

# INVITATION TO BID

## ISD 709 SECURITY IMPROVEMENTS – DISTRICT WIDE

DULUTH, MN

POSTED: AUGUST 9, 2019

Bid #: 19-6601

BIDS DUE: THURSDAY, AUGUST 29, 2019 @ 2:00 PM CST



On Behalf of ISD 709  
215 N. 1<sup>st</sup> Avenue East  
Duluth, MN 55802

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## **TABLE OF CONTENTS**

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INVITATION TO BID & INSTRUCTIONS TO BIDDERS

CITY OF DULUTH GENERAL BID SPECIFICATIONS

BID FORM

AFFIDAVIT OF NON-COLLUSION

RESPONSIBLE CONTRACTOR VERIFICATION

EQUAL EMPLOYMENT OPPORTUNITY (EEO) POLICY STATEMENT & COMPLIANCE  
CERTIFICATE

BYRD ANTI-LOBBYING AMENDMENT CERTIFICATION

SUPPLEMENTARY PROVISIONS – STATE & FEDERAL FUNDING

PREVAILING WAGE RATES

SCOPE OF WORK AND PLAN SHEETS



**Purchasing Division**  
120 City Hall, 411 W. 1st Street  
Duluth, MN 55802-1189  
TEL. 218-730-5340  
[purchasing@duluthmn.gov](mailto:purchasing@duluthmn.gov)

## INVITATION TO BID

### ISD 709 SECURITY IMPROVEMENTS DISTRICT WIDE

**BID NUMBER: 19-6601**

**BID OPENING: THURSDAY, AUGUST 29, 2019 AT 2:00 PM**

**PROJECT DESCRIPTION:** The City of Duluth, on behalf of the Duluth School District (ISD 709), seeks sealed bids for security improvements for the access control systems at twelve (12) locations throughout the District. This project involves the installation of door access control hardware, AiPhone video/voice communication, and AiPhone 3 button head end module control to improve security at schools within ISD 709. Please review the project detail for more information.

**THIS PROJECT IS FUNDED THROUGH A 2018 COPS OFFICE STOP SCHOOL VIOLENCE: SCHOOL VIOLENCE PREVENTION PROGRAM (SVPP) GRANT FROM THE US DEPARTMENT OF JUSTICE. THE ATTACHED FEDERAL CONTRACTING PROVISIONS APPLY.**

**PRE-BID/WALK-THROUGH:** A **MANDATORY** pre-bid meeting will be conducted on THURSDAY, AUGUST 22, 2019 AT 11:00 a.m. at Congdon Park Elementary, located at 3116 E Superior St, Duluth, MN 55812. After the meeting and walk-through at Congdon, interested bidders are responsible for visiting each of the other locations on their own during normal business hours to review the specific needs at each site. All interested bidders must attend the Congdon walkthrough. Bids received from bidders who do not attend the pre-bid/walk-through will be returned, unopened.

**QUESTIONS:** Please submit any questions regarding this project via e-mail to [purchasing@duluthmn.gov](mailto:purchasing@duluthmn.gov). Responses will be issued as an addendum to this solicitation.

The selected contractor will enter into a time and materials not-to-exceed contract directly with the District. The City of Duluth will not hold the contract.

Bid forms, contract documents, plans and specifications are on file at the following offices: Duluth Builder's Exchange, Minnesota Builder's Exchange, BXWI-Fox Valley Plan Room, and Blue Book Building and Construction Network.

## INSTRUCTIONS TO BIDDERS

All bids must be complete, signed, and transmitted in a sealed envelope plainly marked with the bid number, subject matter, and opening date.

Bids may be mailed to the Purchasing Office, City Hall, 411 West 1st Street, Room 120, Duluth, MN 55802 or dropped off in person at the same address.

Bids must be received in Purchasing before 2:00 PM local time on the bid opening date specified

on the Invitation for Bids. The City Purchasing Agent or her designee will conduct a public bid opening in Room 120 immediately following receipt of the bids. Once all bids have been reviewed, bid results will be posted online at <http://www.duluthmn.gov/purchasing/bids-request-for-proposals/>.

No alternatives to the specification will be considered unless specifically requested. Erasures or other changes to the bid must be initialed and dated, however no special conditions shall be made or included in the bid form by the bidder.

The City of Duluth and ISD 709 reserve the right to waive informalities and to reject any and all bids. Price may not be the only consideration for bid award. Bids must be firm for a minimum of 60 days.

**The following documents must be submitted with your bid:**

1. **Bid Bond** - A certified check or bank draft, payable to the order of the City of Duluth, negotiable U.S. Government Bonds (at par value), or a satisfactory bid bond executed by the bidder and acceptable surety, in an amount equal to five per cent (5%) of the total bid. Bids may be withdrawn without forfeiture of surety if the request is submitted by the Bidder and received at the Purchasing Office in writing or by e-mail prior to the scheduled bid opening.
2. **Acknowledgment of Addendum** – any changes to this solicitation will be announced via Addendum. Bidders must indicate that they have reviewed any addendum(s) by initialing and dating on the bid form where indicated. Failure to acknowledge addendum(s) may result in your bid being deemed non-responsive.
3. **Responsible Contractor** - No construction contract in excess of \$50,000 will be awarded unless the Bidder is a “responsible contractor” as defined in Minnesota Statute §16C.285, subdivision 3. All Bidders submitting a proposal for this project must verify that they meet the minimum criteria specified in the statute by submitting a Responsible Contractor Verification and Certification of Compliance form (attached) with their bid. The owner or officer of the company must sign the form under oath verifying compliance with each of the minimum criteria. Making a false statement under oath will render the Bidder or subcontractor that makes the false statement ineligible to be awarded a construction project and may result in termination of a contract awarded to a Bidder or subcontractor that submits a false statement. Bidders must obtain verification of compliance from all subcontractors. Bidders must submit signed copies of verifications and certifications of compliance from subcontractors at the City’s request.

**Please note that the following requirements also apply to this project, and any additional required documents must be submitted prior to award/contract execution. Submitting these documents with your bid will expedite the process.**

1. **Insurance** – Contractor must provide proof of Public Liability and Automobile Liability Insurance with limits not less than \$1,500,000 Single Limit prior to the commencement of work. The City of Duluth and ISD 709 must be named as an additional insured.
2. **Affidavit of Non-Collusion** – The successful bidder shall be required to execute the attached affidavit stating that he/she has not entered into a collusive agreement with any other person, firm, or corporation in regard to any bid submitted.
3. **Performance & Payment Bonds** – The awarded contractor will be required to submit performance and payments bonds in the full amount of the project cost prior to award.
4. **Affirmative Action/EEO** - The contractor must take affirmative action to ensure that the employees and applicants for employment are not discriminated against because of their race, color, creed, sex or national origin, and must meet the affirmative action goals. Contractors are encouraged to subcontract with Disadvantaged Business Enterprises (DBEs) when possible. A

current list of certified DBEs is available on the Minnesota Unified Certification website at <http://mnucp.metc.state.mn.us> . Contractor will comply with all applicable Equal Employment Opportunity laws and regulations. Awarded contractor will submit the attached Equal Employment Opportunity (EEO) Affirmative Action Policy Statement & Compliance Certificate.

5. **Out of State Contractor** - Unless a State of Minnesota Certificate of Exemption is provided, any out-of-state bidder receiving a bid award will have 8% retained from invoice payments on any contracts over \$50,000. Submit a signed copy of the signed exemption form when submitting Payment and Performance Bonds. This form may be found at: [http://www.revenue.state.mn.us/Forms\\_and\\_Instructions/sde.pdf](http://www.revenue.state.mn.us/Forms_and_Instructions/sde.pdf)

6. **Prevailing Wage** - Not less than the minimum salaries and prevailing wages as set forth in the contract documents must be paid on this project.

The City of Duluth is an Equal Opportunity Employer. Contractor shall comply with all applicable Equal Employment Opportunity laws and regulations.

CITY OF DULUTH

Amanda Ashbach  
Purchasing Agent



## GENERAL BID SPECIFICATIONS

Purchasing Division  
120 City Hall, 411 W. 1st Street  
Duluth, MN 55802-1189  
TEL. 218-730-5340  
purchasing@duluthmn.gov

1. General. This document covers bids requested by the City of Duluth ("City"), including those requested on behalf of its Agents and Authorities. Each authority may issue their own purchase order or contract and will be responsible for it. The City of Duluth Authorities are as follows:

- a. Duluth Airport Authority
- b. Spirit Mountain Recreational Area Authority
- c. Duluth Entertainment and Convention Center
- d. Duluth Transit Authority
- e. Duluth Economic Development Authority
- f. Duluth Housing and Redevelopment Authority

2. Investigation by Bidders. Bidders are responsible for thoroughly reading and understanding the information, instructions, and specifications contained in this Invitation for Bids, and for investigating the site conditions at the Project location(s), if applicable. At the time of the opening of bids, each bidder will be presumed to have read and to be thoroughly familiar with the plans, specifications and contract documents (including all addenda). The failure or omission of any bidder to examine any form, instrument, or document shall in no way relieve the bidder from any obligation in respect to their bid.

3. Bidder Questions. Responses to general questions regarding the Invitation for Bids may be made at the discretion of the City. Every request for such interpretation should be in writing and delivered via e-mail or postal mail to the Purchasing Division before the deadline indicated on the Invitation for Bids, or if no deadline is specified, at least five (5) days prior to the scheduled bid opening. Responses will be issued in writing in the form of an Addenda or e-mail to prospective bidders.

4. Changes, Corrections & Withdrawal of Bids. Erasures or other changes to the bid must be initialed and dated, however no special conditions shall be made or included on the bid form by the bidder.

Bidders may make requests to withdraw/replace their bids by notifying the Purchasing Division in writing prior to the bid opening.

5. Unit Pricing. If the total bid price is based on unit pricing, the City will verify the extended bid price for each item (obtained by multiplying the unit bid price by the bid item quantity). If any item is incorrectly calculated, the City will use the unit bid price to recalculate the extended item price and the total bid price.

6. Sales Tax. The City has a sales tax exemption certificate, which will be provided upon request.

7. Bid Submission. All bids must be complete, signed, and transmitted in a sealed envelope plainly marked with the bid number, subject matter, and opening date.

Bids may be mailed to the Purchasing Office, City Hall, 411 West 1st Street, Room 120, Duluth, MN 55802 or dropped off in person at the same address. Bids must be received by Purchasing before 2:00 PM local time on the date specified. Bids will not be accepted via e-mail unless specifically stated in the Invitation for Bids.

8. Non-Collusion Clause. By submitting a bid, the bidder, their agent and/or employee(s) hereby affirm that the attached bid or bids have been arrived at by the bidder independently and have been submitted without collusion with, and without agreement, understanding or planned common course of action with any other vendor of materials, supplies, equipment or services described in the Invitation for Bids, designed to limit independent bidding or competition.

9. Award. Award, if made, will be to the responsible bidder submitting the lowest bid which complies with the conditions of the Invitation for Bids and specifications. A bid summary will be posted on the City website immediately following the bid opening. Awards for construction services and parts /supplies over \$100,000 must be approved by City Council.

10. Bidder Qualifications. Per Sec 41.23(e) of Duluth City Code, price may not be the only consideration for award. The City will make such investigations as deemed necessary to determine the ability, capacity

and skill of the bidder to perform the work and perform it in the time specified without delay or interference, the reputation and experience of the bidder, the quality of the bidder's performance of previous contracts or services, and the sufficiency of the financial resources, equipment available and ability of the bidder to perform the contract. Bidders shall furnish to the City all such information and data for this purpose, when requested.

Minnesota law requires that, in order to transact business in the State, including submitting a response to this request for bids/proposals, a corporate entity of any kind must either be organized under Minnesota law or have a Certificate of Authority from the Minnesota Secretary of State to do business in Minnesota (M.S. 303.03). By submitting this bid/proposal as a corporation, you are certifying that the responding corporation complies with this requirement.

11. Bid Opening. The City Purchasing Agent or her designee will conduct a public bid opening in Room 120 immediately following receipt of the bids. Results will be posted online at <http://www.duluthmn.gov/purchasing/bids-request-for-proposals/> once all bids have been reviewed.

12. Rejection of Bids. The City of Duluth reserves the right to reject any and all bids and to waive any informalities or irregularities in bids received whenever such rejection or waiver is in its best interests.

The City reserves the right to reject any bid if the evidence obtained by the City through such investigation fails to satisfy the City that the bidder is properly qualified to carry out the obligations of the contract and to complete the work as required by the plans and specifications.

13. Liquidated Damages for Failure to Enter into Contract. The successful bidder, upon their failure or refusal to accept a purchase order or execute and deliver the contract, proof of insurance and bonds required within 10 days after receipt of a notice of the acceptance of their bid, shall forfeit to the City, as liquidated damages for such failure or refusal, the security deposited with their bid (if required).

14. Equal Employment Opportunity. Contractor will be required to comply with all applicable Equal Employment Opportunity (EEO) laws and regulations. Affirmative action must be taken to insure that the employees and applicants for employment are not discriminated against because of their race, color, creed, sex or national origin. The City of Duluth is an equal opportunity employer.

15. Quantities. The City reserves the right to increase or decrease the quantities of items within reason, unless otherwise noted.

16. Prevailing Wages. Per Sec 2-26 of Duluth City Code, payment of not less than the prevailing wage and salary rates specified in the contract documents and the conditions of employment with respect to certain categories and classifications of employees is required for all "Public Works" type projects estimated to exceed \$2,000. This does not apply to off-site production and manufacturing of parts and supplies.

17. Validity of Bids. All bids must remain firm for 60 days from the date of bid opening, unless another period is noted in bid documents or if an extension is agreed upon, in writing prior to the end of the 60-day period.

18. Insurance. All vendors doing work on City property, except vendors making routine deliveries, shall submit an insurance certificate verifying insurance coverage as per current city requirements.

19. Reports. Contractors will be required to provide all data required by the city, state or federal funding source(s) for reporting purposes; including, but not limited to job creation and retention data, itemized invoices, payroll records, certifications and licenses.

**BID FORM**  
**BID # 19-6601**  
**ISD 709 ACCESS CONTROL IMPROVEMENTS DISTRICT WIDE**

**REVISED 8/14/19**

The resultant contract will be a lump sum not-to-exceed. Please include a copy of your current rate sheet.

Please enter your price to provide all labor, materials, articles, equipment, incidentals, items, tools, services, supplies, methods, operations, skills in such quantities as may be necessary to complete all work required to provide a turnkey solution for each location below.

<b>SITE #</b>	<b>LOCATION</b>	<b>LUMP SUM FOR ACCESS CONTROL</b>	<b>LUMP SUM FOR AIPHONE</b>	<b>LUMP SUM FOR OFFICE CCTV</b>	<b>TOTAL LUMP SUM FOR LOCATION</b>
1	Congdon Park Elementary School				
2	East High School				
3	Homecroft Elementary School				
4	Lakewood Elementary School				
5	Laura MacArthur Elementary School				
6	Lester Park Elementary School				
7	Lincoln Park Middle School				
8	Lowell Elementary School				
9	Myers Wilkins Elementary School				
10	Ordean East Middle School				
11	Piedmont Elementary School				
12	Stowe Elementary School				
	<b>TOTAL T &amp; M NOT TO EXCEED PER COLUMN=</b>				

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TOTAL NOT TO EXCEED FOR ALL LOCATIONS IN WRITING

**BID FORM**  
**BID # 19-6601**  
**ISD 709 ACCESS CONTROL IMPROVEMENTS DISTRICT WIDE**

**REVISED 8/14/19**

**ALTERNATE UNIT PRICING**

(1) Each Panasonic WVS2131L 1080 P Indoor Dome camera W/IR LED – price to include 300' run of Cat 6a cable max and any and all associated mounting components fully installed and operational.

\$ \_\_\_\_\_

(1) Each Panasonic WVS2531LN 1080 P outdoor Vandal Dome camera W/IR LED – price to include 300' run of Cat 6a cable max and any and all associated mounting components fully installed and operational.

\$ \_\_\_\_\_

**ACKNOWLEDGMENT OF ADDENDA**

ADDENDUM #	INITIAL/DATE
ADDENDUM #	INITIAL/DATE
ADDENDUM #	INITIAL/DATE

Signature \_\_\_\_\_ Date \_\_\_\_\_

Name/Title \_\_\_\_\_

Company Name \_\_\_\_\_

Address \_\_\_\_\_

City, State, Zip \_\_\_\_\_

Tel. \_\_\_\_\_ E-Mail \_\_\_\_\_

If your organization is certified as a Disadvantaged Business Enterprise, please check here: ☐



## AFFIDAVIT AND INFORMATION REQUIRED OF BIDDERS

Affidavit of Non-Collusion:

I hereby swear (or affirm) under penalty of perjury:

That I am the bidder (if the bidder is an individual), a partner in the bidder (if the bidder is a partnership), or an officer or employee of the bidding corporation having authority to sign on its behalf (if the bidder is a corporation);

That the attached bid or bids have been arrived at by the bidder independently and have been submitted without collusion with and without agreement, understanding, or planned common course of action with any other vendor or materials, supplied, equipment or services described in the invitation to bid, designed to limit independent bidding or competition;

That the contents of the bid or bids have not been communicated by the bidder or its employees or agents to any person not an employee or agent of the bidder or its surety on any bond furnished with the bid or bids and will not be communicated to any such person prior to the official opening of the bid or bids;

That a family relationship between a City of Duluth employee and bidder/proposer are in non-collusion; and

That I have fully informed myself regarding the accuracy of the statements made in this affidavit.

Signed: \_\_\_\_\_

Firm Name: \_\_\_\_\_

Subscribed and sworn to me before this \_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_

NOTARY PUBLIC \_\_\_\_\_

My commission expires: \_\_\_\_\_

Bidder's E.I. Number \_\_\_\_\_  
(Number used on employer's quarterly Federal Tax return)

# THIS FORM MUST BE RETURNED WITH YOUR BID

## PRIME CONTRACTOR RESPONSE

### RESPONSIBLE CONTRACTOR VERIFICATION AND CERTIFICATION OF COMPLIANCE

STATE PROJECT NUMBER: \_\_\_\_\_

This form includes changes by statutory references from the Laws of Minnesota 2015, chapter 64, sections 1-9. This form must be submitted with the response to this solicitation. A response received without this form, will be rejected.

Minn. Stat. § 16C.285, Subd. 7. **IMPLEMENTATION.** ... any prime contractor or subcontractor or motor carrier that does not meet the minimum criteria in subdivision 3 or fails to verify that it meets those criteria is not a responsible contractor and is not eligible to be awarded a construction contract for the project or to perform work on the project...

Minn. Stat. § 16C.285, Subd. 3. **RESPONSIBLE CONTRACTOR, MINIMUM CRITERIA.** "Responsible contractor" means a contractor that conforms to the responsibility requirements in the solicitation document for its portion of the work on the project and verifies that it meets the following minimum criteria:

- |     |  |
|-----|--|
| (1) | <p>The Contractor:</p> <ul style="list-style-type: none"><li>(i) is in compliance with workers' compensation and unemployment insurance requirements;</li><li>(ii) is in compliance with Department of Revenue and Department of Employment and Economic Development registration requirements if it has employees;</li><li>(iii) has a valid federal tax identification number or a valid Social Security number if an individual; and</li><li>(iv) has filed a certificate of authority to transact business in Minnesota with the Secretary of State if a foreign corporation or cooperative.</li></ul>   |
| (2) | <p>The contractor or related entity is in compliance with and, during the three-year period before submitting the verification, has not violated section 177.24, 177.25, 177.41 to 177.44, 181.13, 181.14, or 181.722, and has not violated United States Code, title 29, sections 201 to 219, or United States Code, title 40, sections 3141 to 3148. For purposes of this clause, a violation occurs when a contractor or related entity:</p> <ul style="list-style-type: none"><li>(i) repeatedly fails to pay statutorily required wages or penalties on one or more separate projects for a total underpayment of \$25,000 or more within the three-year period, provided that a failure to pay is "repeated" only if it involves two or more separate and distinct occurrences of underpayment during the three-year period;</li><li>(ii) has been issued an order to comply by the commissioner of Labor and Industry that has become final;</li><li>(iii) has been issued at least two determination letters within the three-year period by the Department of Transportation finding an underpayment by the contractor or related entity to its own employees;</li><li>(iv) has been found by the commissioner of Labor and Industry to have repeatedly or willfully violated any of the sections referenced in this clause pursuant to section 177.27;</li><li>(v) has been issued a ruling or findings of underpayment by the administrator of the Wage and Hour Division of the United States Department of Labor that have become final or have been upheld by an administrative law judge or the Administrative Review Board; or</li><li>(vi) has been found liable for underpayment of wages or penalties or misrepresenting a construction worker as an independent contractor in an action brought in a court having jurisdiction. Provided that, if the contractor or related entity contests a determination of underpayment by the Department of Transportation in a contested case proceeding, a violation does not occur until the contested case proceeding has concluded with a determination that the contractor or related entity underpaid wages or penalties;*</li></ul> |

(3)	The contractor or related entity is in compliance with and, during the three-year period before submitting the verification, has not violated section 181.723 or chapter 326B. For purposes of this clause, a violation occurs when a contractor or related entity has been issued a final administrative or licensing order;*
(4)	The contractor or related entity has not, more than twice during the three-year period before submitting the verification, had a certificate of compliance under section 363A.36 revoked or suspended based on the provisions of section 363A.36, with the revocation or suspension becoming final because it was upheld by the Office of Administrative Hearings or was not appealed to the office;*
(5)	The contractor or related entity has not received a final determination assessing a monetary sanction from the Department of Administration or Transportation for failure to meet targeted group business, disadvantaged business enterprise, or veteran-owned business goals, due to a lack of good faith effort, more than once during the three-year period before submitting the verification;*
	* Any violations, suspensions, revocations, or sanctions, as defined in clauses (2) to (5), occurring prior to July 1, 2014, shall not be considered in determining whether a contractor or related entity meets the minimum criteria.
(6)	The contractor or related entity is not currently suspended or debarred by the federal government or the state of Minnesota or any of its departments, commissions, agencies, or political subdivisions that have authority to debar a contractor; and
(7)	All subcontractors and motor carriers that the contractor intends to use to perform project work have verified to the contractor through a signed statement under oath by an owner or officer that they meet the minimum criteria listed in clauses (1) to (6).

Minn. Stat. § 16C.285, Subd. 5. <b>SUBCONTRACTOR VERIFICATION.</b>	
<p>A prime contractor or subcontractor shall include in its verification of compliance under subdivision 4 a list of all of its first-tier subcontractors that it intends to retain for work on the project. Prior to execution of a construction contract, and as a condition precedent to the execution of a construction contract, the apparent successful prime contractor shall submit to the contracting authority a supplemental verification under oath confirming compliance with subdivision 3, clause (7). Each contractor or subcontractor shall obtain from all subcontractors with which it will have a direct contractual relationship a signed statement under oath by an owner or officer verifying that they meet all of the minimum criteria in subdivision 3 prior to execution of a construction contract with each subcontractor.</p> <p>If a prime contractor or any subcontractor retains additional subcontractors on the project after submitting its verification of compliance, the prime contractor or subcontractor shall obtain verifications of compliance from each additional subcontractor with which it has a direct contractual relationship and shall submit a supplemental verification confirming compliance with subdivision 3, clause (7), within 14 days of retaining the additional subcontractors.</p> <p>A prime contractor shall submit to the contracting authority upon request copies of the signed verifications of compliance from all subcontractors of any tier pursuant to subdivision 3, clause (7). A prime contractor and subcontractors shall not be responsible for the false statements of any subcontractor with which they do not have a direct contractual relationship. A prime contractor and subcontractors shall be responsible for false statements by their first-tier subcontractors with which they have a direct contractual relationship only if they accept the verification of compliance with actual knowledge that it contains a false statement.</p> <p><b>Subd. 5a. Motor carrier verification.</b> A prime contractor or subcontractor shall obtain annually from all motor carriers with which it will have a direct contractual relationship a signed statement under oath by an owner or officer verifying that they meet all of the minimum criteria in subdivision 3 prior to execution of a construction contract with each motor carrier. A prime contractor or subcontractor shall require each such motor carrier to provide it with immediate written notification in the event that the motor carrier no longer meets one or more of the minimum criteria in subdivision 3 after submitting its annual verification. A motor carrier shall be ineligible to perform work on a project covered by this section if it does not meet all the minimum criteria in subdivision 3. Upon request, a prime contractor or subcontractor shall submit to the contracting authority the signed verifications of compliance from all motor carriers providing for-hire transportation of materials, equipment, or supplies for a project.</p>	

Minn. Stat. § 16C.285, Subd. 4. **VERIFICATION OF COMPLIANCE.**

A contractor responding to a solicitation document of a contracting authority shall submit to the contracting authority a signed statement under oath by an owner or officer verifying compliance with each of the minimum criteria in subdivision 3, with the exception of clause (7), at the time that it responds to the solicitation document.

A contracting authority may accept a signed statement under oath as sufficient to demonstrate that a contractor is a responsible contractor and shall not be held liable for awarding a contract in reasonable reliance on that statement. A prime contractor, subcontractor, or motor carrier that fails to verify compliance with any one of the required minimum criteria or makes a false statement under oath in a verification of compliance shall be ineligible to be awarded a construction contract on the project for which the verification was submitted.

A false statement under oath verifying compliance with any of the minimum criteria may result in termination of a construction contract that has already been awarded to a prime contractor or subcontractor or motor carrier that submits a false statement. A contracting authority shall not be liable for declining to award a contract or terminating a contract based on a reasonable determination that the contractor failed to verify compliance with the minimum criteria or falsely stated that it meets the minimum criteria. A verification of compliance need not be notarized. An electronic verification of compliance made and submitted as part of an electronic bid shall be an acceptable verification of compliance under this section provided that it contains an electronic signature as defined in section 325L.02, paragraph (h).

**CERTIFICATION**

**By signing this document I certify that I am an owner or officer of the company, and I swear under oath that:**

- 1) My company meets each of the Minimum Criteria to be a responsible contractor as defined herein and is in compliance with Minn. Stat. § 16C.285, and**
- 2) if my company is awarded a contract, I will submit Attachment A-1 prior to contract execution, and**
- 3) if my company is awarded a contract, I will also submit Attachment A-2 as required.**

**Authorized Signature of Owner or Officer:**

**Printed Name:**

**Title:**

**Date:**

**Company Name:**

NOTE: Minn. Stat. § 16C.285, Subd. 2, (c) If only one prime contractor responds to a solicitation document, a contracting authority may award a construction contract to the responding prime contractor even if the minimum criteria in subdivision 3 are not met.

**ATTACHMENT A-1**

**FIRST-TIER SUBCONTRACTORS LIST**

**SUBMIT PRIOR TO EXECUTION OF A CONSTRUCTION CONTRACT**

**STATE PROJECT NUMBER:** \_\_\_\_\_

Minn. Stat. § 16C.285, Subd. 5. A prime contractor or subcontractor shall include in its verification of compliance under subdivision 4 a list of all of its first-tier subcontractors that it intends to retain for work on the project. Prior to execution of a construction contract, and as a condition precedent to the execution of a construction contract, the apparent successful prime contractor shall submit to the contracting authority a supplemental verification under oath confirming compliance with subdivision 3, clause (7). Each contractor or subcontractor shall obtain from all subcontractors with which it will have a direct contractual relationship a signed statement under oath by an owner or officer verifying that they meet all of the minimum criteria in subdivision 3 prior to execution of a construction contract with each subcontractor.

<b>FIRST TIER SUBCONTRACTOR NAMES*</b> <b>(Legal name of company as registered with the Secretary of State)</b>	<b>Name of city where company home office is located</b>

\*Attach additional sheets as needed for submission of all first-tier subcontractors.

<b>SUPPLEMENTAL CERTIFICATION FOR ATTACHMENT A-1</b>	
<b>By signing this document I certify that I am an owner or officer of the company, and I swear under oath that:</b>  <b>All first-tier subcontractors listed on attachment A-1 have verified through a signed statement under oath by an owner or officer that they meet the minimum criteria to be a responsible contractor as defined in Minn. Stat. § 16C.285.</b>	
<b>Authorized Signature of Owner or Officer:</b>	<b>Printed Name:</b>
<b>Title:</b>	<b>Date:</b>
<b>Company Name:</b>	

**ATTACHMENT A-2**

**ADDITIONAL SUBCONTRACTORS LIST**

**PRIME CONTRACTOR TO SUBMIT AS SUBCONTRACTORS ARE ADDED TO THE PROJECT**

**STATE PROJECT NUMBER:** \_\_\_\_\_

This form must be submitted to the Project Manager or individual as identified in the solicitation document.

Minn. Stat. § 16C.285, Subd. 5. ... If a prime contractor or any subcontractor retains additional subcontractors on the project after submitting its verification of compliance, the prime contractor or subcontractor shall obtain verifications of compliance from each additional subcontractor with which it has a direct contractual relationship and shall submit a supplemental verification confirming compliance with subdivision 3, clause (7), within 14 days of retaining the additional subcontractors. ...

<b>ADDITIONAL SUBCONTRACTOR NAMES*</b> <b>(Legal name of company as registered with the Secretary of State)</b>	<b>Name of city where company home office is located</b>

\*Attach additional sheets as needed for submission of all additional subcontractors.

<b>SUPPLEMENTAL CERTIFICATION FOR ATTACHMENT A-2</b>	
<b>By signing this document I certify that I am an owner or officer of the company, and I swear under oath that:</b>  <b>All additional subcontractors listed on Attachment A-2 have verified through a signed statement under oath by an owner or officer that they meet the minimum criteria to be a responsible contractor as defined in Minn. Stat. § 16C.285.</b>	
<b>Authorized Signature of Owner or Officer:</b>	<b>Printed Name:</b>
<b>Title:</b>	<b>Date:</b>
<b>Company Name:</b>	

**EQUAL EMPLOYMENT OPPORTUNITY EEO AFFIRMATIVE ACTION  
POLICY STATEMENT & COMPLIANCE CERTIFICATE**

**TO: City of Duluth, MN      PROJECT NUMBER & DESCRIPTION** \_\_\_\_\_

**FROM:** \_\_\_\_\_

\_\_\_\_\_  
(Vendor's name, address, telephone number)

**A) Employment:** It is the policy of the above named FIRM to afford equal opportunity for employment to all individuals regardless of race, color, creed, religion, national origin, ancestry, age, sex, marital status, status with respect to public assistance and/or disability. The FIRM will take affirmative action to ensure that we will: (1) recruit, hire, and promote all job classifications without regard to race, color, creed, religion, national origin, ancestry, age, sex, marital status, status with respect to public assistance, and/or disability, except where sex is a bona fide occupational qualification; (2) base decisions on employment so as to further the principle of equal employment opportunity; (3) ensure that promotion decisions are in accord with the principles of equal employment opportunity by imposing only valid requirements for promotional opportunities; (4) ensure that all personnel actions such as compensation, benefits, transfers, layoffs, return from layoff, FIRM sponsored training, education tuition assistance, social and recreational programs will be administered without regard to race, color, creed, religion, national origin, ancestry, age, sex, marital status, status with respect to public assistance, and/or disability. The FIRM also intends full compliance with Veteran affirmative action requirements. Additionally, minority and female employees shall be encouraged to participate in all FIRM activities and refer applicants.

I have designated (name) \_\_\_\_\_ to direct the establishment of and to monitor the implementation of personnel procedures to guide the FIRM's affirmative action program. Where PROJECTS exceed \$500,000, this official shall also serve as the liaison officer that administers the FIRM's "Minority Business Enterprise Program." This official is charged with designing and implementing audit and reporting systems that will keep management informed on a monthly basis of the status of the equal opportunity area.

Supervisors have been made to understand that their work performance is being evaluated on the basis of their equal opportunity efforts and results, as well as other criteria. It shall be the responsibility of the FIRM and its supervisors to take actions to prevent harassment of employees placed through affirmative action efforts.

**B) Reports:** Unless exempted by law and regulation, the FIRM shall make available and file those reports related to equal opportunity as may be required by the City of Duluth and State and Federal compliance agencies. Requirements and Reports are defined in 41CFR60 "Compliance Responsibility for Equal Opportunity" published by the U. S. Department of Labor which is incorporated herein by reference. Additional requirements are defined in various State and Federal Civil Rights Legislation and Rules promulgated thereunder.

**C) Nonsegregated Facilities:** The FIRM certifies that it does not maintain or provide for its employees any segregated facilities at any of its establishments and that it does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The FIRM certifies that it will not maintain or provide for its employees any segregated facilities at any of its establishments and that it will not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The FIRM agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this certificate. As used in this Certification, the term "segregated

facilities" means any waiting rooms, work area, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation for entertainment area, transportation, and housing facilities provided for employees which are segregated by explicit directive or are, in fact, segregated on the basis of race, color, religion, or national origin, because of habit, local custom, or otherwise.

- D) Affirmative Action Compliance Program:** Unless exempted by regulation and law, the FIRM—if the FIRM has 50 or more employees and if the value of current contracts with the City of Duluth exceeds \$50,000—shall prepare and maintain a written affirmative action compliance program that meets the requirement as set forth in 41CFR60.
- E) Non-Compliance:** The FIRM certifies that it is not currently in receipt of any outstanding letters of deficiencies, show cause, probable cause, or other such notification of non-compliance with EEO Laws and Regulations.
- F) Employment Goals - "Construction" Projects:** It shall be the goal of the FIRM if the PROJECT is of a construction nature that in all on-site employment generated that no less than 3% of the on-site workforce will be minority employees and that no less than 7% of the on-site workforce will be female employees. Further, it is the goal of the FIRM if the PROJECT is of a construction nature that in all on-site employment generated that no less than 3% of the work hours generated shall be worked by minority employees and that no less than 7% of the work hours generated shall be worked by female employees.
- G) Subcontractors:** The FIRM will for all its PROJECT subcontractors regardless of tier (unless exempted by law and regulation) that received in excess of \$2,500 require that: (1) the subcontractor shall execute an "EEO Statement and Certification" similar in nature to this "Statement and Certification", (2) said documentation to be maintained on file with the FIRM or subcontractor as may be appropriate.

Executed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_ by:

\_\_\_\_\_  
Printed name and title

\_\_\_\_\_  
Signature

**NOTE:** In addition to the various remedies prescribed for violation of Equal Opportunity Laws, the penalty for false statements is prescribed in 18 U.S.C. 1001.



BYRD ANTI-LOBBYING AMENDMENT CERTIFICATION  
(To be submitted with each bid or offer exceeding \$100,000)

The undersigned, [Company] \_\_\_\_\_ certifies, to the best of his or her knowledge, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The Contractor, [Company] \_\_\_\_\_, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. § 3801 *et seq.*, apply to this certification and disclosure, if any.

\_\_\_\_\_  
Signature of Contractor's Authorized Official

\_\_\_\_\_  
Name and Title of Contractor's Authorized Official

\_\_\_\_\_  
Date

## Supplementary Provisions – State & Federal Funding

### 1. Disbursements

- a. No money under this Contract shall be disbursed to any Contractor unless the Contractor is in compliance with the Federal Agency requirements with regard to accounting and fiscal matters to the extent they are applicable.
- b. Unearned payments under this Contract may be suspended or terminated upon the Contractor's refusal to accept any additional conditions that may be imposed by the Federal Agency at any time; or if the grant to the Owner under which this Contract is made is suspended or terminated.

### 2. Subcontracting Requirements

- a. The Contractor shall include in any subcontract the clauses set forth in these Supplementary Provisions in their entirety and shall also include a clause requiring the subcontractors to include these clauses in any lower tier subcontracts which they may enter into, together with a clause requiring this insertion in any further subcontracts that may in turn be made.
- b. The Contractor shall not subcontract any part of the work covered by this Contract or permit subcontracted work to be further subcontracted without the Owner's prior written approval of the subcontractors. The Owner will not approve any subcontractor for work covered by this Contract who is at the time ineligible under the provisions of any applicable regulations issued by a Federal Agency or the Secretary of Labor, United States Department of Labor, to receive an award of such subcontract.

### 3. Breach of Contract.

Owner may, subject to the Force Majeure provisions below and in addition to its other rights under the Contract, declare the Contractor in breach of the Contract by written notice thereof to the Contractor, and terminate the Contract in whole or in part, in accordance with Section 4, Termination, for reasons including but not limited to any of the following:

- a. Failure to begin the Work within the time specified in the Contract;
- b. Failure to perform the Work with sufficient labor, equipment, or material to insure the completion of the specified Work in accordance with the Contract terms;
- c. Unsatisfactory performance of the Work;
- d. Failure or refusal to remove material, or remove and replace any Work rejected as defective or unsatisfactory;
- e. Discontinuance of the Work without approval;
- f. Failure to resume the Work, which has been discontinued, within a reasonable time after notice to do so;
- g. Insolvency or bankruptcy;
- h. Failure to protect, to repair, or to make good any damage or injury to property;
- i. Breach of any provision of the Contract;
- j. Misrepresentations made in the Contractor's bid/proposal; or
- k. Failure to comply with applicable industry standards, customs, and practice.

### 4. Termination.

If the Contractor is in breach of the Contract, the Owner, by written notice to the Contractor, may terminate the Contractor's right to proceed with the Work. Upon such termination, the Owner may take over the Work and prosecute the same to completion, by contract or otherwise, and the Contractor and its sureties shall be liable to the Owner for any additional cost incurred by the Owner in its completion of the Work and they shall also be liable to the Owner for liquidated damages for any delay in the completion of the Work as provided below. If the Contractor's right to proceed is terminated, the Owner may take

possession of and utilize in completing the Work such materials, tools, equipment, and plant as may be on the site of the Work and necessary therefore.

Notwithstanding anything herein to the contrary, the Owner may terminate this Contract at any time upon written notice given by the Owner (for any reason, including the convenience of the Owner) to the Contractor at least sixty (60) days prior to the effective date of the termination of this Contract. The Owner agrees that termination hereunder will not relieve the Owner of its obligation to pay Contractor for Work satisfactorily performed and reasonable costs incurred prior to the effective date of the termination provided that Contractor has not committed a breach of this Contract. Nothing contained in this section shall prevent either party from pursuing or collecting any damages to which it may be entitled by law.

5. Force Majeure.

The right of the Contractor to proceed shall not be terminated nor shall the Contractor be charged with liquidated damages for any delays in the completion of the Work due to any acts of the Government, including controls or restrictions upon or requisitioning of materials, equipment, tools, or labor by reason of war, National Defense, or any other national emergency; any acts of the Owner; causes not reasonably foreseeable by the parties to this Contract at the time of the execution of the Contract which are beyond the control and without the fault or negligence of the Contractor, including, but not restricted to, acts of God or of the public enemy, acts of another Contractor in their performance of some other contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and weather of unusual severity such as hurricanes, tornadoes, cyclones, and other extreme weather conditions; nor to any delay of any Subcontractor occasioned by any of the causes specified above. The Contractor shall promptly notify the Owner in writing within ten (10) days of the delay. Upon receipt of such notification, the Owner shall ascertain the facts and the cause of the delay. If, upon the basis of facts and the terms of the Contract, the delay is properly excusable, the Owner shall extend the time for completing the Work for a period of time commensurate with the period of excusable delay.

6. Equal Employment Opportunity.

During the performance of this contract, the contractor agrees as follows:

- a. The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- b. The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, or national origin.
- c. The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- d. The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- e. The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules,

regulations, and orders.

- f. In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions as may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
- g. The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (a) through (g) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, That in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the contractor may request the United States to enter into such litigation to protect the interests of the United States.

7. Davis Bacon Act.

Contractor shall comply with the Davis-Bacon Act (40 U.S.C. 3141–3144, and 3146–3148) as supplemented by Department of Labor regulations (29 CFR Part 5, ‘Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction’). Contractor shall pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in the wage decision included as part of the bid solicitation. In addition, contractor shall pay wages not less than once a week.

8. Compliance with the Copeland “Anti-Kickback” Act.

Contractor shall comply with the Copeland “Anti-Kickback” Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, “Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States”). Contractor and any subcontractors are prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled.

9. Contract Work Hours and Safety Standards Act. (Applies to all contracts over \$100,000 that employ mechanics or laborers)

Contractor shall comply with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Contractor shall compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. Contractor shall ensure that no laborer or mechanic involved in the Work is required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

10. Clean Air Act and Federal Water Pollution Control Act (Applies to all contracts over \$150,000)

Contractor shall comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401–7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251–1387). Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA). Contractor agrees to include this provision in any subcontract exceeding \$150,000 that is financed in whole or in part with Federal funds.

11. Energy Standards.

Contractor shall comply with all mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 U.S.C. 6201).

12. Suspension and Debarment.

This contract is a covered transaction for purposes of 49 CFR Part 29. As such, the contractor is required to verify that none of the contractor, its principals, as defined at 49 CFR 29.995, or affiliates, as defined at 49 CFR 29.905, are excluded or disqualified as defined at 49 CFR 29.940 and 29.945. The contractor is required to comply with 49 CFR 29, Subpart C and must include the requirement to comply with 49 CFR 29, Subpart C in any lower tier covered transaction it enters into.

13. Byrd Anti-Lobbying Amendment, 31 U.S.C. § 1352 (as amended) (*Applies to all contracts over \$100,000*)

Contractors must certify, by completing the attached certification form, that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352.

14. Procurement of Recovered Materials.

In the performance of this contract, the Contractor shall comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. This shall include making maximum use of products containing recovered materials as designated by the Environmental Protection Agency (EPA) unless (i) the materials cannot be acquired competitively and within the timeframe required by the contract performance schedule; (ii) the materials designated by the EPA do not meet contract performance requirements; or (iii) the materials cannot be acquired for a reasonable price. Information about this requirement, along with the list of EPA- designated items, is available at the EPA's Comprehensive Procurement Guidelines web site, <https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program>.

"General Decision Number: MN20190129 07/26/2019

Superseded General Decision Number: MN20180194

State: Minnesota

Construction Type: Building

County: St Louis County in Minnesota.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.60 for calendar year 2019 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.60 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2019. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the

Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at [www.dol.gov/whd/govcontracts](http://www.dol.gov/whd/govcontracts).

Modification Number	Publication Date
0	01/04/2019
1	02/01/2019
2	02/08/2019
3	06/21/2019
4	07/26/2019

\* ASBE0034-001 06/01/2019

	Rates	Fringes
ASBESTOS WORKER/HEAT & FROST INSULATOR.....	\$ 38.15	33.40

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BOIL0647-008 03/01/2018

	Rates	Fringes
BOILERMAKER.....	\$ 37.22	27.14

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BRMN0001-010 05/01/2018

	Rates	Fringes
BRICKLAYER.....	\$ 34.99	24.64

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BRMN0001-019 05/01/2018

	Rates	Fringes
TILE FINISHER.....	\$ 25.13	5.54

TILE SETTER.....	\$ 25.89	24.34
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CARP0361-008 06/01/2018

	Rates	Fringes
CARPENTER (Includes Drywall Hanging, and Form Work, and Excludes Soft Floor Layer).....	\$ 33.60	19.03
SOFT FLOOR LAYER.....	\$ 33.25	16.94

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\* ELEC0242-002 06/02/2019

	Rates	Fringes
ELECTRICIAN.....	\$ 38.46	27.13

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ENGI0049-019 05/01/2019

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
Bulldozer.....	\$ 40.08	20.55
Crane.....	\$ 41.84	20.55
Drill.....	\$ 40.08	20.55
Forklift.....	\$ 40.08	20.55
Loader.....	\$ 40.08	20.55
Oiler.....	\$ 37.45	20.55
Roller.....	\$ 40.08	20.55

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IRON0512-025 05/01/2018

	Rates	Fringes
IRONWORKER (Structural and Reinforcing).....	\$ 32.64	27.85



LABO1091-025 05/01/2018

	Rates	Fringes
LABORER		
Asbestos Abatement (Removal from Ceilings, Floors, and Walls).....	\$ 30.83	18.70
Common or General.....	\$ 28.04	16.17
Mason Tender - Brick/Cement/Concrete.....	\$ 27.99	15.32
Pipelayer.....	\$ 35.68	16.92

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PAIN0106-007 05/01/2017

	Rates	Fringes
GLAZIER.....	\$ 30.58	18.02

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PAIN0106-009 05/01/2017

	Rates	Fringes
DRYWALL FINISHER/TAPER.....	\$ 30.33	17.27

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PAIN0386-010 05/01/2014

	Rates	Fringes
PAINTER (Spray).....	\$ 25.08	13.99

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PLAS0633-008 05/01/2018

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER....	\$ 32.66	18.68

PLAS0633-011 05/01/2018

	Rates	Fringes
PLASTERER.....	\$ 25.47	14.88

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PLUM0011-007 07/03/2018

	Rates	Fringes
PIPEFITTER (Includes HVAC Pipe Installation and Excludes HVAC Unit Installation).....	\$ 34.59	17.34
PLUMBER (Excludes HVAC Pipe and Unit Installation).....	\$ 34.59	17.34

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\* ROOF0096-019 07/01/2019

	Rates	Fringes
ROOFER.....	\$ 34.15	17.97

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SHEE0010-034 04/30/2018

	Rates	Fringes
SHEET METAL WORKER (Includes HVAC Duct and Unit Installation).....	\$ 33.75	27.21

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\* UAVG-MN-0024 01/01/2019

	Rates	Fringes
OPERATOR: Backhoe/Excavator/Trackhoe.....	\$ 36.89	20.30

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 \* UAVG-MN-0025 01/01/2019

	Rates	Fringes
PAINTER (Brush and Roller).....	\$ 29.50	17.64

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SUMN2015-064 06/22/2018

	Rates	Fringes
OPERATOR: Bobcat/Skid Steer/Skid Loader.....	\$ 32.03	14.80
TRUCK DRIVER: Dump Truck.....	\$ 23.43	12.33

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WELDERS - Receive rate prescribed for craft performing  
 operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information

on contractor requirements and worker protections under the EO is available at [www.dol.gov/whd/govcontracts](http://www.dol.gov/whd/govcontracts).

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

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The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

#### Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

#### Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

#### Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of

each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

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WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- \* an existing published wage determination
- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
Wage and Hour Division  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION"





## **ISD 709 Security Improvements District Wide - Project Detail**

This upgrade includes work at twelve (12) ISD 709 School Sites which are: Congdon Park Elementary, East High School, Homecroft Elementary, Lakewood Elementary, Laura MacArthur Elementary, Lester Park Elementary, Lincoln Park Middle School, Lowell Barnes Elementary, Myers-Wilkins Elementary, Ordean East Middle School, Piedmont Elementary, and Stowe Elementary. (Project excludes Denfeld HS and Rockridge Academy)

From 2008 to 2013, the District constructed new or newly renovated schools, all that contain some form or level of perimeter door access control comprised of the following manufactures (JCI security components consisting of hardware and software, Schlage/Von Duprin/Allegian hardware, and JCI C Cure 9000 software), to include AiPhone video/voice communication, and AiPhone 3 button head end module control in the main office for clerical use to operate specific doors.

This 12 site project upgrades and enhances the door hardware and door control of JCI C-Cure 9000 existing access control systems, and once complete this upgrade will provide the office staff a method to control/release the 5 doors as identified on each school site plan. This upgrade will also provide two way video / voice communication to 2 of the 5 controlled doors at each site.

It is the contractor's responsibility to verify notes and plans with site visits as related to what is existing and what can be re-used at each site. All new equipment shall be comprised of JCI hardware, JCI C-Cure 9000 software, appropriate AiPhone communication devices, Panasonic cameras, and other associated Von Duprin/Schlage/Allegian hardware to match existing hardware at each site. Due to compatibility requirements, no substitutions are allowed.

Site by site existing conditions vary and need site inspection. Required functions and features are identified below and in the attached plan sheets.

**CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING NEEDED MATERIALS TO MEET NEW DEFINED FUNCTIONS AS REQUIRED.**

**ALL PERFORMED WORK SHALL BE DONE WITH GENERALLY ACCEPTED MEANS AND METHODS. ALL WORK MUST COMPLY WITH THE DISTRICT CONSTRUCTION STANDARDS ATTACHED FOR REFERENCE.**

**CONFER WITH OWNER PRIOR TO MOUNTING ANY COMPONENT. ALL MOUNTING LOCATIONS TO BE APPROVED BY OWNER.**

**THIS IS A TURNKEY SYSTEM - CONTRACTOR TO BE RESPONSIBLE FOR TURNING OVER A FULLY FUNCTIONING SYSTEM OF AIPHONE DOOR RELEASE, VIDEO AND VOICE COMMUNICATION SYSTEMS, AND VIDEO VIEWING SYSTEMS.**

**SEE ATTACHED SITE PLANS AS EACH SITE IS DIFFERENT**

## **1. Congdon Park Elementary School**

### **Existing Features:**

Existing access control doors are now located at front main entrance (A), inner vestibule to school (B), entrance door to office (C), loading dock door (E). Currently site clerical desk AiPhone analog module controls only loading dock door, (E).

### **New construction effort to add three separate components:**

#### **1 - Access Control:**

Furnish and install new access control hardware / programming / door hardware / lockset to door D exiting office to school corridor to allow C-Cure 9000 to control door D in a similar manner as other doors. Door D will have a new card in card out feature, with free entrance from corridor when programmed unless secured for non-office hours.

#### **2 – AiPhone**

Furnish and install two new AiPhone IX-MV7-HB - IP head end master stations to control / release doors A, B, C, D, E. This system to include (2) two video and voice modules AiPhone model IX-DV - IP door stations located as per plan in main school entrance vestibule and at loading dock exterior door. The (2) two head end master station modules to be located per plan at main office clerical desk and main office nurse desk. Desk modules to connect to wall outlet with 10' patch cable to allow location changes. Back boxes and any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.

#### **3 – Office CCTV**

Furnish and install system to project video from existing school networked Panasonic cameras (3) located in entry vestibule, school front entrance, and loading dock entrance, via pulling IP camera stream off of existing network through new appliance (head end) Panasonic WJNX200\300T3 to display split screen on 43 inch LED located in main office in clear view of clerical staff. All cabling shall be CAT 6A run in cable trays or in walls with no exposed conduit with proper means and methods to get to proper locations. If no camera is located in that specific location install camera as per add alternate line item cost for new camera and cabling. Any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.

## **2. East High School**

### **Existing Features:**

Existing access control doors are now located at front main entrance (A), inner vestibule to school (B), entrance door to office (C), loading dock door (E). Currently site clerical desk AiPhone analog module controls only loading dock door, (E).

### **New construction effort to add three separate components:**

#### **1 - Access Control:**

Furnish and install new access control hardware / programming / door hardware / lockset to door D exiting office to school corridor to allow C-Cure 9000 to control door D in a similar manner as other doors. Door D will have a new card in card out feature, with free entrance from corridor when programmed unless secured for non-office hours.

#### **2 – AiPhone**

Furnish and install two new AiPhone IX-MV7-HB - IP head end master stations to control / release doors A, B, C, D, E. This system to include (2) two video and voice modules AiPhone model IX-DV - IP door stations located as per plan in main school entrance vestibule and at loading dock exterior door. The (2) two head end master station modules to be located per plan at main office clerical desk and main office secondary desk. Desk modules to connect to wall outlet with 10' patch cable to allow location changes. Back boxes and any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.

#### **3 – Office CCTV**

Furnish and install system to project video from existing school networked Panasonic cameras (3) located in entry vestibule, school front entrance, and loading dock entrance, via pulling IP camera stream off of existing network through new appliance (head end) Panasonic WJNX200\300T3 to display split screen on 43 inch LED located in main office in clear view of clerical staff. All cabling shall be CAT 6A run in cable trays or in walls with no exposed conduit with proper means and methods to get to proper locations. If no camera is located in that specific location install camera as per add alternate line item cost for new camera and cabling. Any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.

### **3. Homecroft Elementary School**

#### **Existing Features:**

Existing access control doors are now located at inner vestibule to school (B), loading dock door (E). Currently site clerical desk AiPhone analog module controls only loading dock door, (E).

#### **New construction effort to add three separate components:**

##### **1 - Access Control:**

Furnish and install as required new access control hardware / programming / door hardware / lockset to doors A, C, and D to allow C-Cure 9000 to control door A, door C, and door D in a similar manner as other doors. Door A and C will have new card in feature, and D will have a new card in card out feature, with door D having free entrance from corridor when programmed unless secured for non-office hours.

##### **2 – AiPhone**

Furnish and install two new AiPhone IX-MV7-HB - IP head end master stations to control / release doors A, B, C, D, E. This system to include (2) two video and voice modules AiPhone model IX-DV - IP door stations located as per plan in main school entrance vestibule and at loading dock exterior door. The (2) two head end master station modules to be located per plan at main office clerical desk and main office nurse desk. Desk modules to connect to wall outlet with 10' patch cable to allow location changes. Back boxes and any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.

##### **3 – Office CCTV**

Furnish and install system to project video from existing school networked Panasonic cameras (3) located in entry vestibule, school front entrance, and loading dock entrance, via pulling IP camera stream off of existing network through new appliance (head end) Panasonic WJNX200\300T3 to display split screen on 43 inch LED located in main office in clear view of clerical staff. All cabling shall be CAT 6A run in cable trays or in walls with no exposed conduit with proper means and methods to get to proper locations. If no camera is located in that specific location install camera as per add alternate line item cost for new camera and cabling. Any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.

#### **4. Lakewood Elementary School**

##### **Existing Features:**

Existing access control doors are now located at inner vestibule to school (B), loading dock door (E). Currently site clerical desk AiPhone analog module controls only loading dock door, (E).

##### **New construction effort to add three separate components:**

###### **1 - Access Control:**

Furnish and install new access control hardware / programming / door hardware / lockset to doors A, C, and D to allow C-Cure 9000 to control door A, door C, and door D in a similar manner as other doors. Doors A and C will have new card in feature, door D will have a new card in card out feature, with door D having free entrance from corridor when programmed unless secured for non-office hours.

###### **2 – AiPhone**

Furnish and install two new AiPhone IX-MV7-HB - IP head end master stations to control / release doors A, B, C, D, E. This system to include (2) two video and voice modules AiPhone model IX-DV - IP door stations located as per plan in main school entrance vestibule and at loading dock exterior door. The (2) two head end master station modules to be located per plan at main office clerical desk and main office nurse desk. Desk modules to connect to wall outlet with 10' patch cable to allow location changes. Back boxes and any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.

###### **3 – Office CCTV**

Furnish and install system to project video from existing school networked Panasonic cameras (3) located in entry vestibule, school front entrance, and loading dock entrance, via pulling IP camera stream off of existing network through new appliance (head end) Panasonic WJNX200\300T3 to display split screen on 43 inch LED located in main office in clear view of clerical staff. All cabling shall be CAT 6A run in cable trays or in walls with no exposed conduit with proper means and methods to get to proper locations. If no camera is located in that specific location install camera as per add alternate line item cost for new camera and cabling. Any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.

## **5. Laura MacArthur Elementary School**

### **Existing Features:**

Existing access control doors are now located at front main entrance (A), inner vestibule to school (B), entrance door to office (C), loading dock door (E). Currently site clerical desk AiPhone analog module controls only loading dock door, (E).

### **New construction effort to add three separate components:**

#### **1 - Access Control:**

Furnish and install new access control hardware / programming / door hardware / lockset to door D exiting office to school corridor to allow C-Cure 9000 to control door D in a similar manner as other doors. Door D will have a new card in card out feature, with free entrance from corridor when programmed unless secured for non-office hours.

#### **2 – AiPhone**

Furnish and install two new AiPhone IX-MV7-HB - IP head end master stations to control / release doors A, B, C, D, E. This system to include (2) two video and voice modules AiPhone model IX-DV - IP door stations located as per plan in main school entrance vestibule and at loading dock exterior door. The (2) two head end master station modules to be located per plan at main office clerical desk and main office nurse desk. Desk modules to connect to wall outlet with 10' patch cable to allow location changes. Back boxes and any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.

#### **3 – Office CCTV**

Furnish and install system to project video from existing school networked Panasonic cameras (3) located in entry vestibule, school front entrance, and loading dock entrance, via pulling IP camera stream off of existing network through new appliance (head end) Panasonic WJNX200\300T3 to display split screen on 43 inch LED located in main office in clear view of clerical staff. All cabling shall be CAT 6A run in cable trays or in walls with no exposed conduit with proper means and methods to get to proper locations. If no camera is located in that specific location install camera as per add alternate line item cost for new camera and cabling. Any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.

## **6. Lester Park Elementary School**

### **Existing Features:**

Existing access control doors are now located at front main entrance (A), inner vestibule to school (B), entrance door to office (C), loading dock door (E). Currently site clerical desk AiPhone analog module controls only loading dock door, (E).

### **New construction effort to add three separate components:**

#### **1 - Access Control:**

Furnish and install new access control hardware / programming / door hardware / lockset to door D exiting office to school corridor to allow C-Cure 9000 to control door D in a similar manner as other doors. Door D will have a new card in card out feature, with free entrance from corridor when programmed unless secured for non-office hours.

#### **2 – AiPhone**

Furnish and install two new AiPhone IX-MV7-HB - IP head end master stations to control / release doors A, B, C, D, E. This system to include (2) two video and voice modules AiPhone model IX-DV - IP door stations located as per plan in main school entrance vestibule and at loading dock exterior door. The (2) two head end master station modules to be located per plan at main office clerical desk and main office nurse desk. Desk modules to connect to wall outlet with 10' patch cable to allow location changes. Back boxes and any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.

#### **3 – Office CCTV**

Furnish and install system to project video from existing school networked Panasonic cameras (3) located in entry vestibule, school front entrance, and loading dock entrance, via pulling IP camera stream off of existing network through new appliance (head end) Panasonic WJNX200\300T3 to display split screen on 43 inch LED located in main office in clear view of clerical staff. All cabling shall be CAT 6A run in cable trays or in walls with no exposed conduit with proper means and methods to get to proper locations. If no camera is located in that specific location install camera as per add alternate line item cost for new camera and cabling. Any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.

## **7. Lincoln Park Middle School**

### **Existing Features:**

Existing access control doors are now located at front main entrance (A), inner vestibule to school (B), entrance door to office (C), loading dock door (E). Currently site clerical desk AiPhone analog module controls only loading dock door, (E).

### **New construction effort to add three separate components:**

#### **1 - Access Control:**

Furnish and install new access control hardware / programming / door hardware / lockset to door D exiting office to school corridor to allow C-Cure 9000 to control door D in a similar manner as other doors. Door D will have a new card in card out feature, with free entrance from corridor when programmed unless secured for non-office hours.

#### **2 – AiPhone**

Furnish and install two new AiPhone IX-MV7-HB - IP head end master stations to control / release doors A, B, C, D, E. This system to include (2) two video and voice modules AiPhone model IX-DV - IP door stations located as per plan in main school entrance vestibule and at loading dock exterior door. The (2) two head end master station modules to be located per plan at main office clerical desk and main office nurse desk. Desk modules to connect to wall outlet with 10' patch cable to allow location changes. Back boxes and any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.

#### **3 – Office CCTV**

Furnish and install system to project video from existing school networked Panasonic cameras (3) located in entry vestibule, school front entrance, and loading dock entrance, via pulling IP camera stream off of existing network through new appliance (head end) Panasonic WJNX200\300T3 to display split screen on 43 inch LED located in main office in clear view of clerical staff. All cabling shall be CAT 6A run in cable trays or in walls with no exposed conduit with proper means and methods to get to proper locations. If no camera is located in that specific location install camera as per add alternate line item cost for new camera and cabling. Any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.



## **8. Lowell Elementary School**

### **Existing Features:**

Existing access control doors are now located at front main entrance (A), inner vestibule to school (B), entrance door to office (C), loading dock door (E). Currently site clerical desk AiPhone analog module controls only loading dock door, (E).

### **New construction effort to add three separate components:**

#### **1 - Access Control:**

Furnish and install new access control hardware / programming / door hardware / lockset to door D exiting office to school corridor to allow C-Cure 9000 to control door D in a similar manner as other doors. Door D will have a new card in card out feature, with free entrance from corridor when programmed unless secured for non-office hours.

#### **2 – AiPhone**

Furnish and install two new AiPhone IX-MV7-HB - IP head end master stations to control / release doors A, B, C, D, E. This system to include (2) two video and voice modules AiPhone model IX-DV - IP door stations located as per plan in main school entrance vestibule and at loading dock exterior door. The (2) two head end master station modules to be located per plan at main office clerical desk and main office nurse desk. Desk modules to connect to wall outlet with 10' patch cable to allow location changes. Back boxes and any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.

#### **3 – Office CCTV**

Furnish and install system to project video from existing school networked Panasonic cameras (3) located in entry vestibule, school front entrance, and loading dock entrance, via pulling IP camera stream off of existing network through new appliance (head end) Panasonic WJNX200\300T3 to display split screen on 43 inch LED located in main office in clear view of clerical staff. All cabling shall be CAT 6A run in cable trays or in walls with no exposed conduit with proper means and methods to get to proper locations. If no camera is located in that specific location install camera as per add alternate line item cost for new camera and cabling. Any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.

## **9. Myers-Wilkins Elementary School**

### **Existing Features:**

Existing access control doors are now located at front main entrance (A), inner vestibule to school (B), entrance door to office (C), loading dock door (E). Currently site clerical desk AiPhone analog module controls only loading dock door, (E).

### **New construction effort to add three separate components:**

#### **1 - Access Control:**

Furnish and install new access control hardware / programming / door hardware / lockset to door D exiting office to school corridor to allow C-Cure 9000 to control door D in a similar manner as other doors. Door D will have a new card in card out feature, with free entrance from corridor when programmed unless secured for non-office hours.

#### **2 – AiPhone**

Furnish and install two new AiPhone IX-MV7-HB - IP head end master stations to control / release doors A, B, C, D, E. This system to include (2) two video and voice modules AiPhone model IX-DV - IP door stations located as per plan in main school entrance vestibule and at loading dock exterior door. The (2) two head end master station modules to be located per plan at main office clerical desk and main office nurse desk. Desk modules to connect to wall outlet with 10' patch cable to allow location changes. Back boxes and any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.

#### **3 – Office CCTV**

Furnish and install system to project video from existing school networked Panasonic cameras (3) located in entry vestibule, school front entrance, and loading dock entrance, via pulling IP camera stream off of existing network through new appliance (head end) Panasonic WJNX200\300T3 to display split screen on 43 inch LED located in main office in clear view of clerical staff. All cabling shall be CAT 6A run in cable trays or in walls with no exposed conduit with proper means and methods to get to proper locations. If no camera is located in that specific location install camera as per add alternate line item cost for new camera and cabling. Any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.

## **10. Ordean East Middle School**

### **Existing Features:**

Existing access control doors are now located at front main entrance (A), inner vestibule to school (B), entrance door to office (C), loading dock door (E). Currently site clerical desk AiPhone analog module controls only loading dock door, (E).

### **New construction effort to add three separate components:**

#### **1 - Access Control:**

Furnish and install new access control hardware / programming / door hardware / lockset to door D exiting office to school corridor to allow C-Cure 9000 to control door D in a similar manner as other doors. Door D will have a new card in card out feature, with free entrance from corridor when programmed unless secured for non-office hours.

#### **2 – AiPhone**

Furnish and install two new AiPhone IX-MV7-HB - IP head end master stations to control / release doors A, B, C, D, E. This system to include (2) two video and voice modules AiPhone model IX-DV - IP door stations located as per plan in main school entrance vestibule and at loading dock exterior door. The (2) two head end master station modules to be located per plan at main office clerical desk and main office nurse desk. Desk modules to connect to wall outlet with 10' patch cable to allow location changes. Back boxes and any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.

#### **3 – Office CCTV**

Furnish and install system to project video from existing school networked Panasonic cameras (3) located in entry vestibule, school front entrance, and loading dock entrance, via pulling IP camera stream off of existing network through new appliance (head end) Panasonic WJNX200\300T3 to display split screen on 43 inch LED located in main office in clear view of clerical staff. All cabling shall be CAT 6A run in cable trays or in walls with no exposed conduit with proper means and methods to get to proper locations. If no camera is located in that specific location install camera as per add alternate line item cost for new camera and cabling. Any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.

## **11. Piedmont Elementary School**

### **Existing Features:**

Existing access control doors are now located at front main entrance (A), inner vestibule to school (B), entrance door to office (C), loading dock door (E). Currently site clerical desk AiPhone analog module controls only loading dock door, (E).

### **New construction effort to add three separate components:**

#### **1 - Access Control:**

Furnish and install new access control hardware / programming / door hardware / lockset to door D exiting office to school corridor to allow C-Cure 9000 to control door D in a similar manner as other doors. Door D will have a new card in card out feature, with free entrance from corridor when programmed unless secured for non-office hours.

#### **2 – AiPhone**

Furnish and install two new AiPhone IX-MV7-HB - IP head end master stations to control / release doors A, B, C, D, E. This system to include (2) two video and voice modules AiPhone model IX-DV - IP door stations located as per plan in main school entrance vestibule and at loading dock exterior door. The (2) two head end master station modules to be located per plan at main office clerical desk and main office nurse desk. Desk modules to connect to wall outlet with 10' patch cable to allow location changes. Back boxes and any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.

#### **3 – Office CCTV**

Furnish and install system to project video from existing school networked Panasonic cameras (3) located in entry vestibule, school front entrance, and loading dock entrance, via pulling IP camera stream off of existing network through new appliance (head end) Panasonic WJNX200\300T3 to display split screen on 43 inch LED located in main office in clear view of clerical staff. All cabling shall be CAT 6A run in cable trays or in walls with no exposed conduit with proper means and methods to get to proper locations. If no camera is located in that specific location install camera as per add alternate line item cost for new camera and cabling. Any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.

## **12. Stowe Elementary School**

### **Existing Features:**

Existing access control doors are now located at inner vestibule to school (B), and loading dock door (D). Currently site clerical desk AiPhone analog module controls only loading dock door, (D).

### **New construction effort to add three separate components:**

#### **1 - Access Control:**

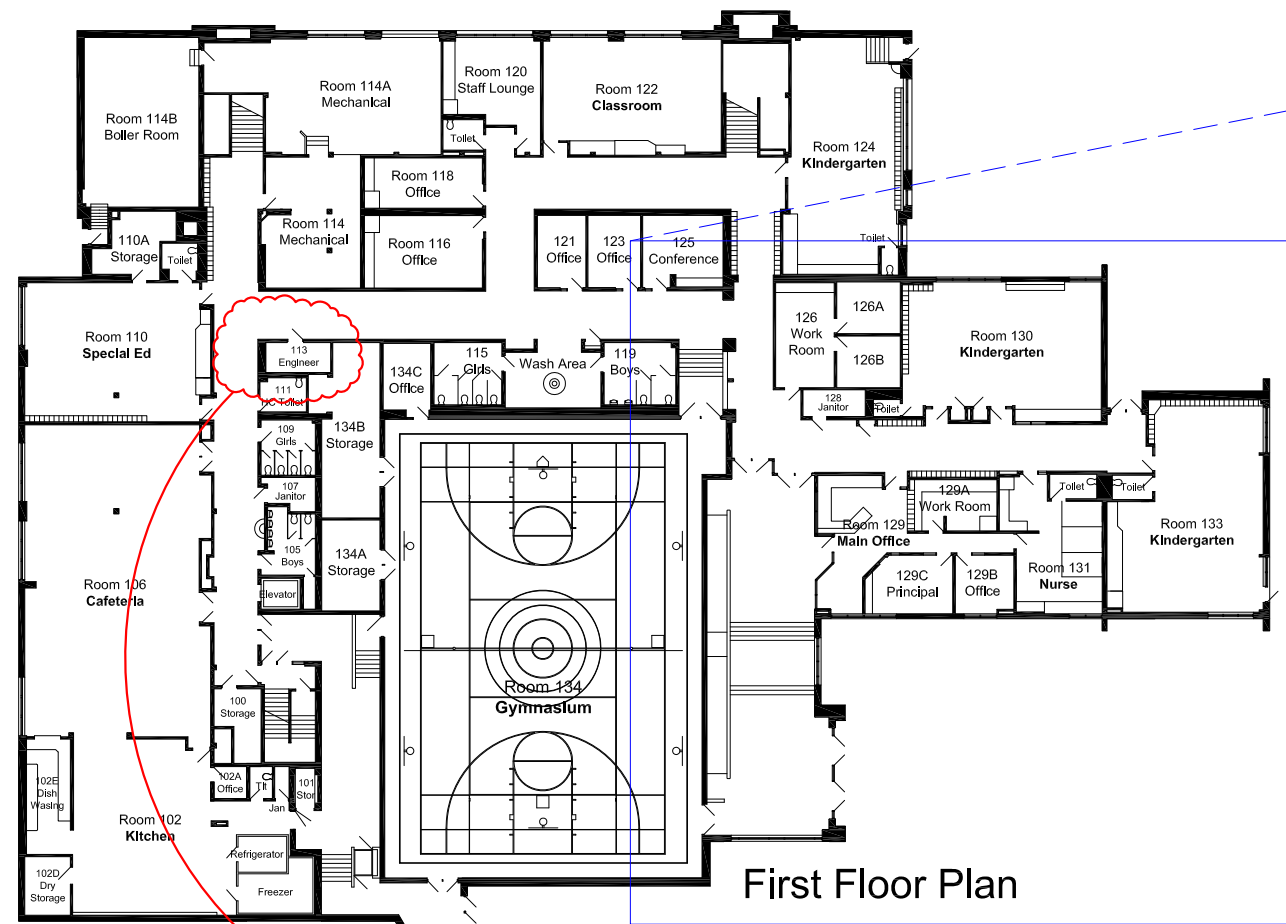
Furnish and install new access control hardware / programming / door hardware / lockset to door A and door C exiting office to school corridor to allow C-Cure 9000 to control doors in a similar manner as other doors. Door A will have a card in feature, and door C will have a new card in card out feature, with free entrance from corridor when programmed unless secured for non-office hours.

#### **2 – AiPhone**

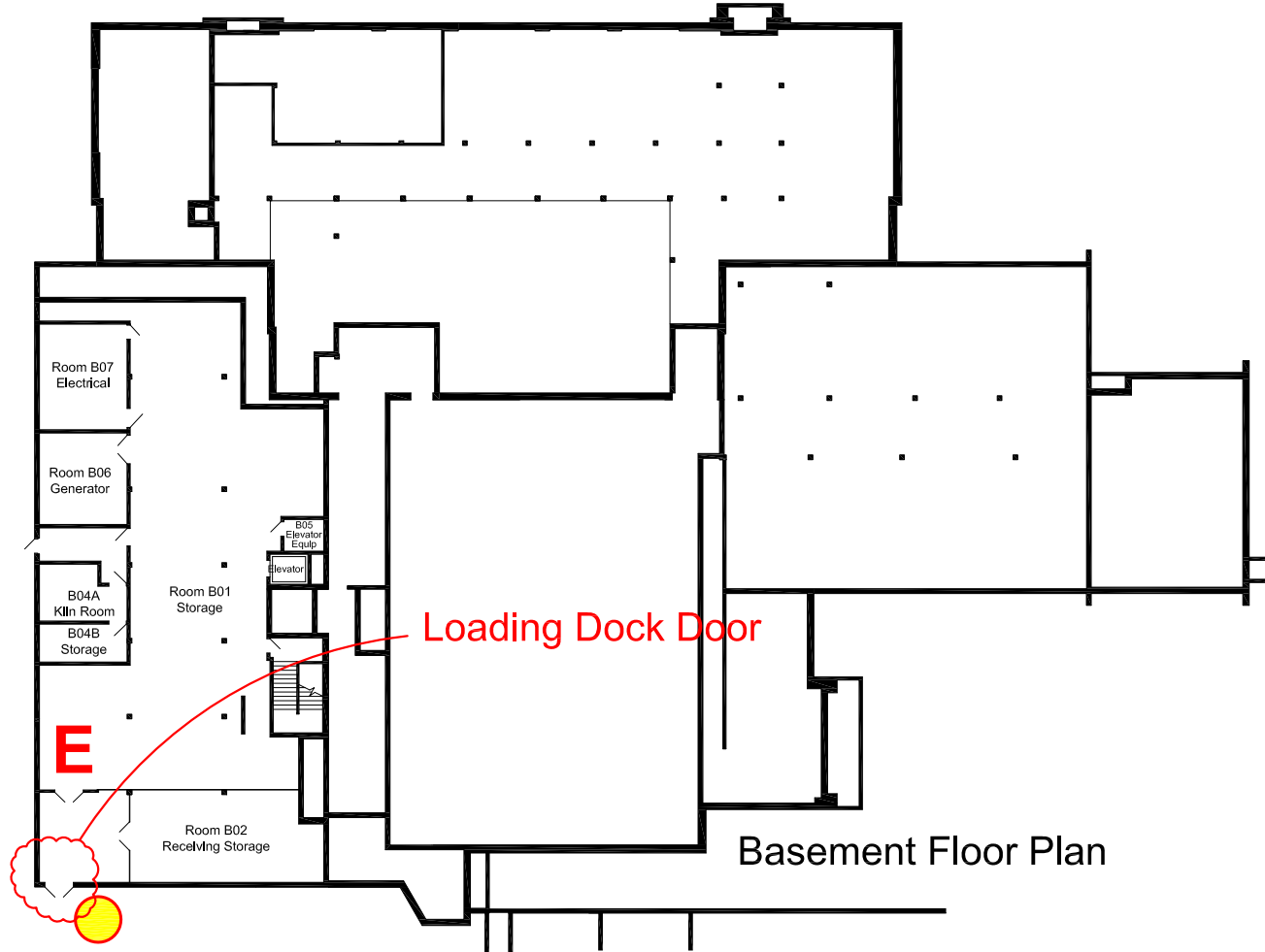
Furnish and install two new AiPhone IX-MV7-HB - IP head end master stations to control / release doors A, B, C, D. This system to include (2) two video and voice modules AiPhone model IX-DV - IP door stations located as per plan in main school entrance vestibule and at loading dock exterior door. The (2) two head end master station modules to be located per plan at main office clerical desk and main office nurse desk. Desk modules to connect to wall outlet with 10' patch cable to allow location changes. Back boxes and any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.

#### **3 – Office CCTV**

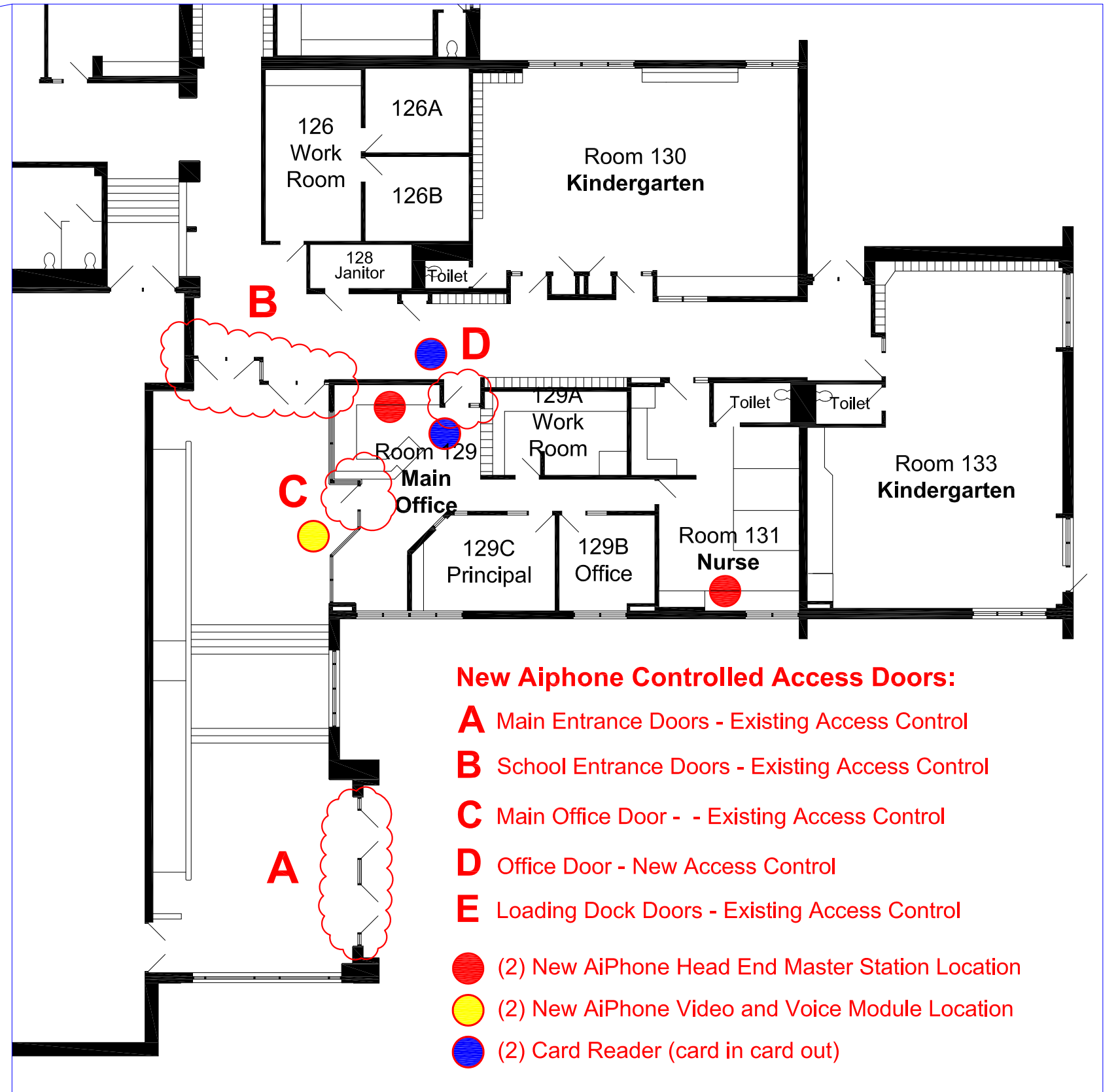
Furnish and install system to project video from existing school networked Panasonic cameras (3) located in entry vestibule, school front entrance, and loading dock entrance, via pulling IP camera stream off of existing network through new appliance (head end) Panasonic WJNX200\300T3 to display split screen on 43 inch LED located in main office in clear view of clerical staff. All cabling shall be CAT 6A run in cable trays or in walls with no exposed conduit with proper means and methods to get to proper locations. If no camera is located in that specific location install camera as per add alternate line item cost for new camera and cabling. Any and all hardware to make system fully functional must be included in base bid. System must be turnkey when done with one hour of training provided.



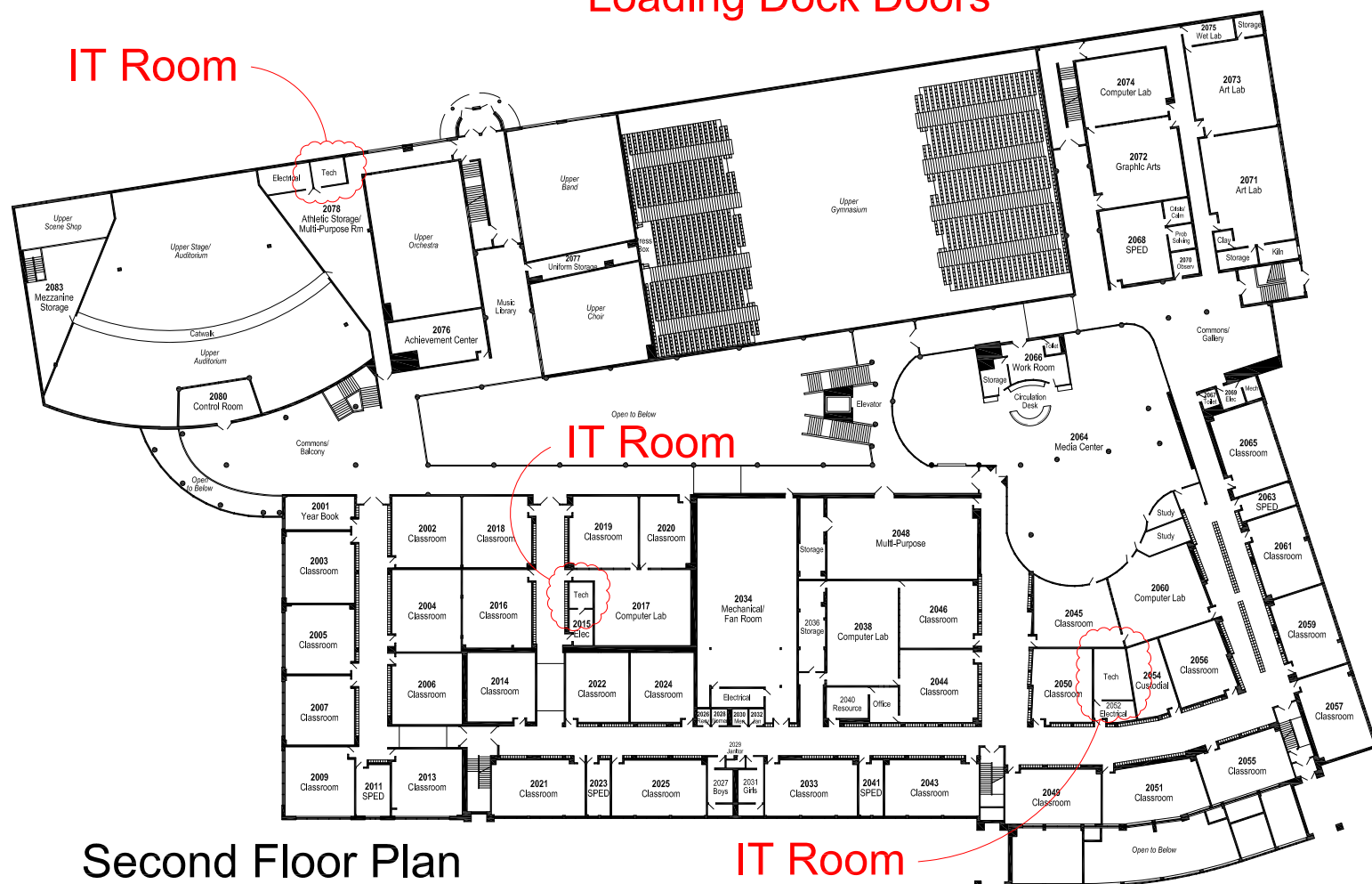
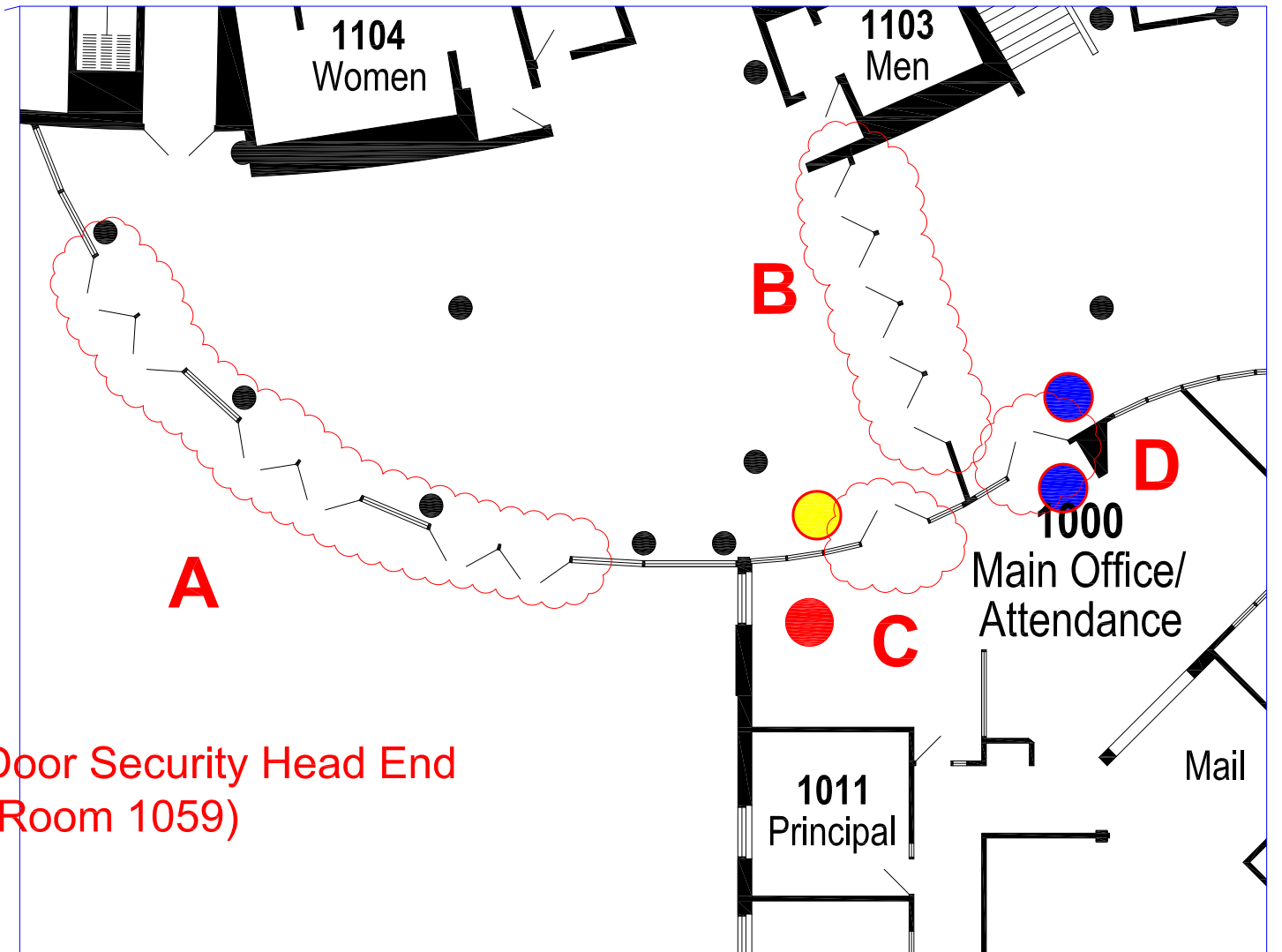
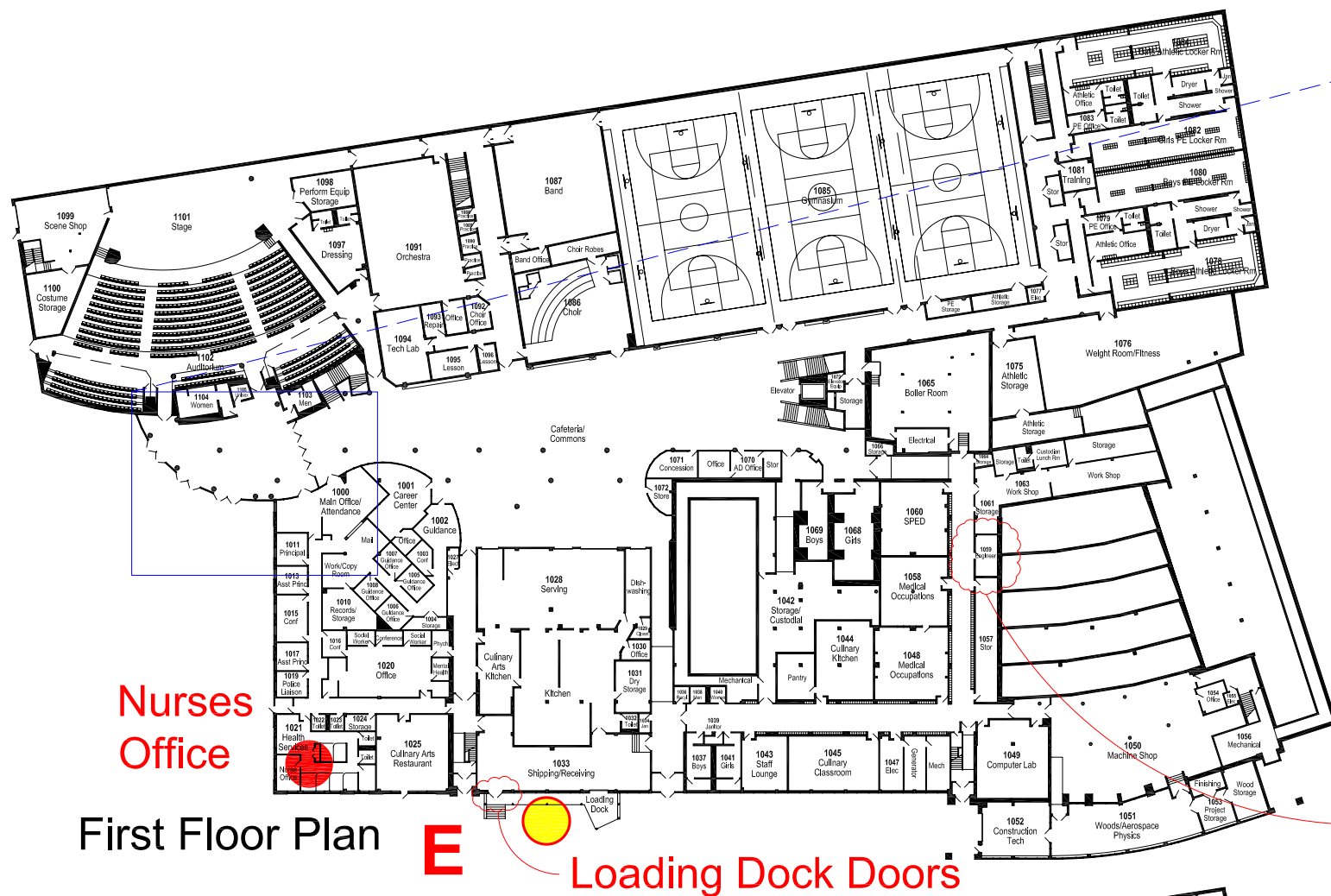
Door Security Head End  
CK721-A (Room 113)



Loading Dock Door



Congdon Park Elementary School - Access Control



## New Aiphone Controlled Access Doors:

- A** Main Entrance Doors - Existing Access Control
- B** School Entrance Doors - Existing Access Control
- C** Main Office Door - Existing Access Control
- D** Office Door - New Access Control
- E** Loading Dock Doors - Existing Access Control

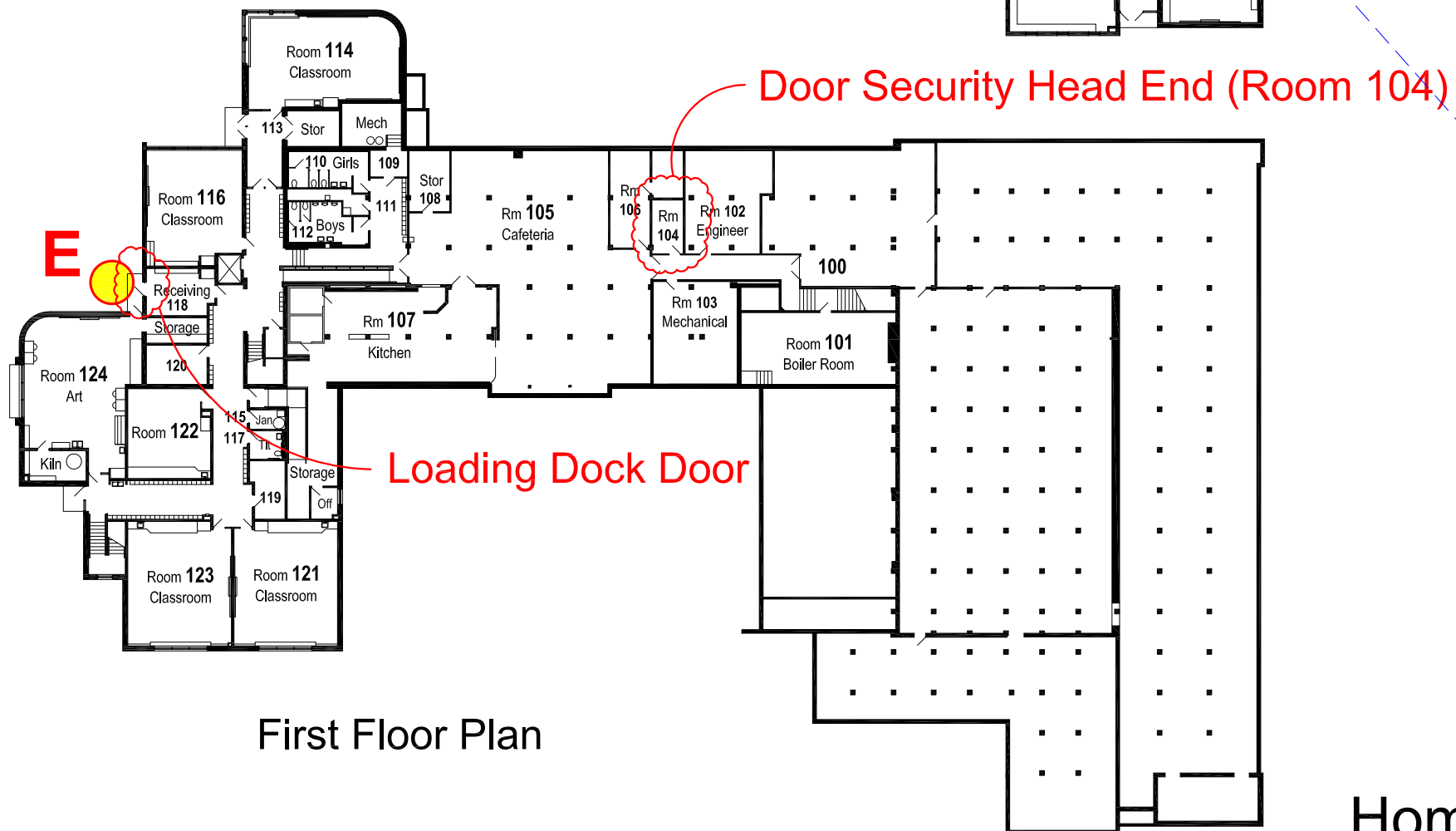
- (2) New AiPhone Head End Master Station Location
- (2) New AiPhone Video and Voice Module Location
- (2) Card Reader (card in card out)

## East High School - Access Plan

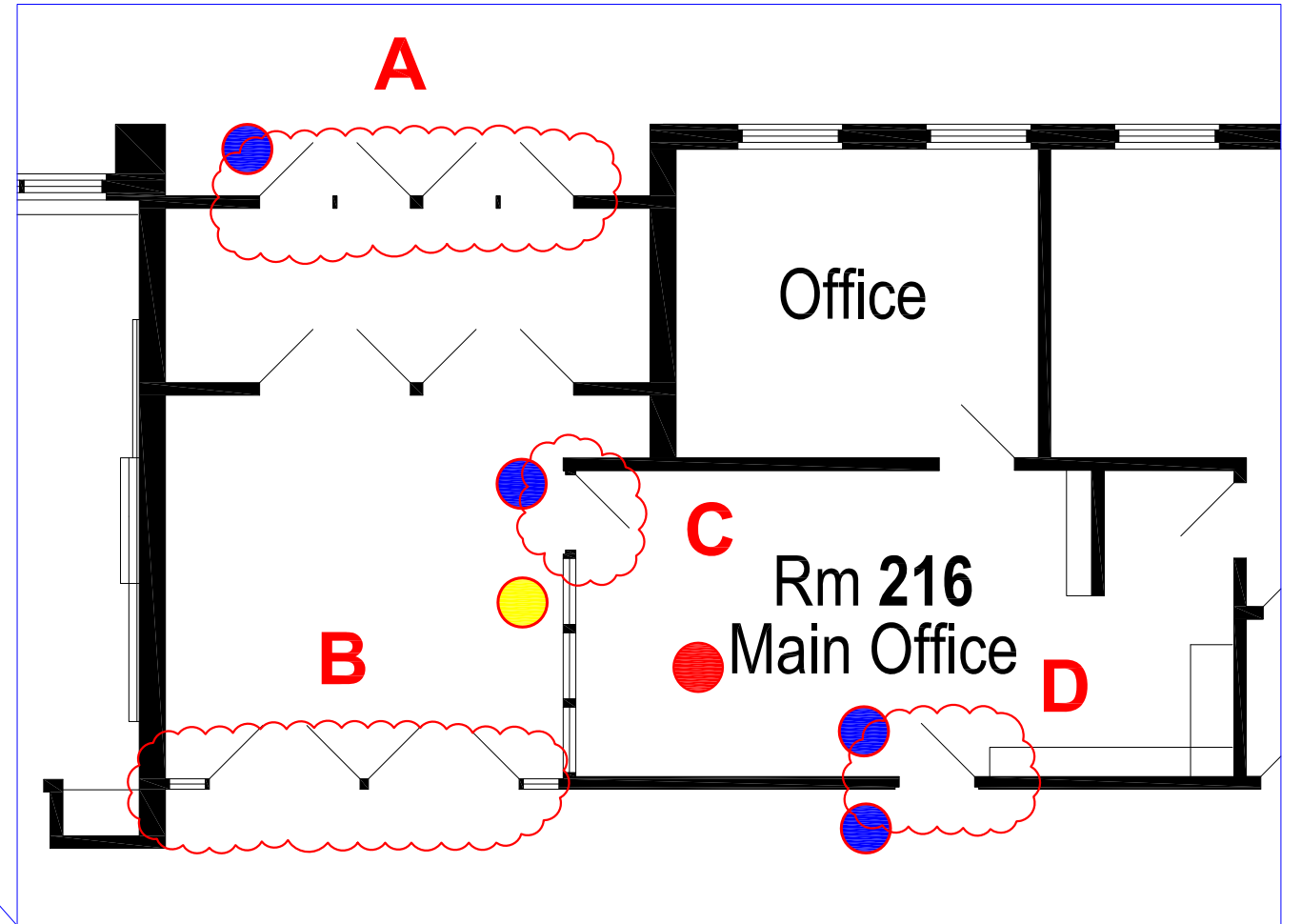




Second Floor Plan



First Floor Plan



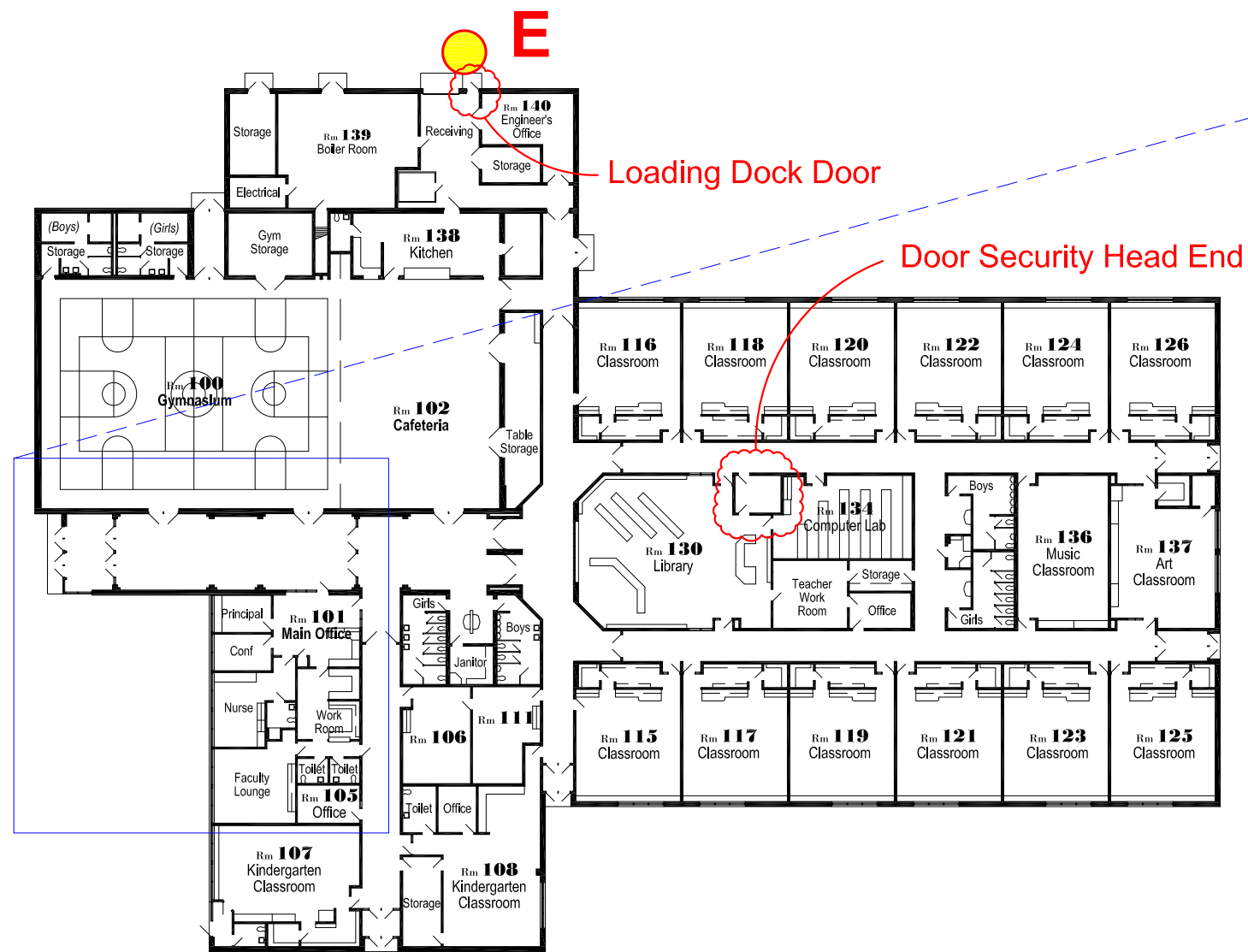
### New Aiphone Controlled Access Doors:

- A** Main Entrance Doors - New Access Control
- B** School Entrance Doors - Existing Access Control
- C** Main Office Door - New Access Control
- D** Office Door - New Access Control
- E** Loading Dock Doors - Existing Access Control

- (2) New AiPhone Head End Master Station Location
- (2) New AiPhone Video and Voice Module Location
- (4) Card Reader (card in card out)

## Homecroft Elementary School - Access Control

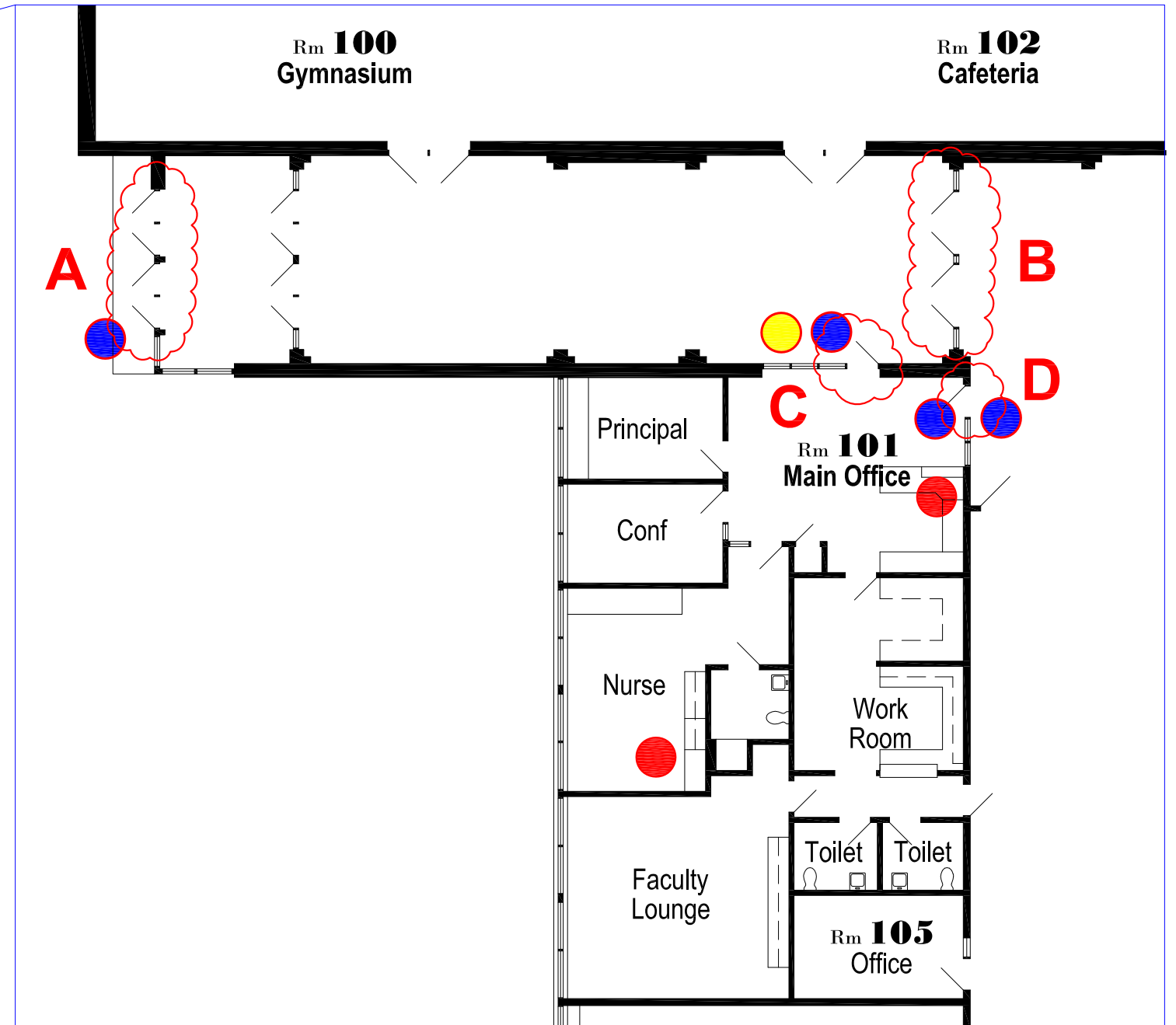




### New Aiphone Controlled Access Doors:

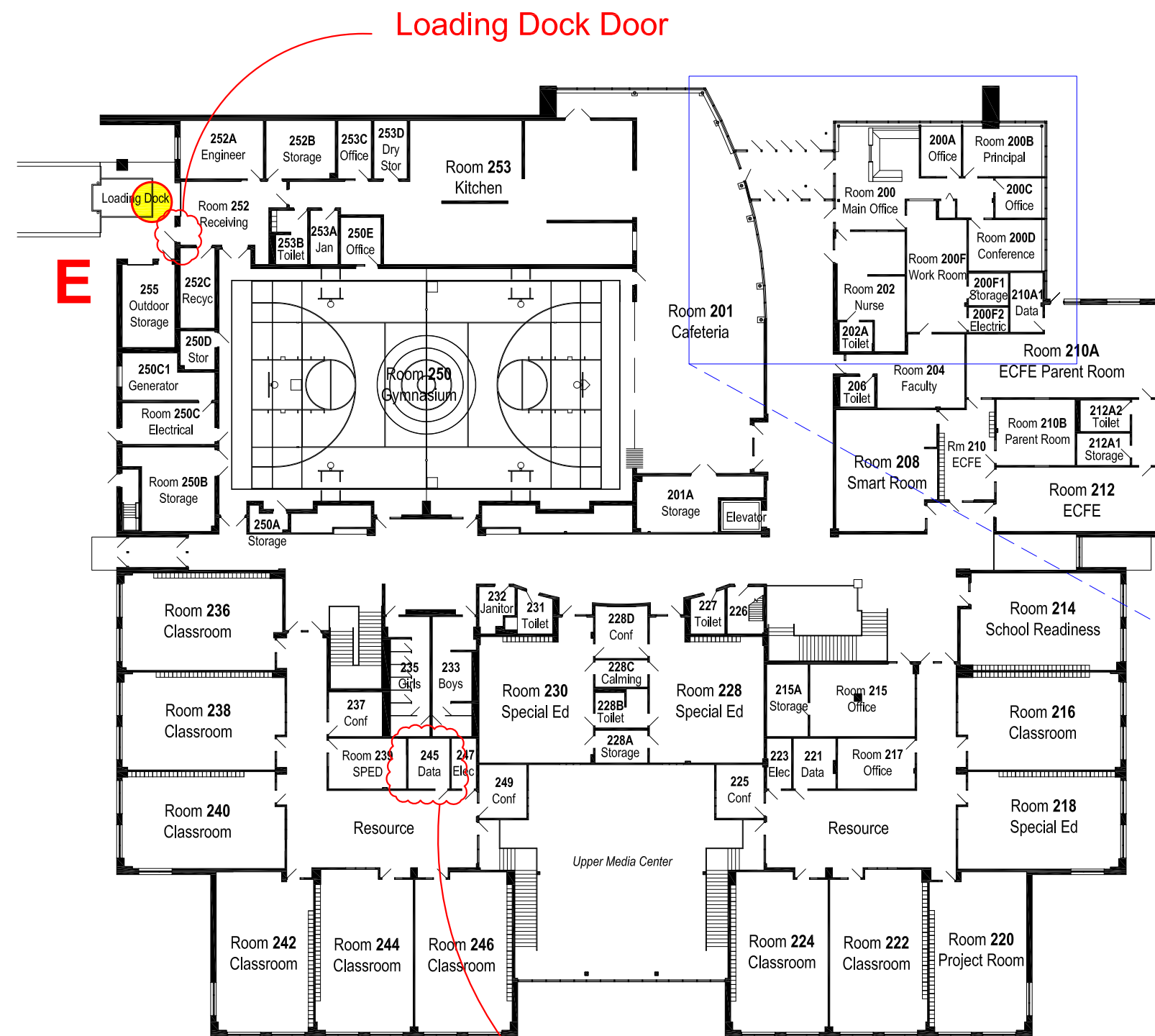
- A** Main Entrance Doors - New Access Control
- B** School Entrance Doors - Existing Access Control
- C** Main Office Door - New Access Control
- D** Office Door - New Access Control
- E** Loading Dock Doors - Existing Access Control

- (2) New AiPhone Head End Master Station Location
- (2) New AiPhone Video and Voice Module Location
- (4) Card Reader (card in card out)



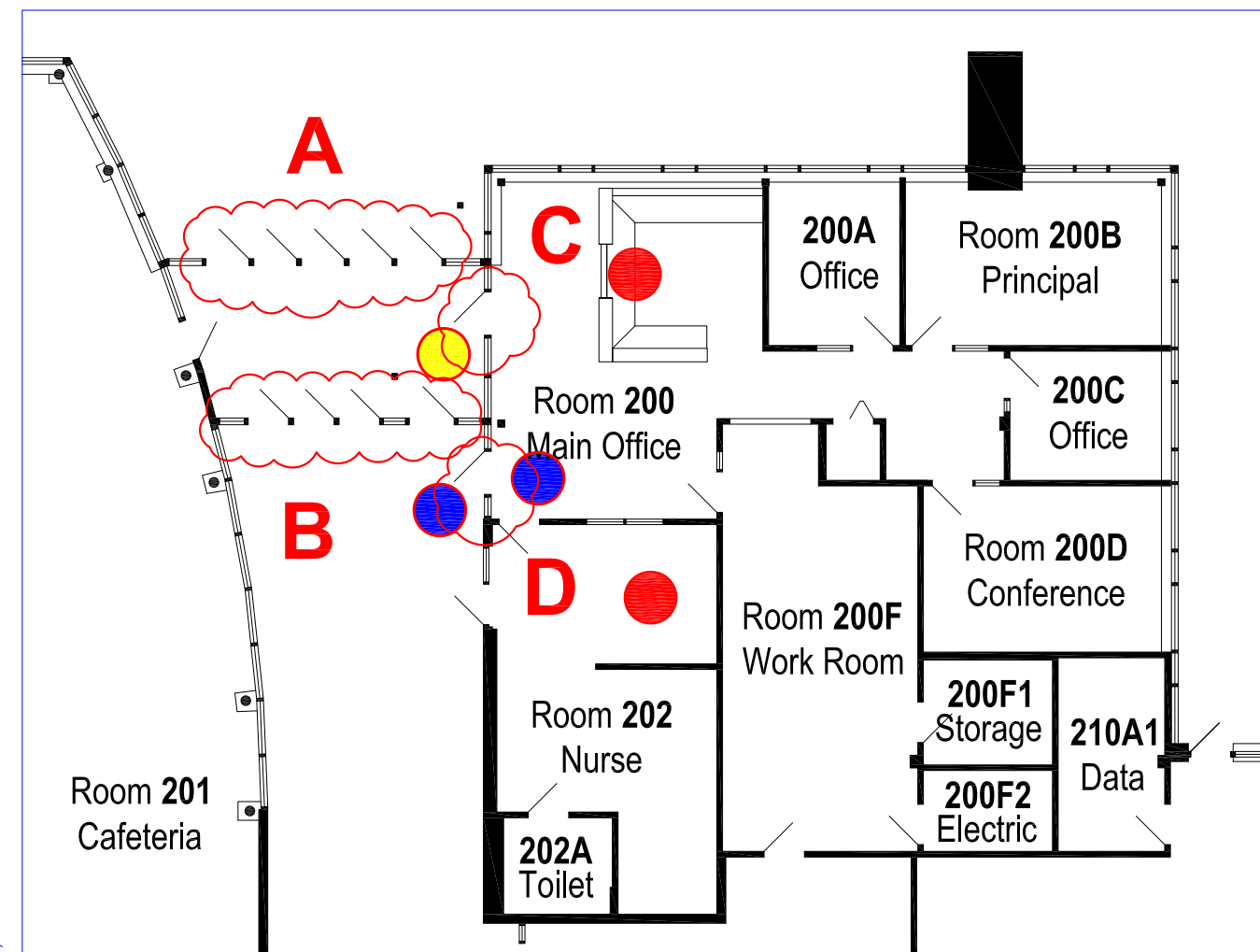
Lakewood Elementary School - Access Control





Second Floor Plan

Door Security Head End (Room 245)



### New Aiphone Controlled Access Doors:

**A** Main Entrance Doors - Existing Access Control

**B** School Entrance Doors - Existing Access Control

**C** Main Office Door - Existing Access Control

**D** Office Door - New Access Control

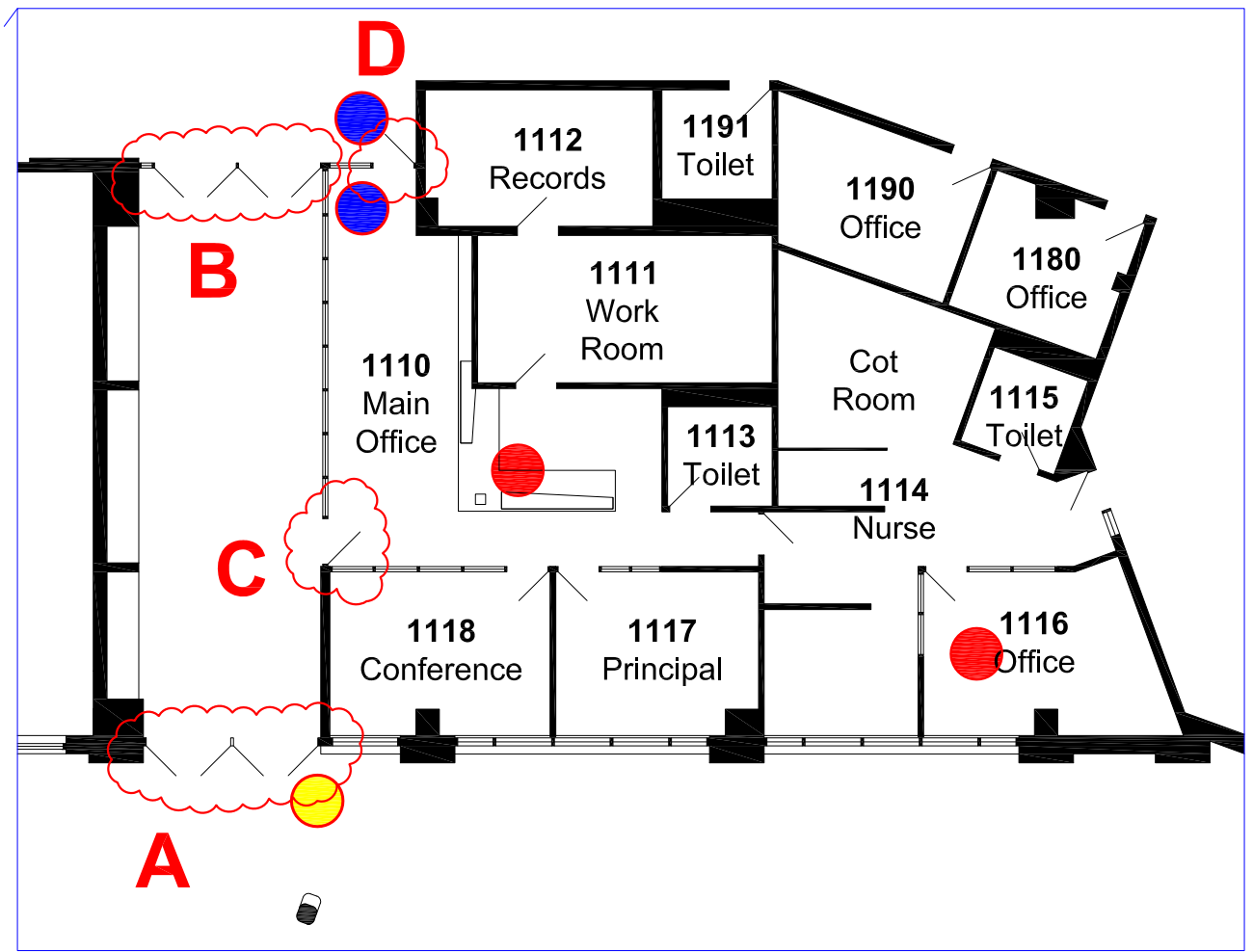
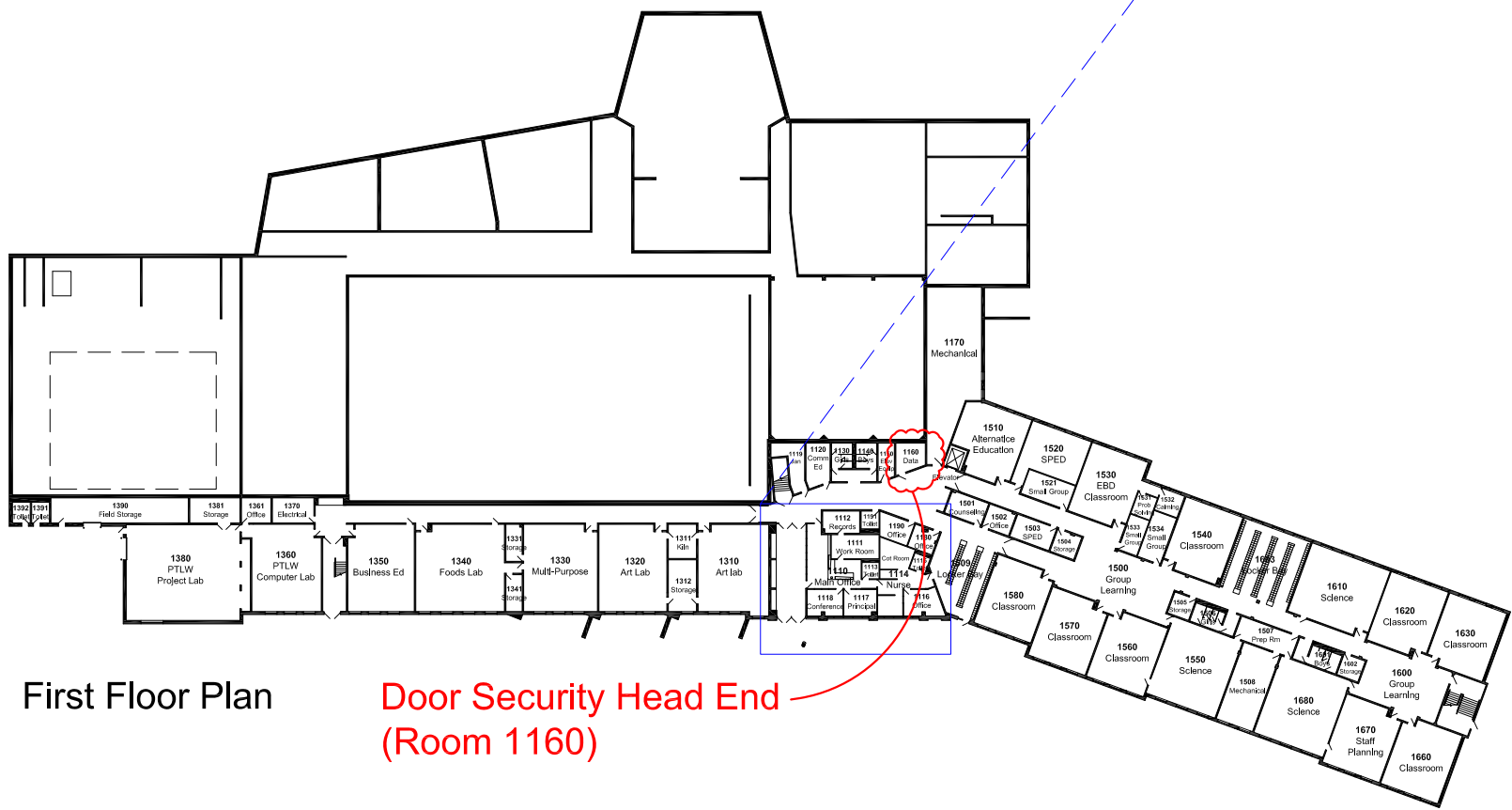
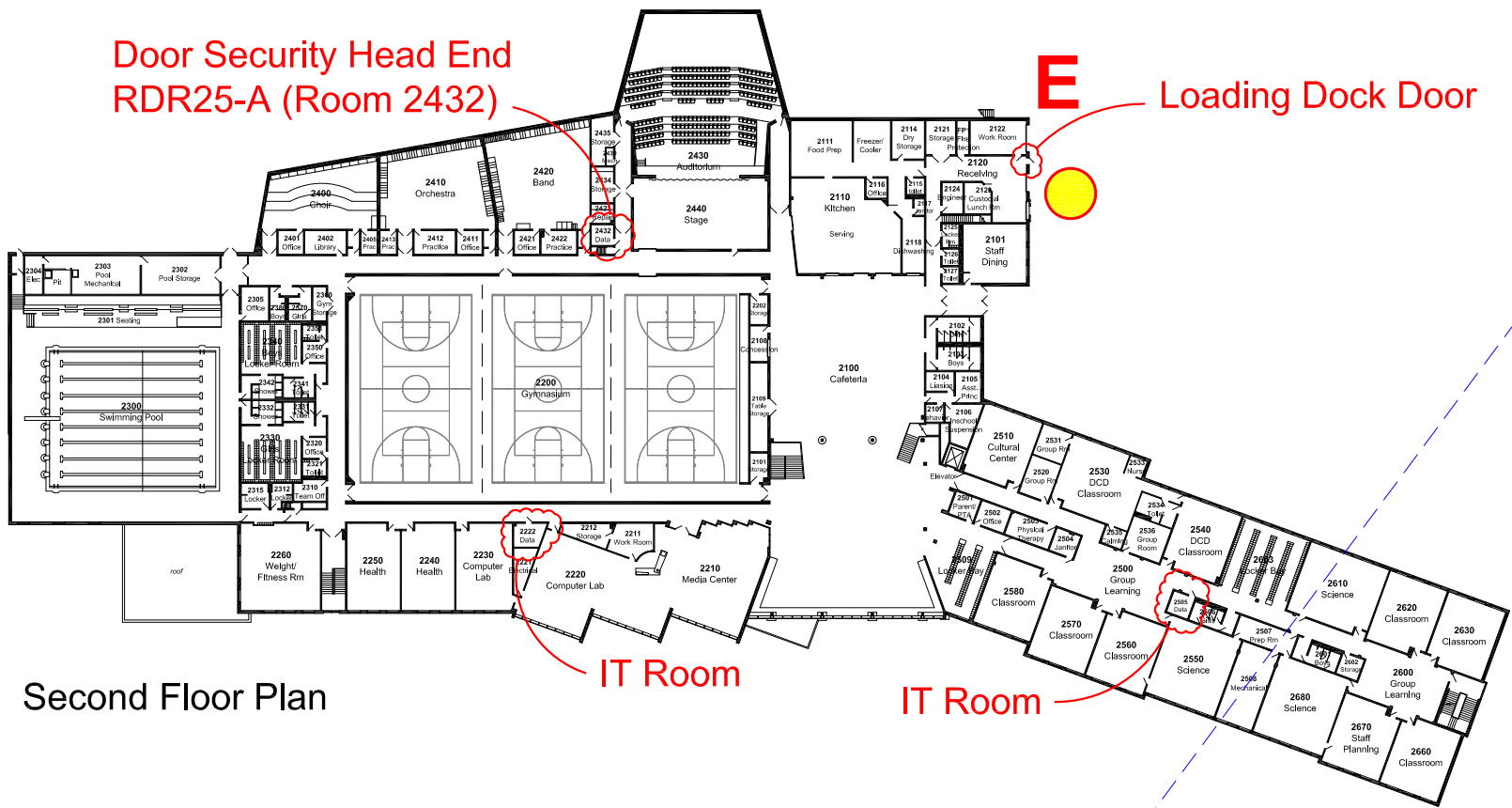
**E** Loading Dock Doors - Existing Access Control

● (2) New AiPhone Head End Master Station Location

● (2) New AiPhone Video and Voice Module Location

● (2) Card Reader (card in card out)

## Lester Park Elementary School - Access Control



### New Aiphone Controlled Access Doors:

- A** Main Entrance Doors - Existing Access Control
- B** School Entrance Doors - Existing Access Control
- C** Main Office Door - Existing Access Control
- D** Office Door - New Access Control
- E** Loading Dock Doors - Existing Access Control
- (2) New AiPhone Head End Master Station Location
- (2) New AiPhone Video and Voice Module Location
- (2) Card Reader (card in card out)

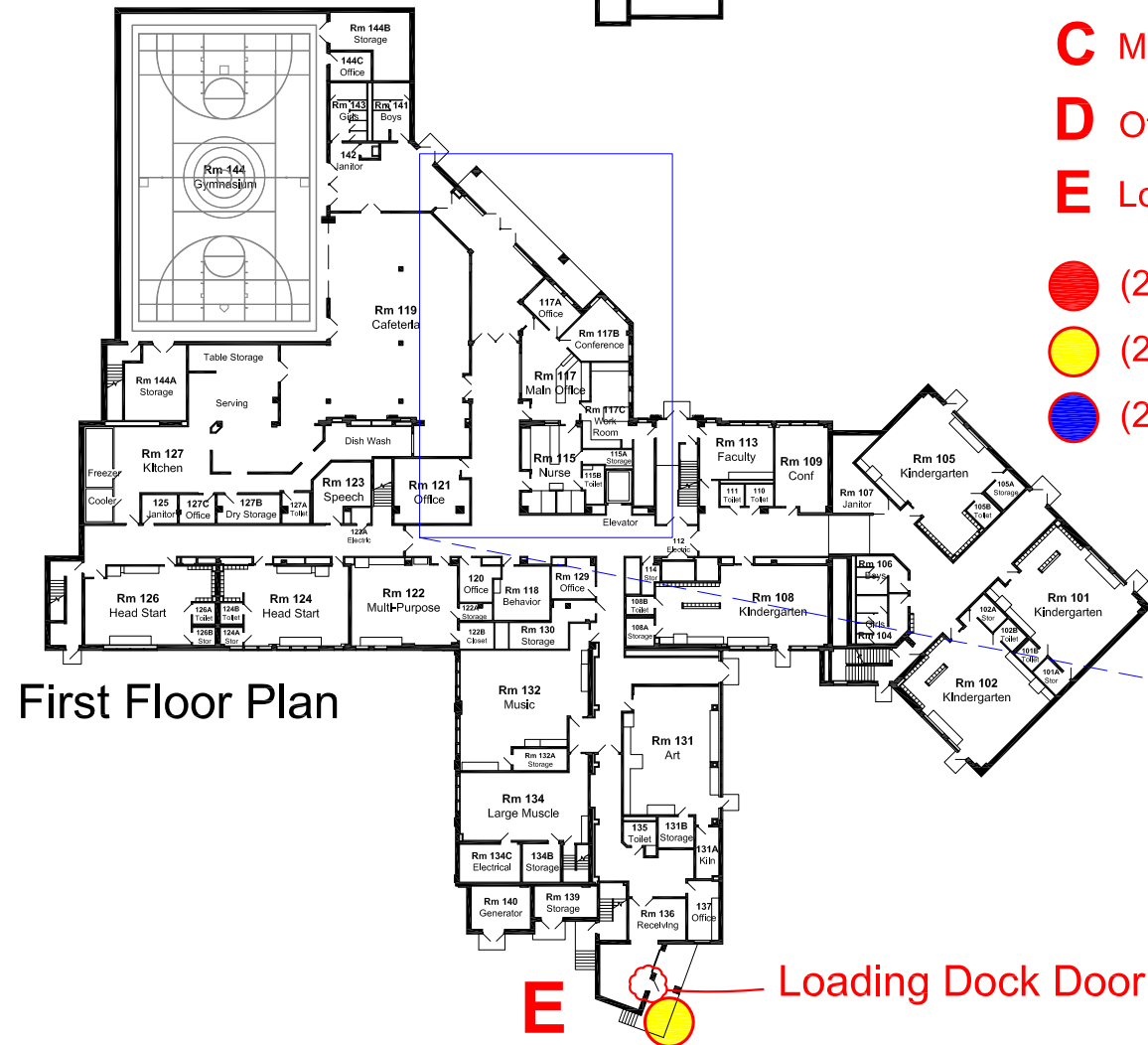
## Lincoln Park Middle School - Access Control







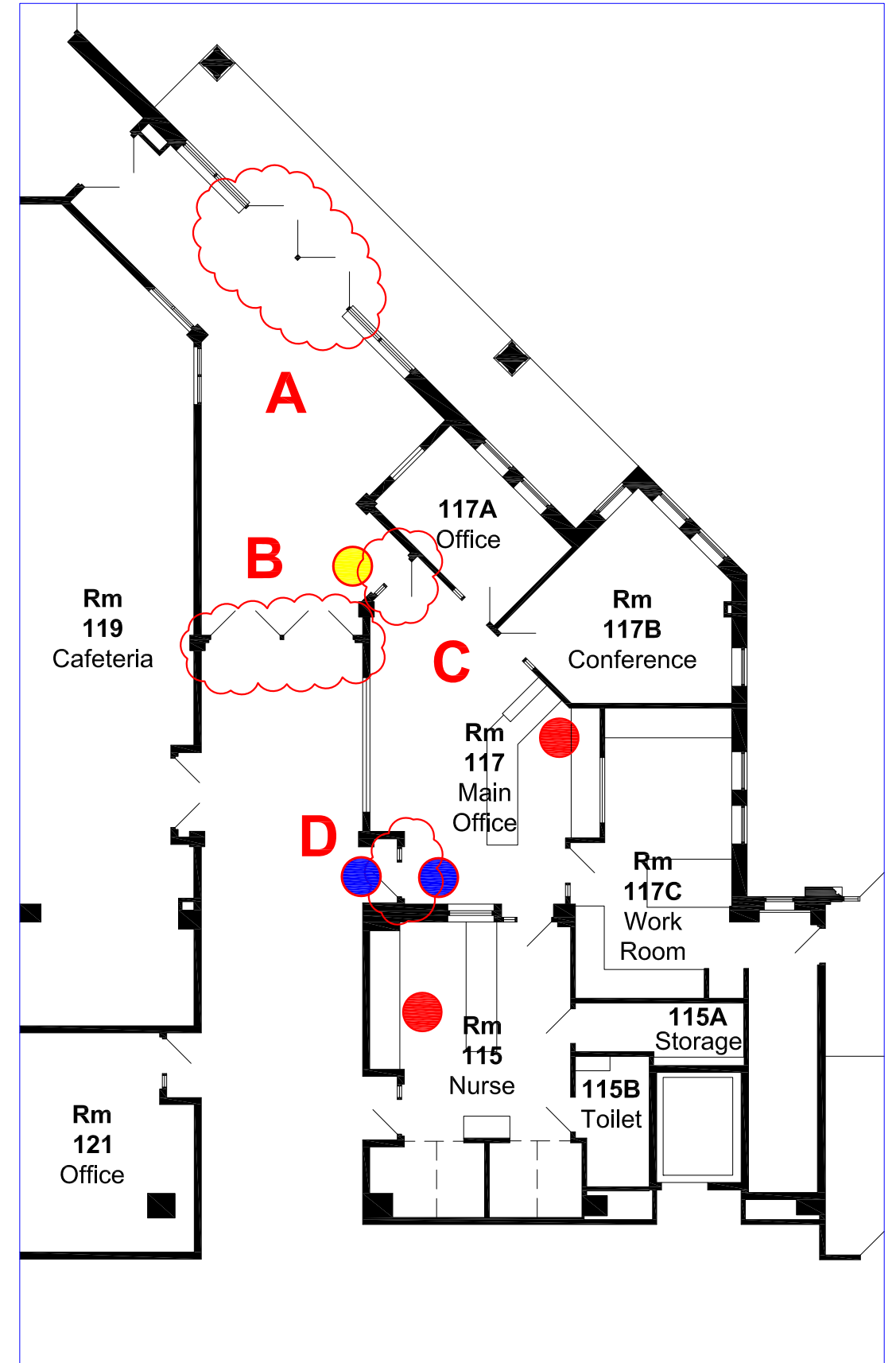
Second Floor Plan

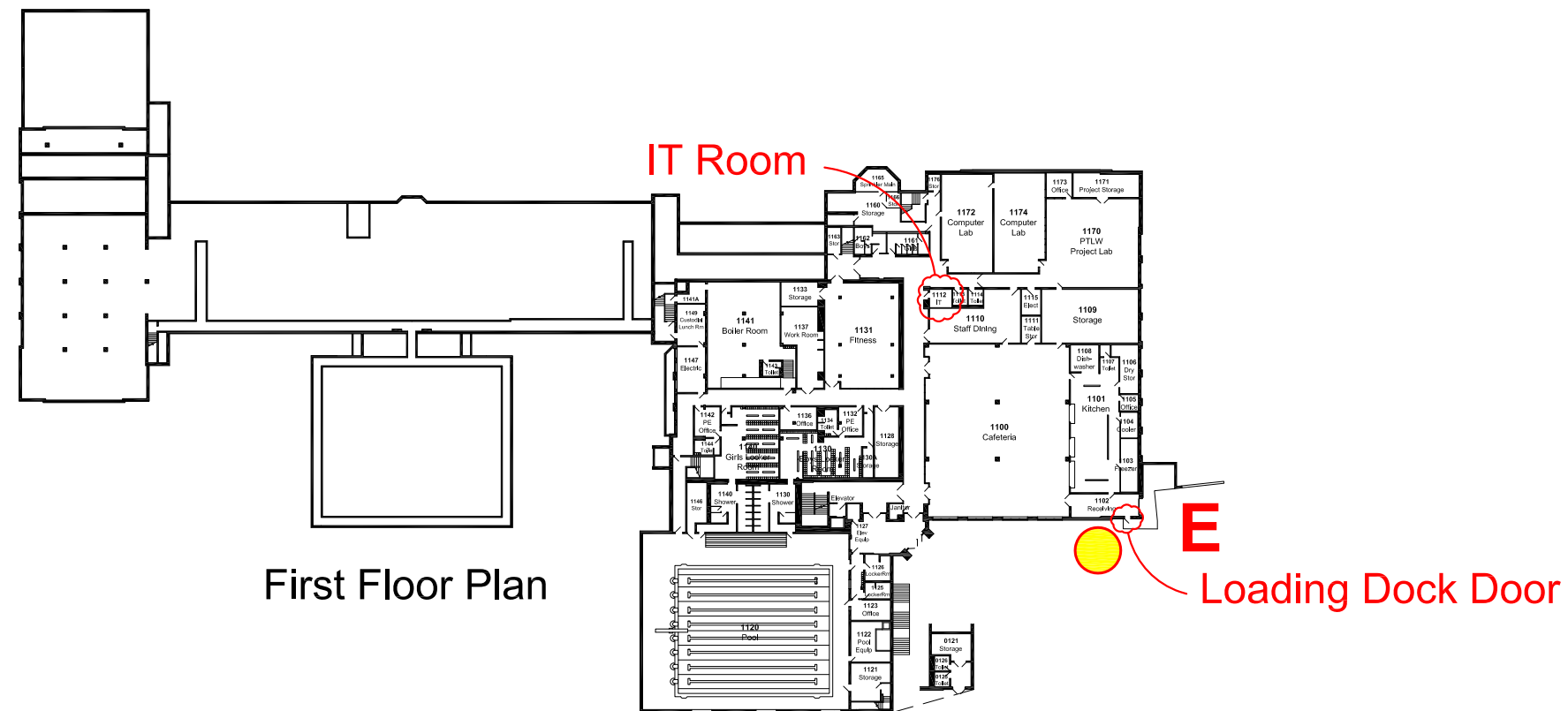
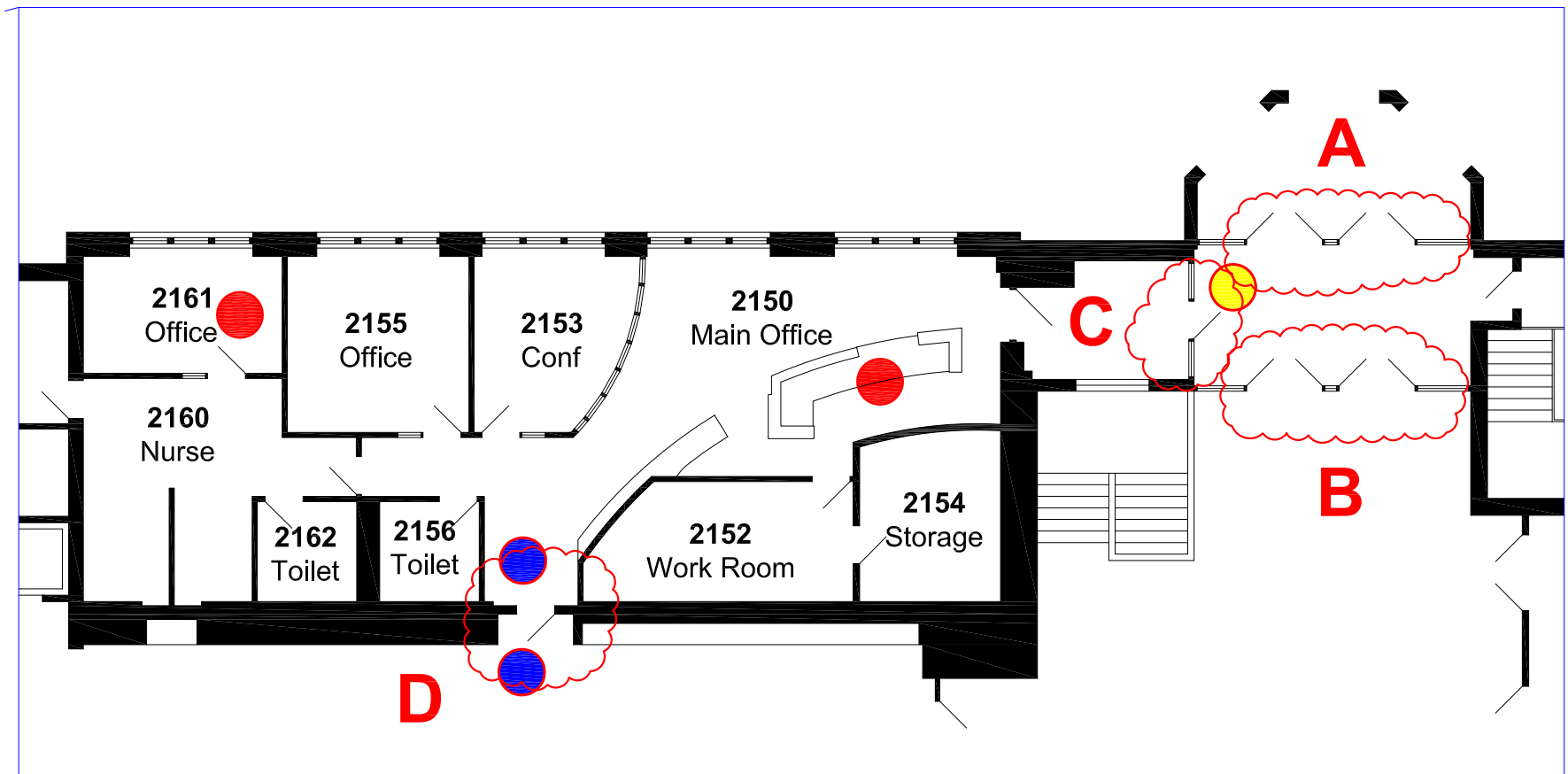
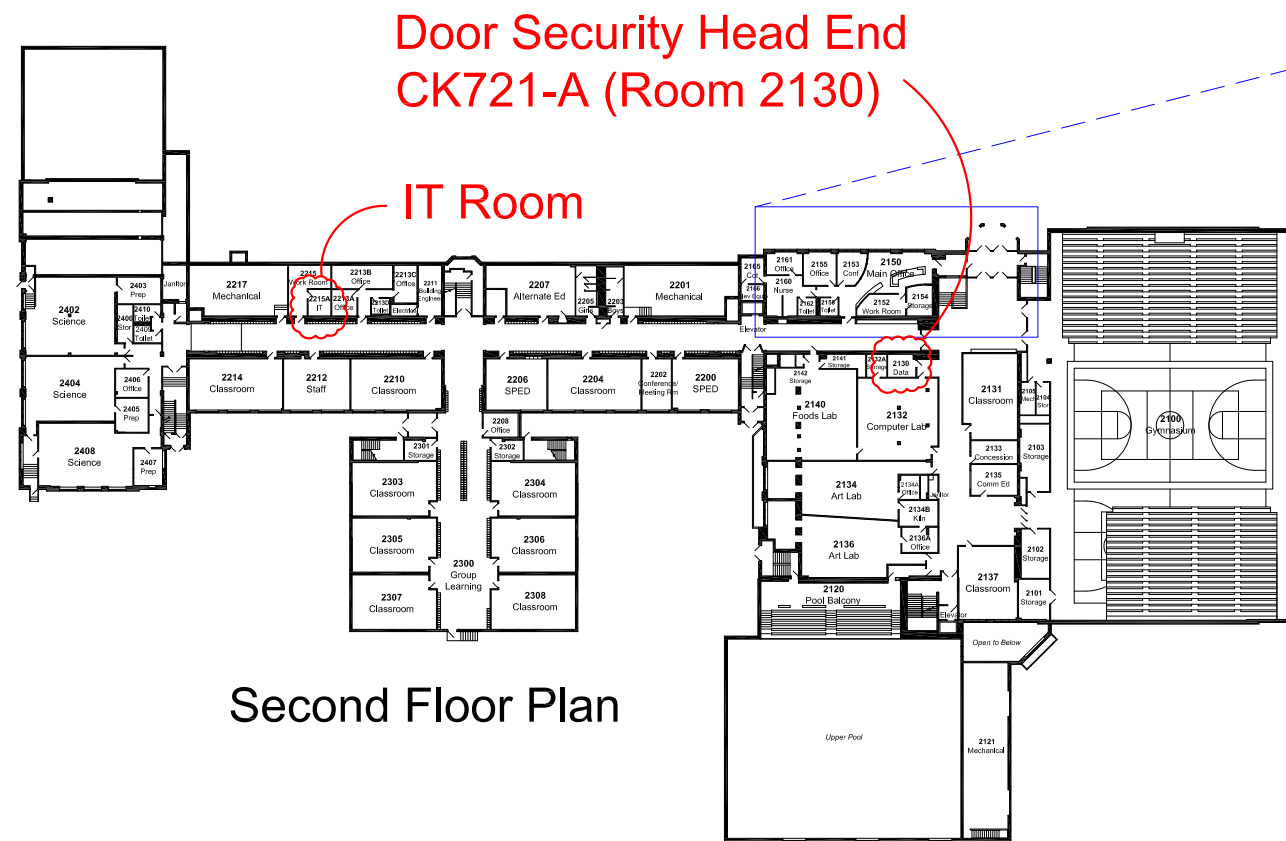


First Floor Plan

### New Aiphone Controlled Access Doors:

- A** Main Entrance Doors - Existing Access Control
- B** School Entrance Doors - Existing Access Control
- C** Main Office Door - Existing Access Control
- D** Office Door - New Access Control
- E** Loading Dock Doors - Existing Access Control
- (2) New AiPhone Head End Master Station Location
- (2) New AiPhone Video and Voice Module Location
- (2) Card Reader (card in card out)





### New Aiphone Controlled Access Doors:

**A** Main Entrance Doors - Existing Access Control

**B** School Entrance Doors - Existing Access Control

**C** Main Office Door - Existing Access Control

**D** Office Door - New Access Control

**E** Loading Dock Doors - Existing Access Control

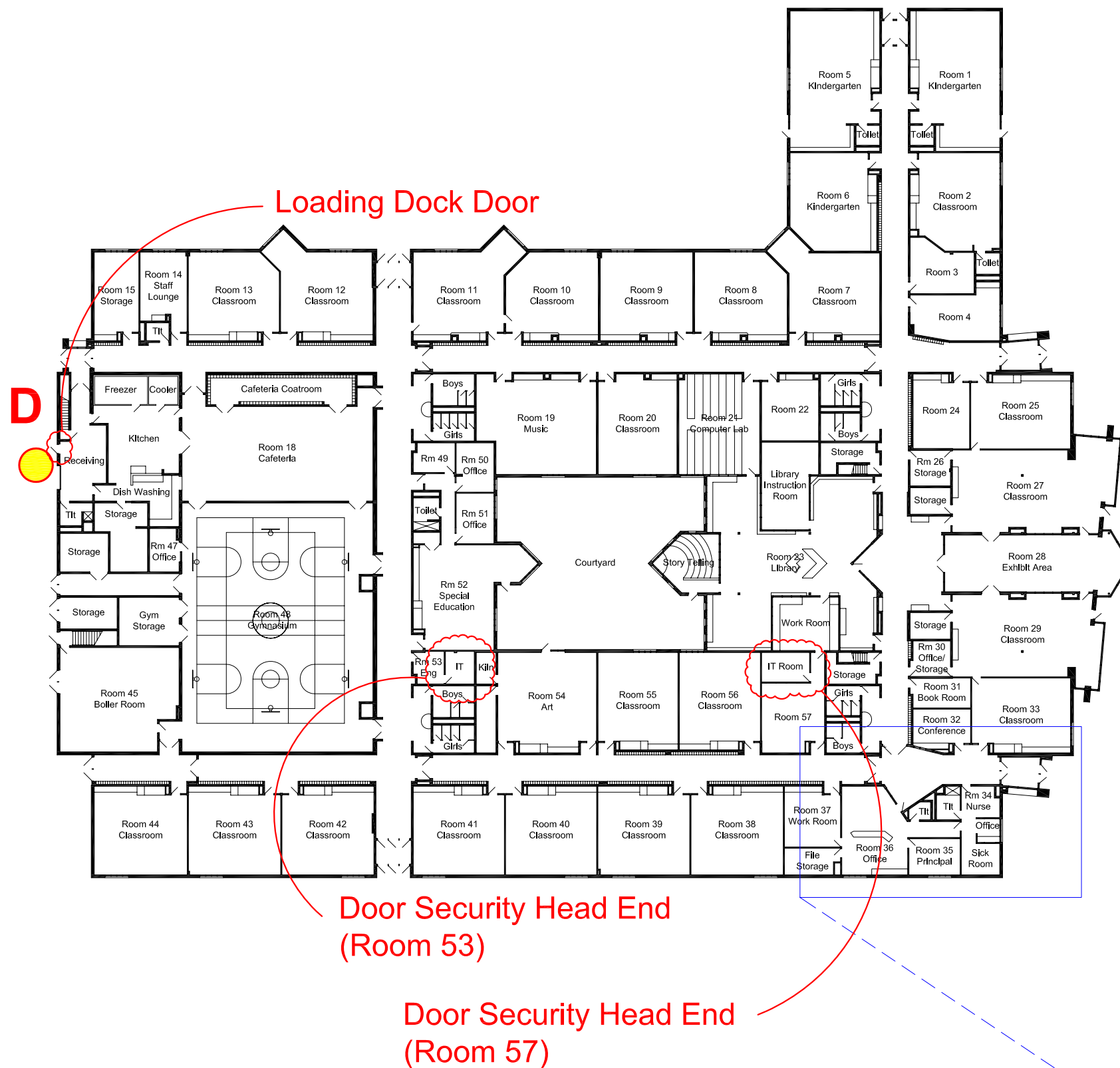
● (2) New AiPhone Head End Master Station Location

● (2) New AiPhone Video and Voice Module Location

● (2) Card Reader (card in card out)



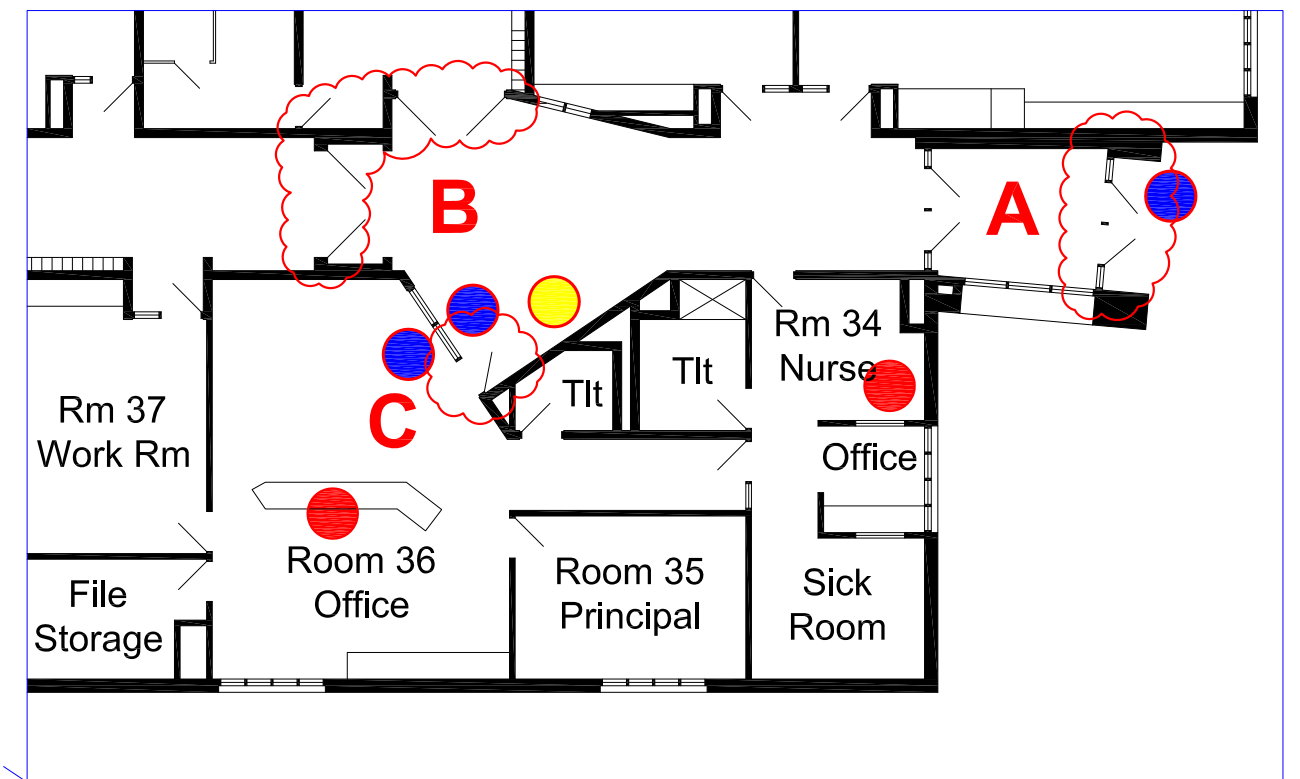




## New Aiphone Controlled Access Doors:

- A** Main Entrance Doors - New Access Control
- B** School Entrance Doors - Existing Access Control
- C** Main Office Door - New Access Control
- D** Loading Dock Doors - Existing Access Control

- (2) New AiPhone Head End Master Station Location
- (2) New AiPhone Video and Voice Module Location
- (3) Card Reader (card in card out)



Stowe Elementary School - Access Control

# ISD 709 CONSTRUCTION STANDARDS



SEPTEMBER 3, 2010

## Table of Contents

<b>REVISIONS</b>	<b>7</b>
<b>SUSTAINABLE DESIGN RESOLUTION</b> <i>(INSERT)</i>	<b>8</b>
<b>GENERAL STANDARDS</b>	<b>9</b>
<b>PART 1: LANDSCAPE SYSTEMS</b>	<b>9</b>
1.1 IRRIGATION	9
1.2 SITE FURNISHINGS	9
1.3 PLANTINGS	10
<b>PART 2: SITE WORK</b>	<b>11</b>
2.1 EARTHWORK	11
2.2 PAVING AND SURFACING	12
2.3 SITE UTILITIES	12
<b>PART 3: SUPERSTRUCTURE</b>	<b>13</b>
3.1 FLOOR CONSTRUCTION	13
3.2 ROOF CONSTRUCTION	13
<b>PART 4: EXTERIOR ENCLOSURE</b>	<b>14</b>
4.1 EXTERIOR WALL CONSTRUCTION	14
<b>PART 5: ROOFING</b>	<b>16</b>
5.1 ROOF COVERINGS	16
<b>PART 6: INTERIOR CONSTRUCTION</b>	<b>17</b>
6.1 PARTITIONS	17
6.2 INTERIOR OPENINGS	18
6.3 SPECIALTIES	19
<b>PART 7: STAIRS</b>	<b>21</b>
7.1 STAIR CONSTRUCTION	21
7.2 STAIR FINISHES	21
<b>PART 8: INTERIOR FINISHES</b>	<b>22</b>
8.1 WALL FINISHES	22
8.2 FLOOR FINISHES	22
8.3 CEILING FINISHES	23
8.4 ROOM FINISHES CONCEPT	24
<b>PART 9: CONVEYING</b>	<b>25</b>
9.1 ELEVATORS	25
9.2 HOLELESS HYDRAULIC ELEVATORS	25
<b>PART 10: FIRE PROTECTION</b>	<b>26</b>
10.1 FIRE PROTECTION SPECIALTIES	26
<b>PART 11: EQUIPMENT</b>	<b>27</b>
11.1 INSTITUTIONAL EQUIPMENT	27
11.2 VEHICULAR EQUIPMENT	27
11.3 OTHER EQUIPMENT	27
<b>PART 12: FURNISHINGS</b>	<b>28</b>
12.1 FIXED FURNISHINGS	28
<b>PART 13: STRUCTURAL SYSTEMS</b>	<b>28</b>
13.1 DESIGN CRITERIA	28
13.2 FOUNDATION SYSTEMS	29
13.3 SLABS ON GRADE	29

13.4 ELEVATED FLOOR FRAMING	29
13.5 ROOF FRAMING	29
13.6 LOAD BEARING WALL CONSTRUCTION	30
FINISH HARDWARE ( <i>INSERT</i> )	31
INTERIOR SIGN SPECIFICATION ( <i>INSERT</i> )	39
LAMINATE CLAD CASEWORK SPECIFICATION ( <i>INSERT</i> )	41
COMPUTER COUNTER TOP SECTION ( <i>DETAIL INSERT</i> )	43
<b>MECHANICAL STANDARDS</b>	<b>44</b>
<b>PART 1: DESIGN CONDITIONS</b>	<b>44</b>
1.1 CLIMATIC DESIGN REQUIREMENTS	44
1.2 VENTILATION AIR REQUIREMENTS	44
1.3 NOISE CRITERIA	44
1.4 CODE REQUIREMENTS	44
1.5 MAINTENANCE ACCESS	44
<b>PART 2: GENERAL MECHANICAL SYSTEM REQUIREMENTS</b>	<b>44</b>
2.1 MOTORS	44
2.2 PIPE EXPANSION	44
2.3 VALVES	44
2.4 MECHANICAL VIBRATION CONTROL	45
2.5 INSULATION	45
2.6 MECHANICAL IDENTIFICATION	45
<b>PART 3: PLUMBING SYSTEMS</b>	<b>46</b>
3.1 SANITARY AND STORM WASTE AND VENT PIPING	46
3.2 CHEMICAL WASTE PIPING	46
3.3 DOMESTIC HOT, COLD, AND RECIRCULATION LINES	46
3.4 WATER HEATERS	47
3.5 PLUMBING SPECIALTIES	47
3.6 PLUMBING FIXTURES	47
<b>PART 4: HYDRONIC HEATING SYSTEMS</b>	<b>50</b>
4.1 GENERAL REQUIREMENTS	50
<b>PART 5: HYDRONIC CHILLED WATER SYSTEMS</b>	<b>51</b>
5.1 GENERAL REQUIREMENTS	51
<b>PART 6: VENTILATION SYSTEMS</b>	<b>51</b>
6.1 GENERAL REQUIREMENTS	51
<b>PART 7: CONTROLS SYSTEMS</b>	<b>52</b>
7.1 GENERAL REQUIREMENTS	52
<b>PART 8: FIRE PROTECTION SYSTEMS</b>	<b>52</b>
8.1 GENERAL REQUIREMENTS	53
<b>PART 9: TESTING AND BALANCING</b>	<b>53</b>
9.1 GENERAL REQUIREMENTS	53
<b>PART 10: COMMISSIONING</b>	<b>53</b>
10.1 GENERAL REQUIREMENTS	53
ENERGY RECOVERY VENTILATION UNIT ( <i>INSERT</i> )	54
<b>ELECTRICAL STANDARDS</b>	<b>55</b>
<b>PART 1: BASIC ELECTRICAL REQUIREMENTS</b>	<b>55</b>

1.1 INTENT	55
1.2 ELECTRICAL DRAWINGS	55
1.3 ELECTRICAL REFERENCE SYMBOLS	55
1.4 ELECTRICAL TEST DATA	55
1.5 DEMONSTRATION OF ELECTRICAL SYSTEMS	56
1.6 IDENTIFICATION	56
1.7 ELECTRICAL EQUIPMENT LOCATIONS	56
1.8 SPECIAL BUILDING REQUIREMENTS	56
PART 2: BASIC ELECTRICAL MATERIALS AND METHODS	56
2.1 BASIC MINIMUM REQUIREMENTS	56
2.2 CLEANING	56
2.3 FIRE-STOPPING	57
PART 3: GROUNDING AND BONDING	57
3.1 GENERAL	57
PART 4: WIRES AND CABLES	57
4.1 GENERAL	57
PART 5: RACEWAYS	58
5.1 MINIMUM SIZES	58
5.2 RIGID NON-METALLIC CONDUIT	58
5.3 FLEXIBLE METAL CONDUIT	58
5.4 CONDUIT FASTENERS	58
5.5 UNDERGROUND RACEWAYS	58
5.6 CORROSION PROTECTION	58
5.7 EMPTY CONDUIT	58
PART 6: BOXES	58
6.1 GENERAL REQUIREMENTS	58
6.2 INSTALLATION	59
PART 7: WIRING DEVICES	59
7.1 GENERAL REQUIREMENTS	59
7.2 DEVICE COLOR	59
7.3 RECEPTACLES	59
7.4 SWITCHES	59
7.5 FLOOR MAINTENANCE EQUIPMENT RECEPTACLES	59
7.6 WALL PLATES	59
7.7 IDENTIFICATION	59
PART 8: MOTORS	60
8.1 GENERAL REQUIREMENTS	60
PART 9: GENERATOR ASSEMBLIES	60
9.1 BASIC MINIMUM REQUIREMENTS	60
9.2 AUTOMATIC TRANSFER EQUIPMENT	60
9.3 LOADS TO BE SERVED	60
PART 10: VARIABLE FREQUENCY CONTROLLER (VFD)	61
10.1 GENERAL REQUIREMENTS	61
PART 11: TRANSIENT VOLTAGE SURGE SUPPRESSION	61
11.1 GENERAL REQUIREMENTS	61
PART 12: SERVICE AND DISTRIBUTION (600 VOLT AND BELOW)	62
12.1 GENERAL REQUIREMENTS	62

<b>PART 13: SAFETY SWITCHES AND CIRCUIT BREAKERS</b>	<b>62</b>
13.1 GENERAL REQUIREMENTS	62
<b>PART 14: ENCLOSED CONTROLLERS</b>	<b>62</b>
14.1 GENERAL REQUIREMENTS	62
<b>PART 15: DISTRIBUTION SWITCHBOARDS</b>	<b>62</b>
15.1 GENERAL REQUIREMENTS	62
15.2 CONSTRUCTION	63
15.3 WIRING	63
15.4 IDENTIFICATION	63
<b>PART 16: PANELBOARDS AND CABINETS</b>	<b>63</b>
16.1 GENERAL REQUIREMENTS	63
16.2 PANELBOARD CONSTRUCTION	63
16.3 IDENTIFICATION	63
16.4 SCHEDULES	64
<b>PART 17: LOW VOLTAGE TRANSFORMERS (600V OR LESS)</b>	<b>64</b>
17.1 GENERAL REQUIREMENTS	64
17.2 EFFICIENCY AND TEMPERATURE RISE	64
17.3 SOUND LEVELS	64
<b>PART 18: OVERCURRENT PROTECTIVE DEVICES</b>	<b>64</b>
18.1 GENERAL REQUIREMENTS	64
18.2 FUSES	64
18.3 BOLTED PRESSURE SWITCHES	64
18.4 CIRCUIT BREAKERS	65
18.5 FUSED SWITCHES	65
<b>PART 19: LIGHTING GENERAL REQUIREMENTS</b>	<b>65</b>
19.1 GENERAL REQUIREMENTS	65
19.2 EXIT SIGNAGE	65
<b>PART 20: INDOOR LUMINARIES</b>	<b>65</b>
20.1 GENERAL REQUIREMENTS	65
20.2 LIGHTING CRITERIA	65
20.3 FIXTURE LENSES	65
20.4 FIXTURE MOUNTING	65
20.5 LIGHTING CONTROL	65
<b>PART 21: EXTERIOR LUMINARIES</b>	<b>65</b>
21.1 GENERAL REQUIREMENTS	66
21.2 POLES AND STANDARDS	66
<b>PART 22: LAMPS</b>	<b>66</b>
22.1 LAMP TYPES	66
<b>PART 23: BALLASTS</b>	<b>66</b>
23.1 GENERAL REQUIREMENTS	66
23.2 FLUORESCENT BALLASTS	66
23.3 HID BALLASTS	66
23.4 REMOTE BALLASTS	67
23.5 REMOVAL AND DISPOSAL OF PCB BALLASTS	67
<b>PART 24: EMERGENCY LIGHT AND POWER</b>	<b>67</b>
24.1 GENERAL REQUIREMENTS	67
<b>PART 25: LIGHTNING PROTECTION SYSTEMS</b>	<b>67</b>

25.1 GENERAL REQUIREMENTS	67
<b>PART 26: FIRE ALARM SYSTEMS</b>	67
26.1 GENERAL REQUIREMENTS	67
26.2 SUBMITTALS	67
26.3 OPERATIONAL PLAN AND TEST	68
26.4 MATERIAL	68
26.5 EXECUTION	69
<b>PART 27: TELECOMMUNICATION SYSTEMS</b>	69
27.1 CENTRALLY MANAGED AND HARDWIRED CARD ACCESS CONTROL SYSTEMS	69
27.2 PUBLIC ADDRESS SYSTEMS	69
27.3 TELEVISION	70
27.4 CLOCK SYSTEM	70
27.5 SECURITY SYSTEM (INTRUSION)	70
27.6 CLOSED CIRCUIT TELEVISION (CCTV)	71
27.7 DOOR ACCESS CONTROL – P2000	71
27.8 GYM SOUND SYSTEMS	71
 <b>TELECOMMUNICATIONS CABLING</b>	 72
<b>PART 1: INTRODUCTION</b>	72
1.1 ABOUT THIS MANUAL	72
1.2 HAZARDOUS MATERIAL	72
<b>PART 2: SPACES</b>	73
2.1 GENERAL	73
2.2 TYPICAL CLASSROOM SPACE	73
2.3 TYPICAL SCIENCE CLASSROOM SPACE	73
2.4 TYPICAL COMPUTER LAB SPACE	73
2.5 TYPICAL ADMINISTRATIVE WORKSPACE	74
2.6 TYPICAL TELECOMMUNICATIONS ROOM SPACE	74
<b>PART 3: MATERIAL AND EQUIPMENT</b>	74
3.1 GENERAL	74
3.2 DATA CABLING SYSTEM	75
3.3 TV DISTRIBUTION	76
3.4 AV PRESENTATION SYSTEM	76
<b>PART 4: STANDARDS AND PRACTICES</b>	77
4.1 GENERAL	77
4.2 INSTALLATION	78
4.3 IDENTIFICATION AND LABELING	78
<b>PART 5: ACCEPTANCE AND TESTING</b>	79
5.1 GENERAL ACCEPTANCE CABLING SYSTEM	79
5.2 GENERAL ACCEPTANCE AUDIO VISUAL SYSTEM	79
Typical Classroom Layout ( <i>insert</i> )	81



**GENERAL NOTE:** Should there be any conflicting information between the "ISD 709 Construction Standards" and the "Space Program Standards", the bricks and mortar "Construction Standards" will take precedence.

## REVISIONS

9/3/10	Part 6: INTERIOR CONSTRUCTION	6.2 Interior Openings	A. Interior Doors and Frames
9/3/10	Part 6: INTERIOR CONSTRUCTION	6.3 Specialties	C. Wall and Corner Guards
9/3/10	Part 6: INTERIOR CONSTRUCTION	6.3 Specialties	E. Metal Lockers
5/19/10	Part 8: INTERIOR FINISHES	8.1 Wall Finishes	C. Interior Wall Finishes
5/19/10	FINISHED HARDWARE (insert)	PART 2 PRODUCTS	2.04 Locks and Latches
5/19/10	FINISHED HARDWARE (insert)	PART 2 PRODUCTS	2.07 Electronic Access Control
5/19/10	Part 27: TELECOMMUNICATION	27.5 Security Systems (Intrusion)	
5/6/10	Part 1: LANDSCAPE SYSTEMS	1.2 Site Furnishings	A. Benches
	Part 6: INTERIOR CONSTRUCTION	6.3 Specialties	E. Metal Lockers
	Part 8: INTERIOR FINISHES	8.2 Floor Finishes	H. Quarry Floor Tile
	Part 8: INTERIOR FINISHES	8.2 Floor Finishes	I. BASF U-Crete
	Part 11: EQUIPMENT	11.3 Other Equipment	C. Athletic Equipment
3/24/10	Part 4: EXTERIOR ENCLOSURE	4.1 Exterior Wall Construction	A. Exterior Wall - Exterior Skin
	Part 6: INTERIOR CONSTRUCTION	6.3 Specialties	E. Metal Lockers
	Part 3: PLUMBING SYSTEMS	3.6 Plumbing Fixtures	B. WC-1, WC1A Water Closets:
	Part 4: WIRES AND CABLES	PROHIBITED	
	Part 4: WIRES AND CABLES	4.1 General	
	Part 15: DISTRIBUTION SWITCHBOARDS	15.2 Construction	
	Part 16: PANELBOARDS & CABINETS	16.2 Panelboard Construction	
	Part 27: TELECOMMUNICATIONS	27.4 Clock System	
2/12/10	Part 8: INTERIOR FINISHES	8.4 Room Finish Concept	C. Kitchen/Food Service:
1/28/10	Part 1: LANDSCAPE SYSTEMS	1.2 Site Furnishings	D. Play Structure Equipment:
1/26/10	FINISHED HARDWARE (insert)	PART 2 PRODUCTS	2.18 Keying (A and B)
1/12/10	Part 6: INTERIOR CONSTRUCTION	6.3 Specialties	G. Hand Dryer:
1/8/10	Part 12: FURNISHINGS	12.1 Fixed Furnishings	A. Casework:
1/5/10	Part 11: EQUIPMENT	11.3 Other Equipment	D. Gymnasium Seating:
	Part 12: FURNISHINGS	12.1 Fixed Furnishings	B. Window Treatments:
11/10/09	Part 6: INTERIOR CONSTRUCTION	6.3 Specialties	G. Hand Dryer:
	Part 7: WIRING DEVICES	7.2 Device Color	



## RESOLUTION

### SUSTAINABLE DESIGN

To adopt the United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) for Schools program at the Silver certification level as the sustainable design standard

The School Board of ISD #709 resolves to adopt the USGBC LEED for Schools program at the Silver certification level, as the sustainable design standard for new school building construction. Where applicable, existing school renovation projects will follow the same design standards. Each specific school will have the flexibility to adapt additional design requirements to meet existing site conditions, building use and student needs with emphasis and priority placed on the following provisions:

- Indoor environmental quality will be optimized to provide increased ventilation, increased day lighting, enhanced acoustical performance and controllability of systems
- Energy efficiency will be combined with reduced operating costs compared to code-required construction
- Materials will be selected to optimize recycled content and local/regional materials while diverting a minimum of 75% of construction wastes from landfill
- Site design will be optimized to reduce water use and soil erosion and maintain amount of storm water run-off

# GENERAL STANDARDS

## Part 1: LANDSCAPE SYSTEMS

### 1.1 Irrigation

- A. Irrigation System: A manually controlled, underground irrigation system will be provided to irrigate natural sports field turf areas at middle and high schools. Listed below are components of the system:
1. Main Pipelines: Rigid, unplasticized PVC, Class 200.
  2. Manual drain down pits and isolation valves.
  3. Locate as necessary to provide adequate coverage.
  4. Acceptable Manufacturers: Toro, Rainbird.

### 1.2 Site Furnishings

- A. Benches:
1. Acceptable Manufacturer: Landscape Forms [www.landscapeforms.com](http://www.landscapeforms.com)
  2. Product: Petoskey, backed bench, perforated metal seat.
  3. Mounting: [Embedded](#).
  4. Color: [Manufacturer's standard colors](#), powdercoat.
- B. Waste Receptacles:
1. Acceptable Manufacturer: Landscape Forms [www.landscapeforms.com](http://www.landscapeforms.com)
  2. Product: Petoskey, tube support.
  3. Mounting: Surface mount.
  4. Color: [Manufacturer's standard colors](#), powdercoat.
- C. Bike Racks:
1. Acceptable Manufacturer: Dero [www.dero.com](http://www.dero.com)
  2. Product: Bike Hitch.
  3. Mounting: Surface mount.
  4. Color: [Hot dipped galvanized finish](#).
- D. Play Structure Equipment:
1. Approved Manufacturers/Suppliers:
    - a. [Miracle Recreation Equipment Company - Kids Choice](#) [www.miracle-recreation.com](http://www.miracle-recreation.com)  
Webber Recreation Design, Inc. 800-677-5153
    - b. [Landscape Structures, Inc. - PlayBooster](#) [www.playlsi.com](http://www.playlsi.com)  
Flagship Recreation 877-550-7860
    - c. [Playworld Systems, Inc. - Playmakers](#) [www.playworldsystems.com](http://www.playworldsystems.com)  
Midwest Playscapes, Inc. 800-747-1452
    - d. [Little Tikes Commercial - KidsBuilders](#) [www.littletikescommercial.com](http://www.littletikescommercial.com)  
Flanagan Sales, Inc. 800-328-3557
  2. All equipment to meet the following requirements:
    - a. Fall Height: According to ASTM F 1487, "the vertical distance between a designated play surface and the protective surfacing beneath it."
    - b. IPEMA: International Play Equipment Manufacturers Association.
    - c. Use Zone: According to ASTM F 1487, "the area beneath and immediately adjacent to a play structure that is designated for unrestricted circulation around the equipment and on whose surface it is predicted that a user would land when falling from or exiting the equipment."
  3. All surfacing to meet the following requirements:
    - a. Fall Height: According to ASTM F1951-00, "the determination of accessibility of surface systems under and around playground equipment" and ASTM F1292-96 "impact attenuation of surface systems under and around playground equipment".
    - b. IPEMA: International Play Equipment Manufacturers Association.
    - c. Acceptable Manufacturer/Product: International Mulch Company - Rubberific Mulch (Shredded

- 0Rubber), or prior approved equal. Color to be selected by Architect.
- d. Install at 14 pounds per square foot of surface area for a minimum of six (6) inches compacted material.
  - e. Rubber Mats: Provide under swings, slide and track slide. Mats shall be 4 foot by 6 foot by 2 inch thick, installed on sub grade below shredded rubber mulch.
4. **NOTE:** Fabric under shredded rubber shall be sewn at all seams.
- E. Swing Set:
- 1. Extra Heavy Duty with slash proof belt seats
- F. Basketball Standard:
- 1. 4-1/2 inch diameter galvanized steel arched (goose neck) support post with 4 foot offset, heavy duty cast aluminum powder coated white fan shaped backboard, heavy duty steel goal with anti-whip nylon net.
- G. Planters:
- 1. Acceptable Manufacturer: Wausau Tile Terra Form Division. [www.wausautile.com](http://www.wausautile.com)
  - 2. Product: T4143.
  - 3. Color: Weatherstone B1 gray.
- H. Flagpoles:
- 1. 30 foot high tapered aluminum ground set, internal halyard.
- I. Bollards:
- 1. Precast Concrete Bollards:
    - a. Acceptable Manufacturer: Wausau Tile Terra Form Division. [www.wausautile.com](http://www.wausautile.com)
    - b. Product: TF6080.
    - c. Color: Weatherstone B1 gray.
  - 2. Removable metal bollards for controlling vehicular traffic.
- J. Fences and Gates:
- 1. Line, Corner, Terminal and Gate Post: Diameter as determined. NO CHANNEL POST.
  - 2. Top, Bottom and Brace Rails: Diameter as determined. Line post spacing shall not exceed 10 foot intervals.
  - 3. Gate Frame: 2 inch diameter minimum for welded fabrication.
  - 4. Fabric: 2 inch diamond mesh interwoven wire, 9 gauge.
  - 5. Accessories:
    - a. Caps: Malleable iron galvanized sized to post diameter, set screw retainer.
    - b. Gate Hardware: Fork latch with gravity drop, three 180 degrees gate hinges per leaf, and hardware for padlock.
  - 6. Finishes:
    - a. Components and Hardware: Galvanized to ASTM A123; 2.0 ounces per square feet.
    - b. Fabric: Aluminum coating to ASTM A428; 0.04 ounces per square feet
    - c. Accessories: Same finish as framing.
  - 7. Installation:
    - a. Install framework, fabric, and gates in accordance with manufacturer's instructions.
    - b. Set line, terminate, gate, and corner post plumb, in concrete footings with top of concrete finished with 1 inch slope to grade.
    - c. Brace each gate and corner post to adjacent line post with horizontal center brace rail and diagonal truss rods. Install brace rail, one bay from end and gate post.
    - d. Provide top and bottom rail through line post tops and splice with 6 inch long rail sleeves.
    - e. Install center and bottom brace rails on corner gate leaves
    - f. Stretch fabric between terminate post or at intervals of 100 feet maximum, whichever is less.
    - g. Position bottom of fabric 2 inches or less from finished grade.  
Fasten fabric to top and bottom rail, line post, braces with tie wire maximum 15 inch on center.
    - h. Attach fabric to end, corner and gate post with tension bars and tension bar clips.

### 1.3 Plantings (locations per specific site to be determined)

- A. Landscape materials including trees and shrubs, sod, and ground cover.
- B. Planting material comprised of nursery and specimen stock, specimen stock approximately 15 percent of

plant material.

- C. Canopy Trees: Representative species include maple, linden, and ash, 2-1/2 inch to 3 inch caliper B&B.
- D. Understory Trees: Representative species include birch, aspen and ironwood, 8 foot height multi-stem or 1-1/2" to 2 inch caliper B&B.
- E. Ornamental Trees: Representative species include serviceberry, dogwood, hawthorn, crabapple and redbud, 1-1/2 inch to 2 inch caliper B&B.
- F. Coniferous Trees: Preferred choice representative species include fir, pine, spruce, and cedar, 4 to 8 feet in height B&B.
- G. Deciduous Shrubs: Representative species include dogwood, alpine currant, 2 gallon container minimum.
- H. Coniferous Shrubs: Representative species include juniper, yew, arborvitae, 2 gallon container minimum.
- I. Groundcovers: Representative species include daylilies, polygonum, euonymus.
- J. Sod: Locations around building perimeter, minimum 9 foot from building. Dense, well rooted and composed of certified mixture of improved bluegrass. Lawn sod as described in Mn/DOT section 3878
- K. Seeding: All other areas; mix to be determined.
- L. Edging: Steel edging.
- M. Mulch: Shredded hardwood bark mulch.
- N. Boulders: Glacial deposited granite boulders ranging in size from 24 inch to 48 inch diameter.
- O. Planting Soil: Fertile friable sandy, clay loam amended with peat moss and add mixtures, per soil test recommendations.
- P. General Conditions:
  - 1. Trees should be located not to interfere with snow plowing.
  - 2. Trees should be of adequate size to minimize damage from vandalism.
  - 3. Trees should not be located near overhead lines.
  - 4. Hedges and bushes should not be planted by building because of security.

## **Part 2: SITE WORK**

### **2.1 Earthwork**

- A. Sediment and Erosion Control: Temporary and permanent sediment and erosion control elements at grading limits and storm sewer inlets as required by site development and local regulatory agencies.
- B. A soils report will be provided for each project as required.
- C. Maintain adequate and positive drainage of entire site for duration of project, do not allow groundwater, surface water or direct precipitation to accumulate on subgrades or in excavations.
- D. Excavation: Excavate to depth and limits required for construction of building, parking structure, paving sections, utilities, landscaping items, and topsoil placement.
  - 1. Segregate approved select uniform aggregate materials free of debris for backfill and fill construction in limited locations.
  - 2. Dispose of unsuitable material off-site in accordance with local codes, regulation, and laws.
  - 3. Balance earth volumes on site using earthwork adjustment areas shown on the plans.
- E. Soils materials:
  - 1. Landscape area fill and non-retaining wall backfill: On site suitable excess material.
  - 2. Vapor Barrier Protection Layer: 2 inch depth fine aggregate (sand). Assume a vapor barrier under all slabs on grade.
  - 3. Topsoil: Pulverized friable loam with organic content over 4 percent must be imported. Peat and fertilizers may be mixed with on site silty sands to develop acceptable topsoil.
- F. Building Lower Levels:
  - 1. If applicable, this system would be synthetic wall drainage and membrane waterproofing system with sub-soil drain pipe by W.R. Grace, Mirafi or equal.
- G. Primary Backfill: Defined as the upper three feet below pavement areas.
  - 1. Fill to be in 8 inch horizontal layers, over approved, compacted subgrade. Testing Agency to approve all sub-grade soil and compaction.
  - 2. Compact fill materials to 100% standard proctor densities required by soils report.
- H. Secondary Backfill: Defined as material placed more than three feet below buildings and pavement areas.
  - 1. Fill to be placed in 8 inch horizontal layers over approved compacted subgrade. Testing Agency to

- approve all sub-grade soil and compaction.
- 2. Compact fill materials to 95% standard proctor densities required by soils report.
- I. Engineered Fill: Defined as all fill inside the building. Assume the fill requirements to be the same as primary fill.
- J. Import Sands or Gravel: Assume importing a minimum 6 inch thickness of 3/4 inch minus crushed gravel for mechanical and electrical equipment yard areas. Also assume these will have a 4 inch perforated poly drain pipe a few feet below the ground surface connected to a storm sewer system.
- K. Fine grade site subgrade as necessary to receive paving sections and landscape materials.
- L. Provide and uniformly place minimum of 4 inches of approved topsoil in landscaped areas.
- M. Construct replacement wetlands at locations designated on the drawings. Existing wetland soils must be stripped and reused at replacement wetlands.

## **2.2 Paving and Surfacing**

- A. Subgrade: Follow earthwork section requirements above.
- B. Aggregate Base: 100% crushed aggregate base, class 5 or 7 in accordance with Mn/DOT spec. Compaction level 100% standard proctor density.
- C. Portland Cement Concrete: 4,000 psi, air entrained concrete.
- D. Bituminous: Provide Mn/DOT 2365 LV bituminous material. The maximum lift thickness to be 3.5 inch and the minimum 1.5 inch. Place all bituminous to 95% Marshall density.
- E. Concrete Expansion Joint Sealer (applies to concrete walks also): Two part urethane sealant over compatible backup material.
- F. Construct paving/surfacing in compliance with Mn/DOT specifications.
- G. Schedule of bituminous paving sections:
  - 1. Bus and Service Dock Roads: Imported 12 inches of coarse sand with perforated poly drainpipe, 8-1/2 inches crushed aggregate base under 6 inch bituminous pavement placed in 2 lifts.
  - 2. Parking Areas: 8-1/2 inches aggregate base course, 2 inch bituminous base course, 2 inch bituminous wear course.
- H. Provide B612 concrete curb and gutter, and S curb (7020J) where appropriate for snow removal.
- I. Concrete in Service Dock Areas: Imported 12 inches of coarse sand with perforated poly drainpipe, then 6 inches crushed aggregate base under 8 inch non-reinforced concrete slab.
- J. Walk Paving:
  - 1. Paving (Type 1): 4,000 psi, air entrained Portland cement concrete reinforced with polypropylene fiber with tooled joints and light broom finish.
    - a. Locations: Major walkways & walks adjacent to parking lots/drives.
    - b. Thickness: 6 inches.
    - c. Base: On site soils recompacted to 100% standard proctor density after discing.
    - d. Reinforcement based on ACI Manual of Standards.
    - e. 8 foot wide minimum.
  - 2. Paving (Type 2): 4,000 psi, air entrained Portland cement concrete reinforced with polypropylene fiber with tooled joints and light broom finish.
    - a. Locations: All other.
    - b. Thickness: 5 inches.
    - c. Base: On site soils recompacted to 100% standard proctor density after discing.
    - d. Wire mesh reinforced.
- K. Gravel Yard: 6 inch depth of crushed stone - dresser trap rock 3/4" to 1" lay on filter fabric.

## **2.3 Site Utilities**

- A. Trenching:
  - 1. The onsite soils are anticipated to meet all the bedding and trenching requirements
  - 2. Pipe Bedding Material: On site materials compacted to 100% standard proctor density.
  - 3. Pipe Zone Backfill Material: On site materials compacted to 100% standard proctor density.
  - 4. Trench Backfill Above Pipe Zone: On site materials compacted to 95% standard proctor density except for primary fill areas under pavements and building. Reference Earthwork section for primary fill requirements.

- B. Pipe materials:
  - 1. Sanitary Sewer Building Services: SCH 40 PVC.
  - 2. Watermain: Ductile iron pipe AWWA Water main specification, or HDPE.
  - 3. Storm Sewer 12 inch and larger: Class III Reinforced Concrete pipe, unless noted otherwise.
  - 4. Storm Sewer 8 inch and 10 inch: SDR 26 PVC or ductile iron pipe depending on location.
  - 5. Storm Sewer less than 8 inch: Schedule 40 PVC.
  - 6. Gas Mains: Coated pipe per gas utility requirements.
- C. Miscellaneous materials:
  - 1. Sewer Structures: Precast or poured in place as appropriate for size and style.
  - 2. Castings: Neenah foundry ductile iron castings unless noted otherwise.
- D. Construct utilities in accordance with requirements of local jurisdiction and as specified.
- E. Align, excavate and prepare trenches for required utility construction.
- F. Bed and lay pipe and maintain required lines and grade with necessary manholes, structures, and appurtenances placed at required locations. Reference trenching above for backfill requirements.
- G. Construct sanitary sewers, storm sewers, subdrains, gas, and water system elements as indicated and in conformance with local requirements. Provide indicated and required appurtenances for complete and operable systems.
- H. Utility Installation (general): The existing utilities including, but not limited to storm sewers, sanitary sewers, gas mains, and water mains are currently located at the site perimeter.
- I. Provide leakage testing of sanitary sewers and water systems.
- J. Storm-Water Management: Storm runoff will be managed in accordance with MPCA regulations. This will involve vegetative filter strips and a permanent sedimentation basin.
- K. The new storm sewers will be designed to carry a minimum 10 year design storm event in accordance with applicable regulatory requirements.
- L. Water System:
  - 1. Wells: Information will be obtained if applicable.
- M. Gas Main: Will be extended to the property line.

## **PART 3: SUPERSTRUCTURE**

### **3.1 Floor Construction**

- A. Refer to Structural Systems Narrative for the following.
  - 1. Structural precast concrete floor planks.
  - 2. Load bearing interior concrete masonry walls supporting floors.
  - 3. Concrete floor topping.
  - 4. Below slab vapor retarders.
- B. Floor Construction Firestopping: Fibrous fire safing and fire penetration sealant will both be used at gaps and penetrations in rated floor assemblies.
- C. Other Floor Construction:
  - 1. Metal gratings used at catwalks over theater.
  - 2. Stage floor constructed out of non-combustible framing.
  - 3. Cast-in-place concrete ramps.
  - 4. Cast-in-place concrete exterior stairs.

### **3.2 Roof Construction**

- A. Refer to Structural Systems narrative for the following.
  - 1. Steel roof joists.
  - 2. Load bearing concrete masonry unit walls supporting roof.
  - 3. Steel roof decking.
- B. Fireproofing: Provide medium density cementitious fireproofing were required by governing authorities.
- C. Firestopping: Fibrous fire safing and fire penetration sealant will be used at gaps and penetrations within rated assemblies.



## PART 4: EXTERIOR ENCLOSURE

### 4.1 Exterior Wall Construction

- A. Exterior Wall - Exterior Skin (options, in order of preference):
  - 1. Clay Masonry Units: ASTM C216, Grade SW, FBX. Mortar set with rubberized asphalt membrane wall flashing, 26 gauge stainless steel drip edge, mortar net, cotton rope weeps, and stainless steel fasteners.
    - a. Exposed stainless steel drip edge shall be between 3/8 to 3/4 inches.
  - 2. Architectural Precast Trim, Coping, Accent Banding: Reinforced as required. Configure as shown or match existing. Color to match existing. Locations approved by owner.
  - 3. Metal Panel: Engineered metal panel system incorporating custom fabricated 1/8 inch aluminum panels mounted on an extruded aluminum support system designed to accommodate expansion and contraction within system. Finish: color anodized.
  - 4. "Hard Coat" EIFS: Select locations only:
    - a. Exterior Insulation and finish system with steel stud back-up wall and insulation outside of sheathing.
    - b. Insulation: Standard expanded polystyrene adhered.
- B. Exterior Wall Construction
  - 1. Architectural Precast Concrete Panel Back-Up Wall: For use with or without cavity wall masonry veneers.
    - a. Design Criteria: Conform to requirements of PCI MNL-117 Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products.
    - b. Basis of Design:
      - 1) Hanson Spancrete.
      - 2) Gage Brothers.
      - 3) Raider Precast Concrete or approved substitute.
    - c. Panel reinforcing and design by supplier based on project specific configuration and loads.
    - d. Exterior Finish: As selected or match existing if exposed to view.
  - 2. Precast Concrete Wall Panels: Precast Concrete Back-Up Wall [AC Series] comparable to Hanson Spancrete, using portland cement and normal-weight aggregate. Finish: To be determined.
    - a. Compressive Strength (28 Days): 5,000 psi.
    - b. Minimum 8 inches thick, standard gray portland cement.
  - 3. Concrete Masonry Units: Normal weight, Class 1, C33 Aggregate, modular size, load bearing, ASTM C90, Type I.
    - a. Unit masonry installed compressive strength:  $f'm = 1,900$  psi.
    - b. Provide stainless steel horizontal reinforcing.
    - c. Deformed Reinforcing Bars for Wall Reinforcing: ASTM A615, Grade 60.
    - d. Construct Bond Beams, Lintels, and Core-Filled Units as required. Minimum compressive strength of corefill shall be 3,000 pounds per square inch at 28 days of age.
  - 4. Cold-formed Metal Studs: 16 gauge structural quality steel sheet with a yield point of not less than 40,000 psi. Comply with ASTM A653, Grade CQ, (33,000 psi yield).
    - a. Stud Spacing: Not more than 16 inches on center.
    - b. Sheathing: 1/2-inch, silicone-treated, glass faced gypsum sheathing conforming to ASTM C1177, high-moisture resistant board with silicone-treated gypsum core and fiberglass reinforced faces.
  - 5. Expansion Control: As required for specific project.
- C. Exterior Wall Vapor Retarders, Air Barriers, and Insulation
  - 1. Air Barrier: Sprayed-on liquid rubberized asphalt membrane designed for use in cavity wall construction to prevent moisture and air infiltration. Standard of Quality shall be Grace "Liquid Perm-a-Barrier".
  - 2. Cavity Wall Insulation: 2 inch rigid extruded polyisocyanurate insulation complying with ASTM C1289, Type I, Class 1; foil faced, both faces. Standard of quality shall be Dow Chemical "Thermax Sheathing".
  - 3. Batt Insulation: ASTM C665, Type I, fiberglass batt (blanket) thermal insulation.

- D. Exterior Wall - Interior Skin
1. Precast Concrete Wall Panels (Gymnasium Walls): Painted with Low-VOC acrylic latex interior paint.
  2. Gypsum Board: ASTM C36; tapered edges. Provide 7/8 inch galvanized steel hat channels for furring gypsum board from concrete masonry unit walls or directly applied to metal stud framing.
  3. Ground Faced (Burnished) Concrete Masonry Units: ASTM C90, normal weight units (minimum 125 pcf), moisture controlled curing, with manufacturer's standard dissipating block protection.
- E. Exterior Louvers: Aluminum of continuous type design with drainable blades, bird screen, extruded aluminum sills, and insulated blank-off panels. Construct of not less than 0.081 inch thick extruded aluminum for frame and blades. 6-inch depth with channel shaped frame. Blades at 45 degree slope. Kynar finish in color selected by Architect.
- F. Exterior Railings: All components and rails shall be aluminum or S.S. in a natural finish. If not aluminum or SS, powder coating can be allowed. Provide handrail and miscellaneous railing materials in sizes, shapes, and types indicated. Tubes or sheet thickness shall be sized by supplier and be appropriate for intended use.
1. Provide complete with miscellaneous fittings, end caps, tees, elbows, outlets, fasteners, and connectors necessary for complete assembly.
  2. Railing system to comply with OSHA requirements to withstand a load of at least 200 pounds applied in any direction at any point on the rail.
- G. Exterior Soffits: Direct-applied exterior finish system (DEFS) consisting of composite assembly, consisting of but not limited to the following components.
1. Steel stud framing with glass mat faced gypsum sheathing.
  2. No insulation layer.
  3. Polymer modified portland base coat with reinforcing mesh (1 coat application directly on sheathing required).
  4. Sealant joints within field and around perimeter of system.
  5. Acrylic DEFS finish coat, color as selected by Architect.
- H. Exterior Glass:
1. Clear Low-E Insulated Glass Unit: Argon gas filled, 1 inch thick unit, high performance low-emissivity coating on No. 2 surface.
    - a. Standard of Quality shall be Viracon "Solarscreen 2000, VE 1-2M".
  2. Clear Insulating Laminated Glass Units: 1-5/16 inch thick laminated, insulated, low-e coated glass unit, 1/4 inch clear heat strengthened outboard light, 1/2 inch air space, 2 layers of 1/4 inch clear tempered inboard light laminated with 0.030 inch clear PVB inner layer.
  3. Glass shall be heat-strengthened and tempered as required for safety and strength.
- I. Exterior Standard Windows: Fixed extruded aluminum windows with anodized finish in color selected by Architect; 1 inch thick insulating glass.
1. Standard of Quality: Fixed.
  2. Air Infiltration: Not exceed 0.10 CFM per lineal foot of sash crack when tested in accordance with ASTM E283 at a uniform pressure of 6.24 PSF.
  3. Water Resistance: No water leakage will occur when windows are tested in accordance with ASTM E331 at a static pressure of 10.00 PSF.
  4. Uniform Load Deflection Test: No glass breakage, permanent damage to fasteners, hardware parts, or damage to make window inoperable or deflection of any unsupported span (meeting rails, muntins, frames, mullions, or other appurtenances) in excess of L/175 at both a positive and a negative load in minimum of 55 PSF when tested in accordance with ASTM E330.
  5. Uniform Structural Load: Unit is to be tested at 1.5 times design wind pressure, both positive and negative at 82.50 PSF in accordance with ASTM E 330. There shall be no glass breakage, permanent damage to fasteners, hardware parts or any other damage to make the window inoperable. There shall be no permanent deformation of any main frame or sash member in excess of 2 percent of its span.
- J. Aluminum Storefront Entrances: Thermally broken fixed framing system, including aluminum doors, designed to receive 1 inch and 1/4 inch vision glass. Anodized finish in color selected by Architect.
1. Profiles: 2 inch wide by depth required by windloading.
  2. Maximum L/175 deflection at design load by applicable code.
  3. No permanent set at 150 percent of design load.
  4. Air infiltration tested at 6.24 PSF. Laboratory test data not to exceed 0.06 CFM/square foot.



5. Water resistance tested at 6.24. No leakage.
6. Doors: Wide stile (5 inch stiles and top rail, 10 inch bottom rail, 5 inch intermediate horizontal mullion).
7. Heavy duty low-power automatic door operator is to be provided at single ADA accessible entry door.
8. Hardware: Prepare and reinforce doors and frames for heavy duty hardware as indicated below.
  - a. Hinges: Hager, or approved equivalent. (one hinge per door leaf in addition to manufacturer's recommendation).
  - b. Exit Devices: Von Duprin 99 Series, or approved equivalent.
  - c. Removable Mullion (when indicated or required): Von Duprin 4954, or approved equivalent.
  - d. Locks, Cylinders and Keying: Locks shall be by Key Company, Duluth, MN, keyed to existing system as directed by owner.
  - e. Closers: LCN 4040 Series, or approved equivalent.
- K. Hollow Metal Exterior Utility Openings: Commercial quality, stretcher leveled flatness, cold rolled steel per ASTM A366 and galvanealed to A60 minimum coating weight standard per ASTM A924. Shop primed and field painted.
  1. Frames: 14 gauge galvanized material with corners fully welded, to hairline accuracy with face joints continuously welded and ground smooth.
  2. Doors: 16 gauge galvanized material, SDI Level III, extra heavy duty Model 1, 2, or 3 full flush door with foamed-in-place polyurethane core insulation.
  3. Hardware: Prepare and reinforce doors and frames for heavy duty hardware as indicated below.
    - a. Hinges: Hager, or approved equivalent (one hinge per door leaf in addition to manufacturer's recommendation).
    - b. Exit Devices: Von Duprin 99 Series, or approved equivalent.
    - c. Removable Mullion (when indicated or required): Von Duprin 4954, or approved equivalent.
    - d. Locksets: Schlage D Series, or approved equivalent.
    - e. Locks, Cylinders and Keying: Locks shall be by Key Company, Duluth, MN, keyed to existing system as directed by owner.
  4. Closers: LCN 4040 Series, or approved equivalent.
  5. Painting Standard: Muralo waterbourne semi-gloss finish.
- L. Large Exterior Special Doors:
  1. Insulated Coiling Doors: 20 gauge G90 galvanized steel substrate with factory applied epoxy primer; motor operated overhead coiling door with exposed housing and surface mounted guide rails.
- M. Exterior Garage Doors:
  1. Insulated Commercial Garage Doors: Raynor TC320 or approved equal.

## **PART 5: ROOFING**

### **5.1 Roof Coverings**

- A. Modified Built-up Roofing System:
  1. First layer of Insulation: 5/8 inch layer of rigid silicone impregnated glass mat gypsum sheathing board, mechanically fastened to metal deck.
  2. Vapor Retarder: 2 layers of asphalt-impregnated glass-fiber felt set in and glazed with steep asphalt.
  3. Insulation: 2 layers polyisocyanurate board roof insulation, each layer set in solid moppings of steep asphalt. Where a minimum of 1/4:12 slopes do not exist, tapered insulation system must be added. (Shop drawings approved by the owner's representative and manufacturer). All drain areas shall have a minimum of 4' x 4' foot sump. Minimum 1/2 inch high density, asphalt impregnated recovery board to be installed over base layers of insulation.
  4. Average R-value: R-30 for roof insulation.
  5. Provide filler boards at deep insulation.
  6. Membrane: Minimum 5-ply total roof system that incorporates high strength cap sheet with a minimum tensile strength of 700 lbs/in and 1,200 lbs/in of tear strength. Modified asphalt shall have minimum low temperature flexibility of -25 degrees F.
  7. Roof system shall incorporate Green Components and be eligible for LEED credits. Green components shall consist of post industrial and post consumer recycled materials minimum. Documentation of green

- components and the associated LEED credits shall be required.
8. Surfacing: Asphalt flood coat applied at a rate of 75 pounds per square foot and gravel surfacing embedded at a rate of 500 pounds per square foot.
  9. Walkway Paths: Modified bitumen walkway pads set in asphalt.
  10. Roofs drains: Internal
  11. Roof system shall comply with manufacturer's 30 year "No Dollar Limit", Full System warranty requirements.
  12. Manufacturer shall provide during installation a minimum of three weekly inspections that include photos and documentation as to the installation quality of the roof system. Manufacturer shall also provide one annual inspection per year of the warranty period with documentation and photographs as to the condition of the roof system. All inspection services shall be provided to the owner at no cost. Inspections shall be provided by a full time employee of the manufacturer.
- B. Steep Slope Roofing: Sheet metal standing seam roofing with all accessory materials, including waterproof membrane. Kynar finish in color selected by Architect.
- C. Steep Slope Roofing: Tile roof to match adjacent conditions with all accessories including water proofing membranes.
1. Basis of Design:
    - a. Classic interlocking roof tiles by Ludowici-Celadon. Color as selected from manufacturer's standard colors.
    - b. Other Acceptable Manufacturers: Gladding and McBean, United States Tile.
- D. Flashing and Sheet Metal:
1. Sheet Metal Parapet Coping, Flashing and Trim: Commercial quality ASTM A653 steel sheet, with G90 hot-dip galvanized coating, mill phosphatized (bonderized) where indicated for painting. In exposed to view conditions, provide with Kynar finish in color selected by Architect. Flashing to extend 12 inches above roof plane.
  2. Joint Sealant: ASTM C920, medium modulus, silicone rubber based, single component, neutral cure elastomeric sealant with plus 50 percent to minus 50 percent movement capability for exterior application and specially formulated to reduce bleeding and resist mildew growth.
- E. Roof Specialties and Accessories:
1. Overflow Scuppers: Same material as metal flashing.
  2. Roof Edge: Option 1 - specially designed extruded aluminum roof edge system with galvanized spring clip substructure, continuous keep, and 0.080 extruded aluminum coverplate where parapets are not used. Option 2 - Architectural precast.
  3. Expansion Joint Cover Assemblies: EPDM bellow type.
  4. Provide safety strap tie-off anchors at each equipment location.
- F. Other Roof Openings:
1. Roof Hatches: Hatch curbs and covers fabricated of not less than 14 gauge prime coated galvanized steel with insulated cover, steel liner, insulated exterior of curb, and locking hardware. Designed for 60 degree ships ladders.
  2. Skylights. Provide metal-framed sloped skylights capable of withstanding loads and thermal and structural movements indicated without failure sloped aluminum frame, Kynar finish in color selected by Architect.
    - a. Glass: Recommend 1-5/16 inch thick insulated laminated glass.
    - b. Structural Silicone Sealant: ASTM C1184.
    - c. Basis of Design: Design professional will have latitude to design this component. Design professional must coordinate any proposed solution with mechanical engineer for load calculations and scheduled glazing.

## **PART 6: INTERIOR CONSTRUCTION**

### **6.1 Partitions**

- A. Interior Fixed Partitions:
1. Unit Masonry Assemblies:

- a. Locations: Corridor, gymnasium, pool, storage, mechanical, locker rooms, cafeteria.
  - b. Normal Weight Concrete Masonry Units: ASTM C90, aggregate shall be normal weight, sand-gravel aggregate conforming to ASTM C33. Install in running bond with concave tooled joints; bullnose exposed outside corners.
    - 1) Provide unit masonry that develops the installed compressive strengths of  $f'm = 1,900$  psi.
    - 2) Provide UL-rated block where required.
  - c. Ground Faced (Burnished) Concrete Masonry Accent Units: ASTM C90, normal weight units (minimum 125 pcf), moisture controlled curing, with manufacturer's standard dissipating block protection, concave tool joints, bullnose exposed outside corners.
2. Steel Stud Partitions:
- a. Locations: Classroom, office, conference, computer, media.
  - b. Non-load bearing, 25 gauge steel studs complying with ASTM C645. Yield point of steel 33,000 psi minimum.
3. Wire Mesh Partitions:
- a. Locations: Gymnasium, storage.
- B. Interior Operable Panel Partitions:
- 1. Gymnasium/Cafeteria - Divider Panel Partitions (when applicable): Operable wall consisting of nominal 4 inch thick, 48 inch wide, continuous steel panels; tracks, trolleys, hangers, adjustable acoustical seals at top, adjustable seals at trailing end panel, and manual crank drop seals at bottom of each panel; motor operated, storage pocket door.
- C. Interior Railings:
- 1. Wood and Metal Handrail System (monumental stair): Red oak hand rail with decorative painted steel frame and infill; include mounting brackets, balusters, posts, post caps, and wall returns.  
Optional: All components and rails shall be aluminum or S.S. in a natural finish. If not aluminum or SS, powder coating can be allowed. Provide handrail and miscellaneous railing materials in sizes, shapes, and types indicated. Tubes or sheet thickness shall be sized by supplier and be appropriate for intended use.
  - 1. Provide complete with miscellaneous fittings, end caps, tees, elbows, outlets, fasteners, and connectors necessary for complete assembly.
  - 2. Railing system to comply with OSHA requirements to withstand a load of at least 200 pounds applied in any direction at any point on the rail.
  - 3. Standard Aluminum or SS Railings: Nominal 1-1/4 inch schedule 40 steel pipe (actual outside diameter of 1.66 inches). Shall be capable of resisting a load of 200 pounds concentrated load applied in any direction at any point on the top rail. Wall brackets shall be malleable iron, 2-1/2 or 2-3/4 inch diameter wall plate, center of rail 2 inches from face of wall.
- D. Interior Windows:
- 1. Aluminum Windows: Non-thermally broken framing matching exterior storefront framing.
  - 2. Steel Windows: Hollow metal lites consisting of 16 gauge commercial quality, stretcher leveled flatness, cold rolled steel per ASTM A366 and A653 general requirements, internally reinforced where required; shop primed and field painted.
  - 3. Glass: 1/4 inch thick clear tempered glass complying with ASTM C1036, Type 1, Class 1 (clear) or Class 2 (tinted, heat-absorbing and light-reducing) and Quality q3. Provide wire glass where required by governing jurisdiction.
- E. Interior Partition Firestopping: Fibrous fire-safing and fire penetration sealant will be used at gaps and penetrations within rated assemblies.
- F. Acoustic Wall Panels with Fabric: Minimum 1 inch thick, 7 pound density fiberglass panel with fabric covering and resin impregnated reinforced edges with 1/8 inch bevel conforming to the following.
- 1. NCR rating (ASTM C423): Not less than 0.90.
  - 2. Method of Attachment: Panel manufacturer's standard mounting clips (permanently mounted).

## 6.2 Interior Openings

- A. Interior Swinging Doors and Frames:
- 1. Steel Doors and Frames: Commercial quality, stretcher leveled flatness, cold rolled steel per ASTM A366 and A653 general requirements; fire-rated where required. Shop prime for field painting.

- a. Locations: Storage, mechanical, locker rooms.
- b. Frames: Fabricate with corners fully mitered, including stop, to hairline accuracy with face joints continuously welded, 16 gauge.
- c. Doors: SDI Level III, Extra Heavy Duty, Model 2, full flush door; 16 gauge face sheet.
- d. Painting Standard: Muralo waterborne **Semi-Gloss** finish.
- 2. Flush Wood Doors:
  - a. Locations: Classroom, office.
  - b. AWI Custom, with Grade A faces, species to be determined; fire-rated where required. Factory applied TR-6 waterborne urethane finish.
  - c. Painting Standard: Pratt & Lambert oil base stain, sanding sealer and varnish.
- 3. Interior Door Hardware:
  - a. Hinges: Hager, or approved equivalent (one hinge per door leaf in addition to manufacturer's recommendation).
  - b. Exit Devices: Von Duprin 99 Series, or approved equivalent.
  - c. Removable Mullion (when indicated or required): Von Duprin 4954, or approved equivalent.
  - d. Locksets: Schlage D Series, or approved equivalent.
  - e. Locks, Cylinders and Keying: Locks shall be by Key Company, Duluth, MN, keyed to existing system as directed by owner.
  - f. Closers: LCN 4040 Series, or approved equivalent.
  - g. Security Boxes: Bommer model #5621 Key Keeper.
- 4. Fiberglass Reinforced Plastic Door (pool area):
  - a. Thickness: 1-3/4 inches.
  - b. Thermal Insulating Value: 'R' factor 11.
  - c. Construction:
    - 1) Core: End-grain balsa wood, resin-impregnated.
    - 2) Door Plates: Molded in one continuous piece, resin reinforced with hand-laid glass fiber mat, nominal 1/8 inch thick, minimum 15 mil gel-coated surface.
    - 3) Door Edges: Minimum three (3) layers resin-reinforced glass fiber mat, nominal 3/8 inch thick, machine tooled.
  - d. Sizes: Indicated on drawings.
  - e. Finish: Smooth gloss surface, minimum value 88 in accordance with ASTM D 523.
- B. Interior Aluminum Entrance Doors: 6063-T5 alloy and temper (ASTM B221 alloy G.S. 10A-T5).
  - 1. Fixed Aluminum-Framed Storefronts.
    - a. 1-3/4-inch thick full glass wide stile aluminum door (5 inch stiles and top rail, 10 inch bottom rail, 5 inch intermediate horizontal mullion).
    - b. Finish: Anodized in color selected by the Architect.
- C. Glass: 1/4 inch thick clear tempered glass complying with ASTM C1036, Type 1, Class 1 (clear) or Class 2 (tinted, heat-absorbing and light-reducing) and Quality q3.
- D. Interior Large Doors:
  - 1. Overhead Coiling Doors: 22 gauge G90 galvanized steel substrate with factory applied epoxy primer; motor operated overhead coiling door with exposed housing and surface mounted guide rails. May be solid or with glass depending on application.
- E. Critical Door Dimension: All doors for custodial closets, maintenance areas, and service areas, to have a minimum dimension of 36 inches wide.
- F. Other Interior Doors:
  - 1. Access Doors and Panels: Provide access panels where required to access operable parts of concealed equipment, fittings or fixtures.

### 6.3 Specialties

- A. Visual Display Boards:
  - 1. Markerboards: Special porcelain enamel panel designed for use with dry-wipe markers and magnetic devices. Provide 1 inch strip of tack board horizontally above marker boards.
  - 2. Tackboard: Plastic impregnated cork board with washable vinyl finish, integral color throughout, and backed with burlap mesh and factory laminated to rigid substrate.

- B. Fabricated Compartments and Cubicles:
1. Solid Polymer Toilet Compartments: Overhead-braced type toilet partitions with wall hung solid polymer urinal screen. Stainless steel ceiling connections and chrome plated hardware. Color to be selected by Architect from manufacturer's standard color palette.
- C. Wall and Corner Guards:
1. Vinyl Alloy Corner Guards and Wall Protection: Extruded, textured, chemical and stain resistant, high-impact, acrylic modified vinyl plastic. S.S. allowed if desired by design professional.
    - a. Standard Size: 3 inch by 3 inch.
    - b. Alternate Size: 1.5 inch by 1.5 inch
      1. Locations would be at areas that have two adjacent guards that would overlap (stud wall end).
- D. Interior Identifying Devices: Interior Signage required for ADA compliance and directional signage.
1. See Sign Specification at the end of this section.
- E. Metal Lockers: Sheet steel complying with ASTM A366, commercial grade, stretcher leveled. Polymer powder coated finish.
1. Corridor Lockers: Full height by 15 inches wide by 12 inches deep, or if run does not allow then 15 inches deep by 12 inches wide, wall mounted (installed 12 inches above finished floor) single tier lockers, sloped tops; combination built-in locks (no locks on elementary lockers). Height as shown on drawings. If double tie lockers are used, they shall be 15 inches wide by 15 inches deep.
    - a. Standard of Quality BASE BID: Art Metal Products Standard Quiet KD Locker or approved equal.
      1. Elementary corridor lockers shall have pre-punched holes 6 inches on-center for flexible shelf and hook mounting heights, shelf to be installed at 40 inches from bottom of locker.
    - b. Standard of Quality ALTERNATE: General Storage Systems, Tri-Lok Eclipse or approved equal.
      1. Lockers located inside elementary classrooms shall have a honeycomb core in the locker door.
    - c. Combination Lock: Shall be Masterlock 1690 single point latch with reinforced door.
  2. Classroom lockers: Plastic Laminate lockers will be allowed in classroom settings. LSI or approved equal only.
    1. Kindergarten classroom lockers shall be 52 inches high with adjustable shelf and coat hook, install shelf at 36 inches above bottom of locker, locker mounted 12 inches above floor.
    2. Standard classroom lockers shall be 52 inches high with adjustable shelf and coat hook, install shelf at 40 inches above bottom of locker, locker mounted 12 inches above floor.
  3. Athletic Lockers: Free standing and surface mounted types; full height, double tier, and triple tier lockers on concrete base, sloped tops, padlock hasps.
    - a. Standard of Quality BASE BID: Art Metal Products AMP-1001 All-Welded Turn handle Athletic and AMP-Box All-Welded Athletic Locker or approved equal.
    - b. Standard of Quality ALTERNATE: General Storage Systems, Tri-Lok Mod-U-Vent or approved equal.
  4. Provide lockers with hat shelf, metal number plate, hooks, latches, and hardware.
- F. Toilet and Bath Accessories: Commercial grade, Type 304 with number 4 satin brushed finish on all exposed surfaces.
- G. Hand Dryer:
1. Standard of Quality: XL-W Xlerator Hand Dryer as manufactured by Excel Dryer, or approved equal.
    - a. Hand Dryer: Warm air, rapid drying, energy efficient electric hand dryer, XLERATOR, Model XL-W, 1.1, surface mounted, entire dryer internally grounded.
    - b. Warranty Period: 5 years, limited warranty.
    - c. Controls: Automatic, activated by infrared optical sensor. Operates while hands are under blower. Shut-off within 2 seconds when hands removed or in 35 seconds if hands not removed.
    - d. Cover: One piece, heavy duty, rust-resistant, rib-reinforced, die-cast zinc alloy.
      1. Finish: Electrostatically applied, chip resistant, white paint.
    - e. Air Intake: Inlet openings on bottom of cover.
    - f. Air Outlet: Delivers focused air stream at average hand position of 4 inches below air outlet.
    - g. Noise Reduction Nozzle: 1.1 noise reduction nozzle.
    - h. Wall Plate: Injection molded, rib reinforced plate with metal L brackets to attach cover, with ten 5/16 inch diameter holes for surface mounting to wall and three 7/8 inch diameter holes for electrical wiring, bottom hole suitable for surface conduit.
    - i. Nominal Size: 11-3/4 inches wide by 12-11/16 inches high by 6-11/16 inches deep.
    - j. Weight: 17 pounds die cast cover.



- k. Power Source: 110/120 volt, 12.5 amp, 60 Hz
- l. Combination Motor and Blower: Series commutated, through-flow discharge, vacuum type; 5/8 HP, 20,000 RPM. Air flow rate: 19,000 linear feet per minute at air outlet, 16,000 linear feet per minute at average hand position of 4 inches below air outlet.
- m. Heater: Nichrome wire element, mounted inside blower housing to be vandal proof.
- n. Heater Safeguard: Automatic resetting thermostat to open when air flow is restricted and close when air flow is resumed.
- o. Air Temperature: 135 degrees F measured at average hand position of 4 inches below air outlet. Air Heater Output: 900 watts.
- p. All metal parts coated according to Underwriters Laboratories, Inc. requirements.
- 2. Splash Guard: If specified, shall be a 16 inch wide by 34 inch high, 20 gauge stainless steel splash guard with a No. 4 satin finish as manufactured by Newton, or approved equal.
- H. Gym Mesh/Fabric Drop Curtains: Operable ceiling mounted drop down curtains for gym station divider.
  - 1. Elementary School: Center divider curtain for two (2) separate gym teaching stations. If cafeteria is adjoining gym operable wall panels shall be used.
  - 2. Secondary School: Two (2) divider curtains for three (3) separate gym teaching stations.
- I. Other Fittings:
  - 1. Floor expansion joint cover assembly.
  - 2. Wall expansion joint cover assembly.
  - 3. Ceiling expansion joint cover assembly.

## **PART 7: STAIRS**

### **7.1 Stair Construction**

- A. Metal Exit Stairs: Preassembled steel stairs with concrete-filled treads.
  - 1. Fabricate to dimension requirements and configurations indicated.
    - a. NAAMM Classification: Commercial class.
  - 2. Treads and Risers:
    - a. Metal Thickness: Not less than 16 gauge.
    - b. Treads: Bent steel subtreads to receive concrete fill.
    - c. Risers: Complete with formed nosings and sanitary cove.
  - 3. Design loading: Design and fabricate stairs, landings and component connections to support live loads of not less than 100 pounds per square foot, creating a deflection not to exceed 1/240 of span.
  - 4. Design and fabricate integral railings and component connections to be capable of resisting a 200 pound concentrated load applied in any direction at any point on the top rail, and a vertical and horizontal thrust of 50 pounds per linear foot applied to the top railing without permanent set or damage. The two loads are not cumulative.
- B. Monumental Stairs: Stairs with epoxy-resin-terrazzo-filled treads and wood/metal ornamental railing system.

### **7.2 Stair Finishes (options in preference order)**

- A. Terrazzo Stair Finish for Public Areas (preferred option): Thin-set, precast epoxy terrazzo tread units, 1/2 inch thick with rounded nosing edge.
  - 1. Abrasive nosing strip and two-line.
  - 2. Color and Pattern: as selected by Architect from manufacturer's full range.
- B. Ceramic Floor Tile: All-purpose edge porcelain type units with manufacturer's standard back-mounting.
- C. Coating for Concrete Stair Treads: acrylic base clear sealing compound complying with ASTM C309 Type 1, Class A&B and containing not less than 30 percent solids, non-yellowing.
- D. Stair Painting:
  - 1. Clean steel to be shop painted in compliance with SSPC No. 6 Commercial Blast Cleaning (SSPC-SP6), and to achieve a blast profile of 1.0 to 2.0 mils.
  - 2. Painting. After preparation and before leaving shop apply one coat of paint. Apply paint, following the manufacturer's instructions to obtain a uniform coating.

## PART 8: INTERIOR FINISHES

### 8.1 Wall Finishes

- A. Gypsum Board Wall: ASTM C36, tapered edges.
  - 1. Provide Type X as required at rated wall assemblies.
  - 2. Wall Tile Substrate (typical): Provide water resistant gypsum board conforming to ASTM C630. Tapered edges.
  - 3. Wall Tile Substrate (wet areas): Provide water-resistant gypsum core board with water-resistant coated and fiberglass reinforced faces conforming to ASTM C1178.
  - 4. Fire-Rated Impact/Penetration Resistant Gypsum Board: ASTM C1396, Type X gypsum core wall panel with Lexan film bonded to the back side to enhance impact/penetration resistance. Standard of quality shall be National Gypsum "Hi-Impact Brand 3000 Fire-Shield Wallboard".
- B. Tile Wall Finishes (toilet rooms, showers and kitchen):
  - 1. Ceramic Wall Tile and Base: Glazed porcelain with smooth finish and absorption of not more than 0.5 percent.
  - 2. Standard thin-set mortar and grouted installation.
- C. Interior Wall Painting:
  - 1. Gypsum Board and Plaster: Low-luster, low-VOC, acrylic-latex finish.
    - a. Surface Preparation:
    - b. Primer: 1 coat latex primer applied as recommended by the manufacturer.
      - 1) New Plaster: Pittsburgh Paints 6-603 alkali resistant acrylic latex primer.
      - 2) New Drywall: Pittsburgh Paints 6-2 interior latex sealer.
    - c. Finish: 2 coats minimum, eggshell acrylic-latex finish applied as recommended by manufacturer.
      - 1) Pittsburgh Paints Pure performance acrylic latex zero VOC.
    - d. **HIGH TRAFFIC AREAS FINISH: 2 coats minimum (corridors, cafeterias, or public restrooms)**
      - 1) Glidden 9200N Lifemaster zero VOC semi gloss.
  - 2. Concrete Masonry Units: Semi gloss, low-VOC.
    - a. Surface Preparation:
    - b. Base coat: 1 coat block filler applied as recommended by the manufacturer.
      - 1) Benjamin Moore 285 Supercraftt alkali.
      - 2) Benjamin Moore M31-M32 waterborne epoxy block filler.
    - c. Primer: 1 coat, CMU primer applied as recommended by the manufacturer.
    - d. Finish: Benjamin Moore finish coats compatible with base coat and primer.
- D. High Moisture Areas: Benjamin Moore solvent base epoxy (gloss).
- E. Vinyl-Coated Fabric Wall Coverings (if applicable):
  - 1. ASTM E84 Flame Spread Rating shall be 25 or less.
  - 2. Complying with Fed. Spec CCC-W-408A.

### 8.2 Floor Finishes

- A. Concrete Floor Finishes:
  - 1. Locations: Locker rooms, storage, custodial.
  - 2. Densifier/Sealer at Mechanical and Electrical Areas: Water soluble, silicate based, concrete curing, sealing, and densifying material.
  - 3. Carpeted Areas: Acrylic base clear sealing compound complying with ASTM C309 Type 1 and containing not less than 30 percent solids, non-yellowing.
  - 4. Finish Areas (stained concrete).
- B. Tile Floor Finishes:
  - 1. Locations: Toilet rooms, showers.
  - 2. Ceramic Tile: Complying with ASTM D2047 Co-efficient of Friction -0.60, minimum.
  - 3. Installation: Standard mortar bed, bond coat, and grouted construction.
  - 4. BASF MMA is an approved equal.
- C. Terrazzo Flooring: Thin-set epoxy terrazzo, 3/8 inch thick, consisting of flexible reinforcing membrane,

primer, epoxy resin, marble chips, divider-strips, finishing grout, and seal coat.

1. Locations: Corridor, cafeteria.
  2. Mix: Comply with NTMA's "Guide Specification for Epoxy Terrazzo" and manufacturer's written instructions for component proportions and mixing.
  3. Color and Pattern: As selected by Architect from manufacturer's standard color palette.
  4. BASF MMA is an approved equal.
- D. Athletic Wood Flooring: Floating parquet flooring, northern hard maple, kiln dried, edge grain, and square edge.
1. Locations: Middle and high school gym, fitness.
  2. Grade: MFMA-PQ Second and Better.
  3. Thickness: Not less than 3/8 inch.
  4. Manufacturer's standard 1/2 inch plywood underlayment (2 layers) and resilient pad system.
  5. Standard of Quality: Conner "SportBond Plus/Neo-Shok".
- E. Resilient Flooring:
1. Locations: Classroom, lab.
  2. Resilient Base: 0.125 inch thick, rubber base conforming to ASTM F-1861, Type TS, Group 1, Styles A and B.
  3. Vinyl Composition Tile: 1/8 inch thick tile conforming to Fed. Spec. SS-T-312B, Type IV.
    - a. Minimum 85 percent natural limestone and post industrial recycled vinyl content.
    - b. Standard of Quality: Mannington, Solid Point.
- F. Carpet Flooring: Commercial grade, low static carpet 6 foot roll goods with maximum flame spread rating of 75 or less; fuel contribution of carpeting in compliance with ASTM E84.
1. Locations: Office, classroom partial.
  2. Provide adhesive, reducer strips, and other components for complete assembly.
  3. Color to be selected by Architect.
  4. Backing shall be 100 percent recycled content, face nylon shall contain reclaimed or recycled nylon.
  5. Shall be part of closed-loop program from manufacturer.
  6. Standard of Quality: Collins and Aikman, "Crayon" or prior approved equal.
- G. Carpet Tile Flooring: Optional from 6 foot roll goods carpet flooring.
1. Milliken Contract - Segue P/6166 36 inch by 36 inch Tufted Modular Carpet with Comfort Plus ES Cushion or prior approved equal.
- H. Quarry Floor Tile:
1. Locations: Kitchen, vestibule, corridor option, cafeteria option.
- I. BASF U-Crete: Alternate Option
1. Locations: Toilets, Kitchen and Serving:
- J. Rubber Sheet Flooring: Elementary gymnasium.
1. Material: Rubber wear layer and rubber shock-absorbent layer, vulcanized together.
  2. Installation Method: Adhered.
  3. Traffic Surface Texture: Smooth.
  4. Color and Pattern: As selected.
- K. Floor Toppings. Refer to Structural Systems narrative for concrete topping applied over precast planks.

### 8.3 Ceiling Finishes

- A. Gypsum Board Ceiling Finishes:
1. Typical Locations: Corridors accents, office, cafeteria accents.
    - a. ICI Lifemaster 9200 waterborne semi-gloss.
  2. Metal Supports for Suspended Ceilings. Size supports to comply with ASTM C754.
    - a. Channels shall be cold-rolled steel, 0.05980 inch minimum thickness of base metal (uncoated), allowable bending stress of 18,000 psi.
    - b. Carrying channels 1-1/2 inch deep by 7/16 inch wide flanges, 475 pounds per 1,000 feet, painted.
  3. Gypsum Board: ASTM C36, tapered edges. Provide Type X as required at rated ceiling assemblies.
  4. Interior Ceiling Painting: Finish gypsum board and plaster as follows:
    - a. Flat acrylic-latex finish.



- b. Surface Preparation
  - c. Primer: 1 coat latex primer applied as recommended by the manufacturer to achieve a minimum DFT of 1.2 mils.
  - d. Finish: 2 coats, minimum, flat acrylic-latex finish applied as recommended by manufacturer to achieve a total DFT of not less than 2.6 mils
- B. Plaster Finishes: Portland cement plaster.
  - 1. Typical Locations: Toilet rooms, showers.
- C. Acoustical Ceiling Treatment:
  - 1. Typical Locations: Classroom, corridor, office, kitchen.
  - 2. Suspension System: Non-fire rated, exposed, tee-grid, single web, fully riveted intermediate duty ASTM C635, cold rolled electro-galvanized steel system with 15/16 inch wide flange cap.
  - 3. Acoustical Ceiling Panels: 24 inches by 24 inches with reveal edge, mold resistant, as selected by Architect.
  - 4. Ceiling panels shall contain minimum of 35 percent recycled content and shall be on manufacturer's recycling program.
  - 5. Vinyl coated at kitchen area.
- D. Exposed Structures: Metal deck/bar joist or precast concrete.
  - 1. Typical Locations: Gymnasium, locker room, fitness.

## 8.4 Room Finishes Concept

- A. Public Corridors:
  - 1. Terrazzo floors preferred (optional porcelain tile, stained concrete).
  - 2. Terrazzo Base (Rubber Base, Porcelain tile base).
  - 3. Burnished Block Walls.
  - 4. Ceilings, ACT.
- B. Cafeteria/Multi-Purpose Space:
  - 1. Terrazzo flooring (porcelain tile, stained concrete).
  - 2. Terrazzo Base (Rubber Base, Porcelain tile base).
  - 3. Burnished Block Walls.
  - 4. Ceilings, ACT.
- C. Kitchen/Food Service:
  - 1. Quarry tile flooring.
  - 2. Quarry tile base.
  - 3. Ceramic tile/epoxy painted CMU at walls where required.
  - 4. Paint finish in food service areas to have an "orange peel" finish.
  - 5. Ceilings, scrubbable ACT.
  - 6. BASF Unicrete is an approved equal.
- D. Administration:
  - 1. Carpet flooring.
  - 2. Rubber Base.
  - 3. Painted gypsum board walls.
  - 4. Ceilings, ACT.
- E. Library:
  - 1. Carpet flooring.
  - 2. Rubber Base.
  - 3. Painted gypsum board walls.
  - 4. Ceilings, ACT.
- F. Academic Houses:
  - 1. Carpet flooring at entry to house.
  - 2. VCT flooring, typical classroom (stained concrete).
  - 3. Rubber base.
  - 4. Painted gypsum board walls.
  - 5. Ceilings, ACT.
- G. Art Room:

1. VCT or Stained and sealed concrete floors.
  2. Rubber base.
  3. Painted gypsum board walls.
  4. Ceilings, ACT.
- H. Music Suite:
1. VCT floor.
  2. Rubber base.
  3. Painted gypsum board walls.
  4. Acoustical panels/reflectors at walls and ceilings.
  5. Ceilings, max achievable height with ACT.
- I. Gymnasium (Secondary):
1. Maple cushioned floor.
  2. Vented base.
  3. Painted precast concrete walls/concrete masonry unit/ground face concrete masonry unit.
  4. Acoustical Panels at walls.
  5. Ceilings, exposed, painted structure.
- J. Gymnasium (Elementary):
1. Sheet rubber.
  2. Wood is an approved equal.
  3. Rubber base.
  4. Painted precast concrete walls/concrete masonry unit/ground face concrete masonry unit.
  5. Acoustical Panels at walls.
  6. Ceilings, exposed, painted structure.
  7. NOTE: Gym Height (floor to underside of joist) 25 foot height without stage 31 foot height with stage.
- K. Restrooms:
1. Ceramic tile.
  2. Ceramic tile base.
  3. Ceramic tile walls.
  4. Gypsum board ceiling with veneer plaster finish.

## **PART 9: CONVEYING**

### **9.1 Elevators**

- A. Regulatory Requirements: Equipment and work shall comply with the following codes.
1. ANSI/ASME A17.1 Safety Code for Elevators and Escalators.
  2. National Electrical Code NFPA 70.
  3. Uniform Federal Accessibility Standards.
  4. AMSI/AWS D1.1 Structural Welding.
  5. Applicable State and Local Codes.

### **9.2 Holeless Hydraulic Elevators**

- A. Performance Requirements:
1. Quantity: 1 Elevator.
  2. Type: Twin direct acting, hydraulic cylinder without well hole.
  3. Number of stops: TBD.
  4. Rise: TBD.
  5. Rated Capacity and Speed: 4,500 pounds, 100/125 fpm (908 kg, 0.50/0.64 M/sec.).
  6. Main Power Supply: 480 Volts +/- 5% of normal, 3 Phase with separate equipment grounding conductor.
  7. Lighting Power Supply: 120 volts, 1 Phase, 15 amp, 60 Hz.
  8. Stopping Accuracy: +/- 1/4-inch under any loading conditions or direction of travel.
  9. Door Opening Time: 4.0 seconds.
- B. Hoistway Components:

1. Car Frame: A suitable car frame shall be provided with adequate bracing to support the platform and car enclosure. The buffer striking plate on the underside of the car frame platform assembly must fully compress the spring buffer mounted in the pit before the plunger reaches its lower limit of travel.
  2. Platform, Heavy Loading Type: Car platform shall be arranged to accommodate one-piece loads weighing up to 25 percent of the rated capacity, such as wheeled mechanical equipment, electrical equipment, etc. The platform shall be recessed 5/16-inch for flooring by others.
  3. Car Guide Rails: Tee-section steel rails with brackets and fasteners.
  4. Spring Buffer: Helical coil spring.
  5. Wiring: For hoistway electrical devices included in scope of the elevator system, hall panels, pit emergency stop switch and the traveling cable for the elevator car.
- C. Car Enclosures:
1. Manufacturer's Custom Car Enclosure: Include ventilation, lighting, ceiling finish, wall finish, access doors, doors, power door operators, sill, trim and accessories. Floor finish is not work of this section, unless indicated.
  2. Doors and Frames: Standard stainless steel brushed frames. Standard stainless steel polished doors.
  3. Panels: As selected by the Architect.
  4. Flooring: As selected by the Architect.
  5. Sills: Cast or extruded aluminum, with grooved surface, 1/4 inch thick, mill finish.
  6. Ceilings: Standard height. Luminous ceiling of fluorescent light fixtures with stainless steel trim of permanent rigid material complying with flammability requirements.
  7. Lighting: Fluorescent fixtures with white reflectors.
  8. Fixtures. Car operating panel with illuminated buttons, telephone cabinet, car position indicator, direction lantern mounted in entrance column.
  9. Handrails: Continuous 1-1/2 inch diameter, satin stainless steel cylindrical, non-continuous on both sides and rear walls.
  10. Accessories: 2 speed exhaust fan, emergency lighting system.
  11. Minimum Size: Interior car size shall be a minimum of 65 inches by 93 inches to accommodate wheelchairs.
  12. Door Size: 48 inches wide.

## **PART 10: FIRE PROTECTION**

### **10.1 Fire Protection Specialties**

- A. Refer to Mechanical Systems narrative for sprinklers, standpipes and other fire protection systems.
- B. Fire Extinguisher Cabinets: Standard full glass door and trim shall be steel. Provide satin finish pull handle with self-adjusting roller catch and continuous piano hinge to match door material.
  1. Cabinet box shall be 18 gauge steel with white baked enamel finish.
  2. Trim and door shall be one piece construction of cold-rolled steel with standard finish of white baked acrylic enamel, useable as a finish or primer coat.
- C. Fire Extinguishers. Provide at each cabinet location multi-purpose dry chemical type fire extinguishers listed by Underwriters Laboratories and bearing the U L label.
- D. Fire Blanket Cabinet: J L Industries, Royal Series 1FB, enclosed blanket is attached to the vertical roller and comes with arm loops to enable a person to wrap themselves in the blanket in one continuous motion with red epoxy cold rolled steel door.
  1. Blanket: Comply with Flammable Fabrics Act; Flammability of Clothing Textiles, Title 16, CFR1610, 100 percent reprocessed wool fire blanket.
  2. Finish: Baked enamel finish in color as selected by Architect.
  3. Surface mounted:
- E. Key Storage Box: Exterior storage for keys or electronic cards for Fire Department building access.
  1. Steel box with hinged door.
  2. Tamper switch: UL listed alarm tamper switch connected to building security system.
  3. Finish: Weather-resistant TGIC polyester powder coating.
    - a. Aluminized for corrosion protection.

- b. Color: To be selected by Architect.

## **PART 11: EQUIPMENT**

### **11.1 Institutional Equipment**

- A. Library Equipment: TBD.
- B. Theater and Stage Equipment:
  - 1. Stage curtains: Medium weight permanently flame resistant curtains with medium duty steel track system, motor operated.
- C. Audiovisual Equipment:
  - 1. Projection Screens: Ceiling-mounted recessed above ceiling automatic operated projection screens and accessories.
- D. Laboratory Equipment: Provide service fittings and accessories, fume hoods, modular casework, epoxy resin countertops and sinks.

### **11.2 Vehicular Equipment**

- A. Loading Dock Equipment: Dock bumpers.

### **11.3 Other Equipment**

- A. Solid Waste Handling Equipment: TBD.
- B. Food Service Equipment:
  - 1. Food Storage Equipment.
  - 2. Food Preparation Equipment.
  - 3. Food Delivery Carts.
  - 4. Food Cooking Equipment.
  - 5. Hood and Ventilator Equipment.
  - 6. Service Line Equipment.
  - 7. Residential appliances provided by owner.
- C. Athletic Equipment:
  - 1. Scoreboards provided by owner.
  - 2. Basketball Goals:
    - a. Elementary School: Total of six (6) basketball goals.
      - 1) Main basketball court (full gym) with two retractable basketball goals.
      - 2) Two (2) basketball courts (sections) with two (2) fixed basketball goals per court.
      - 3) NOTE: All basketball goals shall be height adjustable (8' to 10').
    - b. Secondary School: Total of fourteen (14) basketball Goals.
      - 1) Main center basketball court with two (2) operable basketball goals.
      - 2) Two (2) side basketball courts with a total of six (6) retractable basketball goals each court.
  - 3. Volleyball Courts:
    - a. **Elementary and Middle** Schools: Two (2) side courts with floor insert nets.
    - b. **High** School: Three (3) courts with ceiling mounted operable nets.
  - 4. Batting cage to be provided at High Schools.
- D. Gymnasium Multiple Seating: Telescoping bleachers, wall-attached, motor-operated.
  - 1. Color: As selected by Architect from manufacturer's standard color palette.
  - 2. Standard of Quality: Irwin Model 4500 as manufactured by Irwin Telescopic Seating Company, or equal.
  - 3. Plastic Seat Modules: Shall each be 18" long, one piece, with scuff resistant textured surface 10" deep.
    - a. **Seating without folding back support requires a minimum of 26" row spacing.**
  - 4. Plastic Back Supports: Folding Back Supports shall be permanently attached to each seating position and shall fold forward and store on the seat. Each individual back support is easily raised into the use position by the patron, and will close automatically with the operation of the bleacher system. Each back support shall be blow-molded, double walled, impact resistant polyethylene plastic in a textured

finish. Each back support shall have one location on the front side for a seat donor tag, and one location on the back for a seat number tag. The folding back support requires a minimum of 31" row spacing and 12" rise.

5. Seating Capacity:
  - a. High School: Two (2) sets of bleachers with seating for 1,200 each.
  - b. Middle School: One (1) set of bleachers with seating for 800.
  - c. Elementary School: No bleachers

## PART 12: FURNISHINGS

### 12.1 Fixed Furnishings

- A. Casework: Fabricated in an AWI certified shop including base and wall cabinets, work surfaces, hardware, related items and accessories all under a single source responsibility. Provide casework units in the configurations and with the features indicated. Casework will have Combo Core construction with plastic laminate surfaces. Where casework is marked with code numbers, provide individual modular units with the features indicated. [Laminate Clad Casework specification is located at the end of General Standards. Hardware shall include five knuckle hinge, heavy duty drawer slide and standard steel drawer handle.](#)
  1. Educational facility casework.
  2. Kitchen casework.
  3. Laboratory facility casework.
  4. Library casework.
  5. Residential casework.
  6. Computer lab work stations. Detail of counter top at the end of General Standards.
- B. Window Treatments: Room darkening roller window shade, manually operated.
  1. Standard of Quality: Draper Clutch-Roller Shades with SheerWeave Series SW3000 fabric for window shading (opaque) and SunBloc Series SB9000 fabric for room darkening.
    - a. [Room darkening shades are to be used in science lab classrooms.](#)
  2. Bead chain clutch operated shades with chain hold down, fabric shall be Indiana Coated Fabrics or approved equal.
    - a. Shades shall have clutch stops properly adjusted on site and chain hold downs installed.
  3. Fabric Color: White
- C. Fixed Floor Grilles with Frame: Standard of Quality shall be Pedigrid recessed carpet foot grille by C/S Group.

## Part 13: STRUCTURAL SYSTEMS

### 13.1 Design Criteria

- A. Codes and Standards: Design criteria for the structural analysis and design of this building will be based upon the following Codes and Standards.
  1. Minnesota State Building Code.
  2. 2006 International Building Code.
  3. ACI 318-05 Building Code Requirements for Structural Concrete.
  4. AISC Manual of Steel Construction - 13th Edition.
  5. PCI MNL 120 - PCI Handbook - Precast and Prestressed Concrete.
  6. Steel Joist Institute Specifications.
- B. Design Live Loads:

1. Classrooms	40 PSF*
2. Laboratories	60 PSF*
3. First Floor Corridors	100 PSF
4. Corridors Above First Floor	80 PSF
5. Light Storage Areas	125 PSF**
6. Heavy Storage Areas	250 PSF**

- |   |           |
|---|-----------|
| 7. Mechanical Areas                       | 150 PSF** |
| 8. Roofs                                  | 42 PSF*** |
| (* Plus Additional 20 PSF Partition Load) |           |
| (** Or Equipment Load if Heavier)         |           |
| (***) Plus Drifting Snow Load)            |           |
- C. Lateral Loads for Wind:
- |                      |        |
|----------------------|--------|
| 1. Basic Wind Speed  | 90 MPH |
| 2. Importance Factor | I=1.15 |
| 3. Exposure          | B      |

### 13.2 Foundation Systems

- A. Overview: Based on the "Subsurface Exploration & Preliminary Engineering Report" prepared by selected entity, follow all necessary design criteria for foundation and footing design.
1. Minimum depth below adjacent grade is 5'-0". Open air footings will have not less than 6'-0" of frost protections (to be confirmed by geotechnical report).
- B. Spread Footings:
1. Maximum net allowable soil bearing pressure: TBD.
    - a. Soil removal and engineered fill will be required at areas of the building where soft compressible soils are present to support the structure without a high possibility of detrimental settlement occurring.
  2. Minimum width for wall footing: TBD.
  3. Minimum width for spread footing: TBD.
  4. Minimum depth below adjacent grade shall be 60 inches adjacent to heated spaces.
- C. CMU foundation walls or poured concrete with perimeter insulation.

### 13.3 Slabs on Grade

- A. Standard Unreinforced Slab on Grade:
1. Typical Slab Thickness: 5 inches.
  2. Minimum Compressive Strength:  $f'c = 4,000\text{-psi}$ .
  3. Top-Size Aggregate: 1-1/2 inch.
  4. Combined aggregates shall be well-graded from the coarsest to finest.
  5. Maximum Water-Cementitious Materials Ratio: 0.42.
- B. ASTM E 1745 Class A vapor retarder placed directly below concrete slab.
- C. 6 inch compacted granular trim layer placed below vapor retarder.

### 13.4 Elevated Floor Framing

- A. Elevated Floor Construction, Overall Structural Concept:
1. Precast, prestressed hollow core plank with 2 inch thick cast-in-place concrete topping.
    - a. Maximum Span for 8 inch Plank: 25 feet
    - b. Maximum Span for 12 inch Plank: 32 feet
  2. Floor plank is supported by a combination of steel frame skeleton and CMU bearing walls.
  3. Conditions involving special loadings, longer spans, depressed slabs, etc. may require framing other than typical conditions.

### 13.5 Roof Framing

- A. 1.5-inch x 20 gauge wide rib roof deck.
- B. Acoustical roof deck treatment shall be considered at areas such as gymnasium and music rooms.
- C. Steel bar joists typically spaced at approximately 5 feet on-center, closer spacing at drifted snow areas.
1. Classroom Wings: Approximate roof joist size, TBD
  2. Cafeteria: Approximate roof joist size, TBD
  3. Gymnasium: Approximate roof joist size, TBD

### **13.6 Load Bearing Wall Construction**

- A. CMU load bearing walls will be incorporated where feasible around the perimeter enclosure and interior walls.
- B. Steel columns and beams will be incorporated at areas where CMU walls are not practical.
- C. Precast architectural concrete wall panels may be utilized around the gymnasium and/or pool.



# Finish Hardware

## PART 1 GENERAL

### 1.01 WORK INCLUDED

- A. Furnish all finish hardware specified herein, listed in the hardware schedule, or required by the drawings.
- B. Where items of hardware are not definitely or correctly specified and are required for the intended service, such omission, error, or other discrepancy should be directed to the architect prior to the bid date for clarification by addendum. Otherwise furnish such items in the type and quantity established by this specification for the appropriate service intended.
- C. Hardware for aluminum doors: All hardware except weatherstrip to be supplied by 08710 and shipped to Section 08400 for installation. Weatherstrip to be supplied by aluminum door and frame supplier.

### 1.02 RELATED WORK

- A. Section 06200 - Finish Carpentry
- B. Section 08110 - Standard Steel Doors and Frames
- C. Section 08210 - Flush Wood Doors
- D. Section 08400 - Entrances and Storefronts
- F. Division 16 - Electrical

### 1.03 REFERENCES

- A. A.D.A. - Americans with Disabilities Act
- B. ANSI A117.1 - Specifications for making facilities accessible to physically handicapped people
- C. NFPA 80 - Standards for Fire Doors and Windows
- D. NFPA 101 - Life Safety Code
- E. U.L. - Building Material Directory
- F. D.H.I. - Recommended Locations for Architectural Hardware
- G. Applicable State and Local Building Codes

### 1.04 SUBMITTALS

- A. Hardware Schedule: Immediately after award of hardware contract, submit five (5) copies of a detailed hardware schedule using a vertical format.
  - 1. Itemize hardware in the sequence and format established by this specification.
  - 2. List and describe each opening separately. Include all doors with identical hardware, except hand, in a single heading. Include door number, room designations, degree of swing, and hand.
  - 3. List related details. Include dimensions, door and frame material, and other considerations affecting hardware.
  - 4. List all hardware items. Include manufacturer's name, quantity, product name, catalog number, size, finish, attachments, and related details where applicable.
  - 5. Resubmit (5) copies of the corrected schedule when required.
- B. Keying Schedule: After receipt of approved hardware schedule submit a copy of a proposed keying schedule. Meet with the owner, if required, to finalize keying requirements.
- C. Samples: If so directed by the architect, submit samples of finish hardware items for approval. Properly identify each sample as to make and number, and furnish in the specified finish.
- D. Templates: Furnish a copy of approved hardware schedule, along with applicable templates, for factory prepared hardware to each door and frame fabricator as required.
- E. Electrical Hardware: Submit electrical specifications, wiring diagrams, and other applicable information to the electrical contractor after receipt of the approved hardware schedule.



- F. Substitutions: Submit under provisions of Division One. Provide detailed information and catalog cuts indicating the comparison to the specified hardware. If requested by the architect, provide a sample of the proposed substitution for review.

## 1.05 QUALITY ASSURANCE

### A. Qualifications:

1. Manufacturer: Except where specified in the hardware schedule, furnish products of only one manufacturer for each type of hardware. Minimum of ten (10) years experience in the manufacture of the item specified.
2. Supplier: A company with a minimum of ten (10) years experience in the builders' hardware industry.

### B. Regulatory Requirements:

1. Furnish UL or Warnock Hersey listed hardware for all fire rated and 20 minute openings in conformance with requirements for the class of opening scheduled, whether specifically called for in this specification or not.
2. Furnish hardware that conforms to all applicable state and local building codes. Where specified hardware is not in conformance with applicable codes, such omission or error should be directed to the architect prior to the bid date for clarification by addendum, otherwise furnish hardware as required by code.

## 1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle in accordance with Division One. Mark each original container to correspond with the approved hardware schedule for the installation location
- B. Receive, inventory, and store hardware in a secure and dry environment; protect against loss and damage.
- C. Report any shortages to the hardware supplier no later than 48 hours after receipt of delivery to the jobsite.
- D. Stockpile items sufficiently in advance to ensure their availability. Coordinate delivery, handling, and installation of hardware items to ensure orderly progress of total work and minimize or eliminate losses and damage.

## PART 2 PRODUCTS

### 2.01 ACCEPTABLE MANUFACTURERS

<u>Products</u>	<u>Specified</u>	<u>Acceptable</u>
Hinges	Hager	McKinney, Stanley
Flush Bolts	Ives	DCI, Hager
Locks and Latches	Schlage	No Substitution
Exit Devices	Von Duprin	No Substitution
Pulls, Push bars, Push/Pull Plates	Hiawatha	Burns, Hager
Coordinators	Ives	DCI, Hager
Door Closers	LCN	No Substitution
Low Energy Automatic Operators	LCN	No Substitution
Protective Plates	Hiawatha	Burns, Hager
Overhead Stops	Glynn Johnson	Dorma, ABH
Wall Stops, Floor Stops	Ives	DCI, Hager
Electromagnetic Door Holders	LCN	Dorma, Rixson,
Thresholds, Sweeps, Weatherstrip, Gaskets, and Drip Caps	Reese	Pemko, National Guard

## 2.02 HINGES

- A. Acceptable manufacturers and respective catalog numbers:

<u>Description</u>	<u>Hager</u>	<u>McKinney</u>	<u>Stanley</u>
Std. Wt. Ball Bearing - Steel	BB1279	TB2714	FBB179
Std. Wt. Ball Bearing - Non-ferrous	BB1191	TB2314	FBB191
Hvy. Wt. Ball Bearing - Steel	BB1168	T4B3786	FBB168
Hvy. Wt. Ball Bearing - Non-ferrous	BB1199	T4B3386	FBB199

- B. Quantity: Furnish hinges for each door leaf as follows, unless otherwise noted in groups:

1. All exterior and vestibule doors up to and including 90 inch high - 4 hinges
2. Interior doors up to and including 90 inch high - 3 hinges
3. Doors between 90 inch and 120 inch high - 4 hinges
4. Provide one additional hinge for every additional 30 inches in height over 120 inches.
5. Dutch Doors - 4 hinges

- C. Type: Furnish as follows, unless otherwise noted in groups:

1. Standard weight, ball bearing hinge (BB1279) for interior openings through 40 inches wide.
2. Standard weight, ball bearing hinge stainless steel, (BB1191) as required, for all pool areas and corrosive areas as scheduled.
3. Heavy weight, 4 ball bearing hinge (BB1168) for interior openings over 40 inches wide, and for all vestibule doors.
4. Heavy weight, 4 ball bearing hinge, stainless steel, bronze, or brass (BB1199) as required, for all exterior openings.

- D. Size: Furnish as follows, unless otherwise noted in groups:

1. 1.75 inch doors: 4.5 inch by 4.5 inch.
2. Provide proper hinge width to clear trim and allow full 180-degree swing where required.

- E. Hinges for all exterior doors opening outward shall have non-removable pin (NRP). All other hinges shall have non-rising pins.

- F. Provide all hinges with flat button tips unless otherwise noted in groups.

- G. Concealed electric through-wire feature, when called for in groups, shall be as modified by the hinge manufacturer, or may be as modified by Architectural Control Systems, Inc.

## 2.03 FLUSH BOLTS

- A. Acceptable manufacturers and representative catalog numbers:

<u>Description</u>	<u>DCI</u>	<u>Ives</u>	<u>Hager</u>
Manual - Metal Door	780F	458	282D
Manual - Wood Door	790F	358	283D
Automatic - Metal Door	842	FB31P	292D
Automatic - Wood Door	942	FB41P	291D
Self Latching - Metal Door	845	FB51P	293D
Self Latching - Wood Door	945	FB61P	294D
Dust Proof Strike /w/Mtg. Plate	80	DP2	280X

- B. Furnish a dustproof strike (DP2) for all bottom bolts.

## 2.04 LOCKS AND LATCHES

- A. Acceptable manufacturers and respective catalog numbers:

1. Schlage ANSI A156.2 Series 4000 Grade 1
  - a. Classroom Security Locks: **All student and staff occupied rooms**
    1. Elementary: Schlage ND-Series Classroom Security Lock - ND75PD
    2. Secondary: Schlage ND-Series Vandlgard Classroom Security Lock - ND95PD
  - b. Faculty Restroom Lock: **Staff restrooms only**
    1. Schlage ND-Series Vandlgard Faculty Restroom Lock - ND85PD
  - c. Classroom Lock: **All Public Restrooms**
    1. Elementary: Schlage ND-Series Classroom Lock – ND70PD
    2. Secondary: Schlage ND-Series Vandlgard Classroom Lock – ND94PD

- d. Storeroom Lock: **Mechanical, Custodial, Storage, etc.**
  - 1. Elementary: Schlage ND-Series Storeroom Lock - ND80PD
  - 2. Secondary: Schlage ND-Series Vandlgard Storeroom Lock - ND96PD
- e. Others as determined by Design Professional, Hardware Consultant and Owner.
- B. Furnish lever design as follows: Schlage RHO.
- C. Furnish lock types and functions as specified in the hardware schedule and as follows:
  - 1. Provide 2.75 inch backset
  - 2. Provide wrought box strike for installation in a wood door or frame.
  - 3. Provide ANSI A115.2 strike for installation in a hollow metal door or frame.
  - 4. Strike lip length shall be sufficient to protect trim, but not to project more than 1/8 inch beyond trim, frame, or inactive leaf.
  - 5. Furnish abrasive coating on outside levers that lead to loading platforms, stages, mechanical and electrical rooms, stairs other than exit stairs, and other hazardous locations as required.
- D. Internal electrified functions, when called for in groups, shall be as modified by the lock manufacturer.

## 2.05 EXIT DEVICES

- A. Acceptable manufacturers and respective catalog numbers:
 

<u>Description</u>	<u>Von Duprin</u>
Wide Stile	99 Series
Wide Stile Delayed Egress	CX99 Series
Wide Stile Electric Latch Retraction	EL99 Series
- B. Furnish exit device types, fire rating and functions as specified in the hardware schedule.
- C. Lever handles supplied with exit devices shall match the design specified for locks and latches
- D. Internal electrified functions, when called for in groups, shall be as modified by the exit device manufacturer.
- E. Furnish appropriate power supply as required for electrical function specified.

## 2.06 ELECTRIC POWER TRANSFERS & ELECTRIC STRIKES

- A. Acceptable Manufacturer and respective catalog number.
  - Power Transfer - Von Duprin EPT-2 or EPT-10
  - Electric Strikes - Von Duprin 6000 Series

## 2.07 ELECTRONIC ACCESS CONTROL

- A. Acceptable manufacturers and respective catalog numbers.
 

<u>Description</u>	<u>Locknetics</u>
Surface Door Position Switch	GE-Dual Output
Concealed Door Position Switch	GE-Dual Output
Card Reader	SXF1050
Delayed Egress Maglock	390DEL x MBS x DSM x SEC
Electronic Horn	L1910-1
Key Switch	650 Series
- B. Furnish appropriate power supply as required for electrical function specified.

## 2.08 PULLS, PUSH BARS, PUSH/PULL PLATES

- A. Acceptable manufacturers and respective catalog numbers:
 

<u>Description</u>	<u>Hiawatha</u>	<u>Burns</u>	<u>Hagar</u>
1" Dia. Straight Pull	536B	26C	4J
1" Dia. Offset Pull	658A	39C	12J
1" Dia. Push Bar	1081LBP	422	130S
Push/Pull Plate	200F	54	30S
- B. Length of push bars shall be sufficient to mount each end on center of stile. Push bars on flush doors shall be 3" less than door width.

## 2.09 COORDINATORS

- A. Acceptable manufacturers and respective catalog numbers:

<u>Description</u>	<u>Ives</u>	<u>DCI</u>	<u>Hager</u>
Coordinator	COR Series	600 Series	297D
Mounting Bracket	MB	AB	297
Mounting Bracket	MB	C	297
Carry Bar	CB-1	CB	297C

- B. Furnish filler bars to fill the complete opening width; mounting brackets for all stop applied hardware, carry bars, and special preparation for top latches where applicable.

## 2.10 DOOR CLOSERS

- A. Acceptable manufacturers and respective catalog numbers:

<u>Description</u>	<u>LCN</u>
Heavy Duty Reg. Arm	4041
Heavy Duty Parallel Arm	4041EDA
Heavy Duty Stop Arm	4041CUSH
Heavy Duty Spring Stop Arm	4041S-CUSH
Heavy Duty Hold Open Stop	4041H-CUSH
Heavy Duty Hold Open Spring Stop	4041SH-CUSH

- B. Furnish complete mounting brackets, drop plates, spacers, special shoes, and thru bolts as may be required by the door and frame conditions.

## 2.11 LOW ENERGY AUTOMATIC OPERATORS

- A. Acceptable manufacturers and respective catalog numbers:

<u>Description</u>	<u>LCN</u>
Operator - Push Side Mount	4640
Operator - Pull Side Mount	4630
Hard Wired Flush Wall Switch	8310-856T
Wireless Flush Wall Switch	8310-3856TWF
Wireless Receiver	8310-865

- B. All operators shall contain, and utilize for door control, a heavy-duty ANSI grade 1 door closer body with adjustable spring power and separate hydraulic valves for main speed, latch speed, and back check. The unit shall open and close manually just as a standard door closer.
- C. Provide actuators as detailed in groups
- D. Conduit, electrical back boxes, wire, wiring, and 120 VAC input power by Division 16 – Electrical.

## 2.12 PROTECTIVE PLATES

- A. Furnish protective plates as specified in hardware groups.
- B. All kick plates shall be 10" high and 2" less door width for single doors and 1" less door width for pairs of doors.
- C. Thickness of all plates shall be .050" (16 gauge), have countersunk holes, and have beveled (all four) edges.

## 2.13 OVERHEAD STOPS

- A. Acceptable manufacturers and respective catalog numbers:

<u>Description</u>	<u>Glynn Johnson</u>	<u>Dorma</u>	<u>ABH</u>
Heavy Duty Surface	90	900	9000
Heavy Duty Concealed	100	910	1000
Standard Duty Surface	450	700	4400
Standard Duty Concealed	410	710	4000

- B. Furnish a 450S overhead stop for doors equipped with regular arm surface type closers that swing more than 140-degrees before striking a wall. If the regular arm door closer being supplied limits the swing to less than 140-degrees, an overhead stop must be supplied any time the door can swing beyond that point. Furnish an overhead stop if a door opens against equipment, casework, sidelights, or other objects that would make wall bumpers inappropriate, and as specified in the hardware groups.

## 2.14 WALL STOPS

- A. Acceptable manufacturers and respective catalog numbers:

<u>Description</u>	<u>Ives</u>	<u>DCI</u>	<u>Hagar</u>
Convex Wrought Wall Bumper	WS406CVX	3210T	232W
Concave Wrought Wall Bumper	WS406CCV	3211T	236W
Hvy. Duty 3.75 inch Projection Wall Stop		WS11X	3260X 255W

- B. When a wall stop is called for in a hardware group, provide a WS406CVX or WS406CCV as applicable with the lock function.
- C. Wall stops shall not be mounted to casework, cabinetwork, sidelights, or equipment.
- D. Where wall stops are specified, but are not applicable, supply an overhead stop as specified in paragraph 2.11.B

## 2.15 ELECTROMAGNETIC DOOR HOLDERS

- A. Acceptable manufacturers and respective catalog numbers:

<u>Description</u>	<u>Dorma</u>	<u>Rixson</u>	<u>LCN</u>
Floor Mounted - Single	EM501	FM980	SEM7820
Floor Mounted - Double	EM502	FM981	Not Available
Flush Wall Mount-Std. Catch Plate	EM504	FM998	SEM7850
Surface Wall Mount	EM508	FM996	SEM7830

- B. Provide the voltage as required by electrical.

## 2.16 THRESHOLDS, SWEEPS, WEATHERSTRIP, DRIP CAPS, GASKETS, ASTRAGALS

- A. Acceptable manufacturers and respective catalog numbers:

<u>Description</u>	<u>Reese</u>	<u>Pemko</u>	<u>National Guard</u>
Threshold	S425A	171A	425E
Sweeps	323C	315N	200NA
Weatherstrip	875C	290APK	700EU
Gasket	797B	S88	5050
Meeting Stile Astragals	959C	18041	A605

- B. Where specified in the hardware groups, furnish the above products unless otherwise detailed.
- C. Adjust backset on exit devices as required to allow strike to mount on weatherstrip.
- D. Adjust door closer mounting as required to allow weatherstrip to mount under closer arm/bracket.

## 2.17 DOOR HARDWARE FINISHES

- A. Unless indicated otherwise in the groups, provide finishes as follows:

Hinges – Exterior	US32D
Hinges – Interior	US26D
Flush Bolts	US26D
Exit Devices	US26D
Locks and Latches	US26D
Pulls, Push Bars, Push/Pull Plates	US32D
Coordinators	Prime Coat Painted
Door Closers	Painted Aluminum
Low Energy Automatic Operators	Painted Aluminum
Protective Plates	US32D
Overhead Stops	US32D

Wall Stops	US32D
Electromagnetic Door Holders	Aluminum
Gasket	Black
Thresholds	Mill Aluminum
Weatherstrip, Sweeps, Drip Caps	Clear Anodized Aluminum

## 2.18 KEYING

- A. System: All locks and cylinders shall be keyed to the [new](#) Schlage Grand Master Key System.
- B. All exterior cylinders are to be [Schlage Removable Core Everest Primus "D" Restricted](#), and all interior keyed cylinders are to be [Everest "D" Restricted](#).
- C. Quantity: Provide four (4) Grand Master Keys, four (4) Master Keys for each Master Key set, and two (2) Change Keys for each lock or cylinder.
- D. Meeting: The hardware supplier shall prepare a preliminary keying schedule, and then meet with the owner, if required, to review the proposed key schedule and make any changes required in order to accommodate the owner's requirements.
- E. Delivery of Keys: Master Keys and Grand Master Keys shall be sent to the owner via Registered Mail, or otherwise as requested by the owner, to the individual and address that the owner specifies at the keying meeting.

## 2.19 KEY CABINET:

- A. Acceptable manufacturers and respective catalog numbers:

<u>Description</u>	<u>Lund</u>	<u>Telkee</u>	<u>MMF</u>
Two Tag Wall Mount Cabinet	1200 Series	AWC Series	2018 Series

- 1. Furnish one key cabinet with a capacity 1/3 larger than the number of keys. Supply the owner with instructions on how to prepare the numerical, lock location, and key change number indexes as well as how to maintain the key control system in the future.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Examine doors, frames, and related items for conditions that would prevent the proper application of finish hardware. Notify Architect of any conditions that would inhibit the proper installation of hardware. Do not proceed until defects are corrected.

### 3.02 INSTALLATION

- A. Install each hardware item in strict compliance with the manufacturer's printed instruction and recommendations, using only fasteners supplied by, or called for by the manufacturer.
- B. Set units level, plumb and true to the line and location. Prepare and reinforce the attachment substrate as necessary for proper installation and operation.
- C. Mortise and cut to close tolerance and conceal evidence of cutting in the finished work. Drill and countersink doors that have not been factory prepared for anchorage fasteners.
- D. If manufacturer's instructions do not call out a mounting location refer to the Door and Hardware Institute's publication *Recommended Locations for Architectural Hardware*. Install wall stops to engage levers or pulls.
- E. Deliver to the owner one (1) complete set of installation and adjustment instructions, as well as all tools that were furnished with the hardware.

### 3.03 ADJUSTMENT AND CLEANING

- A. At final completion, adjust and check each operating item of hardware at each door to ensure proper operation and function of every unit. Lubricate any moving parts that do not operate freely,

smoothly, and quietly using only lubricant as recommended by the manufacturer of the hardware item. Replace units that cannot be adjusted or lubricated to operate properly.

- B. Instruct the owner's personnel in the proper adjustments of the hardware as needed.
- C. Clean and restore hardware to the original finish.



# INTERIOR ROOM SIGNAGE

## ENGRAVING PROCESS:

- A. Universal Laser Systems Laser Engraver to do inlay Method.
- B. Rotary engraver for (ADA) tactical Brail.

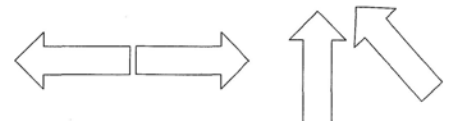
## SIGN INSERTS:

1. Approved Materials:
  - A. PROFILE MATERIAL: (to create tactile copy/graphics)
    1. Gravo-Tac 1-ply 1/16 inch, matte finish
  - B. SUBSTRATE (modified acrylic sign material)
    1. Gravo-Tac 1-ply (for inlay method), matte finish
    2. Gravo-Tac clear Plexiglas (for back plate beveled edge)
2. Finishes and Colors: Gravo-Tac, interior, 1-ply, matte finish, ADA compliant for color contrast and surface finish. Refer to project sign schedules for specific information on colors. (Johnson Plastic/Accent)
3. Frames: Plastic mold injected made for high impact, signs are held in frame with a snap locking mechanism that is a part of the modular frame system. Frames come in various colors to match sign colors. Optional aluminum frames with snap locks.
4. Graphics:
  - A. Tactile Characters: Use approved profile material, computer-engineered, adhesive-backed, raised graphics, complying with ANSI A1 17.1 -1998.
  - B. Pictograms: All "symbols" must match as closely as possible the published international" symbols. Other interpretations not be deemed acceptable. All symbols must be approved prior to fabrication.
  - C. Brail: Use Raster Method patented process for placing Brail dots on architectural signs. Computer engineered, using special carbide engraving bit, press-fit tool with vacuum pump or automated insertion device (Auto-Raster) or manual insertion device (Raster-Pen), and W stable acrylic Raster.
  - D. Design for Characters that are both Tactile and Visual shall comply with ANSI 17.1-1998, Sections 703.2.1 through 703.2.8 1)
    1. Character and Number Height: 5/8 inch minimum, based on an uppercase "I", measured vertically from the baseline of the character.
    2. Character and Number Depth: Raised 1/32 inch.
    3. Copy Style: Upper case, sans serif. (Aphil Helvetica Regular) is the letter style designated for information on sign types.
    4. Brail: Comply with ANSI A1 998, sections through 703.5.4 Grade 2 (conforming to specifications National Library Service, Library of Congress), rounded and doomed, .025 inch to .037 inch high, to allow smooth tactile sweep of fingers, from to right. Braille Rasters should be uniform depth. Background surface shall be smooth without ridges or other intrusions that will interfere with the ability to read the dots. Raised elements, such as borders, shall be separated a minimum of 3/8 inch from the Brail Raster cells groups. This clearance dimension shall be applied to the depression caused by a routed or similar Brail fabrication system, to the distance of the border to tactile characters, or from dot cells to tactile characters in a Raster type system. A clear cell may be inserted at the beginning and end of a row to set the and right border spacing in lieu of 3/8 inch.
    5. Brail Message: All messages to be lower case, and may not directly reflect the style of the tactile letters.
    6. The Brail area shall be located below the corresponding tactile text. If the tactile message is multi-lined and expresses a phrase, the entire Brail text should be grouped together below it tactile message.
    7. Letter Style: Americans with Disabilities Act (ADA) requires all uppercase letters (capitalized) on any sign designated as identifying a permanent space. Includes any permanent suite or room identification.
    8. Directional signs are to use a mix of upper and lower case characters or all upper case characters whenever specified.



#### ARROWS & SYMBOLS:

1. Arrows: The standard arrow is a curved tip and wing arrow that is condensed 70%. The arrow is to be justified left and precedes the copy to which it applies.



#### RESTROOM SYMBOLS:

1. The men and women symbols are standard DOT symbols and should be accompanied by the international symbol of accessibility if appropriate. This symbol must be in field of at least and separate from accompanying text.



#### ADA SYMBOLS:

- 1) The international symbol of accessibility (refer to above) should appear at all buildings entrances, restrooms, auditoriums, etc. that are accessible to the physically disabled. There are no size restrictions but it is recommended that the symbol be large enough to be identified from a decision point.  
The volume control telephone, TDD and Asseritive Listening System Identify where telephones have been adapted for the use of the hearing impaired.



#### MISCELLANEOUS SYMBOLS:

- 1) Miscellaneous symbols are visual clues to assist in way finding and identification.  
Symbols are frequently updated by individual city and or fire codes based on current regulations or interpretations of regulations by the particular municipality. It is the fabricators responsibility to check all current code status in the jurisdiction and modify icon accordingly.



#### INSTALLATION:

1. All signs be as indicated on drawings or where directed by customer or the designer, signs shall be secured with studs, toggle bolts, expansion bolts, or methods as approved on shop drawings specified hereinafter and sizes required to assure rigid attachment. Removal of existing shall be done in a manner not damaging surfaces beyond the coverage of the new sign wherever possible.

#### SHOP DRAWINGS, IF REQUESTED, FOR CHANGES OR ALTERNATES:

1. Three (3) copies of shop drawings indicating changes or alternates in detail shall be submitted to customer or designer. Approval of shop drawings shall be required before any work under this section has begun.

#### INSTALLATION METHODS:

The appropriate installation method dependent upon:  
Sign type, Wall surface, Aesthetic consideration, Need for permanence

#### SILASTIC ADHESIVE:

Silicone adhesive provides a permanent bond between sign and wall surface. Double faced foam tape (1/16" or less) is applied continuously to the perimeter of the sign back, inset The tape to the color coordinated with the sign face and side (white tape on light color and black tape on dark color signage.) the proper silicone adhesive is applied continuously within the foam tape area.

If installation is to take place on a glass sidelight panel the installation method remains the same; however, the backsides of the glass (from the interior of the room) must be covered with a back plate. This is done to hide the installation materials from public view ability.

#### MECHANICAL MOUNT:

This installation method is employed in instance where the mounting surface is not conducive to use of foam tape or silastic adhesive.

# LAMINATE CLAD CASEWORK

## MATERIALS

### Core Materials:

- A. CFC Combo Core: Veneer core consisting of Western softwood inner core, with outer plys on both faces consisting of medium density fiberboard (MDF) resulting in a smooth laminating surface with minimal telegraphing. 5-ply for 1/2 inch thickness, 7-ply for 3/4 inch thickness, and 9-ply for 1 inch thickness. Roseburg SkyPly CFC Veneer Core panels, or approved equal with no added urea-formaldehyde and contributes to achieving LEED credits. (Confirm this is necessary)

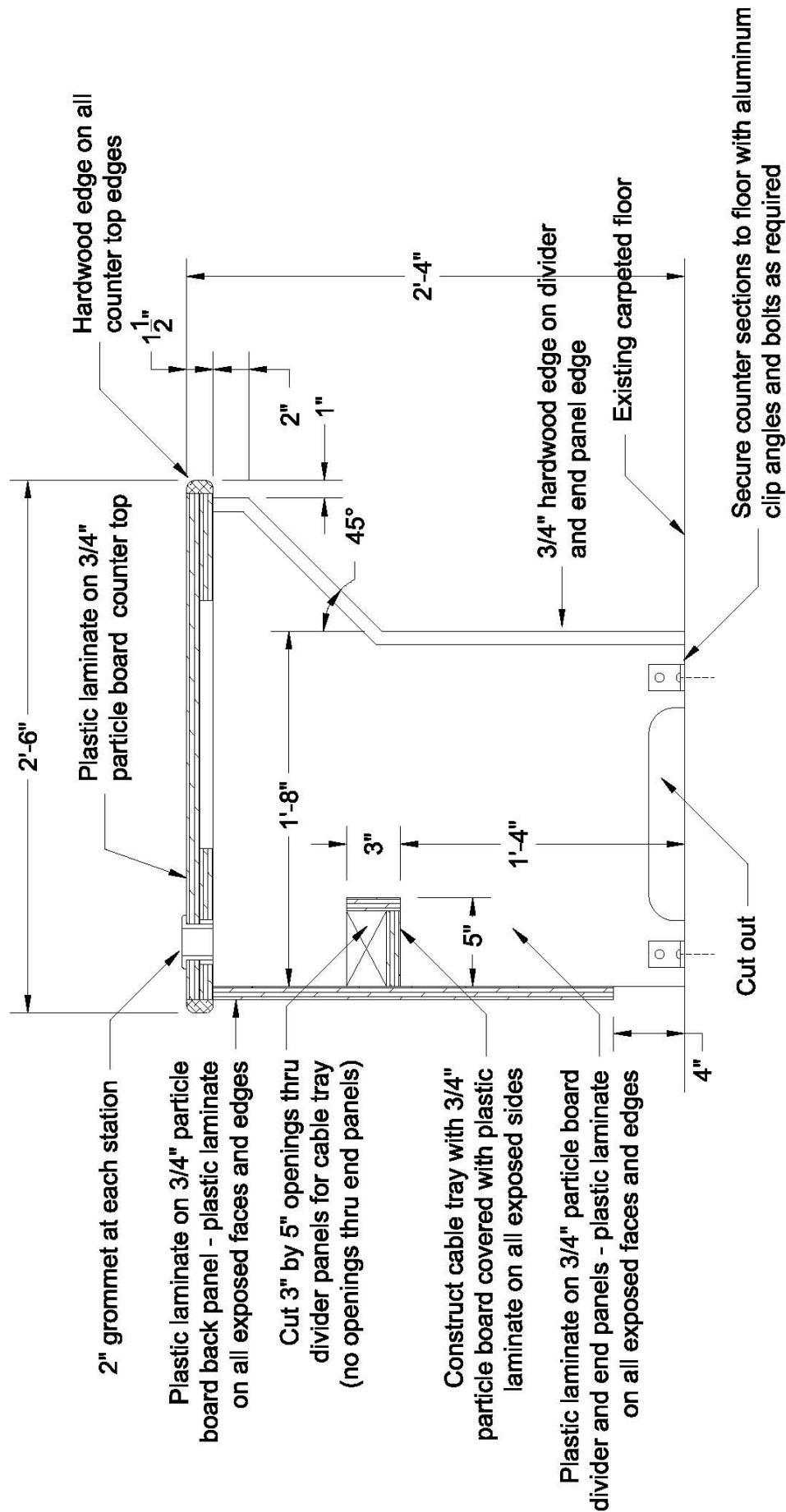
## FABRICATION:

- A. Fabricate casework, countertops and related products to dimensions, profiles, and details shown.
- B. Cabinet Body Construction:
  - 1. Tops and bottoms are glued and doweled to cabinet sides and internal cabinet components such as fixed horizontals, rails and verticals. Minimum 6 dowels each joint for 24 inch deep cabinets and a minimum of 4 dowels each joint for 12 inch deep cabinets.
    - a. Tops, bottoms and sides of all cabinets are CFC Combo Core.
  - 2. Cabinet backs: 1/4 inch thick medium density fiberboard panel fully captured by the cabinet top, bottom and side panels. Finish to match cabinet interior. 3/4 inch x 4 inch CFC Combo Core rails will be placed behind the back panel at the top and bottom, and doweled to the sides utilizing 10mm hardwood fluted dowels. A third intermediate rail will be included on all cabinets taller than 56 inches. Utilize hot melt glue to further secure back and increase overall strength.
    - a. Exposed back on fixed or movable cabinets: 3/4 inch thick CFC Combo Core with the exterior surface finished in VGS laminate as selected.
  - 3. Fixed base and tall units have an individual factory-applied base, constructed of 3/4 inch thick exterior grade plywood. Base is 96mm (nominal 4 inch) high unless otherwise indicated on the drawings.
  - 4. Base units, except sink base units: Full sub-top. Sink base units are provided with open top and a stretcher at the front, attached to the sides. Back to be split removable access panel.
  - 5. Side panels and vertical dividers shall receive adjustable shelf hardware at 32mm line boring centers. Mount door hinges, drawer slides and pull-out shelves in the line boring for consistent alignment.
  - 6. Exposed and semi exposed edges.
    - a. Edging: 1mm PVC machine applied.
  - 7. Adjustable shelf core: 3/4 inch thick CFC Combo Core up to 30 inches wide, 1 inch thick CFC Combo Core over 30 inches wide.
    - a. Front edge: 1mm PVC.
  - 8. Interior finish, units with open Interiors:
    - a. Top, bottom, sides, horizontal and vertical members, and adjustable shelving faces with CLS with matching prefinished back.
  - 9. Interior finish, units with closed Interiors:
    - a. Top, bottom, sides, horizontal and vertical members, and adjustable shelving faces with CLS with matching prefinished back.
  - 10. Exposed ends:
    - a. Faced with VGS high-pressure decorative laminate.
  - 11. Wall unit bottom:
    - a. Faced with CLS.
  - 12. Balanced construction of all laminated panels is mandatory. Unfinished core stock surfaces, even on concealed surfaces (excluding edges), not permitted.
- C. Drawers:

1. Sides, back and sub front: Minimum 1/2 inch thick plywood, laminated with CLS doweled and glued into sides. Top edge banded with 1mm PVC.
  2. Drawer bottom: Minimum 1/2 inch thick plywood laminated with CLS screwed directly to the bottom edges of drawer box.
  3. Paper storage drawers: Minimum 3/4 inch thick plywood sides, back, and sub front laminated with CLS. Minimum 1/2 inch thick plywood drawer bottoms screwed directly to the bottom edges of the drawer box. Provide PVC angle retaining bar at the rear of the drawer.
- D. Door/Drawer Fronts:
1. Core: 3/4 inch thick Combo Core.
  2. Provide double doors in opening in excess of 24 inches wide.
  3. Faces:
    - a. Exterior: VGS High-pressure decorative laminate.
    - b. Interior: High-pressure cabinet liner CLS.
  4. Door/drawer edges: 3mm PVC, external edges and outside corners machine profiled to 1/8 inch radius.
  5. Miscellaneous Shelving:
    - a. Core material: 3/4 inch or 1 inch thick Combo Core.
    - b. Exterior: VGS High-pressure decorative laminate.
    - c. Edges: 3mm PVC, external edges and outside corners machine profiled to 1/8 inch radius.

#### **DECORATIVE LAMINATE COUNTERTOPS:**

- A. Countertops: 1 inch thick ANSI A208.1-1993 M-2 Certified particleboard.
- B. Surface: High-pressure decorative HGS/HGP laminate with balanced backer sheeting.
- C. Edges, including applied backsplash: 3mm ABS, exposed edges and corners machine profiled to 1/8 inch radius. Edges are machine applied with water based low Volatile Organic Compound (VOC), non-toxic, PVA adhesive.
- D. All countertops joints must be dry fit at the factory to check for consistency in color from one panel to the other and overall finished panel thickness, resulting in a high quality product easy to install.



## Computer Counter Top Section

# MECHANICAL STANDARDS

## PART 1: DESIGN CONDITIONS

### 1.1 Climatic Design Requirements

#### A. ASHRAE 2005 Fundamentals:

1. Summer: 1% design criteria for Duluth, Minnesota 85 degree F DB  
71 degree F WB
2. Winter: 99.6% design criteria for Duluth, Minnesota - 21 degree F DB
3. Indoor: Winter: 72 degree F DB  
Summer: 50% RH maximum and 75 degree F DB.

### 1.2 Ventilation Air Requirements

#### A. Per ASHRAE 62.1-2004.

### 1.3 Noise Criteria

- A. Classroom and gymnasium spaces shall be designed at a NC level of 35 dBA or less per Minnesota Department of Education Requirements.
- B. Specialty areas such as auditoriums, libraries, etc. shall be designed at levels required by acoustical consultant recommendations.
- C. Equipment installed outside shall maintain current state and local code required levels.
- D. Additional information can be found in ANSI S12.60-2002 Acoustical Performance Criteria, Design Requirements and Guidelines for Schools.

### 1.4 Code Requirements

- A. Mechanical designs shall comply with all applicable Federal, State, and Local Building Code Requirements.

### 1.5 Maintenance Access

- A. All mechanical designs shall incorporate adequate equipment maintenance access and shall be planned for throughout the design process.

## PART 2: GENERAL MECHANICAL SYSTEM REQUIREMENTS

### 2.1 Motors

- A. Premium efficiency for all motors over 1 HP and compliant with maximum local utility rebate requirements. All motors below 1 HP shall still be of high quality construction.
- B. Inverter duty rated to allow for variable frequency drive operation.
- C. 120 volt, single phase for motors less than 1/2 HP.
- D. Voltage for motors 1/2 HP and larger to be determined by electrical engineer.

### 2.2 Pipe Expansion

- A. Hydronic piping systems shall be designed to allow for expansion.

### 2.3 Valves

- A. Manufacturers:
  1. Nibco, Watts, Grinnell, Hammond, Milwaukee, Stockham, Victualic.
- B. Full port two piece ball valves for piping 2 inch diameter and less rated for service.

- C. Butterfly valves with EPDM disc for piping 2-1/2 inch diameter and larger rated for service.
- D. Check valves shall be bronze, silent operating.

## 2.4 Mechanical Vibration Control

- A. All systems shall account for noise and vibration.
- B. Vibration isolation for all hanging equipment shall utilize spring type isolation hangers.
- C. All rooftop air handling equipment shall be installed on vibration curb rails equal to Mason Industries Model CMAB.
- D. Rooftop curbs shall be installed per a detail to be provided by District.
- E. Pumps above grade shall utilize inertia bases.

## 2.5 Insulation

- A. Piping and ductwork shall be externally insulated, compliant with the Minnesota Energy Code.
- B. All pipe, duct wall, and floor penetrations shall comply with fire rating of wall and floor and shall be fire sealed.

## 2.6 Mechanical Identification

- A. Piping shall be identified as follows:
  1. Manufactured Pipe Markers (general): Preprinted, color-coded, with lettering indicating service, and showing direction of flow.
  2. Colors: Comply with ASME A13.1, unless otherwise indicated.
  3. Lettering: Label letters in white and abbreviate per service as shown below:
 

<u>Piping Service</u>	<u>Abbreviation</u>
Hot Water Heating Supply	HWS
Hot Water Heating Return	HWR
Chilled Water Supply	CHWS
Chilled Water Return	CHWR
Coil Condensate Return	COIL COND
Domestic Cold Water	DCW
Domestic Hot Water (120 deg)	DHW
Circulating Hot Water	CDHW
Sanitary Sewer	SAN
Storm Sewer	STORM
Firm Natural Gas	FNG
Interruptible Natural Gas	ING
Fire Protection Water	FIRE PROT
  4. Pipes with OD, Including Insulation, Less Than 6 Inches: Full-band pipe markers extending 360 degrees around pipe at each location.
  5. Pipes with OD, Including Insulation, 6 Inches and Larger: Either full-band or strip-type pipe markers at least three times letter height and of length required for label.
  6. Arrows: Integral with piping system service lettering to accommodate both directions; or as separate unit on each pipe marker to indicate direction of flow.
- B. Duct shall be identified as follows:
  1. Manufactured Markers (general): Preprinted, color-coded, with lettering indicating service, and showing direction of flow.
  2. Colors: Comply with ASME A13.1, unless otherwise indicated.
  3. Lettering: Label letters in white and abbreviate per service as shown below:
 

<u>Duct Service</u>	<u>Abbreviation</u>
Outdoor Air	OA
Supply Air	SA
Return Air	RA
Relief Air	RLA
Building Exhaust Air	EA

Grease Exhaust Air	GEA
Fume Hood Exhaust	FEA

C. Intervals for duct and piping labels shall occur as follows:

1. Adjacent to all changes in direction.
2. Adjacent to all valves and flanges.
3. At both sides of floor and wall penetrations.
4. At any point of entry into the line.
5. At 50 foot intervals of straight runs.

D. Valves shall be identified as follows:

1. Valve Tags: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2 inch numbers, with numbering scheme as described below. Provide 5/32 inch hole for fastener.
2. Material: .032" thick brass with brass wire link or braided chain.
3. Prefix letters for valve service:

<u>Service</u>	<u>Valve Tag Prefix Format</u>
Plumbing	P - (Valve #)
Heating Water	H - (Valve #)
Chilled Water	C - (Valve #)
Fire Protection	F - (Valve #)
Natural Gas	G - (Valve #)

E. Ceiling markers used to identify equipment located above the ceiling tile shall include:

1. Provide celluloid covered 5/8 inch diameter colored marking tacks suitable for ink notation.
2. Provide colored ceiling markers directly below the following devices. Install marker on t-bar grid of acoustical tile ceiling system or access door frame.

<u>Item to Be Marked</u>	<u>Color</u>
Plumbing Valves	Green
Heating Valves	Yellow
Chilled Water Valves	Orange
Dampers (manual or auto)	Black
Fans	Aluminum
VAV Boxes	Blue
Terminal Coils	Purple
Fire and Fire/Smoke Dampers	Red

## PART 3: PLUMBING SYSTEMS

### 3.1 Sanitary and Storm Waste and Vent Piping

- A. Underground piping shall be cast iron or PVC (unless elevated waste water temperatures require cast iron).
- B. Above ground piping shall be hub-less cast iron.
- C. Above ground storm drainage piping shall be externally insulated.
- D. Above ground floor drain bodies to a distance of 10 feet from floor drain serving HVAC coils producing condensate shall be insulated to reduce chance of condensate on piping.

### 3.2 Chemical Waste Piping

- A. Piping shall be of code approved material.
- B. Incorporate chemical waste receptor.

### 3.3 Domestic Hot, Cold, and Recirculation Lines

- A. Systems shall comply with NSF 61, "Drinking Water System Components - Health Effects."
- B. Water meter to be coordinated with local water department to determine which entity provides.
- C. Provide separate water meter for the lawn irrigation system if present.
- D. Piping shall be insulated hard copper tubing, type "L", soldered with lead free solder.



- E. Hot water re-circulating lines shall be installed for all systems and shall be brought to within 20 feet of classroom sinks and 10 feet of main toilet room and all kitchen sinks. Provide circulating pump for recirculation line and provide balance valves for all main branch lines of recirculation loop.
- F. Provide full port ball valves for all toilet groups, branch lines, and main building zones.
- G. Domestic water piping system shall have all code and system required:
  - 1. Backflow preventers
  - 2. Vacuum breakers
  - 3. Drain valves
  - 4. Water hammer arresters
  - 5. Unions
  - 6. Meters and gauges

### **3.4 Water Heaters**

- A. Utilize the return water from the heating system to a hot water to domestic hot water heat exchanger sized for 140 degree F entering heating water temperature to allow for heating water temperature reset. This heat exchanger shall provide the domestic water for the building during boiler operation.
- B. Natural gas fired to provide 120 degree F. water for summer operation.
- C. Extra high efficiency type equal to A.O. Smith Cyclone. Sealed combustion.
  - 1. Water heater to be provided for redundancy and summer operation.
- D. Incorporate expansion tank as required by system.
- E. Incorporate adequately sized storage tank where required for showers, etc.
- F. Kitchen hot water requirements to be coordinated with the kitchen consultant, but preferably served from the 120 degree F. water system and boosted at the kitchen devices by kitchen consultant.
- G. Kitchen consultant to increase domestic hot water temperature to 180 degree F. via a gas fired booster heater located in a nearby equipment room.

### **3.5 Plumbing Specialties**

- A. Provide escutcheons for all wall and floor pipe penetrations.
- B. Provide cleanouts in serviceable locations.
- C. Roof drains shall be cast iron bodies with cast iron dome with stainless steel bolts and connectors.
  - 1. Roof drain sumps to be field insulated.
- D. Downspout nozzles to cast bronze with stainless steel bolts and connectors.
- E. Freeze-proof wall hydrants where desired by District.
- F. Hose bibs with backflow preventer in mechanical rooms and shower/locker rooms.
- G. Provide additional domestic cold water hose bib with backflow preventer in janitors closets for cleaning equipment interface. Locate over mop basin.
- H. Floor drains shall be provided in the following areas:
  - 1. Main group toilet areas.
  - 2. All Public use toilet areas.
  - 3. Mechanical rooms near water heaters, boilers, pumps, air handling units, water meters, sprinkler risers, etc.
  - 4. Janitor's closet (this is in addition to the mop basin) to allow for floor cleaning equipment drainage.
  - 5. Near backflow preventers.
  - 6. Near emergency eye wash and shower stations.
  - 7. All areas in kitchens required by kitchen consultant.
  - 8. Other areas as determined by code or District.
- I. Grease interceptors where required by kitchen consultant. District input is required for type and service requirements.

### **3.6 Plumbing Fixtures**

- A. Manufacturers:
  - 1. Fixtures American Standard and Kohler
  - 2. Low Flow Urinals Sloan, Zurn



- |                        |  |
|------------------------|--|
| 3. Flush Valves        | Sloan, Zurn  |
| 4. Trim/Faucets        | American Standard, Kohler, T & S Brass, Chicago Faucet |
| 4. Seats               | Bemis, Church, Beneke                                  |
| 5. Sinks               | Just, Elkay  |
| 6. Shower Valves       | Leonard, Symmons                                       |
| 7. Water Coolers       | Oasis, Halsey Taylor, Elkay, Sunroc                    |
| 8. Wash Fountains      | Bradley, Sloan   |
| 9. Eye Wash            | Bradley, Guardian, Haws                                |
| 10. Service Sinks      | Fiat, Swan   |
| 11. Trap Wraps         | Brocar, Truebro, Plumberex                             |
| 12. Floor /Roof Drains | Josam, Zurn, Wade, Smith, Watts                        |
- B. WC-1, WC-1A (handicap height) Water Closets: Wall hung white vitreous china, siphon jet, elongated bowl, 1-1/2 inch top spud, china bolt caps, 1.6 gallon low water consumption flush. Fully glazed 2 inch trapway.
1. Closet: Afwall EL 1.6 No. 2257.103.
  2. Flush Valve: Sloan Royal sensor operated Optima Model 111 ES- S. Provide one (1) model EL-154 transformer for every eight (8) fixtures in the main toilet areas and one (1) transformer for each fixture in the single toilet areas.
  3. Seat: Olsonite No. 10 CC/SS white solid plastic, check hinge, self- sustaining, stainless steel hinge posts, open front, less cover.
  4. Carrier: Josam, Wade, Watts, Smith or Zurn. Carrier shall be adjustable.
  5. Height of water closets shall be as follows (from floor to top of seat):
    - a. 16 inches for elementary school toilets.
    - b. 18 inches for secondary school, adult and handicap toilets.
- C. UR-1, UR-1A (handicap height) Urinals: Wall hung white vitreous china, siphon jet, 3/4 inch top spud, integral flushing rim, extended sides.
1. Urinal: Wall hung rated for 1 pint per flush. Sloan Model WEUS 1000.1301 urinal package.
  2. Flush Valve: Sloan Royal sensor operated Optima Model 186-1.0- ES-S. Field adjust all flush valves to 0.7 gallon per flush after installation. Provide one (1) model EL-154 transformer for every eight (8) fixtures in the main toilet areas and one (1) transformer for each fixture in the single urinal areas.
  3. Carrier: Josam, Wade, Smith or Zurn. Carrier shall be adjustable.
- D. LAV-1 Lavatories: Wall hung white vitreous china with back, anti- splash rim, faucet ledge, front overflow and side splash shields.
1. Lavatory: Lucerne No. 0355.012, or approved equal.
  2. Trim: Sloan Optima ETF-600 faucet, sensor operated, vandal resistant head with .5 gpm aerator, perforated strainer, and 1-1/4 inch brass tailpiece. Provide high quality check tee mixing valve with required loose key shutoff stops. Provide EL 154 transformer as needed. Install transformers in an easily accessible location above the drop ceiling, and install mixing valve below sinks. Provide ETF-529 Opti-shield.
  3. Supplies: 3/8 inch angle supplies flexible tube riser, brass stops, chromard finish.
  4. Trap: 1-1/4 inch adjustable cast brass "P" trap with cleanout.
  5. Size: 20-1/2 inch width x 18-1/4 inch depth.
  6. Arm Support Carrier: Wade No. W-520 (adjustable) or equal.
  7. Trap Guard: Handi Lav-gard Model 102, P-trap and wall supplies insulation kit. Provide for all lavatories in single lav locations. Main toilet rooms require a Lav Shield Model 2018, Rigid high impact, stain resistant PVC. Provide tamper resistant screws and provide model required for sink manufacturer purchased.
- E. WF-1 Wash Fountains: Wall hung four user sensor operated, vandal resistant infrared, Terreon (or equal) polyester resin fixture.
1. Fixture: Bradley Model MF2949 IR. Provide solenoid valves, and transformers as required for a fully operational wash station.
  2. Trim: Provide .5 gpm flow aerators. Provide all required thermostatic mixing valves, checks, stops, strainers, flexible supplies hoses, traps, and sensors as required for a fully operational fixture.
  3. Color: Architect to select.
- F. S-1 Sink: Countertop, single compartment, type 304, 18-8 stainless steel, 18 gauge, self-rimming, back

ledge. Centered two hole with 4 inches on center separation.

1. Sink: Just No. SL-ADA-1921-A-GR. Drain location to be center rear.
  2. Trim: Heritage No. 7402.372H with gooseneck swing spout, wristblade handles, aerator, JB-99 basket strainer. Provide .5 gpm aerators.
  3. Trap: Chrome plated cast brass "P" trap with cleanout.
  4. Supplies: 3/8 inch angle supplies with flexible tube riser, brass stops, chromard finish.
  5. Size: 21 inches wide x 19 inches deep x 5-1/2 inch bowl depth.
- G. S-2 Sink: Countertop, single compartment, type 304, 18-8 stainless steel, 18 gauge, self-rimming, back ledge. Centered two hole with 4 inches on center separation.
1. Sink: Just No. SL-1815-A-GR.
  2. Trim: Heritage No. 7402.372H with gooseneck swing spout, wristblade handles, aerator, JB-99 basket strainer. Provide .5 gpm aerators.
  3. Trap: Chrome plated cast brass "P" trap with cleanout.
  4. Supplies: 3/8 inch angle supplies with flexible tube riser, brass stops, chromard finish.
  5. Size: 15 inches wide x 18 inches deep x 7-1/2 inch bowl depth.
- H. S-3 Sink: Countertop, single compartment, type 304, 18-8 stainless steel, 18 gauge self-rimming, back ledge. Centered three hole with 4 inches on center separation.
1. Sink: Just No. SLXD-2219-A-GR.
  2. Trim: Chicago Faucet No. 201-GN8 with gooseneck swing spout, econoflow outlet, wristblade handles, aerator, JB-99 basket strainer. Provide 2.2 gpm aerators.
  3. Trap: Smith No. 8730 solids interceptor. Suspended type with removable bottom sediment strainer.
  4. Supplies: 3/8 inch angle supplies with flexible tube riser, brass stops, chromard finish.
  5. Size: 19 inches wide x 22 inches deep x 12 inch bowl depth.
- I. S-4 Sink: Countertop, single compartment, type 304, 18-8 stainless steel, 18 gauge, self rimming, back ledge. Centered two hole with 4 inches on center separation.
1. Sink: Just No. SLX-1921-A-GR.
  2. Trim: Heritage No. 7402.372H with gooseneck swing spout, wristblade handles, aerator, JB-99 basket strainer. Provide 2.2 gpm aerators.
  3. Trap: Chrome plated cast brass "P" trap with cleanout.
  4. Supplies: 3/8 inch angle supplies with flexible tube riser, brass stops, chromard finish.
  5. Size: 21 inches wide x 19 inches deep x 10-1/2 inch bowl depth.
- J. S-5 Sink: Countertop, double compartment, type 304, 18-8 stainless steel, 18 gauge, self-rimming, back ledge.
1. Sink: Just No. DL-ADA-17537-A-GR.
  2. Trim: Heritage No. 7230.372H with gooseneck spout, wristblade handles, .5 gpm aerator, JB-99 basket strainer.
  3. Trap: Chrome plated cast brass "P" trap with cleanout.
  4. Supplies: 3/8 inch angle supplies with flexible tube riser, brass stops, chromard finish.
  5. Size: 37 inches wide x 17-1/2 inches long (countertop depth) with two (2) 16 inch x 11-1/2 inch x 5-1/2 inch deep bowls.
- K. SH-1, Shower:
1. Shower Valve (stand alone showers): Leonard No. LVC-BL blade handle, thermostatic mixing valve with integral stops.
  2. Shower Valve (gang shower areas): Shared anti-scald mixing valve located in the coach's office serving the showers. Mixing valve shall hang on the wall in a cabinet to be accessed by maintenance and coaching staff. Provide adjustable timed push button operators at shower stations.
  3. Spray Assembly: Provide Leonard No. 501P fixed spray hand shower, 48 inch chrome plated wall bar with adjustable height slide bracket, 59 inch flexible chrome hose, in-line vacuum breaker.
  4. Flow: 1.8 GPM maximum flow rate.
  5. Drain: Wade W 1102-STD-6 with satin nickel bronze top.
- L. EWC-1 Electric Water Cooler: Oasis Model P8-AMSL, wall hung two level water cooler, stainless steel top, apron color to be selected by Architect.
1. Capacity to cool 8 GPH to 50 degree F with inlet water at 80 degree F and 90 degree F room temperature.
  2. Electrical requirements 1/4 HP, 120 volt.

3. Tank shall be lead-free.
  4. Provide Flexi-Guard Safety Bubbler.
  5. Provide all required stops, traps, strainers, and flexible connections.
  6. Provide wall supports.
- M. EW-1 Eye Wash: Bradley Model S19-220BF with stainless steel bowl with wrap around skirt wall bracket.
1. Provide mixing valve that will serve two eye wash stations and shall discharge a mixed water temperature of 70 degree F.
  2. Pipe discharge to floor drain.
- N. SS-1 Service Sink: Floor-mounted molded stone janitors mop basin.
1. Basin: Fiat Model MSB 2424 molded stone, 3 inch stainless steel drain body with dome strainer.
  2. Drain: 3 inch stainless steel drain body with dome strainer. Contractor to reduce 3 inch connection to 2 inch underground sanitary connection.
  3. Trim: Chicago Faucet No. 897 quatern service sink faucet with vacuum breaker, 3/4 inch hose thread spout, adjustable wall brace, pail hook.
  4. Furnish four feet of garden hose with female treaded connector.
  5. Provide field modifications required for Autoscrub Floor Washer connection on owner selected service sinks.
- O. SS-2 Service Sink with Can Wash: Poured concrete to be provided by architect.
1. Drain: 4 inch cast iron coated can wash drain with double drainage flange, weepholes, bottom outlet, square top, removable sediment bucket and bronze spray nozzle assembly for 3/4 inch cold water connection. Equal to Josam Series 39240.
  2. Trim: Chicago Faucet No. 770 quatern service sink faucet with wristblade handle.
  3. Backflow Preventer: Provide Watts 800 M4QT pressure backflow preventer upstream of faucet handle outside of wall and fully accessible.
- P. WH-1 Wall Hydrant: Equal to Woodford style No. 67 freeze proof, with removable key handle (provide 3 keys for every wall hydrant), vacuum breaker and hose outlet with testable backflow preventer, nickel bronze finish and wall sleeve.
- Q. HB-1 Hose Bibs: Chicago Faucet Company No. 952, hose end sill faucet with vacuum breaker. Chromium plated.
- R. Kitchen Equipment Fixtures: See plans for information. This contractor to provide all necessary connection fittings, valves, etc. as shown on the construction document plans.

## PART 4: HYDRONIC HEATING SYSTEMS

### 4.1 General Requirements

- A. Boilers:
1. Primary boilers shall be sealed combustion, high efficiency condensing type manufactured by Aerco or Fulton (Ultra Quiet Model) and shall handle 100% of the load. Provide 70% backup capability, which can be accomplished by modular boiler plant.
  2. Backup boilers shall be natural gas/fuel oil backup, standard efficiency boilers used in curtailment mode only. This only applies if dual fuel rate is applicable. None of the schools currently qualify for a dual fuel rate.
  3. Bypass chemical feeders shall be installed as well as glycol fill drum and electric pump.
- B. Hydronic heating piping shall contain 35% **propylene** glycol in entire loop. Glycol content shall be verified by a third party source after contractor installation. Glycol shall be Dowfrost.
- C. Temperature drop through the heating loop shall be designed around a 30 degree drop.
- D. Hydronic piping shall be Schedule 40 steel or type "L" copper piping using welded, screwed, or grooved fittings.
1. Flow measuring devices to be installed on all coils, terminal heating devices, and main heating branch lines.
  2. Shutoff valves shall be installed for each heating device, main branch lines, and building zones.
  3. Air vents shall be installed on all system high points as well each terminal heating coil, and shall be accessible for maintenance.

4. System shall be chemically flushed and cleaned.
- E. Hydronic pumps shall be manufactured by Bell and Gossett, Taco, or Armstrong and shall be floor mount end suction if 3 HP or greater. In-line pumps can be utilized for pumps under 3 HP.
  1. Standard efficiency boilers shall have an isolation pump as to not allow the boiler system from being shocked with low temperature water.
  2. Pumps shall have flexible connections and shall be installed on inertia bases if above grade.
  3. Pumps shall be parallel flow operation for the building heating loop.
  4. Pumps shall be Variable Frequency Drive operated.
  5. Pumps shall be laser aligned.
- F. All spaces with external exposure shall have sloped top finned tube radiation 12 inches high and 4 inches deep, and shall be supplied with matching pipe enclosure for remodel projects. Finned tube shall be sized to handle 100% of the building envelope loss for the space served.
- G. All vestibules shall have Hydronic cabinet unit heaters located on the wall with inverted airflow discharge.

## PART 5: HYDRONIC CHILLED WATER SYSTEMS

### 5.1 General Requirements

- A. Chillers shall be air cooled rotary screw or scroll and manufactured by Trane, McQuay, or York.
  1. Chillers shall be enclosed in sound enclosures where required on a site by site basis.
  2. All chillers shall have factory installed full chiller unit enclosures.
- B. Refrigerant shall be R-134A or R-410A.
- C. Chiller shall be sized for a 40 degree F. water supply temperature.
- D. Hydronic chilled water piping shall contain 35% **ethylene** glycol in entire chilled water loop. Glycol content shall be verified by a third party source after contractor installation.
- E. Temperature drop through the chilled water loop shall be designed around a 12 degree drop.
- F. Hydronic piping shall be Schedule 40 steel or type "L" copper piping using welded, screwed, or grooved fittings.
  1. Flow measuring devices to be installed on all coils and main chilled water branch lines.
  2. Shutoff valves shall be installed for each chilled water, main branch lines, and building zones.
  3. Air vents shall be installed on all system high points as well each coil, and shall be accessible for maintenance.
  4. System shall be chemically flushed and cleaned.
  5. Provide bypass chemical feeder and glycol fill drum and electric pump.
- G. Hydronic pumps shall be manufactured by Bell and Gossett, Taco, or Armstrong and shall be floor mount end suction if 3 HP or greater. In-line pumps can be utilized for pumps under 3 HP.
  1. Pumps shall have flexible connections and shall be installed on inertia bases if above grade.
  2. Pumps shall be Simplex flow and allow for minimum chiller flow with loop bypass as required.
  3. Single pump for building loop. No backup required.
  4. Pumps shall be laser aligned.
  5. Pumps shall be Variable Frequency Drive operated if possible, and if not be provided for soft start.

## PART 6: VENTILATION SYSTEMS

### 6.1 General Requirements

- A. Ventilation systems for all new school classroom areas shall be displacement ventilation consisting of:
  1. 100% dedicated outdoor air handling units with total energy (or sensible only - verify with JCI) wheels, heating and dehumidification coils sized for 50 degree F. discharge air. The dehumidification coils shall be located upstream of the heating coils. Plan of unit arrangement at the end of Mechanical Standards.
  2. Parallel Flow Fan powered VAV boxes serving displacement diffusers in all classroom areas. Fan powered boxes shall have heating coils on the induced air inlet of the fan powered VAV box. Boxes shall be selected for a discharge and radiated NC of 25 or less.
  3. 5 foot sound attenuators shall be installed on the return and supply ducts for the fan powered boxes as

- well as energy recovery units.
4. Displacement diffusers shall be selected at a NC of 20 or less.
- B. Ventilation systems for all existing schools requiring major ventilation retrofits will utilize displacement ventilation where possible.
- C. Schools not utilizing displacement ventilation shall utilize pressure independent variable air volume boxes with reheat coils sized to raise the temperature of the air from 50 degree F. to 70 degree F. plus the entire room loss.
- D. Air Handling Units and Energy Recovery Units:
1. Manufactured by Trane, McQuay, or York.
  2. Double wall.
  3. Dehumidification coils to be installed upstream of heating coils.
  4. Sound attenuators on supply and return ducts.
  5. Closed cell duct liner equal to Imcoa 0% moisture absorption, from fan to 20 feet downstream of supply fan, and 20 feet upstream of return fan.
  6. Provide airflow measuring stations for the outdoor air.
  7. Filtration shall consist of 2 inch MERV 8 pre filters, with 4 inch MERV 11 post filters in the mixed air stream.
- E. Office areas shall be served by single zone AHU's with DX dehumidification coils and VAV boxes with hot water reheat. Condensing units shall be multi-staged with hot gas bypass, if system allows.
- F. Outdoor air intakes shall not be located near loading docks, vehicle drop off areas, building or kitchen exhaust, science exhausts, plumbing vents, etc. Access for cleaning shall be included for outdoor air intakes and relief openings. Size outdoor air openings to reduce rain and snow intake with a face velocity of 250 feet/minute or less.
- G. Ductwork:
1. Shall be galvanized sheet steel having a G90 coating designation.
  2. Supply duct shall be designed and constructed at a 4 inch w.c. pressure class upstream of terminal devices and 2 inch w.c. pressure class downstream of terminal devices.
  3. Return and exhaust duct shall be designed and constructed at 2 inch w.c. pressure class.
  4. All exposed ductwork which will be painted shall be "paint grip, galvanealed type".
  5. Ductwork shall be sealed and pressure tested during construction.
- H. Provide access doors adequately sized for inspection and cleaning for:
1. Fire and fire/smoke dampers.
  2. Motorized operating control dampers.
  3. Terminal coils.
  4. Airflow measuring stations.
- I. Utilize high efficiency takeoffs for all diffusers and duct branch fittings.
- J. Flex duct shall not extend for more than 5 feet.
- K. Provide flexible connectors for all air moving equipment.
- L. Displacement diffusers shall be manufactured by Stifab, Halton, Repus
- M. All other diffusers, registers, and grilles:
1. Shall be manufactured by Krueger, Nailor, Price, Titus, Tuttle and Bailey
  2. Shall be selected at NC 20 or less.
  3. Slot diffusers shall allow full 180 degree airflow adjustment and shall have an insulated plenum.

## **PART 7: CONTROLS SYSTEMS**

### **7.1 General Requirements**

- A. DDC controls system.
- B. See Controls Sequences provided for projects.

## **PART 8: FIRE PROTECTION SYSTEMS**

## **8.1 General Requirements**

- A. Building shall be sprinkled with a wet system per NFPA 13.
- B. One water service to building for both fire protection and domestic water if allowed by building officials and site has flow availability.
- C. Domestic water line to have automatic shut off valve which will close upon fire protection flow switch actuation.
- D. Piping shall be black iron pipe with threaded, welded, or grooved joints.
- E. Buildings shall have 100% coverage and zoned as required.
- F. Zone isolation is desired by the District for emergency shutoff in areas such as gyms, auditoriums, stages, cafeterias, etc.
- G. Provide test locations in janitor's closets when possible. If not, coordinate test locations with owner such that the discharge will not discolor the building and will discharge near grade.

## **PART 9: TESTING AND BALANCING**

### **9.1 General Requirements**

- A. Testing and Balancing of the Hydronic and Air Systems to be provided by a testing and balancing agency directly contracted to the District.
- B. Work to be based on the Mechanical Engineer's specifications.

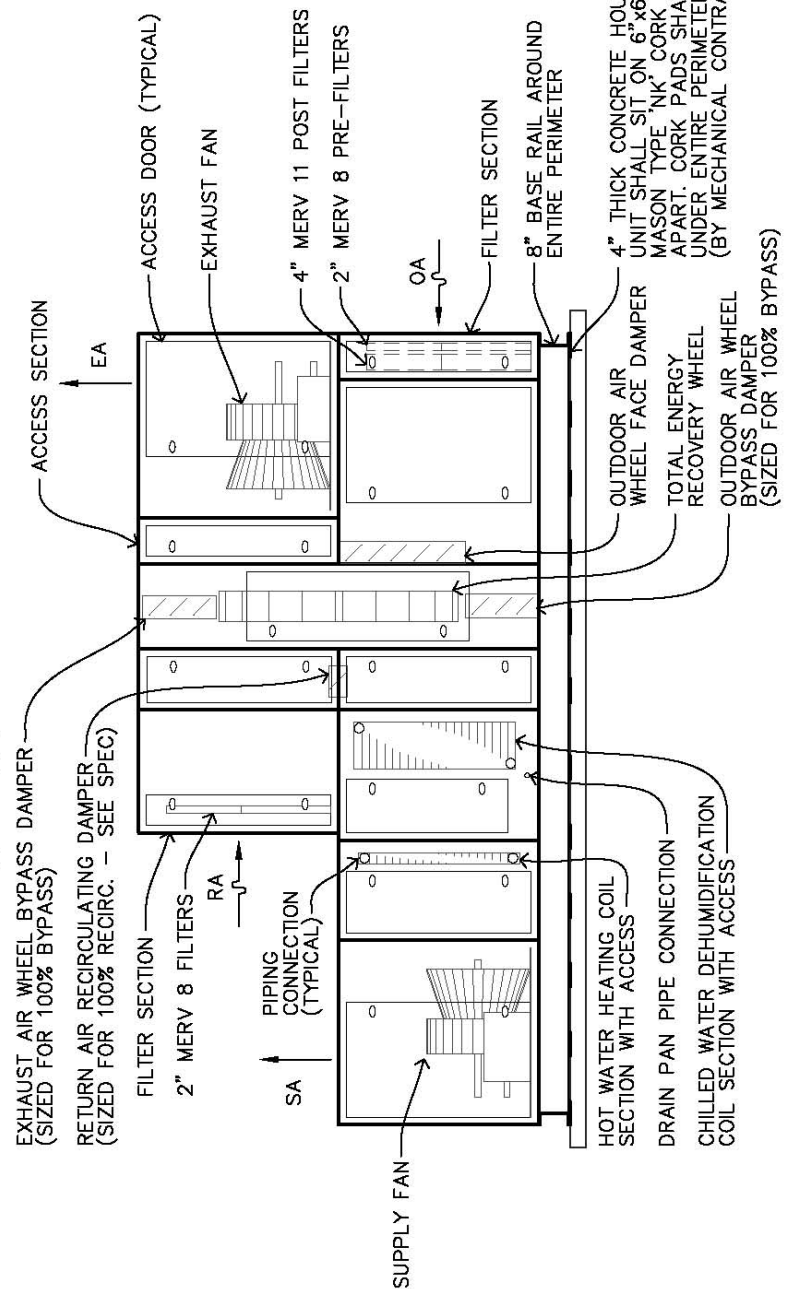
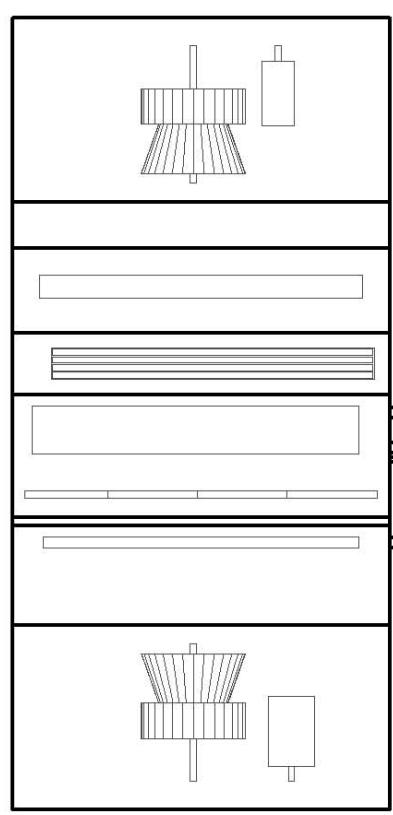
## **PART 10: COMMISSIONING**

### **10.1 General Requirements**

- A. Commissioning to be provided for all applicable projects.



NOTE:  
TOTAL ENERGY WHEEL SHALL BE SIZED  
FOR 100% OUTDOOR AIRFLOW FOR 100%  
OUTDOOR AIR UNITS AND SIZED FOR  
MINIMUM OUTDOOR AIRFLOW ON  
RECIRCULATING MIXED AIR UNITS.  
(NON 100% OUTDOOR AIR UNITS).



<b>Strategic Solution Engineering</b>	<b>ENERGY RECOVERY VENTILATION UNIT WITH TOTAL ENERGY RECOVERY WHEEL</b>		<b>Project</b> 108-009	<b>Drawing Number</b>
	1188 ZEALAND AVE. N. CHAMPLIN, MN 55316		<b>Date</b> 7/15/2008	<b>ERVU</b>
	PHONE: 763-201-8400		<b>Drawn by</b> BAN	
	FAX: 763-201-8410		<b>Checked by</b> RDS	

# ELECTRICAL STANDARDS

## PART 1: BASIC ELECTRICAL REQUIREMENTS

### 1.1 Intent

Provide electrical design, construction documents and record documents adequate for operations and future modifications.

- A. It is the intent of these Standards to provide the requirements for the electrical systems throughout the Duluth School District. It is not to be used as a specification for bidding but rather a guide to preparing the drawings and specifications.
- B. The design shall reflect that no electrical system shall be worked on in an energized state.

### 1.2 Electrical Drawings

- A. Demolition and construction drawings shall be depicted separately.
- B. Show circuit lighting and power outlets on the drawings and identify the panel terminal point for each circuit. Identify load locations and/or room numbers on panelboard schedules.
- C. Indicate on the drawings and size special system raceways and wiring, including voice/data, either on the floor plans or on a riser diagram. Describe or schedule cable types.
- D. Provide a schematic wiring diagram of power and lighting related control circuits on the construction drawings. Identify electrical and mechanical devices.
- E. Provide power distribution one line diagram from the service distribution panelboards and major loads, including fire pump and metering.
- F. Provide a riser diagram for each system covered under Division 16. Identify location and/or room numbers for components.
- G. Show electrical schedules for panelboards, distribution boards, motors, control centers and related items on the drawings (not in the specifications).
- H. Define responsibility and coordination of work between the contractor and the equipment supplier. State that rough-in locations and requirements be verified with the equipment suppliers shop drawings prior to installation of the wiring system.
- I. Identify provisions for intended additions or modifications in the future.

### 1.3 Electrical Reference Symbols

- A. Use industry standard symbols for fire alarm drawings.
- B. Define symbols in a legend on the drawings.

### 1.4 Electrical Test Data

- A. Specify the operational tests and test methods required for the following equipment and materials:
  - 1. Engine generators and emergency power system.
  - 2. Auditorium sound systems.
  - 3. Television antenna and systems.
  - 4. Fire alarm systems.
  - 5. Transformers.
  - 6. Ground fault protective systems.
  - 7. Secondary service conductors/bus duct.
  - 8. Security systems.
- B. The contractor shall furnish all instruments, labor, communication devices and expertise needed for conducting and recording tests.
- C. The contractor shall furnish a copy of certification and test results.
- D. The A/E shall review and accept the test results.
- E. Specify that tests on electrical service equipment and material be completed. The A/E shall review and



accept the test results at least one week before the contractor's request for the first electrical outage and/or switching.

## **1.5 Demonstration of Electrical Systems**

- A. The contractor shall test and supervise the initial operation of all equipment and special systems. The contractor shall demonstrate the equipment and special systems to school personnel, and instruct personnel in operation and maintenance.
- B. Refer to Division 1, Section 01650 - Commissioning and Section 16303 - Electric Utility Commissioning.

## **1.6 Identification**

- A. All switching, protective devices, and metering on main distribution switchboards shall be identified with black-white-black laminated 1/8 inch thick plastic plates. Plastic plates shall be attached to the equipment with screws, rivets or appropriate adhesives.
- B. Identification plates are required for all electrical distribution equipment from the service through branch circuit panelboards and motor control centers. Labels shall identify the equipment designation, operating voltage, and the source supplying the equipment.
- C. The A/E shall specify numbering and wording of identification plates.
- D. Motor and associated equipment numbers shall be the same.

## **1.7 Electrical Equipment Locations**

- A. PROHIBITED: Installing electrical distribution equipment in stairwells, corridors or other occupied space of a building.
- B. PROHIBITED: Locating plumbing facilities above the electric vault or switchboard room.
- C. Locate electrical distribution equipment in dedicated electrical closets, electrical rooms or mechanical equipment rooms.
- D. Exclude piping, ductwork and other systems that are not compatible with the electrical installation from the entire interior of electrical closets and electrical rooms.
- E. Equipment and raceways in such rooms shall be mounted or suspended in a manner that will prevent excessive noise and vibrations in adjacent spaces.
- F. Exclude raceways and electrical equipment from ducts, plenums, areaways and tunnels unless required by their function to be located there.

## **1.8 Special Building Requirements**

- A. The design for buildings that house sensitive equipment shall clearly address the power quality requirements for the equipment.

# **PART 2: BASIC ELECTRICAL MATERIALS AND METHODS**

**PROHIBITED:** Direct-buried conductor systems for underground wiring.

**PROHIBITED:** Lead, fiber or wood anchors that support raceways or equipment.

## **2.1 Basic Minimum Requirements**

- A. Electrical work in architecturally finished spaces shall be concealed or installed in approved surface raceway systems where concealment is not possible.
- B. Provide nominal 4 inch high concrete housekeeping pads for floor mounted equipment. Pads shall extend two inches to four inches horizontally beyond equipment.

## **2.2 Cleaning**

- A. Require exterior and interior surfaces of electrical equipment enclosures be wiped or cleaned with a vacuum two weeks before scheduled use, and again immediately prior to final completion.

- B. Accessible elements of disconnecting and protective equipment items shall be cleaned with a vacuum before energizing.
- C. Scratches on painted surfaces shall be touched up with paint of equivalent quality and matching color.

### 2.3 Fire-stopping

- A. Identify and provide installation practices for fire-stopping materials associated with the construction materials. Include details of fire-stop systems. List specific UL or other approved test assembly numbers.
- B. Use removable fire-stopping pillows for cable tray penetration fire-stop.

## PART 3: GROUNDING AND BONDING

### 3.1 General

- A. Grounding systems shall not be specified solely by conformance with the NEC. The systems shall be fully designed, specified and shown on the drawings. Include a one-line diagram of the facility grounding system on the drawings.
- B. Specify types of attachment or connection such as cable to cable, flat metal, pipes, conduits, and to boxes or enclosures.
- C. The design shall ensure adequate grounding of generator neutrals, shielded isolation transformers, and regulation transformers as required for separately derived systems.
- D. All grounding system components shall be copper. All connections shall be UL listed and exothermic welded or use compression connectors qualified to IEEE Standard 837. Standard mechanical connectors shall not be used.
- E. Provide an exposed ground bus with minimum dimensions of six feet long by four inches wide by ¼-inch thick. Mount the bus on standoff insulators 18 inches above the floor of the electrical equipment room with a direct tap connection from the ground grid. This tap provides ground connection for separately derived systems and miscellaneous equipment.
- F. Inspect the completed ground grid system prior to back filling and testing ground resistance as noted on the specifications. Inspection also should be done prior to connecting the ground grid system to existing ground systems or grounded piping systems.
- G. Surface raceway systems shall incorporate a separate grounding conductor, integrally connected to all devices, the raceway and building ground system.

## PART 4: WIRES AND CABLES

**PROHIBITED:** Aluminum [branch circuit](#) wires.

### 4.1 General

- A. The minimum size of conductors for lighting and power circuits is No.12 AWG.
- B. Wires shall not be drawn into conduit until plastering and tile work are complete and conduit has been thoroughly swabbed out.
- C. Any conductors installed in flexible conduit at terminal connections of rotating, vibrating or moveable equipment shall be of stranded wire.
- D. 600-volt conductor insulation shall be rated 75 degrees C minimum temperature rating.
- E. Neutral conductor capacity shall be increased as necessary for harmonics.
- F. Low voltage wiring may be run above ceilings provided.
  - 1. It is supported per NEC.
  - 2. It is plenum rated.
  - 3. It is bundled with wires from the same system.
  - 4. It is run in cable tray where possible.
- G. [All control wiring shall be stranded.](#)
- H. [Allow Aluminum Feeders 200 amps and larger.](#)

- I. Allow Aluminum service entrance conductors.
- J. Mechanical compression-type connectors shall be used on all aluminum conductors. Connectors shall be used with a tool designed for the purpose by the manufacturer of the connector.
- K. Where Aluminum conductors are being substituted for copper conductors voltage drop and total ampacity shall be reconfirmed.

## **PART 5: RACEWAYS**

### **5.1 Minimum sizes**

- A. The minimum size conduit for line voltage shall be 3/4 inch.
- B. The minimum size conduit for communication, low voltage and voice data shall be one inch.

### **5.2 Rigid Non-metallic Conduit**

- A. Rigid non-metallic raceways may be used below grade, embedded in concrete, and for special service applications such as corrosive locations. Non-metallic raceways shall not be used inside of buildings unless specifically permitted elsewhere in the Standard.
- B. Specify that steel elbows are to be used with non-metallic conduits. PVC covered steel elbows shall be used in buried PVC conduit runs.
- C. Specifications shall state to use primer/cleaner for gluing joints.

### **5.3 Flexible Metal Conduit**

- A. Use of flexible conduit shall be limited to recess lighting luminaries, motors and equipment.
- B. All metal conduit fittings shall be galvanized steel or malleable iron.

### **5.4 Conduit Fasteners**

- A. Straps, hangers and other hardware shall be compatible with the atmosphere of the area in which they are installed.

### **5.5 Underground Raceways**

- A. Install underground raceways in excavated trenches with proper bedding and backfill. Detail these requirements on drawings.
- B. To prevent corrosion, protect direct-buried conduits with a tape-wrap material or non-metallic conduits.
- C. To locate concealed utilities in the future, install wiring for street lighting services within 24 inches of inner curb lines. Install wiring for site lighting within six inches of walkways.
- D. Conduit can be routed parallel to but not under walkways and/or driveways, unless perpendicular crossing. Where necessary, protect the conduit against soil movement.
- E. Outdoor conduit lighting shall be sized one inch or larger.

### **5.6 Corrosion Protection**

- A. Specify the protection requirements for electrical systems exposed to corrosive atmospheric conditions.

### **5.7 Empty Conduit**

- A. Empty conduits shall have nylon pull cord installed with temporary caps and/or plugs.

## **Part 6: BOXES**

### **6.1 General Requirements**

- A. Surface boxes used on or in exterior building surfaces, or on the site, shall be rated for outdoor use and in

use weather-tight covers.

## 6.2 Installation

- A. Provide tile rings over outlet boxes in glazed tile walls and wood paneling.
- B. To reduce sound transmission, wall outlet boxes shall not be installed back-to-back in partitions.
- C. Mount boxes that are installed in concrete block walls at the block joint.

# PART 7: WIRING DEVICES

## 7.1 General Requirements

- A. Minimum quality for devices shall be specification grade.
- B. Receptacles and switches shall be side and back wiring type. Any wire connection shall be screw-clamp type.
- C. Recommended mounting heights above the floor for devices:
  - 1. Nominal 18 inches for electrical and communication/data outlets.
  - 2. Nominal 42 inches for light switches and wall phone outlets.
- D. Receptacles must be provided on the ground floor of all stairwells and in elevator lobby banks.
- E. Provide light and duplex GFCI receptacle mounted 42 inches above each floor in all pipe spaces, pipe shafts, attic space, tunnels and mechanical equipment space so equipment can be easily repaired.

## 7.2 Device Color

- A. General purpose wiring devices shall be [gray \(receptacles and switches\)](#).
- B. Receptacles on emergency power circuits shall be red.

## 7.3 Receptacles

- A. General-purpose receptacles shall be rated 20 amps.
- B. All pieces of mechanical equipment shall have a duplex receptacle within 20 feet for service. The distance shall be measured as an extension cord would be run.

## 7.4 Switches

- A. Toggle and key type wall switches for lighting loads shall be AC, quiet type, rated 20 amps at 120/277 volts.

## 7.5 Floor Maintenance Equipment Receptacles

- A. For corridors, large assembly areas and other areas where floor maintenance equipment is used, locate receptacles so that a 45-foot cord will reach any part of the floor. Each receptacle location shall have a duplex, 120V, 20 amp outlet. Receptacles shall be hospital grade. On each floor, these receptacles shall be served with #10 AWG circuits from a panel on the same floor.
- B. Provide at least one duplex receptacle in each room where floor maintenance equipment is needed and receptacles are not otherwise available for floor maintenance.

## 7.6 Wall Plates

- A. Wall plates shall be satin finish stainless steel. No. 430 magnetic stainless steel in non-corrosive locations and No. 302 non-magnetic type stainless steel in corrosive locations such as pools and laboratories.
- B. Identify special purpose receptacles such as emergency power and isolated ground by engraved and filled lettering on the wall plate.

## 7.7 Identification

- A. All devices shall be labeled with their panel and circuit number with clear tape similar to “Kroy”.

## **PART 8: MOTORS**

### **8.1 General Requirements**

- A. Coordinate mechanical and electrical specifications so that the responsibility for wiring of equipment, motors and controls is clear and not duplicated.
- B. With the exception of portable maintenance equipment, motors more than 1/3 horsepower shall be of three-phase design.
- C. Provide phase loss protection for motors per industry standards.
- D. Specify inverter duty motors for VFD applications. Specifications shall clearly assign responsibility for VFD and motor compatibility to the contractor or specific equipment supplier. If VFDs using IGBT output devices or high carrier frequency are permitted by specifications, address requirements for motor over-voltage and surge protection in the design. Provide auxiliary switch in any load side disconnect and interlock with VFD.

## **PART 9: GENERATOR ASSEMBLIES**

### **9.1 Basic Minimum Requirements**

- A. Consult with Project Management to determine whether provisions for peak shaving shall be included in the generator system design. Provisions for peak shaving include:
  - 1. Noise and vibration control measures.
  - 2. Load and transfer equipment compatible with the normal operation of the connected load.
  - 3. Electronic ignition for generators greater than 1,000 kW.
  - 4. Exhaust evaluation for compliance with Ambient Air Quality Standards (AAQS).
  - 5. Emissions control options and costs for stack discharges that cannot model in compliance with AAQS if applicable.
- B. All generator sets shall be located to disperse exhaust fumes and noise without affecting the normal functions of the building and surrounding site. Specify a method of damping vibrations to acceptable levels. Ensure that exhaust will not be re-entrained by nearby air intakes, including adjacent buildings. Confirm with DEHS that exhaust models are in compliance with ambient air quality standards before determining final design. In general, exhaust stacks must be located approximately 10 feet above the highest roofline to disperse the exhaust and avoid building downwash, which can cause ambient air quality problems. The ambient air quality standards are listed in Minnesota Rules 7009. DEHS shall provide modeling for compliance with ambient air quality standards. Refer to Division 1 - Program Information/General Requirements, Basic Design Requirements 3, Permits.
- C. Fuel source shall be natural gas.
- D. Refer to Division 15 - Mechanical for requirements for ductwork, piping and exhaust flues.
- E. Provide contacts for remote indication of generator status, alarm and shutdown, and battery charger alarm.
- F. Voltage and frequency steady state regulation, electronic speed regulation and transient performance shall be specified for all classes of load and load application and rejection.
- G. When installed outside provide a weatherproof sound attenuating enclosure.

### **9.2 Automatic Transfer Equipment**

- A. Provide a minimum of two sets of auxiliary form C contacts for normal and emergency transfer switch positions.
- B. Provide 250 degree or digital, 2.0 percent accuracy, switchboard-type indicating ammeter, phase selector switch and current transformers for the load side feeder from each automatic transfer switch.
- C. The building program requirements will determine whether integral bypass/isolation capability is required.

### **9.3 Loads to be Served**

- A. The loads to be served are broken into Code required emergency power, i.e. egress lighting and fire alarm.

These shall be connected to a separate automatic transfer switch and distribution system.

- B. The following loads on the generator shall be connected to a second automatic transfer switch and distribution system for non required standby power.
  - 1. The phone system and related technologies including cooling for the head end equipment.
  - 2. The PA system
  - 3. Lighting in the main office.
  - 4. Minimal receptacles in main office to allow at least one computer, monitor and printer.
  - 5. Lighting in public restrooms.
  - 6. Lighting and at least one receptacle in the boiler room.
  - 7. Lighting and at least one receptacle in the generator room.
  - 8. Lighting and at least one receptacle in the electrical service room.
  - 9. Minimal lighting in the gym to allow assembly functions.

## **PART 10: VARIABLE FREQUENCY CONTROLLER (VFD)**

### **10.1 General Requirements**

- A. The VFD's shall be manufactured by ABB, Square D, Cutler Hammer or Johnson Controls. The design shall address the effects of VFD input current harmonics on the distribution system. Specify harmonic criteria and require field testing of harmonic performance when appropriate. Minimum level of performance shall be compliant with IEEE 519 criteria for a general distribution system, modified as appropriate for the specific project.
  - 1. Incorporate DC line reactor to reduce input harmonics.
  - 2. Incorporate fused disconnects.
  - 3. No bypass.
- B. Where specifications permit high-carrier frequency or IGBT output devices, address requirements for motor over-voltage surge protection as part of the design.
- C. All drives shall be furnished by mechanical contractor.
- D. Specify the following VFD performance and features:
  - 1. Automatic extended power dip ride-through of control circuits with auto restart.
  - 2. Operation not affected by harmonic distortion or notching of the input voltage.
  - 3. Minimum efficiency at full load: 95 percent.
  - 4. Minimum displacement PF at full load: 95 percent.
  - 5. Overload capability: 110 percent for variable torque application, 140 percent for constant torque application.
  - 6. Carrier frequencies (in excess of 3,000 Hz) shall be adjustable.
  - 7. DC line reactor to reduce input harmonics.
  - 8. Automatic restart and ability to start into rotating motor.
  - 9. Separate acceleration and deceleration rates available.
  - 10. Ability to operate with motor disconnected for troubleshooting and maintenance.
  - 11. Minimum of five critical frequency lockout ranges.
  - 12. Minimum of two programmable digital contact outputs for status and VFD failure.
  - 13. Minimum of two programmable digital inputs for preset speed selection.
  - 14. Integral closed-loop PID controller.
  - 15. English language display: Alphanumeric codes not acceptable.
  - 16. RS485 serial communication port programmed to interface to DDC system.
  - 17. Field wiring terminal boards (identified on the drawings) for all customer connections.
  - 18. Manual speed control potentiometer and Hand/Off/Auto switch.
  - 19. 24-month factory warranty.
- E. Include requirements for factory-certified field services for startup and training in the specifications.

## **PART 11: TRANSIENT VOLTAGE SURGE SUPPRESSION**

### **11.1 General Requirements**



- A. Standard practice is to provide utility grade electric power. The designer shall review options with the user to determine specific needs. As a general practice, suppression should be as close to the application as possible. Since transients and frequencies of different magnitudes can originate anywhere on a system, suppression at a service or circuit breaker panelboard may not provide the level of protection anticipated. Conversely, point of use devices could cause operation and maintenance problems. Specify that TVSS systems carry certified testing laboratory labels for the application.

## **PART 12: SERVICE AND DISTRIBUTION (600 VOLT AND BELOW)**

### **12.1 General Requirements**

- A. Secondary service and distribution shall be of adequate size to provide for 20% load growth during the life of the building. Consider the facility type and use to determine needed capacity in excess of the initial demand plus 20%.
- B. Identify the reserve capacity provided in the design.

## **PART 13: SAFETY SWITCHES AND CIRCUIT BREAKERS**

### **13.1 General Requirements**

- A. Safety switches shall be heavy duty.
- B. To remove or repair equipment and provide an immediate and observable point of electrical disconnect, locate a disconnect switch near each piece of fixed electrical equipment.

## **PART 14: ENCLOSED CONTROLLERS**

### **14.1 General Requirements**

- A. Clearly indicate on the construction documents who is responsible for supplying motor control equipment.
- B. Motor Control:
  - 1. In areas where there are a reasonable number of three-phase motors, provide a motor-control center.
  - 2. Brace the MCC bus work and cabling to withstand the available short-circuit current. Specify values.
  - 3. Starters shall have fusible disconnects rather than circuit breakers or MCPs.
  - 4. Motor controllers shall be NEMA-rated.
  - 5. Control circuit voltage shall be 120 volt or less.
  - 6. Each motor starter shall have its own control power source within reason. Control circuit voltage shall be 120 volts or less.
  - 7. Duplex Pumps: Each unit shall be labeled and have its own on/off control. Incorporate an alternator, software or mechanical that allows it to stop and automatically restart via the building automation system. Provide an auto-backup feature.
  - 8. Specify hand/off/automatic control for fan motors.
  - 9. Incorporate a minimum of two auxiliary contacts (one N.O. and one N.C.) in magnetic starters in addition to what is being used.
  - 10. Include a schedule for the motor control center on the electrical drawings.
  - 11. Design each motor control center section so starter units may be rearranged, removed or added after installation.

## **PART 15: DISTRIBUTION SWITCHBOARDS**

### **15.1 General Requirements**

- A. Each new building shall have a distribution switchboard.

## 15.2 Construction

- A. Specify copper or plated Aluminum phase, neutral and ground buses.
- B. The phase arrangement on three-phase buses shall be A-B-C from left to right, top to bottom, front to back, as viewed from the front of the switchboard.
- C. Specify provisions for future circuits. Provide provisions for future increases in electrical requirements. To increase flexibility, provide 20% usable space in lieu of spare devices.
- E. Include continuous ground bus the full length and height of the switchboard that is equipped with bolted pressure clamp-type lugs.
- F. The design shall include provisions for extension of main bus in the future.

## 15.3 Wiring

- A. Group together, laced or tie wrap meter and control wiring from measuring device to indicating unit. Identify wire terminals and terminations on both ends.

## 15.4 Identification

- A. Identify switchboards and distribution boards on the drawings. Indicate on the drawings the main service transformer feeding each board.
- B. Identify which circuit is served for the circuit protective devices, circuit controlling devices and meters on switchboards and distribution boards.

# PART 16: PANELBOARDS AND CABINETS

## 16.1 General Requirements

- A. To accommodate additional wiring in the future, provide spare conduit stubs from flush panels into suspended ceiling space or other accessible space. Determine the quantity by the spare circuits and space available in the panel.

## 16.2 Panelboard Construction

- A. Rough-in boxes shall have a minimum width of 20 inches and a minimum depth of 5-3/4 inches.
- B. Phase, neutral and ground bus shall be copper or plated aluminum.
- C. Use flat oval head truss-head screws in tapped holes in rough-in box flanges to install cabinet door trim. Drill flanges on the job to ensure plumb, square and true trim appearance.
- D. Provide hinged trim with full-length piano-type hinges for panelboards. Provide a latch, lock and key set at the door covering the circuit protective devices.
- E. Circuit breakers shall be bolt on type.
- F. All panelboards shall be 42 Pole with a minimum of 12 spare 20/1 circuit breakers.
- G. All shops and kitchens shall have a minimum of 20 spare circuits (If one panel then it shall have 20 spares, if two panels are in the space then they shall each have 12 spares for a total of 24 spares).
- H. Size for 20% future additions, size for 20% load growth during life of building.
- I. Identify future growth in documents.
- J. Provide typewritten schedules and provide word document to owner.
- K. Provide all labels based upon owners actual room numbers not plans.

## 16.3 Identification

- A. Furnish each electrical panel with a clear, plastic-covered, typed-circuit schedule mounted in a metal cardholder. The schedule shall identify circuits by room number using final numbers that the owner furnishes. Verify room numbers with the Architect.
- B. Provide a number designation on each circuit protective device. Odd numbers shall be used in sequence down the left side and even numbers in sequence down the right side.



- C. Provide cross breaker connectors and bus for breakers in the future. Indicate the designated space in panelboard schedules for panelboards to accept maximum capacity.
- D. Identify the panelboard ID and power origin on each panelboard on the outside or inside door.

## **16.4 Schedules**

- A. Show the schedule for panelboards and cabinets on the drawings, preferably on the same sheet as the power riser diagram. Include the following information as a minimum:
  - 1. Voltage, phase and wire.
  - 2. Main bus rating.
  - 3. Main breaker rating.
  - 4. Short circuit rating.
  - 5. Circuit numbers.
  - 6. Branch breaker current rating and number of poles.
  - 7. Load description.
  - 8. Connected loads.

## **PART 17: LOW VOLTAGE TRANSFORMERS (600V OR LESS)**

### **17.1 General Requirements**

- A. Locate distribution, buck/boost, signaling, isolation, control and autotransformers in accessible, ventilated, cool, dry and clean areas.
- B. Where these conditions cannot be provided, specify transformers that are suitable for the environment.
- C. Transformers shall be based on Powersmith.

### **17.2 Efficiency and Temperature Rise**

- A. Transformers for all buildings shall comply with the Minnesota Energy Code, minimum efficiencies or K-rated as required for the project.

### **17.3 Sound Levels**

- A. Sound levels of transformers shall be consistent with the use of the building areas adjacent to the transformer. Sound levels shall not exceed ANSI standards. In areas of very low ambient noise level such as libraries and reading rooms, use transformers with lower sound levels.

## **PART 18: OVERCURRENT PROTECTIVE DEVICES**

**PROHIBITED:** Tandem branch circuit breakers.

### **18.1 General Requirements**

- A. The design engineer shall conduct studies on short circuit and coordination to determine protective device ratings and requirements. The design engineer shall not assign this responsibility to the contractor.

### **18.2 Fuses**

- A. Specify each size and type of fuse required.
- B. Specify rejection type fuse holders where current-limiting fuses are used.

### **18.3 Bolted Pressure Switches**

- A. Fused switches that are 800 amps and larger, and mounted on panels and switchboards shall be UL-approved, of bolted-pressure type and have a 600-volt rating.

## **18.4 Circuit Breakers**

- A. Circuit breakers on branch circuit panelboard shall be bolt-on type or secured by a bolt(s).

## **18.5 Fused Switches**

- A. Fused switch circuit protective devices shall be heavy-duty rated.

# **Part 19: LIGHTING**

## **19.1 General Requirements**

- A. Provide aiming diagrams for luminaries, and require that the contractor aim the luminaries. The A/E shall witness the aiming.
- B. Show and identify lighting luminaries on the electrical drawings.
- C. All Mechanical equipment shall have permanent lighting for service.

## **19.2 Exit Signage**

- A. Light Emitting Diode (LED), high-intensity type lamps shall illuminate exit signage with battery back-up if not on a generator life safety circuit.

# **PART 20: INDOOR LUMINARIES**

## **20.1 General Requirements**

- A. Include a separate switchboard corridor night light system in the design.

## **20.2 Lighting Criteria**

- A. Determine foot-candle levels per the latest IES recommendations.

## **20.3 Fixture Lenses**

- A. Metal halide luminaries shall have tempered glass or high-impact safety lenses.

## **20.4 Fixture Mounting**

- A. Provide details of supports for lighting luminaries on the drawing.

## **20.5 Lighting Control**

- A. The lighting control shall be by Programmable Logic Controllers (PLC). Provide three-way and four-way controls in long corridors, gymnasiums, auditoriums and other vast areas.
- B. The designer shall review and determine how many automatic controls for lighting are needed based upon the amount of natural daylight.
  - 1. Allow fluorescent luminaries to be switched from inboard to outboard and vice versa in private offices, classrooms, laboratories and conference rooms.
  - 2. Mount occupancy sensors on the ceiling, and integrate them in the control schemes of classrooms, restrooms and office areas that have many occupants. Use sensors with combined ultrasonic/infrared technology, and are provided with an integral manual over-ride switch.
  - 3. Connect the lighting control for each space through the building automation system with a timed override in each space.

# **PART 21: EXTERIOR LUMINARIES**

## **21.1 General Requirements**

- A. General area and security lighting shall be high-pressure sodium. Perimeter lights shall be on from dusk to dawn. All wall mounted fixtures shall be no higher than 18 feet above grade.
- B. Lighting in parking lots shall also be high-pressure sodium. Parking lot lights shall be controlled via the building automation system.
- C. Determine foot-candle levels per the latest IES recommendations.

## **21.2 Poles and Standards**

- A. Describe poles in the fixture schedule. Provide complete details for bases on the electrical drawings. Anchor bolts shall be galvanized.
- B. Include required grounding. Provide a copper grounding rod or equivalent as part of the pole base.
- C. Provide in-line fuses that are readily accessible via hand holes in the base of the pole.
- D. Verify fixture and standard placement and style with the owner's representative. Poles shall be a minimum of 5 feet from roadways.

# **PART 22: LAMPS**

**PROHIBITED:** Incandescent lamps for general lighting.

**PROHIBITED:** Low-pressure sodium lamps for safety and disposal waste.

**PROHIBITED:** Mercury-vapor lamps due to low efficacy.

**PROHIBITED:** Fluorescent T12 lamps.

## **22.1 Lamp Types**

- A. Lamps shall have a correlated color temperature of 4100 K.
- B. To prevent a hazardous failure mode where metal halide lamps are used, make provisions for switching off luminaires a minimum of 15 minutes per week.
- C. Classrooms, offices, corridors, storage rooms, and similar spaces shall be illuminated with 32 watt T8 fluorescent.
- D. Gyms and pools shall be illuminated with high bay fluorescent T5 HO lamps.

# **PART 23: BALLASTS**

## **23.1 General Requirements**

- A. Provide ETL certified ballasts that conform to applicable CBM certification.
- B. Ballasts shall comply with FCC and NEMA limits for Electromagnetic Interference (EMI) and Radio Frequency Interference (RFI). They also shall not interfere with the operation of other building equipment.

## **23.2 Fluorescent Ballasts**

- A. Fluorescent ballasts shall be efficient solid-state electronic ballasts with an A sound rating, and a true power factor of .90 or greater with 20 percent or less total harmonic distortion.
- B. Fluorescent ballasts for outside applications or in areas where ambient temperature is lower than 50 degrees F shall have a minimum starting temperature of -20 degrees F.

## **23.3 HID Ballasts**

- A. Specify high power factor regulator type HID ballasts that have a minimum power factor of 90 percent over the life of the lamp. Also specify that the ballasts provide less than one percent variation of lamp wattage per percent of line voltage variation.
- B. HID ballasts for outside applications shall have a minimum starting temperature of -40 degrees F.

## **23.4 Remote Ballasts**

- A. Luminaries mounted in areas that are difficult to access shall have remote ballasts.
- B. Remote mounted ballasts shall be located in an accessible, cool, dry location with adequate ventilation. Each ballast shall be labeled to correspond to its fixture location.

## **23.5 Removal and Disposal of PCB Ballasts**

- A. The designer shall consult with the Department of Environmental Health and Safety (DEHS) for requirements on handling and disposing PCB ballasts.
- B. Remove and dispose of ballasts that contain PCB per EPA requirements.
- C. The contractor shall examine existing ballasts that are to be removed from service. If a ballast does not clearly indicate that it does not contain PCB, it shall be assumed to contain PCB.
- D. DEHS shall provide a ballast collection container at or near the project site. Ballasts that contain PCB shall be placed in the ballast collection container as they are removed. The owner shall dispose of the container and its contents.

# **PART 24: EMERGENCY LIGHT AND POWER**

## **24.1 General Requirements**

- A. Exit and emergency lighting shall be with an emergency generator, connected through a separate life safety transfer switch. If no generator is present then provide battery packs to light to the public way.
- B. See Part 9 Generator Assemblies for additional information.

# **PART 25: LIGHTNING PROTECTION SYSTEMS**

## **25.1 General Requirements**

- A. The A/E shall consider the building design, site elevations, and other site conditions and make recommendations to the merits of providing a lightning protection system.
- B. If installed, lightning protection systems shall carry the Master Label as defined by the Underwriters' Laboratory.

# **PART 26: FIRE ALARM SYSTEMS**

## **26.1 General Requirements**

- A. The fire alarm system shall be a fully intelligent addressable system by Simplex or Edwards.
- B. Fire alarm signal systems shall meet the design requirements of the latest applicable codes.

## **26.2 Submittals**

- A. Submit the fire alarm shop drawings in accordance with Division 1, Section 01300, Submittals. Include a riser diagram, sequence of operation, wire size and type, battery calculations, voltage drop calculations, a floor plan that shows all the devices, data sheets for the devices and copies of fire alarm specifications as required by applicable state codes.
- B. The contractor shall provide record documents of the fire alarm installation to the owner. The documents shall include all shop drawing information, the device-to-device wiring scheme, a revised floor plan showing any devices added or relocated during the construction project, final sequence of operations, final voltage drop calculations and an owner's manual regarding required maintenance and testing.

### 26.3 Operational Plan and Test

- A. Confirm with the owner's representative if the fire alarm and the interface to related systems will be commissioned.
- B. The A/E is to commission the system.
  - 1. Within the project manual, the A/E shall include a test manual for the specific testing requirements for the fire alarm and related systems.
    - a. The test manual shall include test procedures to verify that the fire/life safety interface is operating correctly for the following systems:
      - 1) Door Closures.
      - 2) Elevators.
      - 3) Fire Alarm System and Devices (test every device).
      - 4) HVAC Systems.
      - 5) Smoke/Fire Damper Activation and Reset.
      - 6) Sprinkler Flow and Tamper Switches.
    - b. Each test procedure shall include a detailed description of the following items:
      - 1) Recording format.
      - 2) Sequence of operations for control functions of the fire alarm system.
      - 3) Test equipment required.
      - 4) Test participants.
- C. The following parties shall sign off with date, indicating the system performed according to the required sequence of operations:

Fire Alarm Vendor _____	Date _____
Electrical Contractor _____	Date _____
Fire Protection Contractor _____	Date _____
Mechanical Contractor _____	Date _____
A/E _____	Date _____
- D. The final acceptance test shall be conducted in the presence of the Building Code Division Fire Inspector, Facilities Management operations representative and the A/E. A typed NFPA 72 Certificate of Completion shall document the installation and acceptance test.
- E. The A/E shall specify that the acceptance of the fire protection system be based upon completion of the necessary testing as outlined in the state and national fire codes. All testing must be documented on certificate forms. The fire protection contractor is responsible for maintaining the equipment in service after the acceptance test, as well as minimizing impairments to the system for the remainder of the project. During remodeling or after Certificate of Occupancy or substantial completion, coordinate impairments with the owner's representative.

### 26.4 Material

- A. All fire alarm equipment shall be UL listed.
- B. Fire alarm systems shall be the addressable type. If the system has more than 10 smoke detectors, they shall be analog addressable type and have alarm verification set at 60 seconds.
- C. All devices associated with the fire alarm system shall operate through the fire alarm main panel instead of as independent systems tied into the building fire alarm system. Examples include special releasing device controls and pre-action systems.
  - 1. Other independent fire alarm/control systems shall report via the building fire alarm system with three common points: Alarm, supervisory and trouble.
- D. The fire alarm system shall have 24 hours of battery capacity even with generator backup.
- E. The fire alarm control panel shall have three Form C contacts: Trouble, supervisory and alarm to report any alarm condition.
- F. The minimum size conductor for door holder circuits, horn and strobe circuits shall be 14 AWG. Provide raceways or cable tray for fire alarm wiring to minimize costs over the operating life of the building. Paint raceway junction box covers red for identification.

## **26.5 Execution**

- A. Water flow detection devices shall have one device per address.
- B. In buildings with all sprinklers, specify the minimum number of manual pull stations (usually two) to comply with code.
- C. Tamper supervision devices shall be within reasonable proximity for grouping.
- D. Each control relay operated by the fire alarm system shall be supervised and within three feet of the device operated, in addition to being numbered and labeled.
- E. Locate the fire alarm main control panel for a building in a non-public area. Locate an annunciator at the fire department entrance to the building.
- F. Specify mounting height for devices to comply with ADA and NFPA requirements.
- G. The Contractor shall program the fire alarm control system.
- H. Organize alarm and notification circuits by floor or area to accommodate troubleshooting.
- I. Do not load signaling line circuits with greater than 75 percent of capacity. The panel shall have one spare signaling line circuit or capacity for 50 additional initiating devices.
- J. Notification appliance circuits shall be designed with a minimum of 20 percent spare capacity. System performance shall include the capability to silence audible appliances without affecting visual appliance operation. It shall be either two, 2-wire systems or a 2-wire addressable system.
- E. All circuits shall be Class B. Locate the end of line resistor at the last device of the circuit, and identify it on the drawings and in the field. Limit circuits to one floor or major area. Label terminal strips. Provide terminal boards in control panels.
- F. Use door hold open circuits from fire alarm panel in lieu of auxiliary contacts in the detector base.
- G. Concealed initiating devices such as duct smoke detectors and tamper switches shall have remote alarm indicators that identify the location of the devices. Locate remote indicators in public spaces such as corridors. Duct smoke detectors shall have remote indicators with test stations.
- H. A weatherproof exterior horn/strobe shall be mounted above the sprinkler system fire department connection, and be powered by a notification appliance circuit. Wall mounted horns and strobes shall be a maximum of 18' above grade.
- I. Provide an electrical service outlet within 10 feet of the fire alarm control panel.
- J. Provide adequate lighting around area where fire alarm is serviced. K. Paint fire alarm junction box covers red.
- L. Document the fire alarm address for each device, along with wire and cable identification numbers, on record drawings.

## **PART 27: TELECOMMUNICATION SYSTEMS**

### **27.1 Centrally Managed and Hardwired Card Access Control Systems**

- A. The card access system will interface with the district wide software.
- B. Coordinate with building managers as the number and location of doors that require card reader access, door alarms, and timed delay egress.
- C. Provide video intercom between the receiving door and the main office.

### **27.2 Public Address Systems**

- A. Provide a public address system for general paging, with speakers in each class room. Calls to the office and calls to a specific room will be over the VOIP phone system.
- B. Equipment shall be of solid-state type. Locate head end equipment in a lockable, controlled area.
- C. Public address system shall be based on Bogen with up to eight zones (dependent on site and determined by discussion with owner). Zone suggestions include all call, outside, cafeteria/kitchen, gym, corridors/hallways/common areas, classrooms (all), individual classrooms, media center/library, maintenance areas.
  - 1. Class change bells through Bogen system.

## 27.3 Television

- A. Provide a CAT 6a data drop for television from the server room.

## 27.4 Clock System

### A. SYSTEM DESCRIPTION

1. Furnish and install a complete new network wireless clock system with internal transmitter, relay tone generator, and battery operated clocks.
2. The system shall synchronize all clocks to each other. The system shall utilize GPS technology to provide automatic time. The system shall not require hard wiring. Clock shall adjust automatically for Daylight Savings Time.
3. Analog clocks shall be synchronized to within 10 milliseconds 6 times per day, and the system shall have an internal oscillator that maintains plus or minus one second per day between synchronizations, so the clocks accuracy shall not exceed plus or minus 0.2 seconds.
4. The system shall include an internal clock reference so that failure of the network signal shall not cause the clocks to fail in indicating time.
5. The system shall incorporate a "fail-safe" design so that failure of any component shall not cause failure of the system. Upon restoration of power or repair of failed component, the system shall resume normal operation without the need to reset the system or any component thereof.
6. Clock locations shall be as indicated, and clocks shall be fully portable, capable of being relocated at any time.
7. The system must operate in accordance with a "Radio Station Authorization", Form FCC 601 - LM, granted by the Federal Communications Commission (FCC). This license will be issued to and held by the end user.
8. Provide a new dedicated lap-top computer for use in programming the clock system

### B. COMPONENTS

1. Transmitter: Basis of design Primex Model 14000 internal antenna.
  - a. 1 watt transmission (at transmitter)
  - b. 72 MHz frequency range
  - c. Number of channels: 16
  - d. Daylight savings time bypass switch
  - e. Time zone adjustment switch
  - f. LCD display for time, date, and signal verification
  - g. Power Supply:
    1. Input: 120V, 60Hz, 0.4 Amp
    2. Output: 9VDC, 2.0 Amp (6 foot cord)
  - h. Cabling: 100 feet between transmitter and antenna
  - i. FCC Part 90 accepted
  - j. IC RSS-119 accepted
  - k. Network plug in.
2. Relay tone generator: For connection to paging system. Relay shall connect to the system network. Bell tones shall be programmed by the Owners central network system.
3. Clocks: 12" round with durable polycarbonate frames and lenses in standard areas, 16" in gyms and cafeterias.
  - a. Standard color by Owner.
  - b. Face to have custom "Duluth School" graphic face.
  - c. Battery: Dual D-Cell Lithium Battery Pack with 5 year life.
  - d. Provide 16" clocks in gymnasiums, cafeterias, lectures halls, and other large shared spaces.

- C. Clock system shall be Primax [www.primexwireless.com](http://www.primexwireless.com), No Substitutes.

## 27.5 Security System (Intrusion)

- A. Provide a security system to monitor all doors.
- B. Provide motion detectors in corridors and all rooms with windows on grade level.



## **27.6 Closed Circuit Television (CCTV)**

- A. Closed Circuit Television (CCTV) cameras are to cover the entrances and the main corridor intersections. Cameras will also be placed on the exterior of the building covering the entrances, parking lot and areas of concern for security.
- B. The cameras shall be internet protocol (IP) style, cameras connected to a digital video recorder (DVR)/multiplexer with CAT 6a cable.
- C. The camera system shall be connected to the District's server with software upgrades.

## **27.7 Door Access Control – P2000**

- A. Access Control shall be provided on all public accessible doors that provide a means to the building exterior. The District will provide input regarding door function and number of credential operated doors.
- B. The District has incorporated and purchased JCI P2000 software that is serving control functions District Wide. Each site will have to tie in and function with existing buildings and software.

## **27.8 Gym Sound Systems**

- A. Gym Sound Systems in elementary schools are to be intended for teaching and general use, not for performance oriented programs. Gym sound systems in middle and high schools must have the additional capability to function for athletic events and school performances.
- B. General elements in sound systems to include: Speakers to provide general coverage (8 to 12 per court), minimal control exposed to unauthorized personnel, remote master volume control located in the gym area, two wireless microphone systems, one handheld system and one system with Headset/body pack transmitter and Handheld transmitter, CD Player, line input (Ipod), feedback suppression, two wired microphone inputs, opposite ends of gym, one wired microphone.



# TELECOMMUNICATIONS CABLING and CLASSROOM PRESENTATION SYSTEMS STANDARDS

## Foreword

This document has been developed to create District standards for the design of voice, data, TV distribution, classroom sound amplification and interactive whiteboard systems for the Duluth Public Schools. This document is to be used in conjunction with industry standards and in compliance with all federal, state and local codes. The goal of this document is to adapt the industry standards to meet the technology needs of the District.

## Part 1: INTRODUCTION

### 1.1 About this Manual

- A. This manual contains the Telecommunications Standards for use by those who are involved in telecommunications projects for the Duluth Public Schools. This manual shall be used as a guide for projects providing telecommunications infrastructure and cabling, including inside plant cable, wireless networks, broadband TV distribution, audio-visual and network systems. Work may include new and renovated buildings, as well as, the upgrading and/or the addition of cabling infrastructures and electronic equipment.
- B. This manual presumes that the user is familiar with telecommunications distribution systems, the cable and hardware used in them, the cabling pathways and support structures and the installation of cabling, video, audiovisual and network systems in buildings and campus environments. It is not intended to be a training manual in the design of telecommunications distribution systems, a replacement of existing industry standards or used as an installation guide by an installing contractor.
- C. Requests for variances or clarification of specific design and/or standards issues shall be submitted to the Duluth Public Schools Facilities and Technology Departments.
- D. The intent of this manual is to depict the installation requirements necessary to support a specific Project. Contractor shall furnish materials shown and/or called for on Drawings and Specifications but not necessarily mentioned in the Drawings or Specifications that are necessary for the installation and support of the systems whether or not the material is specifically called for in both documents. In addition, the Contractor shall provide incidental equipment and materials required for the completion of systems included in this contract whether or not specified or shown on the drawings.
- E. The intent of listing specific brands is to establish a standard of quality, function and features. It is the responsibility of the bidder to insure that any product requested for substitution meets or exceeds every standard set forth by the product listed. Products or equipment will be considered only if equal or superior to that specified. To be "equal" or "equivalent" means to include the same performance qualities and characteristics and fulfill the serviceable function, including maintaining the components, as well as the ability to adequately service them, without any decrease in quality, durability and longevity, but not necessarily identical. Substitution of material shall be submitted to the Duluth Public Schools Technology Representative.

### 1.2 Hazardous Material

- A. Hazardous material such as asbestos is present in certain sites. **Consult with the Building Engineer** and refer to the Building Management Plan (located in the Main Office in each building) before penetrating or cutting materials that may contain asbestos. Contractor's must sign an acknowledgement form stating they have been informed about the locations of the asbestos, and have reviewed the asbestos management plan. For more information, contact ISD 709 Facilities Management at 218-336-8907.

## **Part 2: SPACES**

### **2.1 General**

- A. This manual addresses “typical” building spaces. They are; classroom, science classroom, computer lab, office, and telecommunications room spaces.
- B. Each space shall contain up to nine items. The location of each item shall be as instructed by a Duluth Public Schools authorized representative. Confirm each item to be installed as the budget may preclude or limit some of the equipment and/or systems listed for each space.

### **2.2 Typical Classroom Space**

- A. Each typical classroom shall contain; Plans of typical classroom at end of Telecommunications Standards.
  - 1. Seven data outlets.
    - a. Three locations with two data outlets.
    - b. One location with one data installed above ceiling in the center of room with 25 feet coiled labeled for future use.
  - 2. Cisco VOIP telephone, provided by owner.
  - 3. Classroom sound amplification system.
  - 4. Video projector.
  - 5. Interactive white board located in the front of the room.
  - 6. DVD/VCR player.
  - 7. Document camera.
  - 8. Classroom response system.
  - 9. Wireless access point, provided by owner.
- B. A teaching multimedia control station is located on the front wall of the room on the opposite side from the door.

### **2.3 Typical Science Classroom Space**

- A. Each typical science classroom shall contain;
  - 1. Six data outlets.
    - a. One location with two data outlets located at the control station.
    - b. One location with one data installed above ceiling in the center of room with 25 feet coiled labeled for future use.
    - c. Three locations with one data for wireless access points (WAP).
  - 2. Cisco VOIP telephone, provided by owner.
  - 3. Classroom sound amplification system.
  - 4. Video projector.
  - 5. Interactive white board located in the front of the room.
  - 6. DVD/VCR player.
  - 7. Document camera.
  - 8. Classroom response system.
  - 9. Three wireless access points, provided by owner.
- B. A teaching multimedia control station is located on the front wall of the room on the opposite side from the door.

### **2.4 Typical Computer Lab Space**

- A. Each typical computer lab shall contain;
  - 1. Forty-six data outlets.
    - a. One location with four data outlets located at the control station.
    - b. Eighteen locations with two data outlets for student computers.
    - c. Two locations with one data for security cameras.

- d. One location with one data installed above ceiling in the center of room with 25 feet coiled labeled for future use.
- e. One location for a wireless access point (WAP).
- f. One location with two data outlets for printers.
- 2. Cisco VOIP telephone, provided by owner.
- 3. Classroom sound amplification system.
- 4. Video projector.
- 5. Projection screen, minimum diagonally 120".
- 6. DVD/VCR player.
- 7. Document camera.
- 8. Classroom response system.
- 9. Wireless access point, provided by owner.

## **2.5 Typical Administrative Workspace**

- A. Each typical administrative workspace shall contain;
  - 1. Two data outlets.
  - 2. Cisco VOIP telephone, provided by owner.

## **2.6 Typical Telecommunications Room Space**

- A. Telecommunications spaces are special-purpose spaces that provide a secure operating environment for telecommunications and/or network equipment and shall be designed and provisioned according to the requirements in ANSI/TIA/EIA-569-B.
- B. There should be a minimum of one 10 foot by 11 foot (1,100 square feet) telecommunications room per floor and for each 10,000 square feet area or if the horizontal distribution distance to the workstation exceeds 295 feet. Ceiling height should be no less than 8 foot 6 inches.
- C. Telecommunications rooms shall;
  - 1. Allow a minimum of 36 inches of clear working space in front and rear of equipment cabinets, racks and cross-connect fields.
  - 2. Have floors that are sealed concrete or tile.
  - 3. Be lined with trade size void free, 8 feet high, 3/4 inch AC-grade fire retardant plywood or plywood painted with two coats of white fire-retardant paint.
  - 4. Be accessible directly from public hallways and not through offices or other spaces.
  - 5. Be dedicated to telecommunications functions and related support facilities and shall not be shared with electrical installations or other equipment or building services.
  - 6. Be located such that the average horizontal cable run is 150 feet or less and that no individual cable run exceeds 295 feet.
  - 7. Not be located near electrical power supply transformers, elevator or pump motors, generators, x-ray equipment, radio transmitters, induction heating devices and other potential sources of electromagnetic interference (EMI) and radio frequency interference (RFI).
  - 8. Not have drop or false ceiling tiles installed.
  - 9. Not contain water or drain pipes including overhead piping of any type not directly required in support of the equipment within the room. Drain or drip pans with an appropriate drain shall be placed beneath each pipe. Sprinkler heads and pipes located within the room shall not be located directly above electronic equipment racks or cabinets.

## **Part 3: MATERIAL AND EQUIPMENT**

### **3.1 General**

- A. Systems shall include all incidental and insignificant items not specifically identified but which are necessary and essential for a complete and operational system.
- B. All products shall be new. Installation of used equipment is not allowed.

## 3.2 Data Cabling System

- A. Contractor shall furnish, install and test all necessary material and labor for a Category 6A cabling system as specified.
- B. Contractor shall furnish, install and test all necessary material and labor for a laser optimized 2000 MHz\km 50\125 micron Data Backbone Cabling system as specified.
- C. Telecommunications Outlets, Patch Panels and Assemblies:
  - 1. Connectivity products (patch panels, jacks, faceplate etc.) shall be by the same approved connectivity manufacturer for each building.
  - 2. Provide eight pin, eight conductor, TIA\EIA 568B pinout, light ivory in color, Category 6A jacks and patch panels meeting or exceeding EIA/TIA-568-B Category 6A specifications.
  - 3. Workstation jacks shall be flush with faceplate.
  - 4. Manufacturers: Provide products by one of the following.
    - a. Panduit TX6 10Gig series
    - b. Prior approved equivalent
- D. Horizontal UTP CABLE:
  - 1. Provide 100-ohm, 4-pair UTP, all FEP constructed, plenum jacketed, Category 6A cable meeting or exceeding EIA/TIA-568-B Category 6A specifications.
  - 2. Color: White for wireless access points, yellow for security cameras, blue for all other data outlets.
  - 3. Manufacturers: Provide products by one of the following.
    - a. General Genspeed 10000
    - b. Panduit TX6 10Gig
    - c. Prior approved equivalent
- E. UTP Patch Cords:
  - 1. Provide 100-ohm, 4-pair UTP, all FEP constructed, PVC jacketed, Category 6A patch cable meeting or exceeding EIA/TIA-568-B Category 6A specifications.
  - 2. Color: White for wireless access points, yellow for security cameras, orange for IP telephony phones, blue for all other data outlets.
  - 3. Lengths shall be equal quantities of 5 and 7 foot.
  - 4. Manufacturers: Provide products by one of the following.
    - a. Panduit TX6 10Gig
    - b. Prior approved equivalent
- F. UTP Workstation Cords:
  - 1. Provide 100-ohm, 4-pair UTP, all FEP constructed, international gray PVC jacketed, Category 6A workstation cable meeting or exceeding EIA/TIA-568-B Category 6A specifications.
  - 2. Lengths shall be equal quantities of 7, 10 and 15 foot.
  - 3. Manufacturers: Provide products by one of the following.
    - a. Panduit TX6 10Gig
    - b. Prior approved equivalent
- G. Backbone Optical Fiber Cabling:
  - 1. Provide Multimode, OM3, 50/125-micrometer, 24 strand fiber, loose tube, armored, plenum rated, aqua in color, laser optimized optical fiber cable exceeding EIA/TIA-568-B specifications.
  - 2. Minimum Modal Bandwidth: 2000 MHz-km at 850 nm; 500 MHz-km at 1300 nm.
  - 3. Manufacturers: Provide products by one of the following.
    - a. Corning
    - b. General
    - c. Hitachi
    - d. Prior approved equivalent
- H. Fiber Optic Patch Cords:
  - 1. Provide factory made LC to LC, multimode, 50/125-micrometer, dual fiber, aqua in color, laser optimized optical fiber patch cords.
  - 2. Lengths shall be 7 foot.
  - 3. Manufacturers: Provide products by one of the following.
    - a. Corning
    - b. Panduit

- c. Prior approved equivalent
- I. Equipment Rack:
  - 1. Provide 7 foot by 19 inch floor mounted steel equipment rack, black in color with integrated vertical and horizontal wire management.
  - 2. Quantity: One per wiring closet.
  - 3. Manufacturers: Provide products by one of the following.
    - a. Chatsworth 55053-703
    - b. Prior approved equivalent
- J. Four Post Equipment Rack:
  - 1. Provide 7 foot by 19 inch four post floor mounted steel equipment rack, one ton load rated, black in color.
  - 2. Quantity: One per main wiring closet.
  - 3. Manufacturers: Provide products by one of the following.
    - a. Chatsworth QuadraRack
    - b. Prior approved equivalent
- K. Rack Cable Manager:
  - 1. Provide 7 foot by 10 inch two sided vertical cable and patch cord manager, black in color.
  - 2. Quantity: One per wiring closet plus one per rack.
  - 3. Manufacturers: Provide products by one of the following.
    - a. Chatsworth 30163
    - b. Prior approved equivalent
- L. Power Strip:
  - 1. Provide 1U Rack Height, 120v Input and Output, install in each rack and cabinet.
  - 2. Quantity: One per rack and cabinet.
  - 3. Manufacturers: Provide products by one of the following.
    - a. Leviton 5500-190 Rackmount
    - b. Prior approved equivalent
- M. Ground Rail:
  - 1. Provide 19 inch ground rail, install in each rack and cabinet.
  - 2. Quantity: One per rack and cabinet.
  - 3. Manufacturers: Provide products by one of the following.
    - a. Chatsworth 10610-019
    - b. Prior approved equivalent
- N. Uninterruptible Power Supply:
  - 1. Provide rack-mount UPS with 120V Input and Output, black in color. Confirm with owner for sizing requirements.
  - 2. Interface Ports: RS232, SmartSlot, USB, Network Jack, Temperature Probe.
  - 3. Quantity: One per telecommunications room.
  - 4. Manufacturers: Provide products by one of the following.
    - a. APC
    - b. Prior approved equivalent

### 3.3 TV Distribution

- A. The District will distribute the TV distribution signal via IP. Each location where TV Distribution is required, a data jack shall be placed. Jacks and connecting hardware shall meet requirements of the data cabling system.

### 3.4 AV Presentation System

- A. Contractor shall furnish, install and test all necessary material and labor for AV presentation systems that include, but are not limited to interactive white boards, video projectors and associated cabling and mounting hardware, Sound field system and associated cabling and mounting hardware, and system control and monitoring systems and associated cabling and mounting hardware.
- B. Systems shall present audio and visual service of live locally-originated and prerecorded signals.
- C. Video Projector: Provide 2200 ANSI lumen XGA video projector. Projector shall have four input

connectors, 30 degree keystone correction and 5 watt audio speaker. Include all necessary mounting hardware. Include one spare projector bulb for every 3 projectors provided.

1. Manufacturers: Provide products by one of the following.
  - a. Epson 83C
  - b. Prior approved equivalent
- D. Interactive White Board (IWB) System: Provide 77 inch diagonal Interactive white board with integrator projector, touch sensitive surface, pen tray, Bluetooth USB, height adjustable wall mount bracket and software capable of operating Windows or Macintosh applications. Include wall mount brackets and all necessary mounting hardware and cabling.
  1. Manufacturers: Provide products by one of the following.
    - a. SMART Technologies 680i Gen2 with ECP and WC6
    - b. Prior approved equivalent
- E. DVD\SVHS Video Cassette Player: Provide DVD\SVHS video cassette player with 4 head, Hi-Fi stereo, and infrared remote control. Deck shall be capable of DVD, DVD-RW, DVD+RW, CD, CD- RW/-R, JPEG, MP3, VCD and VHS playback.
  1. Manufacturers: Provide products by one of the following.
    - a. Sony SLV-D380P
    - b. Prior approved equivalent
- F. Infrared Sound Field System: Provide infrared sound field system with integrated 50 watt output amplifier and four speakers. System shall have separate volume controls for each wireless and line level input and line level output for assisted listening systems. Include AEH-07 handheld microphone/transmitter, AERC-07 teardrop pendant style transmitter/microphone with AE-1002 Omni directional collar microphone, CS-07 charging stand for handheld and teardrop microphone, AE-DCF dome sensor mixer and two EDS-07 IR dome sensors. Speakers shall be ceiling mount where lay-in ceilings are present or wall mounted where hard ceilings are present, contractor shall verify speaker type prior to ordering. Include all necessary mount hardware and associated cabling.
  1. Manufacturers: Provide products by one of the following.
    - a. Audio Enhancement Ultimate II
    - b. Prior approved equivalent
- G. Two Gang AV Faceplate: Light ivory in color and must containing a computer video with stereo audio interface and an additional stereo audio interface.
  1. Manufacturers: Provide products by one of the following.
    - a. Extron AAP Series
    - b. FSR PCI-5BWPA with FSR IPS-A510S
    - c. Prior approved equivalent
- H. Document Camera: Provide document camera with true 20fps, native XGA 1/3 inch 850,000 pixel progressive scan CCD 4 head, 42x powered auto focus, zoom lens, and 270 degrees rotation on the base and camera head.
  1. Manufacturers: Provide products by one of the following.
    - a. Samsung SDP-850DX Compact Digital Presenter
    - b. Prior approved equivalent
- I. Classroom Response System: Provide classroom response system with LCD screen. Remotes shall be RF and do not require a line of sight with the receiver. Remotes have a range of up to 100 feet and be capable of operating with Windows or Macintosh applications.
  1. Manufacturers: Provide products by one of the following.
    - a. SMART Technologies Steneo
    - b. Prior approved equivalent

## **Part 4: STANDARDS AND PRACTICES**

### **4.1 General**

- A. All cabling, equipment and work shall conform to the most recent requirements of the following codes, standards and organizations where applicable:
  1. American National Standards Institute (ANSI)



2. Electronic Industries Association (EIA)
  3. Federal Communications Commission (FCC)
  4. Institute of Electrical and Electronics Engineers (IEEE)
  5. International Standards Organization (ISO)
  6. National Electrical Code (NEC)
  7. National Fire Protection Association (NFPA)
  8. Telephone Industries Association (TIA)
  9. Underwriters Laboratories (UL)
- B. The contractor shall be licensed to install power limited cabling systems in the State of Minnesota.
  - C. All personnel on site shall have been trained in the types of systems they are installing.
  - D. The Contractor shall obtain all required permits.
  - E. Contractor shall ensure that all work areas are cleaned and free of dust and debris at the end of each work day.
  - F. Contractor shall provide firestop for all conduits and penetrations used for telecommunications cabling.
  - G. Contractor shall provide a 10 foot long service loop in the wiring closet room a 4 foot long service loop at the station end of the cable.
  - H. Contractor shall provide a one (1) year warranty on all defective material and labor starting at the date of completion.
  - I. All systems shall be tested to most recent parameters of operability as recommended by the appropriate system standards body.

## **4.2 Installation**

- A. Install all cabling, equipment and components specified in accordance with manufacturers written installation instructions and in compliance with all standards and regulatory requirements.
- B. Contractor shall remove and legally dispose of all abandon telecommunications systems components.
- C. All work must be performed by factory authorized and trained personnel.
- D. Install equipment to facilitate service, maintenance, and repair or replacement of components of both communications equipment and other nearby installations.
- E. Comply with requirements and recommended practices of the NEC, TIA/EIA and BICSI for grounding conductors, connectors and systems.
- F. Comply with TIA/EIA-606-A for labeling materials, including label stocks, laminating adhesives, and inks used by label printers.
- G. Where raceway is not furnished, provide J-hooks to support all cabling.
- H. Cables installed in telecommunications rooms shall be fastened with Velcro type cable ties. Ties shall be plenum rated.
- I. Patch panels shall be installed at the top of the equipment rack.
- J. Conceal conductors and cables in accessible ceilings, walls, floors and raceway where possible. Exposed cabling, cabling mounted to ceiling supports, conduit or other devices is not acceptable.
- K. Fixed projectors, lenses and cameras shall be solidly mounted and braced so there shall be no observable movement in the image induced by motor vibration or other mechanical operations.

## **4.3 Identification and Labeling**

- A. Identify system components, wiring, and cabling complying with TIA/EIA-606-A and as specified.
- B. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with faceplate and cable jacket color but still complies with requirements in TIA/EIA-606-A. A sample shall be required for approval.
- C. Jacks modules will have two computer icons installed, blue icon on the left, white icon will be on the right, and this will correspond to the icons on the patch panel.
- D. Identify each outlet and associated termination point with the following label format. Telecommunications Room (TR) number followed by the room number followed by letter A through Z followed by a number 1 through #. The letter indicating work area outlet within the room and the number indicated the jack within the work area outlet if more than one jack is installed.

### **Example of Work Area Outlet Labeling:**

TR1-121-A1	Terminated in Telecommunications Room 1 (TR1), 1st cable of the 1st work area outlet in Room 121.
TR1-121-A2	Terminated in Telecommunications Room 1 (TR1), 2nd cable of the 1st work area outlet in Room 121.
TR1-121-A3	Terminated in Telecommunications Room 1 (TR1), 3rd cable of the 1st work area outlet in Room 121.
TR1-121-A4	Terminated in Telecommunications Room 1 (TR1), 4th cable of the 1st work area outlet in Room 121.
TR1-121-B1	Terminated in Telecommunications Room 1 (TR1), 1st cable of the 2nd work area outlet in Room 121.
TR1-121-B2	Terminated in Telecommunications Room 1 (TR1), 2nd cable of the 2nd work area outlet in Room 121.
TR2-202-K1	Terminated in Telecommunications Room 2 (TR2), 1st cable of the 11th work area outlet in Room 202.

### **Example of Patch Panel in all Telecommunication Enclosures:**

121-A1	1st cable of the 1st Work Area outlet in Room 121.
121-A2	2nd cable of the 1st Work Area outlet in Room 121.
121-A3	3rd cable of the 1st Work Area outlet in Room 121.
121-A4	4th cable of the 1st Work Area outlet in Room 121.
121-B1	1st cable of the 2nd Work Area outlet in Room 121.
121-B2	2nd cable of the 2nd Work Area outlet in Room 121.
202-K1	1st cable of the 11th Work Area outlet in Room 202.

## **Part 5: ACCEPTANCE AND TESTING**

### **5.1 General Acceptance Cabling System**

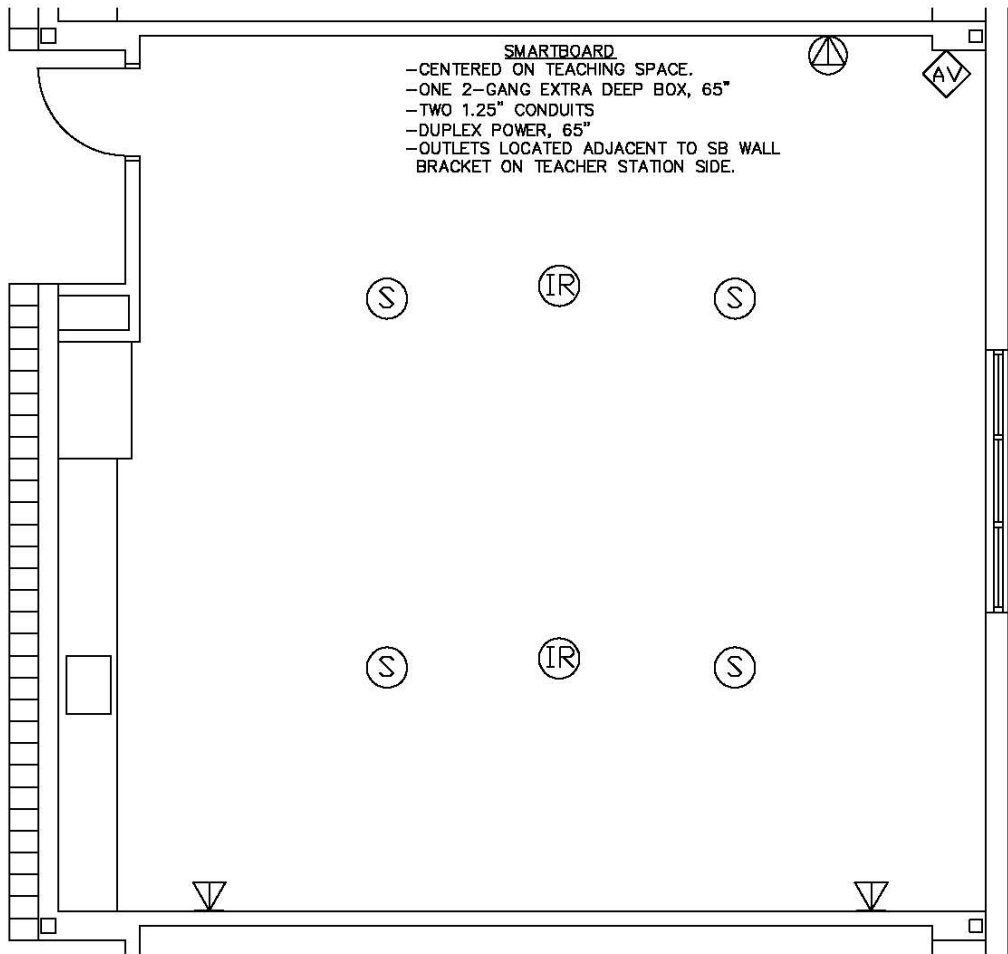
- A. Test results of the data cabling shall be certified to meet or exceed the ANSI/TIA/EIA 568-B Category 6A standards and be provided to ISD709 in an electronic format (CD, DVD, etc.). The test information must minimally include the following;
  1. Vendor's name
  2. Test date
  3. School summary sheet. The summary sheet must minimally include the following;
    - a. School name
    - b. Test results sorted by work area outlet label
    - c. The total cable distance
    - d. Category 6A pass or fail status
  4. The complete test result information and format will vary between the test equipment used by the vendor but must include the following information for each cable tested.
    - a. Testing date
    - b. Name of person performing the test
    - c. Work area outlet label
    - d. Cable length
    - e. Category 6A pass or fail status
- B. An authorized ISD 709 representative for final acceptance will do a review of the cabling installation, labeling and all documentation required.

### **5.2 General Acceptance Audio Visual System**

- A. Test results of the audio system shall meet or exceed the following;
  1. Signal-to-Noise Ratio: (including cross talk) 55 dB minimum.
  2. Total Harmonic Distortion: 0.1% maximum from 20 Hz to 20,000 Hz.



3. Frequency Response:  $\pm 1.0$  dB, 20 Hz to 20,000 Hz.
  4. Test sound output capability using recorded music and microphones to provide program levels of not less than 95 dB in the seating area without objectionable distortion, rattle or buzz.
  5. Hum and noise shall be inaudible under normal operation and as observed in normal seat locations.
- B. Test results of the video system shall meet or exceed following;
1. Signal-to-Noise Ratio: (peak to RMS) un-weighted DC to 4.2 MHz: 55 dB minimum.
  2. Frequency Response:  $\pm 0.5$  dB to 4.2 MHz.
  3. Test sound output capability using recorded music and microphones to provide program levels of not less than 95 dB in the seating area without objectionable distortion, rattle or buzz.
  4. Hum and noise shall be inaudible under normal operation and as observed in normal seat locations.



**DUAL DATA OUTLET**  
 ONE 2-GANG EXTRA DEEP BOX, 18"  
 ONE 1.25" CONDUIT  
 DUPLEX POWER



**INSTRUCTIONAL MULTIMEDIA OUTLET**  
 TWO 2-GANG EXTRA DEEP BOX, 18"  
 TWO 1.25" CONDUITS TO 1ST, ONE 1.25" CONDUIT TO 2ND BOX,  
 DOUBLE DUPLEX POWER, 18"



**AUDIO SYSTEM W/DVD/VCR**  
 ONE 2-GANG EXTRA DEEP BOX, 48"  
 TWO 1.25" CONDUITS  
 DUPLEX POWER, 48"



**AUDIO SYSTEM SPEAKER**



**AUDIO SYSTEM INFRARED RECEIVER**



**The Woodland Group, Inc.**  
 12427 Central Avenue NE, Suite 210  
 Phone 755-757-4224  
 Fax 755-757-4225

## DULUTH PUBLIC SCHOOLS BUILDING UPDATES

**PROJECT NO. XX-XXXX**

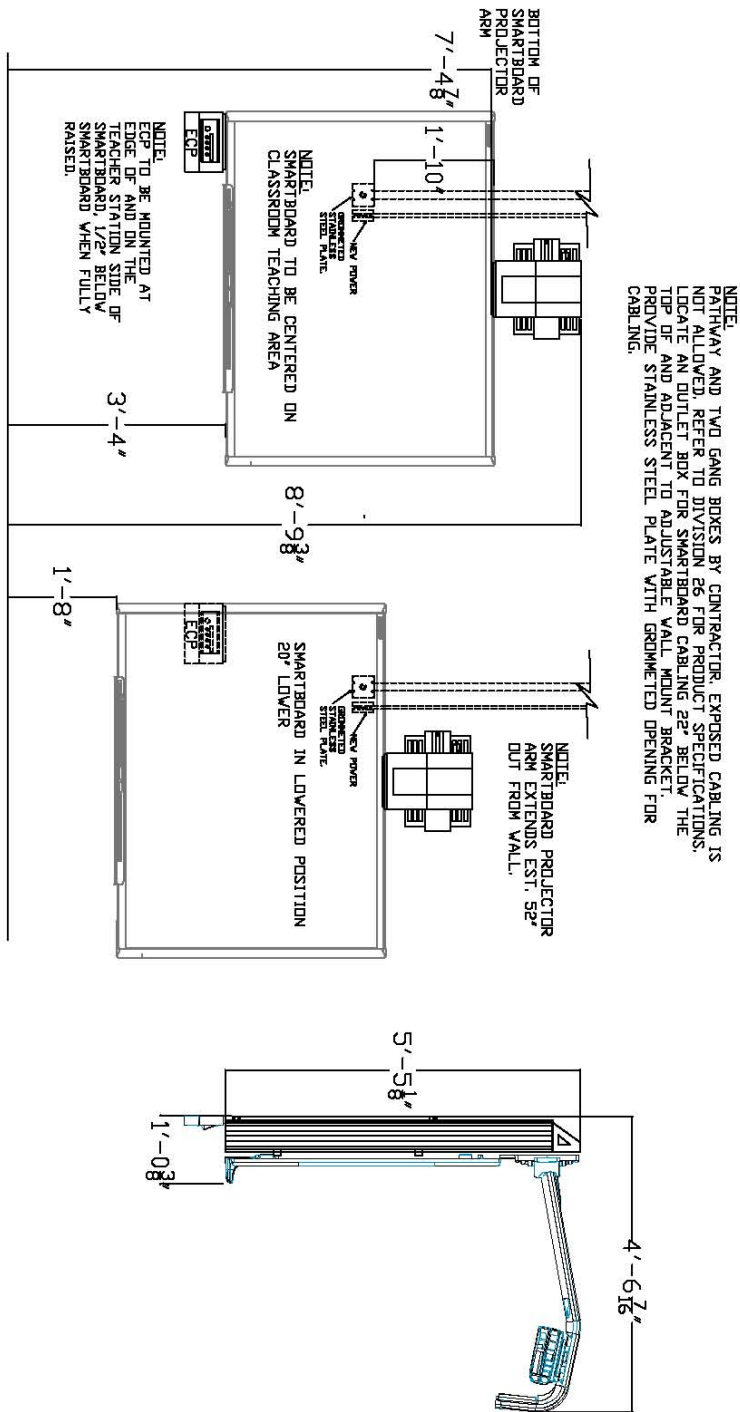
## TYPICAL CLASSROOM LAYOUT

**SCALE: NONE**

**DIVISION 27  
DETAIL**

**T-X**

**DATE: 11/10/08  
DRAWN BY: JAW**



## DULUTH PUBLIC SCHOOLS BUILDING UPDATES

PROJECT NO. XX-XXXX

## TYPICAL MINIMUM ELEMENTARY SCHOOL SMARTBOARD HEIGHT DETAIL

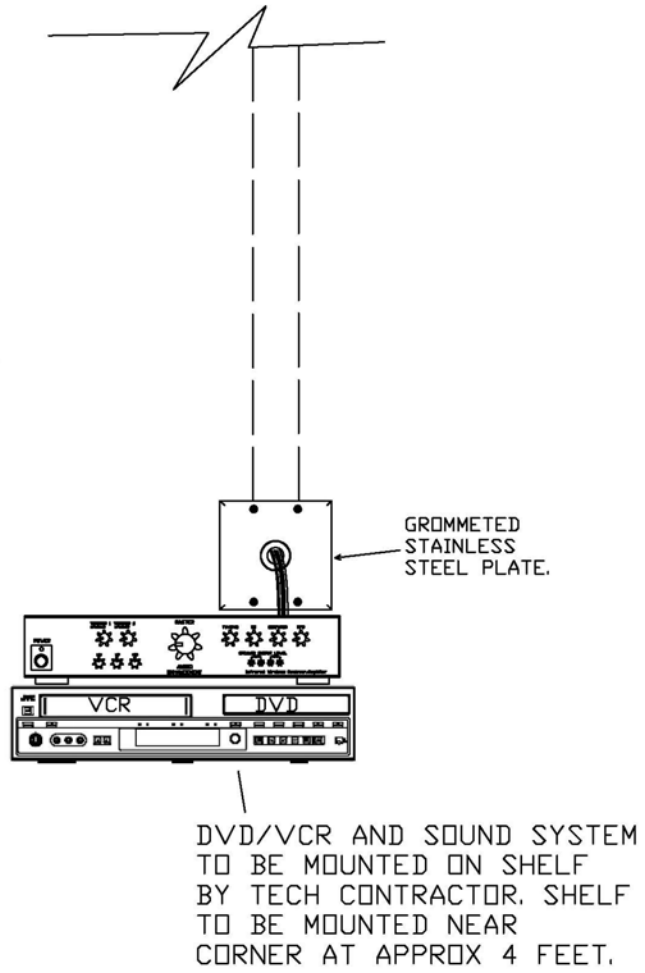
SCALE: NONE

DIVISION 27  
DETAIL

**T-X**

DATE: 11/10/08  
DRAWN BY: JAW

NOTE:  
 PATHWAY, TWO GANG BOX  
 AND FACEPLATE BY  
 CONTRACTOR. REFER TO  
 DIVISION 26 FOR PRODUCT  
 SPECIFICATIONS.



**DULUTH PUBLIC SCHOOLS  
 BUILDING UPDATES**

**PROJECT NO. XX-XXXX**

**TYPICAL AV AMP & DVD  
 SYSTEM LOCATION  
 DIAGRAM**

**SCALE: NONE**

**DIVISION 27  
 DETAIL**

**T-X**

**DATE: 11/10/08  
 DRAWN BY: JAW**