIALS AS ASSIGNED TO THE ELEC. CONTRACTOR BY DRAWINGS, SPECIFICATIONS, CONSTRUCTION MANAGER'S WORK CATEGORY DESCRIPTIONS, ETC.
2. IF THERE IS A CONFLICT BETWEEN THE FOODSERVICE DRAWINGS/SPECIFICATION AND THIS DRAWING OR DIVISION 26 SPECIFICATIONS, THE ELEC. CONTRACTOR SHALL BID USING THE MORE STRINGENT AND GREATER-COST REQUIREMENTS. CLARIFICATIONS MAY BE REQUESTED IN WRITING PRIOR TO BID. COORDINATE WITH CONSTRUCTION MANAGER'S PROCEDURES.
3. "THE WORK SHOWN ON THIS DRAWING AND "THE DIVISION 26 SPECIFICATIONS SHALL SUPERCEDE THE FOOD SERVICE EQUIPMENT DRAWINGS/SPECIFICATION.
4. LABEL ALL RECEPTACLES IN KITCHEN AND SERVING AREAS WITH CORRESPONDING PANELBOARD, CIRCUIT NUMBER, AND FOODSERVICE EQUIPMENT ITEM NUMBER AS REFERENCED ON THE FOODSERVICE EQUIPMENT DRAWINGS.
5. ELEC. CONTRACTOR SHALL VERIFY AND COORDINATE WITH THE FOODSERVICE EQUIPMENT VENDOR THAT ALL SINGLE-PHASE RECEPTACLES (120V, 1-Ø OR LESS, 50A OR LESS) AND THREE-PHASE RECEPTACLES (120V, L-Ø OR LESS, 100A OR LESS) IN KITCHEN AND SERVING AREAS HAVE GFCI PROTECTION FOR PERSONNEL AS REQUIRED BY NEC 210.8(B)(2), EITHER AT THE DEVICE (GFCI RECEPTACLE) OR AT THE RESPECTIVE PANELBOARD (GFCI BREAKER FOR THE BRANCH CIRCUIT). FOR ANY SUCH RECEPTACLE LOCATIONS THAT ARE NOT READILY ACCESSIBLE (NEC DEFINITION), GFCI PROTECTION SHALL BE PROVIDED FOR THE BRANCH CIRCUIT AT THE PANELBOARD USING A GFCI BRANCH CIRCUIT BREAKER.
6. PROVIDE CONCEALED ROUGH-IN FOR REMOTE MANUAL PULL STATIONS CONNECTED TO VENTILATION HOOD FIRE PROTECTION SYSTEMS. SURFACE-MOUNTED CONDUIT, PIPE, AND PULL STATIONS ARE NOT ACCEPTABLE. COORDINATE LOCATIONS WITH ENGINEERED SHOP DRAWINGS FOR SYSTEM.

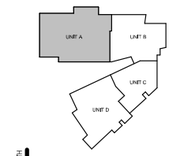
ELECTRICAL KEYNOTES

K01	FLOOR-MOUNTED PEDESTAL WITH RECEPTACLE AS REQUIRED. BOX SHALL BE "FD"-TYPE CAST ALUMINUM OR STAINLESS STEEL MOUNTED HORIZONTALLY WITH (2) HUBS ON BOTTOM (LONG) SIDE TO ACCEPT THREADED RIGID METALLIC CONDUIT. PROVIDE WITH CAST METAL, WEATHERPROOF HINGED COVER OVER WIRING DEVICE. TOP OF RECEPTACLE BOX SHALL NOT EXCEED 9" AFF.
K02	RESET STATION FOR EQUIP. SHUTDOWN CONTROLS (REFER TO DETAIL)
K03	E.C. SHALL INTERWIRE ALL COMPONENTS OF MAKE-UP AIR UNIT, EXHAUST FAN, HOOD LIGHTS, AND HOOD CONTROLS AS SHOWN ON FOODSERVICE EQUIP. DRAWINGS AND AS REQUIRED BY EQUIPMENT MANUFACTURER. VERIFY WITH EQUIPMENT SHOP DRAWINGS.
K04	EXHAUST HOOD FIRE SUPPRESSION SYSTEM, INTERCONNECT WITH FIRE ALARM INITIATION CIRCUIT FOR SUPERVISORY MONITORING PER LOCAL CODES AND CONTROL CONTACTOR FOR SHUTDOWN OF EQUIPMENT ELEC. SUPPLY UNDER HOOD UPON RELEASE OF EXTINGUISHING AGENT. REFER TO DETAIL ON FSE DRAWINGS AND CONTROL DETAIL.
K05	E.C. SHALL INTERWIRE ALL COMPONENTS OF WALK-IN COOLER OR FREEZER AS SHOWN ON DRAWINGS AND REQUIRED BY EQUIPMENT MANUFACTURER. COORDINATE WITH SHOP DRAWINGS.
K06	COORDINATE WITH PLUMBING CONTRACTOR FOR LOCATION OF HEAT TRACE POWER SUPPLY.
K07	CONNECT DISHWASHER EXHAUST FAN TO DISHWASHER CONTROL PANEL. REFER TO FSE DRAWINGS.



1 / E2.80 FOODSERVICE EQUIP. ELEC SHUTDOWN DETAIL

NOT TO SCALE



NORTH

KEYPLAN

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NEW 5TH - 6TH GRADE FACILITY

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES

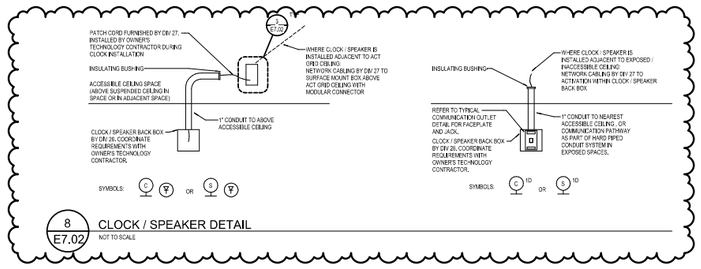
10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
10.26.2021	BULLETIN 019

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5085

KITCHEN & SERVING AREA POWER & COMMUNICATIONS ENLARGED PLAN

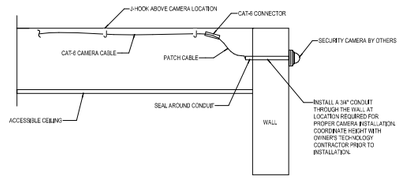
E2.80

BIM 360://5-5085 Hudsonville Public Schools_5-65-5065E 2019.rvt
10/25/2021 7:45:26 PM

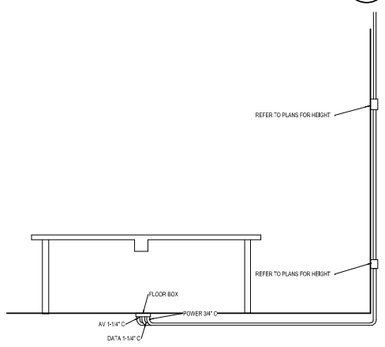


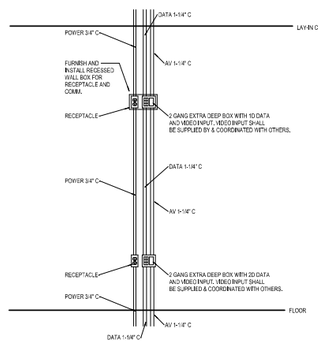
8 E7.02 CLOCK / SPEAKER DETAIL
NOT TO SCALE

NOTES:
1. ROUGH-IN FOR CAMERAS ONLY. CAMERAS PROVIDED BY OWNER'S TECHNOLOGY CONTRACTOR. REFER TO DRAWINGS FOR ROUGH-IN HEIGHT.
2. COORDINATE WITH OWNER'S TECHNOLOGY CONTRACTOR FOR MOUNTING HEIGHTS OF ROUGH-INS.

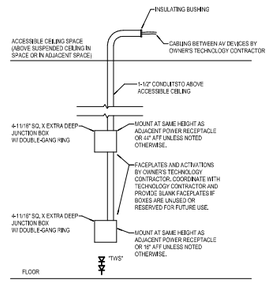


7 E7.02 TYPICAL WALL MOUNT SURVEILLANCE CAMERA INSTALLATION
NOT TO SCALE

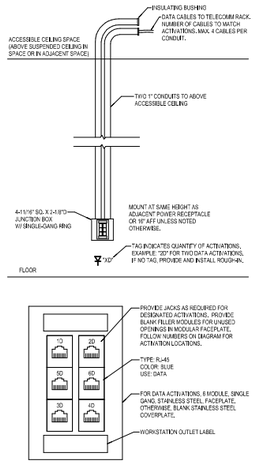




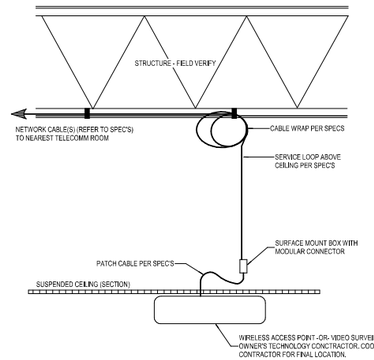
6 E7.02 VIDEO CONFERENCE SECTION
NOT TO SCALE



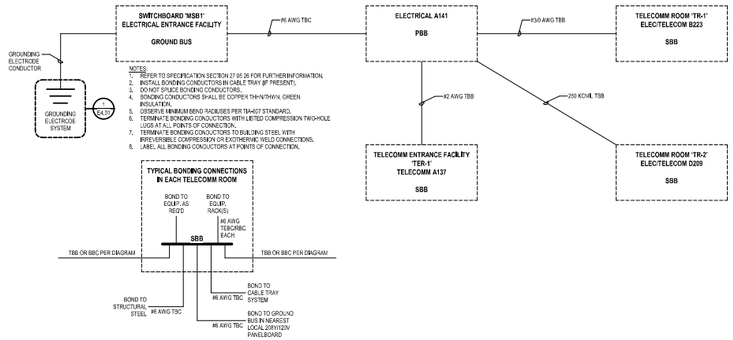
5 E7.02 TEACHER WORKSTATION DETAIL
NOT TO SCALE



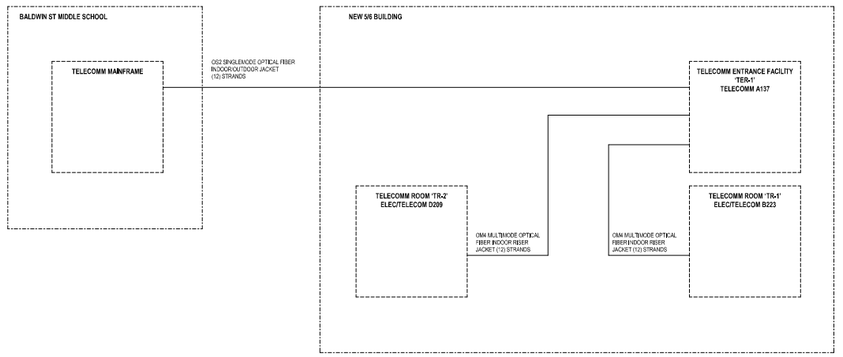
4 E7.02 TYPICAL COMMUNICATION OUTLET
NOT TO SCALE



3 E7.02 CEILING MOUNTED COMMUNICATION DEVICE
NOT TO SCALE



2 E7.02 COMMUNICATIONS GROUNDING/BONDING SYSTEM RISER DIAGRAM
NOT TO SCALE



1 E7.02 COMMUNICATIONS CABLING BACKBONE RISER DIAGRAM
NOT TO SCALE

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HUDSONVILLE, MICHIGAN

ISSUANCES

10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001
11.25.2020	ADDENDUM 004

DRAWN JFB
REVIEWED AAB
PROJECT NO. 5-5065

ELECTRICAL DETAILS

E7.02

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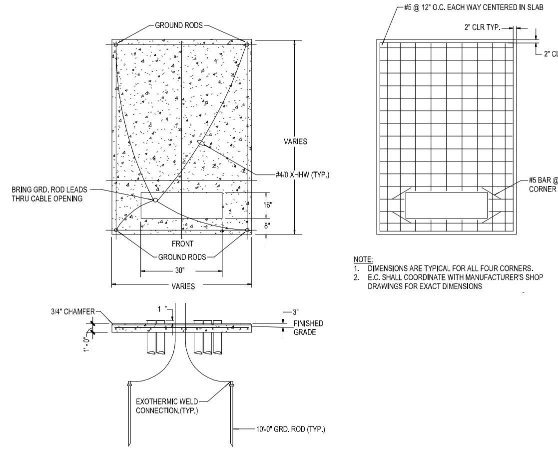
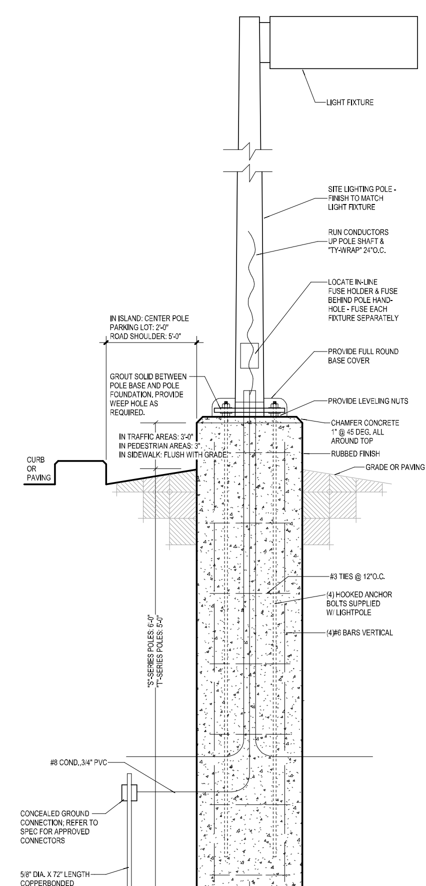


NOTES:
1. DIMENSIONS ARE TYPICAL FOR ALL FOUR CORNERS.
2. E.C. SHALL COORDINATE WITH MANUFACTURER'S SHOP DRAWINGS FOR EXACT DIMENSIONS

NOTES:
1. CONCRETE TO BE PLACED ON ONE FOOT OF PACKED WASHED GRAVEL OR PEA STONE.
2. CONCRETE = 4,000 PSI COMPRESSIVE STRENGTH AT 28 DAYS WITH AIR ENTRAINMENT.
3. GRADE OF REINFORCING RODS = ASTM A615: GRADE 60 O R 75.
4. TOLERANCES OVERALL DIMENSIONS AND PAD OPENING DIMENSIONS = 1/2".

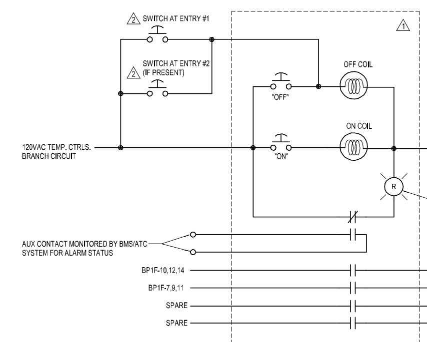
10 E7.01 TRANSFORMER/GENERATOR GROUNDING DETAIL

NOT TO SCALE



9 E7.01 SITE LIGHTING POLE FOUNDATION

NOT TO SCALE

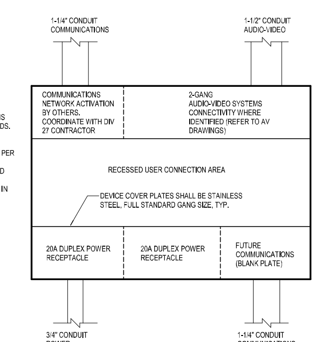


1. 30A, 4-POLE, MECHANICALLY-HELD CONTACTOR WITH 120VAC CONTROL COILS, MOMENTARY ON/OFF PUSH BUTTONS, ONE N.C. AND ONE N.O. AUX CONTACTS, RED LED PILOT LIGHT WIRED TO N.C. AUX CONTACT FOR "OFF" INDICATION. CUSTOM ENGRAVED DEVICE LABELS, NEMA 1 ENCLOSURE. PROVIDE ENGRAVED NAMEPLATE INDICATING "EMERGENCY BOILER SHUTDOWN".
2. RED MOMENTARY PUSHBUTTON SWITCH MOUNTED ON YELLOW POLYCARBONATE BODY, CLEAR POLYCARBONATE HINGED COVER, CUSTOM LABEL "BOILER SHUTDOWN". PROVIDE "STOPPER STATION" SERIES AS MFR'D BY SAFETY TECHNOLOGY INTL. INC., MODEL NO. SS2224ZA-EN OR APPROVED EQUIV. PROVIDE W/ MATCHING BACKBOX (MODEL NO. KIT-71101A-Y) FOR APPLICATIONS WITHOUT A RECESSED SWITCH BOX FOR MOUNTING

8 E7.01 BOILER EMERGENCY SHUTDOWN CONTROL DETAIL

NOT TO SCALE

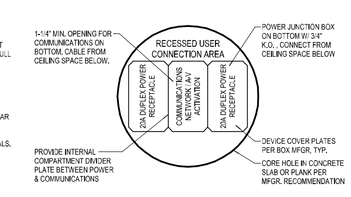
FLOOR BOX NOTES:
1. REFER TO SECTION 270528 "PATHWAYS FOR COMMUNICATIONS SYSTEMS" FOR ACCEPTABLE CONDUIT INSTALLATION METHODS. OBSERVE BEND RADIUS AND PULL BOX REQUIREMENTS PER CURRENT BICSI AND EIA/TIA STANDARDS.
2. PROVIDE TWO 20A GENERAL PURPOSE DUPLEX RECEPTACLE PER FLOOR BOX. REFER TO PLAN FOR CIRCUIT.
3. SIDE KNOCKOUTS SHOWN IN USE FOR REPRESENTATION. END AND BOTTOM KNOCKOUTS MAY BE USED AS NECESSARY.
4. ELECTRICAL CONTRACTOR SHALL PROVIDE NYLON PULL LINE IN ALL COMMUNICATIONS CONDUITS.
5. COORDINATE INSTALLATION WITH OTHER TRADES.
6. COMMUNICATIONS CONTRACTOR SHALL PROVIDE MODULAR FACEPLATES/FRAMES, JACKS, AND MODULE BLANKS FOR ALL UNUSED OPENINGS.
7. REFER TO SPEC'S FOR MANUFACTURER/MODEL APPROVALS. LAYOUT MAY VARY SLIGHTLY DEPENDING ON SELECTED PRODUCT; COORDINATE EXACT LAYOUT WITH ENGINEER.



7 E7.01 TYPE "FB3" FLOOR BOX CONFIGURATION

NOT TO SCALE

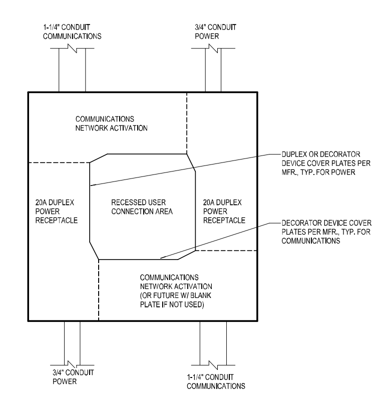
FLOOR BOX NOTES:
1. REFER TO SECTION 270528 "PATHWAYS FOR COMMUNICATIONS SYSTEMS" FOR ACCEPTABLE CONDUIT INSTALLATION METHODS. OBSERVE BEND RADIUS AND PULL BOX REQUIREMENTS PER CURRENT BICSI AND EIA/TIA STANDARDS.
2. PROVIDE TWO 20A GENERAL PURPOSE DUPLEX RECEPTACLE PER FLOOR BOX. REFER TO PLAN FOR CIRCUIT.
3. COORDINATE INSTALLATION WITH OTHER TRADES.
4. COMMUNICATIONS CONTRACTOR SHALL PROVIDE MODULAR FACEPLATES/FRAMES, JACKS, AND MODULE BLANKS FOR ALL UNUSED OPENINGS.
5. REFER TO SPEC'S FOR MANUFACTURER/MODEL APPROVALS. LAYOUT MAY VARY SLIGHTLY DEPENDING ON SELECTED PRODUCT; COORDINATE EXACT LAYOUT WITH ENGINEER.



6 E7.01 TYPE "FB2" FLOOR BOX CONFIGURATION

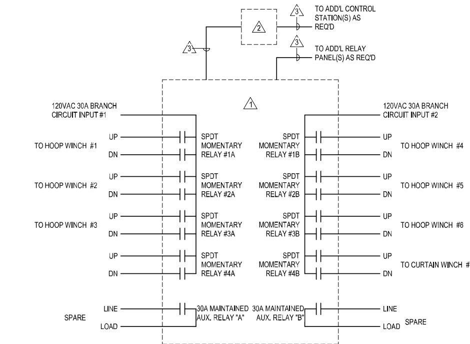
NOT TO SCALE

FLOOR BOX NOTES:
1. REFER TO SECTION 27 05 28 "PATHWAYS FOR COMMUNICATIONS SYSTEMS" FOR ACCEPTABLE CONDUIT INSTALLATION METHODS. OBSERVE BEND RADIUS AND PULL BOX REQUIREMENTS PER CURRENT BICSI AND EIA/TIA STANDARDS.
2. PROVIDE TWO 20A GENERAL PURPOSE DUPLEX RECEPTACLE PER FLOOR BOX. REFER TO PLAN FOR CIRCUIT.
3. SIDE KNOCKOUTS SHOWN IN USE FOR REPRESENTATION. END AND BOTTOM KNOCKOUTS MAY BE USED AS NECESSARY.
4. ELECTRICAL CONTRACTOR SHALL PROVIDE NYLON PULL LINE IN ALL COMMUNICATIONS CONDUITS.
5. COORDINATE INSTALLATION WITH OTHER TRADES.
6. COMMUNICATIONS CONTRACTOR SHALL PROVIDE MODULAR FACEPLATES/FRAMES, JACKS, AND MODULE BLANKS FOR ALL UNUSED OPENINGS.
7. REFER TO SPEC'S FOR MANUFACTURER/MODEL APPROVALS. LAYOUT MAY VARY SLIGHTLY DEPENDING ON SELECTED PRODUCT; COORDINATE EXACT LAYOUT WITH ENGINEER.



5 E7.01 TYPE "FB1" FLOOR BOX CONFIGURATION

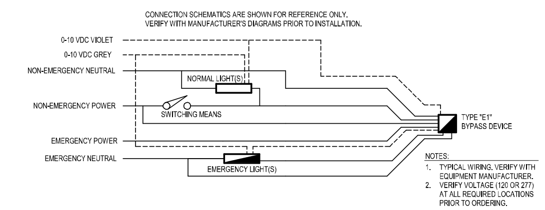
NOT TO SCALE



1. GYMNASIUM EQUIPMENT CONTROL SYSTEM RELAY PANEL, FURNISHED BY SECTION 11 66 23, INSTALLED AND WIRED BY ELEC. CONTRACTOR. WIRING CONNECTIONS ARE SHOWN FOR CONCEPT ONLY; REFER TO MANUFACTURER'S SHOP DRAWINGS FOR EXACT REQUIREMENTS AND WIRING ARRANGEMENTS.
2. GYMNASIUM EQUIPMENT CONTROL SYSTEM OPERATOR INTERFACE (KEYPAD OR TOUCHPANEL, AS SPEC'D), FURNISHED BY SECTION 11 66 23, INSTALLED AND WIRED BY ELEC. CONTRACTOR. MOUNT SEMI-FLUSH AT 44" AFF TO BOTTOM OF BOX WITHIN LINE OF SIGHT OF ALL EQUIPMENT TO BE CONTROLLED. REFER TO MANUFACTURER'S SHOP DRAWINGS FOR EXACT ROUGH-IN REQUIREMENTS.
3. CONTROL-VOLTAGE CABLE, FURNISHED AND WIRED BY ELEC. CONTRACTOR. REFER TO SECTION 26 05 23 FOR TYPICAL CABLE; REFER TO MANUFACTURER'S SHOP DRAWINGS TO CONFIRM EXACT CABLE TYPE REQ'D.

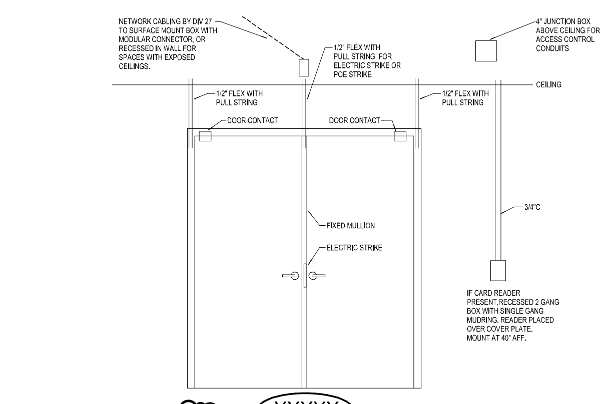
4 E7.01 GYMNASIUM EQUIPMENT CONTROL SYSTEM DETAIL

NOT TO SCALE



3 E7.01 EMERGENCY LIGHTING AUTOMATIC LOAD CONTROL RELAY

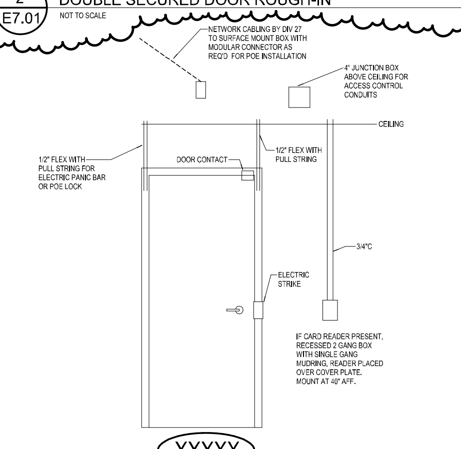
NOT TO SCALE



NOTES:
1. SEE SPECIFICATIONS FOR SPECIFIC DOOR CONTROL DEVICES PER SECURED DOOR.
2. COORDINATE WITH ACCESS CONTROL CONTRACTOR AND SHOP DRAWINGS FOR SPECIFIC REQUIREMENTS.
3. WHERE POE DEVICES ARE SPECIFIED IN THE DOOR HARDWARE SCHEDULE, COORDINATE LOCATION OF ACTIVATION AS TO PREVENT TAMPERING WITH NETWORK CONNECTION TO HARDWARE.
4. REFER TO DOOR HARDWARE SCHEDULE FOR MORE INFORMATION.

2 E7.01 DOUBLE SECURED DOOR ROUGH-IN

NOT TO SCALE



NOTES:
1. SEE SPECIFICATIONS FOR SPECIFIC DOOR CONTROL DEVICES PER SECURED DOOR.
2. COORDINATE WITH ACCESS CONTROL CONTRACTOR AND SHOP DRAWINGS FOR SPECIFIC REQUIREMENTS.
3. WHERE POE DEVICES ARE SPECIFIED IN THE DOOR HARDWARE SCHEDULE, COORDINATE LOCATION OF ACTIVATION AS TO PREVENT TAMPERING WITH NETWORK CONNECTION TO HARDWARE.
4. REFER TO DOOR HARDWARE SCHEDULE FOR MORE INFORMATION.

1 E7.01 SINGLE SECURED DOOR ROUGH-IN

NOT TO SCALE

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NEW 5TH - 6TH GRADE FACILITY
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HUDSONVILLE, MICHIGAN

ISSUANCES

10.30.2020	BIDS & CONSTRUCTION
11.18.2020	ADDENDUM 001

DRAWN	JFB
REVIEWED	AAB
PROJECT NO.	5-5065

ELECTRICAL DETAILS

E7.01

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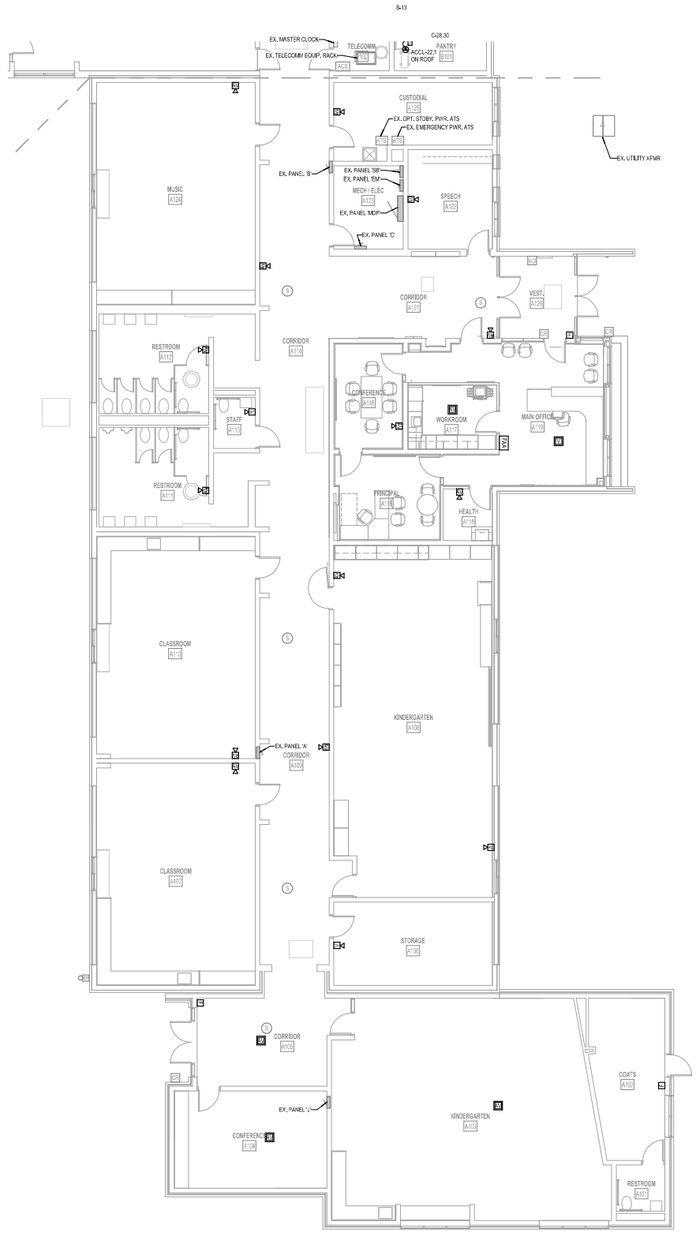

North

UNIT 'A' POWER PLAN

1/8" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. PROVIDE 120VAC POWER FOR ALL SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS.
   A. REFER TO MECHANICAL/HVAC DRAWINGS FOR EXACT LOCATIONS OF DAMPERS.
   B. CONNECT TO DEDICATED 20A BRANCH CIRCUIT (WITH BREAKER LOCK-ON ACCESSORY) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT).
   C. TERMINATE WI BOX-COVER FUSIBLE DISCONNECT SWITCH AT EACH DAMPER.
   D. PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET).
   E. PROVIDE FIRE ALARM ADDRESSABLE RELAY(S) FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT(S) PER CODE REQUIREMENTS.
4. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 10 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR (AND WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT). TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.
5. DESIGNATED CABLING PATHWAYS (CONDUITS, CABLE TRAYS, PENETRATION SLEEVES, ETC.) SHALL BE RESERVED FOR DIV. 27 COMMUNICATIONS CABLING AND DIV. 28 SAFETY/SECURITY CABLING ONLY. OTHER CABLING TYPES, SUCH AS DIV. 23 CONTROLS, DIV. 26 CONTROLS, AND ARCHITECTURAL EQUIPMENT CABLING SHALL BE SUPPORTED AND SLEEVED BY OTHER INDEPENDENT PATHWAYS, HANGERS, AND SUPPORTS.
6. CONCEDLEATE ALL POWER SUPPLIES REQUIRED FOR ELECTRONIC DOOR HARDWARE (REF. SECTION 08 71 00) TO CENTRAL LOCATION(S) ADJACENT TO DESIGNATED ACCESS CONTROL EQUIPMENT LOCATION(S). CONNECT ALL POWER SUPPLIES TO DEDICATED STANDBY POWER SYSTEM BRANCH CIRCUIT(S) AS DESIGNATED.
7. THE FOLLOWING DIV. 27 AND DIV. 28 SYSTEMS WILL BE DOCUMENTED AND BID SEPARATELY BY CONSULTANTS IN ASSOCIATION WITH HUDSONVILLE P.S. TECHNOLOGY DEPT.
   A. NETWORK ELECTRONICS (SWITCHES, ACCESS POINTS, ETC.)
   B. VOIP TELEPHONE SYSTEMS
   C. CLASSROOM AUDIO-VIDEO EQUIPMENT AND INSTRUCTIONAL TECHNOLOGY
   D. AUDIO-VIDEO SYSTEM FOR GYMNASIUM
   E. ACCESS CONTROL SYSTEM
   F. VIDEO SURVEILLANCE SYSTEM

North

KEYPLAN

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FOREST GROVE ELEMENTARY GYM ADDITION

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES

09.22.2021 BIDS & CONSTRUCTION

DRAWN MCK

REVIEWED JFB

PROJECT NO. 5-5362

UNIT 'A' POWER PLAN

E2.1A

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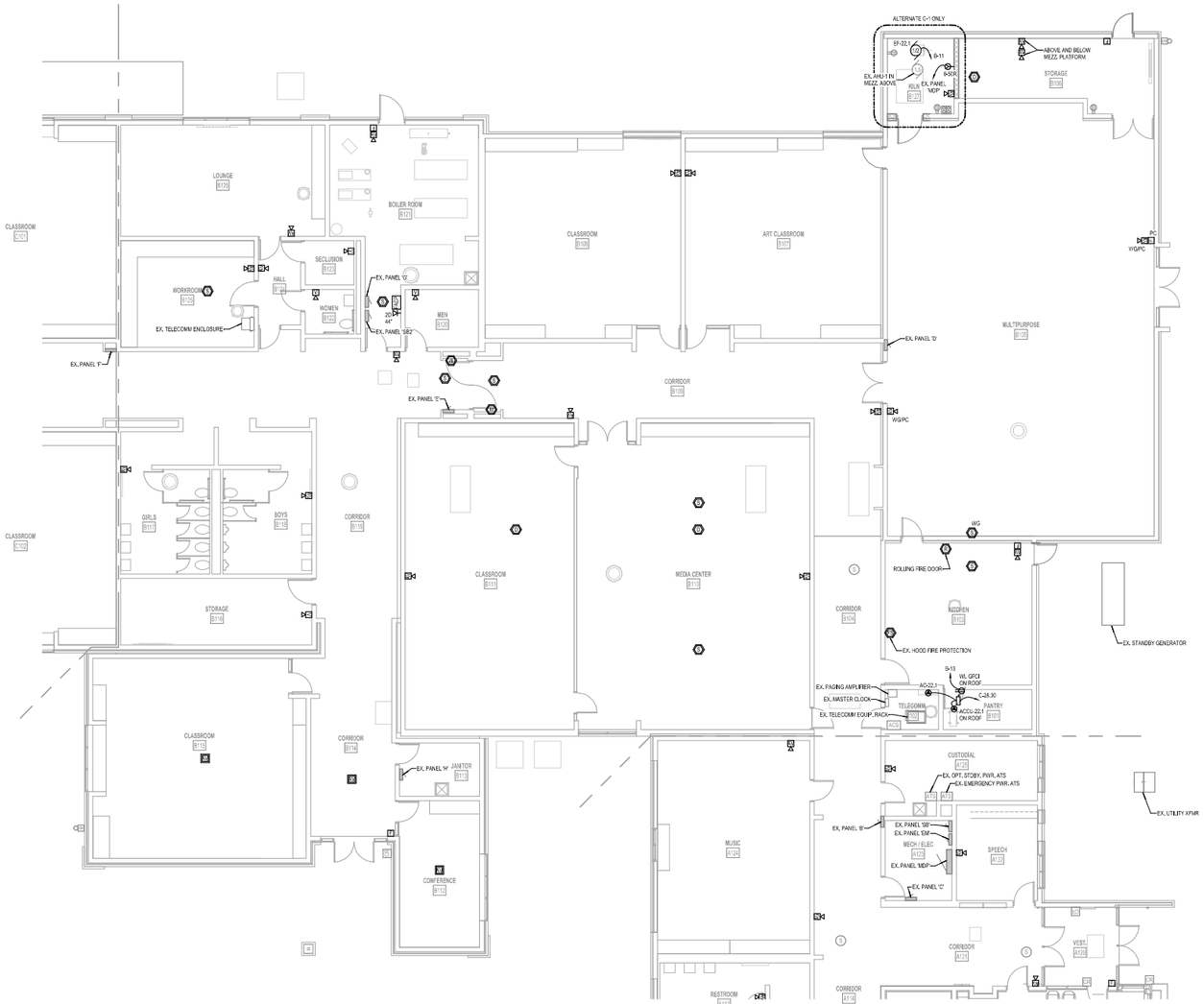
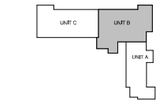


UNIT 'B' POWER PLAN

1/8" = 1'-0"

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. PROVIDE 120VAC POWER FOR ALL SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS.
   A. REFER TO MECHANICAL/HVAC DRAWINGS FOR EXACT LOCATIONS OF DAMPERS.
   B. CONNECT TO DEDICATED 20A BRANCH CIRCUIT (WITH BREAKER LOCK-ON ACCESSORY) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT).
   C. TERMINATE W/ BOX-COVER FUSIBLE DISCONNECT SWITCH AT EACH DAMPER.
   D. PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET).
   E. PROVIDE FIRE ALARM ADDRESSABLE RELAY(S) FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT(S) PER CODE REQUIREMENTS.
4. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR LOAD WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT. TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.
5. DESIGNATED CABLING PATHWAYS (CONDUITS, CABLE TRAYS, PENETRATION SLEEVES, ETC.) SHALL BE RESERVED FOR DIV. 27 COMMUNICATIONS CABLING AND DIV. 28 SAFETY/SECURITY CABLING ONLY. OTHER CABLING TYPES, SUCH AS DIV. 23 CONTROLS, DIV. 26 CONTROLS, AND ARCHITECTURAL EQUIPMENT CABLING SHALL BE SUPPORTED AND SLEEVED BY OTHER INDEPENDENT PATHWAYS, HANGERS, AND SUPPORTS.
6. CONSOLIDATE ALL POWER SUPPLIES REQUIRED FOR ELECTRONIC DOOR HARDWARE (REF. SECTION 08 71 00) TO CENTRAL LOCATION(S) ADJACENT TO DESIGNATED ACCESS CONTROL EQUIPMENT LOCATION(S). CONNECT ALL POWER SUPPLIES TO DEDICATED 'STANDBY' POWER SYSTEM BRANCH CIRCUIT(S) AS DESIGNATED.
7. THE FOLLOWING DIV. 27 AND DIV. 28 SYSTEMS WILL BE DOCUMENTED AND BID SEPARATELY BY CONSULTANT IN ASSOCIATION WITH HUDSONVILLE P.S. TECHNOLOGY DEPT.:
   A. NETWORK ELECTRONICS (SWITCHES, ACCESS POINTS, ETC.)
   B. VOIP TELEPHONE SYSTEMS
   C. CLASSROOM AUDIO-VIDEO EQUIPMENT AND INSTRUCTIONAL TECHNOLOGY
   D. AUDIO-VIDEO SYSTEM FOR GYMNASIUM
   E. ACCESS CONTROL SYSTEM
   F. VIDEO SURVEILLANCE SYSTEM



KEYPLAN

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FOREST GROVE ELEMENTARY GYM ADDITION

HUDSONVILLE PUBLIC SCHOOLS

HUDSONVILLE, MICHIGAN

ISSUANCES

09.22.2021 BIDS & CONSTRUCTION

DRAWN MCK
REVIEWED JFB

PROJECT NO. 5-5362

UNIT 'B' POWER PLAN

E2.1B

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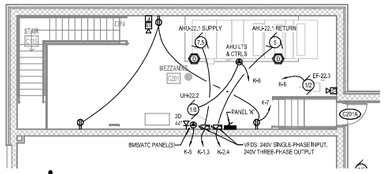


NORTH

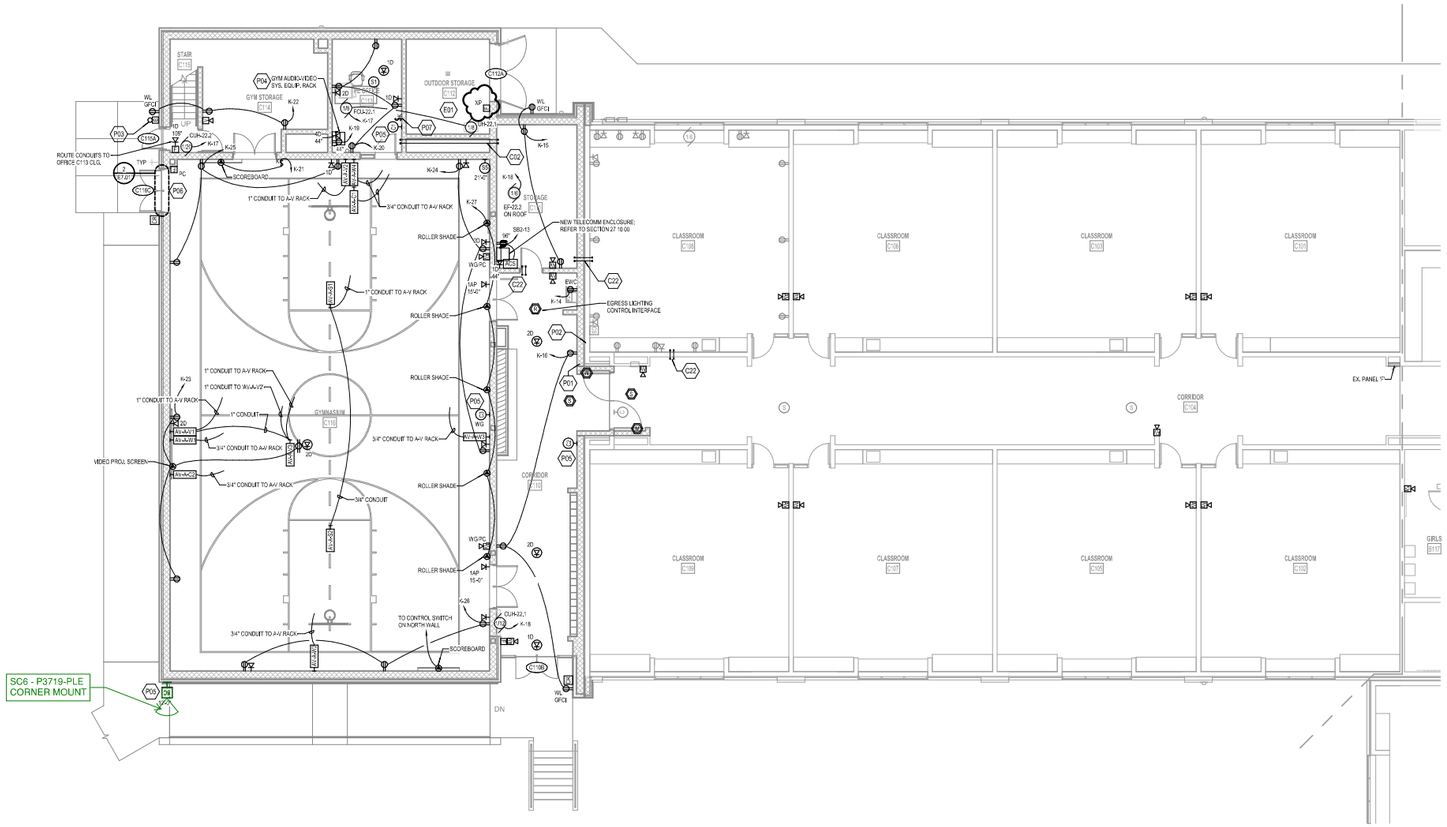
MEZZANINE POWER PLAN

1/8" = 1'-0"

AUDIO-VIDEO SYSTEMS BOX & CONNECTOR PLATE SCHEDULE						
ITEM I.D. / TAG	ROUGH-IN OR ITEM SIZE	MOUNTING	LOCATION (HEIGHT TO BOTTOM OF BOX)	BOX & CONDUIT PROVIDED BY	CONNECTOR PLATE & WIRE/CABLE PROVIDED BY	SPECIAL NOTES
A/V-AC1	TWO GANG x 3 1/2" DEEP	FLUSH	44" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	A/V SYSTEM CONTROL TOUCHPANEL
A/V-AC2	SINGLE GANG x 3 1/2" DEEP	FLUSH	15'-9" AFF (VERIFY; SEE DETAIL)	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	PROJECTION SCREEN CONTROL
A/V-AS1	4" SQ. x 2 1/8" DEEP	SURFACE	SIDE OF ROOF JOIST JUST ABOVE BOTTOM CHORD (APPROX. 22'-0" AFF)	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	SPEAKER JUNCTION BOX
A/V-AS2	4" SQ. x 2 1/8" DEEP	SURFACE	SIDE OF ROOF JOIST JUST ABOVE BOTTOM CHORD (APPROX. 22'-0" AFF)	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	SPEAKER JUNCTION BOX
A/V-AV1	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	18" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	VIDEO INPUT(S)
A/V-AV2	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	18" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	VIDEO INPUT(S)
A/V-AV3	4" SQ. x 2 1/8" DEEP	SURFACE	SIDE OF ROOF JOIST JUST ABOVE BOTTOM CHORD (APPROX. 22'-0" AFF)	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	VIDEO PROJECTOR OUTPUT/CONTROL. VERIFY EXACT LOCATION OF PROJ. W/ INSTALLERS
A/V-AW1	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	18" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	AUDIO/VIDEO INPUT(S)
A/V-AW2	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	18" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	AUDIO/VIDEO INPUT(S)
A/V-AW3	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	18" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	AUDIO/VIDEO INPUT(S)
A/V-AW4	4 11/16" SQ. x 2 1/8" DEEP, SINGLE GANG RING	FLUSH	18" AFF	SECTION 27 05 28	N.I.C. (SEPARATE BID PACKAGE)	AUDIO/VIDEO INPUT(S)

POWER & COMMUNICATION GENERAL NOTES

1. REFER TO ELECTRICAL GENERAL NOTES ON SHEET E0.01.
2. REFER TO CODE COMPLIANCE PLAN FOR LOCATIONS AND RATINGS OF VERTICAL AND HORIZONTAL BUILDING ASSEMBLIES. PROVIDE APPROPRIATE FIRESTOPPING SYSTEMS PER SPECIFICATIONS TO MEET ALL APPLICABLE CODES.
3. PROVIDE 120VAC POWER FOR ALL SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS.
   A. REFER TO MECHANICAL/HVAC DRAWINGS FOR EXACT LOCATIONS OF DAMPERS.
   B. CONNECT TO DEDICATED 20A BRANCH CIRCUIT (WITH BREAKER LOCK-ON ACCESSORY) IN LOCAL PANELBOARD FOR DAMPER(S) IN EACH AREA (DAMPERS MAY BE GROUPED ON EACH CIRCUIT).
   C. TERMINATE W/ BOX-COVER FUSIBLE DISCONNECT SWITCH AT EACH DAMPER.
   D. PROVIDE FIRE ALARM DUCT SMOKE DETECTOR WITHIN 5 FEET OF EACH DAMPER (UNLESS COVERED BY ANOTHER DUCT DETECTOR WITHIN 5 FEET).
   E. PROVIDE FIRE ALARM ADDRESSABLE RELAY(S) FOR INTERLOCKING DAMPER W/ CORRESPONDING HVAC UNIT(S) PER CODE REQUIREMENTS.
4. PROVIDE BOX-COVER FUSIBLE DISCONNECT SWITCH (ON BUILDING INTERIOR IN ACCESSIBLE LOCATION) FOR EACH SMALL (< 1/2 HP) MECHANICAL AND/OR PLUMBING EQUIPMENT MOTOR (JNO WHERE MORE THAN ONE UNIT IS CONNECTED TO A COMMON BRANCH CIRCUIT). TYPICAL EQUIPMENT TYPES INCLUDE BUT ARE NOT LIMITED TO CABINET HEATERS, DAMPERS, EXHAUST FANS, FAN COIL UNITS, PUMPS, UNIT HEATERS, VAV BOXES, ETC.
5. DESIGNATED CABLING PATHWAYS (CONDUITS, CABLE TRAYS, PENETRATION SLEEVES, ETC.) SHALL BE RESERVED FOR DIV. 27 COMMUNICATIONS CABLING AND DIV. 28 SAFETY/SECURITY CABLING ONLY. OTHER CABLING TYPES, SUCH AS DIV. 23 CONTROLS, DIV. 26 CONTROLS, AND ARCHITECTURAL EQUIPMENT CABLING SHALL BE SUPPORTED AND SLEEVED BY OTHER INDEPENDENT PATHWAYS, HANGERS, AND SUPPORTS.
6. CONSOLIDATE ALL POWER SUPPLIES REQUIRED FOR ELECTRONIC DOOR HARDWARE (REF. SECTION 08 71 00) TO CENTRAL LOCATION(S) ADJACENT TO DESIGNATED ACCESS CONTROL EQUIPMENT LOCATION(S). CONNECT ALL POWER SUPPLIES TO DEDICATED STANDBY POWER SYSTEM BRANCH CIRCUIT(S) AS DESIGNATED.
7. THE FOLLOWING DIV. 27 AND DIV. 28 SYSTEMS WILL BE DOCUMENTED AND BID SEPARATELY BY CONSULTANT IN ASSOCIATION WITH HUDSONVILLE P.S. TECHNOLOGY DEPT.:
   A. NETWORK ELECTRONICS (SWITCHES, ACCESS POINTS, ETC.)
   B. VOIP TELEPHONE SYSTEMS
   C. CLASSROOM AUDIO-VIDEO EQUIPMENT AND INSTRUCTIONAL TECHNOLOGY
   D. AUDIO-VIDEO SYSTEM FOR GYMNASIUM
   E. ACCESS CONTROL SYSTEM
   F. VIDEO SURVEILLANCE SYSTEM

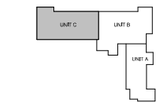


NORTH

UNIT 'C' POWER PLAN

1/8" = 1'-0"

ELECTRICAL KEYNOTES	
C02	(2) 4" CONDUIT SLEEVES FOR DIV. 27 COMMUNICATIONS CABLING
C22	(2) 6.7 SQ. IN. CABLE PATHWAY PENETRATION DEVICE (FIRE) PER SECTION 27 05 28
E01	ALL ELECTRICAL MATERIALS AND INSTALLATION IN THIS ROOM SHALL COMPLY WITH NEC ARTICLE 500 HAZARDOUS LOCATION REQUIREMENTS FOR CLASS 1, DIVISION 1, GROUP C & D
P01	ESTABLISH NEW CONCRETE-ENCASED GROUNDING ELECTRODE IN FOOTING OF NEW ADDITION, INTERCONNECT WITH GROUNDING ELECTRODE SYSTEM AT SERVICE ENTRANCE OR NEAREST SEPARATELY-DERIVED SYSTEM PER NEC AND SPECIFICATION REQUIREMENTS.
P02	BOND METAL STRUCTURE OF ADDITION TO METAL STRUCTURE OF EXISTING BUILDING PER NEC REQUIREMENTS.
P03	RE-INSTALL EX. SIGNALING BELL SALVAGED FROM BUILDING EXTERIOR; INTERCEPT AND EXTEND EXIST. WIRING FROM PREVIOUS LOCATION AND RECONNECT TO RELOCATED BELL.
P04	INSTALL 8"W X 8"W X 6"D JUNCTION BOX BEHIND AUDIO EQUIP. RACK FOR A/V CONDUITS TO ENTER RACK WHILE RECESSED IN WALL. SURFACE-MOUNTED CONDUITS ARE NOT ACCEPTABLE ABOVE, BELOW, OR ON SIDES RACK. STUB AN ADDITIONAL (2) 1" CONDUITS OUT ABOVE ACCESSIBLE CEILING SPACE FROM BOX.
P05	PROVIDE "1D" NETWORK ACTIVATION FOR CONNECTION TO COMMUNICATIONS OR SAFETY/SECURITY DEVICE. TERMINATED INSIDE RECESSED DEVICE BACKBOX
P06	ROUTE ACCESS CONTROL CONDUITS FROM DOOR FRAME THROUGH WALL OVER TO STAIRWELL AND STUB OUT ABOVE 6'-0" AFF.
P07	ROLLER SHADE CONTROL FOR GYMNASIUM, KEY-OPERATED SWITCH FURNISHED BY SECTION 12 24 13, WIRED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS



NORTH

KEYPLAN

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FOREST GROVE ELEMENTARY GYM ADDITION
HUDSONVILLE PUBLIC SCHOOLS
HUDSONVILLE, MICHIGAN

ISSUANCES
09.22.2021 BIDS & CONSTRUCTION
11.16.2021 BULLETIN 001

DRAWN MCK
REVIEWED JFB
PROJECT NO. 5-5362

UNIT 'C' POWER PLAN

E2.1C

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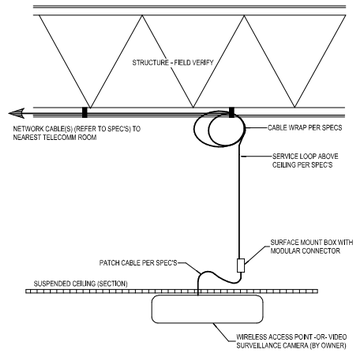
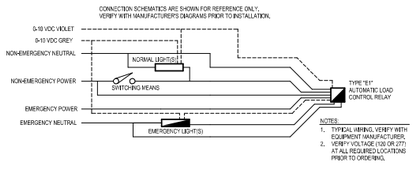
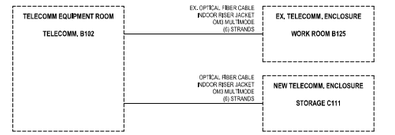


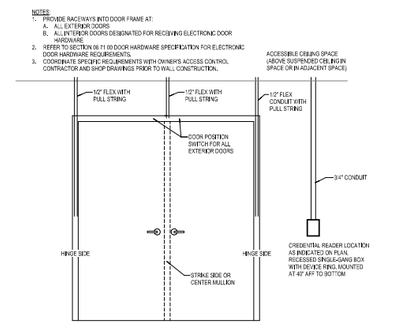
5 E7.01 CEILING MOUNTED COMMUNICATION DEVICE
NOT TO SCALE



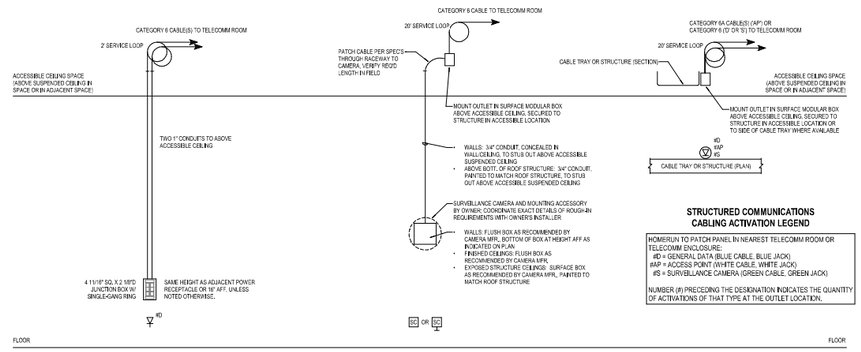
4 E7.01 EMERGENCY LIGHTING AUTOMATIC LOAD CONTROL RELAY
NOT TO SCALE

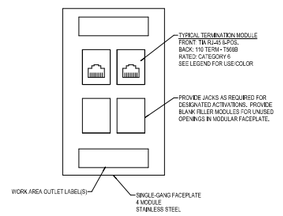


3 E7.01 COMMUNICATIONS CABLING BACKBONE RISER DIAGRAM
NOT TO SCALE

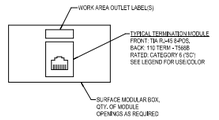


2 E7.01 TYPICAL ROUGH-IN FOR DOORS WITH ELECTRONIC ACCESS CONTROL / MONITORING
NOT TO SCALE

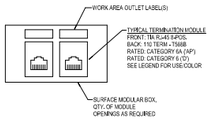




TYPICAL COMMUNICATIONS WALL OUTLET WITH '_D' OR '_AP' ACTIVATION



TYPICAL COMMUNICATIONS OUTLET FOR VIDEO SURVEILLANCE CAMERA



TYPICAL COMMUNICATIONS OUTLET ABOVE ACCESSIBLE CEILING (WIRELESS ACCESS POINT, AUDIO-VIDEO SYSTEM EQUIP., ETC.)

1 E7.01 TYPICAL COMMUNICATIONS OUTLET DETAILS
NOT TO SCALE

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DRAWN MCK
REVIEWED JFB

PROJECT NO. 5-5362

ELECTRICAL DETAILS

E7.01

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